FROM PROMETHEUS TO PISTORIUS: A GENAELOGY OF PHYSICAL ABILITY

by

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Abstract

(Fragile Frames + Monstrosities)ModernWar
+ (Flagged Bodies + Cyborgs)PostmodernWar
= dis-AbilityCyborged

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Chapter 1
Introduction

The history of war is, in reality, the history of men, young men and of the breaking of their bodies on the frontlines. The First World War (WWI) marked the beginning of a global ideological shift: "for modernism as a whole" when, "The urge to create and destroy changed places. The urge to destroy was intensified; the urge to create became increasingly abstract" (Eksteins 1989:329). The "Great War" suffered "great" (massive) casualties with conflict lasting for such a long period of time that even death itself became mundane.[1] However, some men returned: severely wounded, marred by the trenches, shells, machine guns and gas. Artist Otto Dix endeavoured to capture this bleak reality in his paintings, seen in images such as *The Skat Players* (1992:101). This painting depicts three men severely deformed wearing odd-looking prosthetics, a representation of the grotesque and twisted reality of post-WWI life for many veterans. Despite these wounds their ability to play "skat" remains, which evokes the grotesque reality of life after acquired disability: "There is something deeply disturbing about the fact that these grim figures are not just artistically but also physically composed of collaged fragments of different materials" (Otto Dix 1992:101).[2] This is one of the many ironies that confront both historic and contemporary conflicts; and it is in this sense that art, based on life, brings new insight into the "games" of war. *The Skat Players* stands as a salient reminder

[1] "When there's 'nothing to report' from France, that means the regular 5,000 casualties that happen every day" (Eksteins 1989:155)

[2] This work of Dix is a salient example of the Dadaist method of juxtaposition, "producing a shocking realism which succeeds in penetrating the spectator's consciousness with a horror that is both physical and psychological" (Otto Dix 1992:101). It is this literal and figurative patchwork of humanness that comes to bear in the later chapters and is evidenced through the deconstruction of disability, the military and the cyborg soldier (see Chapter 3).

of war in the twentieth century. Furthermore, it brings to fore the importance of artistic interpretations of reality which demonstrate that art and life exist in a feedback loop with each other impacting each other in extreme and visceral ways (Haraway 1991:164; Cichowski 2007; Case 2011). Famously, Oscar Wilde claims in his Socratic treatise, *The Decay of Lying* that, "Life imitates Art far more than Art imitates Life" (1999:39). This can be seen in the image of the "cyborg soldier," a figment that is better understood as part of popular science-fiction (sci-fi) versus physical fact (Masters 2010). However, this body has shifted from art to life, "Life holds the mirror up to Art, and either reproduces some strange type imagined by painter or sculptor, or realizes in fact what has been dreamed in fiction" (Wilde 1999: 32-33, 39; Cichowski 2007; Masters 2010).[3]

Classical warfare, with structured often-familiar enemies and enemy lines and with state pressed against state was both the work and the sacrifice of the flesh; however, this no longer exists. Instead, unknown enemies in unfamiliar places characterize conflicts of the twenty-first century. For this task the cybernetic interface and robotic technologies have begun to not only augment, but also replace the "human" (Haraway 1991; Masters 2010). Today, we are witness and complicit in a "Postmodern War" – a war of technologies, of uncertainty, of chaos and complexity (Gray 1997:7; Bousquet 2008:917). The *Skat Players* remains as a representation of the harsh realities for casualties of war. However, with the forthcoming prosthetic revolution and the

[3] This is especially salient in the field of robotics, as work of this nature follows fiction writer Isaac Asimov's three laws of robotics, which are actually taught to students in robotics programs across the globe: "(1) A robot may not injure a human being, or through inaction, allow a human being to come to harm. (2) A robot must obey any orders given to it by human beings, except where such orders would conflict with the first law. (3) A robot must protect its own existence as long as such protection does not conflict with the First or Second laws" (Asimov1991:37; Meadows 2011:19).

introduction of robotics to the frontlines create imagery that is more akin to the *Terminator* series or *2001: A Space Odyssey* versus Dix's post-war art (Cameron 1984, 1991; Kubrick 1968; Otto Dix 1992).

Though the tools of soldiers have changed, Artificial Intelligence (AI) is still limited. Some of these semi-autonomous systems include: PackBots, Reaper drones and human-enhancing technologies (Singer 2009a; Meadows 2011). Exoskeletons and prosthetics for bodies living with acquired disability are rebuilding the limits of the "human" frame. These renewed abilities of the human frames and the realisation of new corporeal boundaries pose a threat to monolithic conceptions of humanness. A question about the realities of contemporary humanness must be asked: have we become Posthuman? Modern militaries are using stranger than fiction technologies (even beyond the imaginings of sci-fi) to fight off enemies because, "When a robot dies, you don't have to write home to its mother" (Singer 2009a). Therefore, the face of contemporary warfare no longer showcases merely the image of the soldier but rather the cybernetic machinery augmenting the soldering body, both on and off the battlefield.

Even though the human is no longer the only figure that contributes to the logistics of conflict, the soldier is still marred by physical and psychological scars that remain long after the battles have been fought (Otto Dix 1992; Grabham 2009:64; Becker 2000:326; Lagacé 2010). In the realm of Disability Studies materiality becomes requisite to comprehend the diverse lived experiences of the body. There is a vast array of "disabilities," and those classified as "disabled" (either self-identified or externally labelled) experience their bodies in unique and different ways (Davis 2006; Siebers

2008). In this study, the body in question is an individual with acquired limb loss in the wake of war, known as the military amputee. These bodies maintain a symbolic value of the state that is forced to co-exist with the fallibility of their flesh. The military amputee becomes an exemplary platform for engagement with identity politics of the twenty-first century. These fragile frames are both deconstructed (and then reconstructed) by modern technologies of war (and rehabilitation). This has in turn had a trickle down effect in the field of prosthetic technologies (Bousquet 2009). The experiences of war have been transformed with the advent of advanced technological innovation in weaponry, networking and biomedicine (Gray 1997; Masters 2010).

This Master's thesis looks to sci-fi and the contemporary soldiering body as sites for an exploration of the changing nature of war. Disability Studies provides the main vantage point from which to interrogate the realities of "postmodern war" (Gray 1997). The result of the intimate interface between disability and military spawns the "cyborg soldier" (Gray 1997; Masters 2010). The number of severely injured Canadian and American troops returning from the contemporary conflicts in Afghanistan and Iraq (versus the numbers killed in twentieth century warfare) has dramatically increased (Bogue 2011). This increase is due to new threats, such as the Improvised Explosive Device (IED), "IEDs used in Afghanistan had increased by 400% since 2007 and the number of troops killed by them has risen by a similar percentage; the proportion of those wounded has increased by 700%" (Bogue 2011; DND 2011; Patzkowski, Blanck, Owens, Wilken, Blair and Hsu 2011). The IED is an extremely malleable device, existing in a wide variety of forms and functions:

> They can contain many different types of initiators, detonators, penetrators and explosive loads, including artillery shells, mines and conventional or homemade high explosives. Anti-personnel IEDs typically also contain shrapnel-generating objects such as nails or ball bearings. Equally, IEDs can be triggered by several methods which include remote control/cellphones, infrared or magnetic triggers, pressure-sensitive bars, trip wires and electrical command wires. In many cases, they are triggered by two hack-saw blades separated by a spacer. Stepping on or driving over the blades completes an electronic circuit which initiates detonation. In some cases, multiple IEDs are wired together in a so-called "daisy chain" to attack a convoy of vehicles (Bogue 2011).

This makes the fronts of Afghanistan extremely "hostile foreign terrain" (Bogue 2011; DND 2011). The IED represents modern technologies of "chaoplexity," and are being combated on the allied side with state of the art robotic technologies of the American Military Industrial Complex (MIC) (Bousquet 2008:917). In turn bodies, war and their union – the cyborg soldier – will be interrogated, through three Chapters: Human as Machine (disability), Machine as Human (robotics) and HumanMachine (sport and the cyborg).

My Body is a Cage

Chapter 1, *Human as Machine* looks to socially locate the body exploring how ability and disability have been constructed in both historical and contemporary representations (Foucault 1979; Magdalinski 2008; Siebers 2008). This train of theoretical and discourse review and critique is meant to address the centrality of the charity, medical and social models of disability, as well as their major critiques (Davis 1995, 2006; Democracy Disability and Society Group 2003; Siebers 2008). Disability has been portrayed through a number of tropes, and in this chapter the monstrosity of the body is deployed. Using

Mary Shelley's *Frankenstein* as a sci-fi parallel to the historic freak show, disability can be explored as an oppressed identity politic (Garland-Thomson 1996; Lykke 1996).

Chapter 2, *Machine as Human*, engages with the realities of "postmodern war" exploring the shifting role of the soldiering body in the face of modern technologies of war, specifically robotics (Doyon 2005:38; Masters 2010; Bogue 2011). Traditional wars of the flesh are now augmented by digital and robotic technologies fought through intimate cybernetic interfaces (Haraway 1991; Gray 1997; Hayles 1999). Mass fatalities are on the decline due to modern technological improvements but those who return have often been severely injured (Nessen, Lounsbury, Edmond and Hetz 2008; Bogue 2011; Patzkowski et al. 2011). This chapter also looks to debunk the false consciousness around the probabilities of "strong AI" seen in sci-fi representations that highlight the wars of man versus machines (Cameron 1984, 1991). Machines are tools and though sci-fi representations warn of the abilities of these tools to dominate humans we are quite distant from that reality. Instead robots act as prosthetics for troops, augmenting human potential and challenging classical conceptions of war (Von Clausewitz 1976).[4]

Chapter 3, *HumanMachine* marks a collapsing of the binary between nature and artifice. The "tactical athlete" demonstrates the mechanical reconstruction of bodies that have been broken and rehabilitated through sport (Messinger 2009:2; Lagacé 2010; McKie 2011). The histories of sport and war are explored for their intimacy, which unsurprisingly has contributed to sport-oriented rehabilitation programs as well as the

[4] Here, the term "prosthetic" is understood as an extension of self or "artificial body part," affixed externally to the body.

Olympic and Paralympic Games. The injured solider, who loses a limb in battle, has torn flesh replaced with sleek prosthetics and it is from here that the "cyborg" emerges (Haraway 1991; Gray 2003; Masters 2010; Norman and Moola *forthcoming*). Cyborg soldiers are a real manifestation of the scientific imagination, cultivated through the histories of both war and sport (Orwell 1945; McLaren 2009; Hughes 2009; Scherer and Koch 2010).

The soldier's body becomes the site of a narrative structure that fits well with Michel Foucault's method of "genealogy." It is therefore the ideal site, from which to dissect the "truths" behind popular conceptions of ability (1979). This type of analysis will reveal the complexities of both "disability" and "humanness," which are situated within varying social relations (Seidman 2008; Watermeyer and Swartz 2008). Foucault's work serves as a toolbox for developing this analysis used, to debunk myths and challenge dominant discourses, to chronicle:

> [A] set of different knowledges, all marginalized in some ways from the dominant defining discourse…Genealogy also signifies all the complexity of a living family, involving not just facts about occupations, travels, children, deaths, and so on but also the intangible elements of myth, mystery, incompleteness and the tangle of relationships wound with the emotions of love, hate, and indifference (Gray 1997:98).

This thesis will use this method to deconstruct the myths that lie around disability, the military, sport and the cyborg. As Foucault himself stated in an interview, if we can use his work as a "screwdriver or spanner to short-circuit, discredit or smash systems of power…so much better!" (Foucault cited in McLaren 2009). Therefore using this Foucaultian lens as a foundational form of critique to breakdown the ideals that govern the contrasting roles of disability and ability, we can discover that the "normal" is merely

"a configuration that arises in a particular historical movement…part of a notion of progress, of industrialization, and of ideological consolidation of the power of the bourgeoisie" (Davis 1995:49). Through tracing dominant conceptions of ability throughout history, via a genealogy of physical ability, the multiple truths of corporeality can be uncovered (Dewsbury Clarke, Randall, Rouncefield and Sommerville 2004:157; Seidman 2008).

The pure soldiering body is a figment of both idealized corporeality and the scientific imagination. The fragile human body, disabled through military service, gives rise to the postmodern cyborg body. Through analyzing the literal destruction and then reconstruction of the modern soldier through the lens of Disability Studies, this thesis asserts that the disabled body – a casualty of war – makes use of advanced biomedical innovations, in the way of prosthetics, to itself transcend antiquated concepts of essential humanness (Haraway 1991; Magdalinski 2008; Gray 2003; Watermeyer and Swartz 2008; Masters 2010). This transcendence not only plays with conceptions of idealized sporting bodies (as imagined by Baron Pierre de Coubertin and Sir Ludwig Guttmann) but can also be seen as a site of activism to further the accessibility of advanced technologies for civilian as well as military casualties (Beamish and Ritchie 2006; Bailey 2008; Magdalinski 2008). The method of genealogy paired with a sociological approach permits an integration of the personal and political by tracing the intersection of personal biography with its historical and social location.

Chapter 2

Human as Machine

Constructions of DISability: Freaky Frames, Bizarre Bodies and Sick Selves
Deconstructing "disability" and reimagining "the disabled"[5]

On a daily basis, North Americans are inundated with images of "the perfect body" – fit elite athletes, thin beautiful celebrities and airbrushed centre folds (Shogan 1999; Connell 2001; Magdalinski 2008; Gray 2009). These images suggest that one can potentially achieve the ideal body through external infiltrations or personal discipline by using the latest developments in science and technology, such as dietary regimens, excessive exercise and even surgery (Foucault 1979; Magdalinski 2008). Central to these false promises lies the myth of corporeal perfection (Connell 2001; Magdalinski 2008). Contrary to these idealized images of corporeality in popular culture, lies the human body that is often blemished by bumps, bruises, scratches and breaks (Hughes 2007; Siebers 2008:71). Some bodies incur severe injury, chronic illness and even disability (temporary or permanent) throughout their lives. Disability Studies from its inception in the 1980s, has engaged with the situated location of disability from a variety of perspectives (Davis 1995, 2006; Shakespeare 1998; Hughes 1999, 2007, 2009; Barnes 2000; Corker and Shakespeare 2002; Siebers 2008). The fallibility of the human frame has enabled scholars and journalists alike to recognize the impossibility of these ideals, because in reality

[5] The author wishes to recognize the heavy criticism for the words "disability," as a category of classification. However, there is no language currently in use that is superior to this terminology (in fact there are many worse), therefore, for the sake of this thesis project, "disability," will be the dominant terminology. The term "the disabled" is used here with a sense of satire or irony.

"You too, *can't* have a body like this" (Connell 2001; Magdalinski 2008; Bee 2010). Disability, contrary to its definition,[6] is a normative expression of the human frame, not fixed and impenetrable but dynamic and fragile. Sifting through the literature on disability, one can highlight such inconsistencies within idealized conceptions of the pure "human" body. Through a short analysis of the dominant models of disability – charity, medical and social as well as their critiques, an interdisciplinary approach will be demonstrated to be the method of Otherness and ideal for the discussion of disabled identity (Democracy Disability and Society Group 2003; Nicholls 2011). The trope of monstrosity, that often confronts the disabled frame, can be used to comprehend the dynamic and fractured identities that make up a Person With a Disability (PWD) and what this means in a postmodern (and posthuman) era.

What is Essential Hu(Man)Ness? Reclassifying the Monstrous

The "human" is constructed as a privileged position that assumes a public space, "a being that is publicly considered an agent in the world," to be considered fully human is "contingent on social recognition; it speaks to social value" (Landsman 2008:52). The allocation or recognition of humanness confers legal rights and agency onto the individual (Palmer 2009). Attempts to establish and re-establish who or what constitutes a "human" have occurred throughout history (Garland-Thomson 1996; Mitchell and Snyder 1997; Hughes 1999, 2007, 2009; Mihic 2008; Palmer 2009). Human, is not a

[6] *Disability, n.* is a, "(1) a. Lack of ability; inability, incapacity; weakness, b. An instance of lack of ability. Chiefly in *pl.* (2) a. physical or mental condition that limits a person's movements, senses, or activities; the fact or state of having such a condition" (OED 2011). "Disabled," is therefore portrayed as a negation of *ability*, *n.* which is defined as, "Suitableness or adaptation *for* a purpose; fitness, aptitude; (also) an instance of this" (emphasis original OED 2011).

universal designation and therefore refers only to the select number of bodies that are seen as deserving their position: "Everywhere there is a human kind embracing the home society" however, it is only the "socially dominant members" who enjoy this privileged position fully (Landsman 2008:51). The very definition of humanity therefore relies on socially contingent foundations, which can shift depending on the current cultural or political climate (Watermeyer and Swartz 2008). These constructed standards have excluded a vast number of bodies throughout history, under the guise of scientific fact: "Much nineteenth-century science devoted itself to policing the category of human by questioning the full humanity of women and people of color" (Cohen and Weiss 2003:133). These discriminatory practices are still in effect and confront the physically disabled body in the form of environmental as well as social and political barriers. The disabled body, similar to other minority identities, and throughout history, has been designated a wide variety of offensive and conflicting labels.

> We are held to be visually repulsive; helpless; pathetic; dependent; too independent; plucky, brave and courageous; bitter, with chips on our shoulders; evil (the 'twisted mind in a twisted body'); mentally retarded; endowed with mystical powers; and much else (Sutherland 1981:6).

Disability theorist, Bill Hughes, mobilizes three more tropes, the "wounded, monstrous and abject" to explore further the dynamics of disability (2009). He argues that each of these tropes has operated to establish the disabled body at the bottom of a hierarchy of bodily manifestation. Hughes explains that the disabled body is seen as wounded, not whole as well as monstrous and abject or Other (non-human) when compared to the Self (or human) embodied within the trope of the normalized able-body (Hughes 2009). The classification of "human" (humanness) is contingent on this social location, "The concept

of the human, then, does not involve a fixed definition but must be a work in progress, just as human beings should always be works in progress" (Siebers 2008:92). Hughes' exploration of "monstrosity" is especially revealing as it confronts popular constructions of the disabled as less than human. This can be explored through the uncanny relationship between disability and monstrosity that exists both within fact and science-fiction (Shelley 2011). This relationship expresses the socially constructed and fragile binaries that separate "natural" humanness from animality and artifice. To actualize disability requires the breaking down of stringent barriers, specifically those constructed through archaic binaries that separate human from machine.

Mary Shelley's *Frankenstein or the Modern Prometheus* highlights a futuristic vision, exploring the naïveté of an unchecked technophile (Shelley 1823; Mitchell and Snyder 1997; Hughes 1999). The abnormal physiology of "the monster" exacerbates anxiety, which often accompanies the unknown, requiring the normal Self to differentiate from monstrous Other (Said 1979).[7] *Frankenstein* confronts the fears that emerge from concerns around the stability of the category of essential "humanness" (Shelley 1823; Halberstam and Livingston 1995; Mitchell and Snyder 1997; Hughes 1999; Watermeyer and Swartz 2008). Shelley's villain Dr. Victor Frankenstein "awakens" a corpse and brings to life something beyond human (Allen 1992; Sharpe 2000; Duchaney 2006). The

[7] Edward Said's (1979) *Orientailism* expresses the dichotomy that emerges within designations of Self and Other. In his text he highlights the West, which historically (and arguably still) depicts the "Orient" as simultaneously fascinating and frightening. Said explains that due perceptions of the inferiority of these peoples, the powers of the West (principally Britain, France and the Netherlands) saw fit to colonize territories they considered vacant. This concept can therefore be translated to the Othering of the disabled body, as bodies living with disability are considered non-agential, or incapable of self-care (exaggerated in the charity and medical models) and therefore these bodies can be "colonized" by an able-bodied Self.

good doctor egotistically believes that he can control his creation but contrary to the doctor's orders, the monster leaves organized society and becomes murderous in his isolation. This tale stands as a warning to those who would dare play games meant only for the divine.

Exemplified in the title, Dr. Frankenstein shares a great deal with the Greek titan Prometheus. The myth details the heinous act of Prometheus stealing fire from the gods, which he brings as a gift to humankind. This act brings both the beginning of a great technological revolution for humanity and the end of its hero, for upon discovery of his crime he is punished. Prometheus is tied to a rock for eternity, daily gored by an eagle (who eats his liver) only to have the same pain, horror and trauma occur the next day, upon the organ's re-growth. Dr. Frankenstein, like Prometheus, is a man who believes he is greater than the sacred divisions created by the gods. In the case of Prometheus, this is the line between light (fire) and darkness and for Dr. Frankenstein it is the division between human (nature) and machine (artifice). Prometheus brings light to darkness and Dr. Frankenstein plays God by making a human-like machine, sewing "the monster" together from inanimate pieces of flesh to form a pastiche of personhood (Shelley 1823). Dr. Frankenstein is also punished for his creation when "the monster" destroys him (Allen 1992; Duchaney 2006). However the so-called "monster" is actually the tragic hero of this tale as he is not responsible for his profane birth or the violence that it causes (Shelley 1823; Duchaney 2006:30). Instead, this burden lies with his creator, who can be seen as more monstrous than the "monster" himself. Dr. Frankenstein's experiment fractures the sacred divisions between human and machine through his fabricated

mechanic monster (Allen 1992:518; Duchaney 2006:12). The question that emerges from this tale concerns the constitution of "monstrosity;" Shelley demonstrates that the dark side of humanness is more monstrous than the "monster" himself. This tale marks a pivotal work in gothic horror, which inspires later sci-fi writings, many of which make use of the same cautionary narrative structure (Shelley 2011).[8] Her novel reflects historic conceptions of different (Other) bodies as "monstrous." However, the true stories around the treatment of the Other (those considered monstrous) are in fact far stranger than this fiction (Garland-Thomson 1996; Hughes 2009).

Beginning as early as the sixteenth century (long before the writing of *Frankenstein*), searches for fantastic monsters from across the world had commenced. As Harriet Ritvo notes in *The Platypus and the Mermaid and Other Figments of the Classifying Imagination*: "Only a small divergence from what seemed ordinary or natural sufficed to make a monster" (1997:131). Ritvo explains that within the seventeenth century the category of "monstrous Other" was based on any (and all) minor deviations from artificial, normative standards (1997:160). Through these systems of classification, subjects were treated as objects, which robbed them of their agency (Said 1979; Garland-Thomson 1996; Ritvo 1997). The disabled body was often described as a "freak of nature," breaking perceived (sacred) divisions between human and animal and therefore considered "inhuman" (Garland-Thomson 1996; Mitchell and Snyder 1997).[9] From this

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[8] Ward Shelley's image "The History of Science Fiction" covers the merger of Art, Philosophy and History into the Horror genre that later becomes futuristic visions in popular Science Fiction such as the Terminator Series (2011)

[9] This construction of disabled bodies as "inhuman" or morally suspect is especially salient in discussions of intellectual disability, exemplified in a Texas execution in 2000: "…the prosecutor argued that the fact

understanding of the disabled as monstrous, the "freak show" emerged as a form of entertainment (Said 1979; Garland-Thomson 1996; Mitchell and Snyder 1997). Rosemarie Garland-Thomson explains in her book, *Freakery* that these bodies were catalogued based on abnormal physical manifestations and oppressively celebrated for these "defects," exploiting their bodies as "wondrous" mistakes of God and nature (1996:24). Garland-Thomson's work looks at the history of freak shows to reveal the prejudices of the subject/viewer (able) against the object/viewed[10] (disabled) (Said 1979; Kristeva 1989; Garland-Thomson 1996:1, 2005). The enjoyment of the viewers of the freak show was marked by simultaneous sensations of both fear (phobia of the monstrous Other) and fascination (phillia of the exotic Other) (Garland-Thomson 1996; Hughes 1999). This expresses the dual space that the "monstrous" fills in the corporeal imagination as both fascinating and frightening at the same time:

> In Western history, the figure of the monster or the freak is perhaps the exemplar of the unexpected, the unfamiliar, the novel. Monsters and freaks are forms that challenge the status quo of human embodiment (Garland-Thomson 2005).

Though exploitive, the freak show emerged from the need for disabled bodies to find paid employment. Individuals who became involved in "Freakery" did so, due to a lack of formalized roles available within "normal" (able-bodied) society (Garland-Thomson 1996). Disabled bodies were (and are) viewed as incapable of contributing to

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that Mr. Cruz [a man with a "severe" intellectual disability and low IQ] 'may not be very smart' made him 'more dangerous,' and so was the reason to sentence him to death…" (Siebers 2008:79).

[10] Kevin Connolly's *Rolling Exhibition* (http://www.therollingexhibition.com) is a collection of photography that highlights the act of "Staring at the Other" (2009). Connolly is missing his lower extremities, and often travels on a skateboard, much to the surprise of his onlookers. He documented the "stares" he incurred whilst traveling and explores inhabiting a subaltern body in this stunning compilation of Otherness.

society as a whole as the ability to work and contribute to the state translated to ability in a more absolute sense (Davis 1995). Marx's treatise on capitalism, *Das Kapital*, argued that modern western societies had created oppressive ideals for labour through establishing "average labour" (Marx 1996:28-31). He thought that the establishment of this oppressive "average" of labour power perpetuated a standard that would be used to measure all bodies comparing average to below-average to construct a normalized curve of capability (Davis 1995; Marx 1996; Gould 1996). Through the construction of this average the human was expected to act as a machine, with each movement meticulously measured for maximum efficiency (Grint 2005). Marx was vehemently against this capitalist mode of production as he saw it as requiring the oppression of workers through the objectification of their bodies and of work. Marx warned that this would lead to its own undoing, as such production would exhaust all natural resources, including bodies themselves (Marx and Engels 2000). Capitalism establishes ability as synonymous with productivity and therefore rejects the disabled body as a useful member of society.

Average is later translated to "normal," seen in the establishment of the Bell Curve (Davis 1995; Gould 1996). Beginning with "average intelligence" the Bell Curve became a measurement to be used against all forms of human potential (Gould 1996). Disabled bodies, in physical labour capacity or intelligence, were therefore seen as deviating from the norm, and were therefore classified as "deviants" in "normal" society (Davis 1995; Garland-Thomson 1996, 2005; Mitchell and Snyder 1997; Siebers 2008). The disabled body is therefore "flagged" as a less-than-ideal subject of the state (Grabham 2009; Rose 2007, Landsman 2008). Without access to the exploitive trade of the freak show many

were reduced to begging on the streets.[11] Terms used for the bodies, such as "cripple," [12] emerge from this sordid history. Beginning as the term "crypel"[13] in Old English:

> [C]ripple fills my mind with visions of the days when the disabled formed the majority of the beggar population. In times before wheelchairs, proper crutches, and white canes, the disabled were reduced to begging, creeping around city gates, bowls in hands, pleading for hand-outs (Jennings, Barath, Cork and Creighton 2011:6).

In short, to be "crippled" or "deformed" (disabled) was to be excluded. Though disability is a naturally occurring state, it has historically been constructed as a fearful and limiting manifestation, one that must be overcome or avoided at all costs (Magdalinski 2008; Hughes 2009). Disability theorists have moved to categorize these historic and contemporary labels associated with disability through a series of models (Democracy Disability and Society Group 2003).[14] This includes an individualized or micro-level focus, as seen within the charity and medical models, as well as macro-level focus, such as social and interdisciplinary models (Democracy Disability and Society Group 2003). These models have come to influence policy, research and practice and are therefore central to the praxis of Disability Studies and changing public perceptions of "disability" altogether.

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[11] See multiple works by Dix (1992): *Prager Staße (1920) and The War Cripples (1920)*, which represent, "Dix's shift from a personal to a political response to the war" to demonstrate the, "brutal, dehumanising effects of war still being suffered by the impotent masses, and the political disregard of this misery in 1920" (54, 99). The *Match Seller* created in the same year is meant to stand as, "Embarrassing reminders of a lost war, ignored, reviled and pissed on by dogs, war cripples begging or selling matches for survival" (Otto Dix 1992:99).

[12] The language around disability is extremely tense and highly debated among different groups. "Cripple" is still used, though it is not seen as politically correct (McRuer 2006; Withers 2010). In the contemporary context both "Disabled" and "Person with a Disability" (PWD) are seen as more correct points of reference.

[13] This word can loosely be translated to one who "can creep" (OED 2011).

[14] The term "model" here refers to the framework of a larger theory, set of assumptions about how a process operates. The charity, medical and social models are all ways of seeing, that contain a series of theories and often define practices.

In Sickness and in Health: Marriage of Church and State

Health in the middle ages represented corporeal, moral and ideological wellness. The "sick" therefore included the diseased, the deranged and intellectually unfit. These conceptions of Otherness can be seen within Christian doctrine as early as the sixteenth century. Such religion-based ideals helped to form North American understandings of disability. Therefore "disability" has a pre-scientific location, emerging first from the Church, through the charity model (Hughes 2007:682; McColl 2011).

"The disabled" were perceived of as sick or suffering and therefore both worthy of pity and deserving of care (Hughes 2007:682). The rights of "the disabled" are markedly absent from the common religious vernacular because these bodies were assumed to be naïve and child-like, and therefore incapable of self-care; they had "lost control…and require[d] the paternalistic support of a moralised system of social welfare" (Hughes 2009:410). Some understandings that emerge from the Church express that a defect of body reflected a deeper (invisible) defect of mind and soul which required forgiveness and redemption from a higher power (Mitchell and Snyder 1997; Hughes 1999). The Anglican Church of Canada[15] provides a valid exemplar as this Christian doctrine calls upon its fellows to help bodies that are considered abnormally weak and in need (1982). This tradition-based belief system makes use of archaic terminologies for disability, expressing that the "crippled," "sick," and "deformed" are wards of the

[15] Anglicanism is a sect under Christianity, described as "reformed Catholicism," whose core beliefs reside in the existence of a singular God, the father of Jesus Christ whose life and death are contained with the gospels. The Anglican Church of Canada begins on the east coast as established by British chaplains, but does not make firm footing in Canadian culture until the 18th century (Book of Common Praise (formerly Prayer) 1962; Book of Alternative Services 1982; www.anglican.ca 2011).

Christian state (The King James Version 1982:Acts 14). Such fundamentalism dictates that Christians are responsible for these bodies, as one of God's "creatures" (The King James Version 1982: Exodus 11). This is further evidenced in the gospels, which describe the miracles performed by the Son of God, Jesus Christ (Book of Common Prayer 1962:138; The King James Version 1982, Luke 18:31). In these gospels Christ, through the power of faith, cured the lame, blind and sick (including lepers) of their ailments (The King James Version 1982). These acts of healing were interpreted as a measure of Christ's (and therefore God's) love and commitment to all of his peoples (The King James Version 1982). Within the social history of Christianity the strong (able-bodied) are often expected to actualize their morally grounded duty to aid such persons in the name of Christ, as "Good Samaritans." Historically, this can be seen as a positive manifestation, as this model espouses an acceptance of all bodies and historically (and even still) provides great comfort for some. However, it also fosters pity and constructs the disabled body as needy and suffering (Mitchell and Snyder 1997:189-201; Hughes 2009; McColl 2011). Further, within this religious doctrine ability and disability have often been expressed within a modernist binary of good/evil (Miles 1995; Mitchell and Snyder 1997:192; Hughes 2009).[16] Though it does not reflect the views of all individuals with faith, it does, however, locate negative connotations of disability within recent social history (Miles 1995). Overall in the twenty-first century, the role of the charity model has

[16] Mitchell and Snyder analyse at length the role that physical defects (or disabilities) have as 'markers of evil' within fiction throughout the ages (1997). This is exemplified within Shelley's Frankenstein, which expresses the monstrous trope as perversions of "essential humanness," evidenced in the horror bought forth by Adam's frightening frame (Duchaney 2006:6; Watermeyer and Swartz 2008).

become far less prominent in the lives of "the disabled," with few exceptions.[17] This is due, primarily, to increased secularization in North America and the separation of Church and State (Hughes 2009). However, the oppressive binary of "sickness" versus "health" has become even more prominent, even without the Church, as seen through the medical model (Mairs 1996: 28, 160; Democracy Disability and Society Group 2003).

A disabled body is considered, in the medical field, machine-like and thus fixable via the infiltration of external forces, such as doctors or other health "experts." This has resulted in the medicalization of knowledge, particularly within the realm of body politics. Therefore the knowledge and ability of medical doctors to diagnose the body through empirical testing is privileged above subjective knowledge of the individual (Mairs 1996; Stone and Priestly 1996; Dewsbury et al. 2004; Seidman 2008; Palmer 2009). This role of expertise expresses the ideal of the "biologically universal body" which assumes that all bodies can be treated in the same manner medically (Sargent and Larchanche 2007:80). However, these epistemological assertions must be recognized as "socially embedded" and therefore are not objective but are culturally and politically situated (Stone and Priestly 1996; Seidman 2008; Palmer 2009:177). The doctor expresses agency over his or her patient, believing in the "objective" nature of the "problem" of disability (Mairs 1996; Barad 2007). With the advent of advanced biomedical techniques, the body has thus been reduced to the sum of its parts. This fact is especially salient in the twentieth century where medical technologies have accelerated at

[17] Contemporary faith-based charities are still able to raise funds, aid and provide comfort for PWD. There is a vast array of literature that goes into greater depth of the role that religion has played in the construction of disability, both positively and negatively. See Burton Cooper's *the Disabled Go*d (1992) and Nancy Eiesland's *The Disabled God: toward a liberatory theology of disability* (1994).

an incredible pace. Such technologies have enabled practitioners to better understand the body, especially the impaired body through surgical techniques and pharmaceuticals, but these are also used to combat or "cure" disability. Therefore disability becomes constructed similarly to an illness or disease (McGrattan 2006). Medical professionals and other health experts therefore use these ideals to force PWD to conform to normative expectations of functioning and living, which require the patient to comply with their diagnoses. Subsequently, those who do not are labelled "bad" or even "stupid" patients (Bark 2010). This can drastically affect the quality of care given to bodies that are labelled in this manner, creating even greater barriers for "disabled" bodies. However, no body is a simple machine, not even the "monster" from Shelley's *Frankenstein* (1823).

Both the charity and medical models concern the construction of truth through the testimony of experts. This establishes disability as a problem or a defect of the individual, who must be saved or cured by the good Christian or doctor (Democracy Disability and Society Group 2003). PWD are therefore constructed as abnormal and in need of experts to correct congenital or acquired "defects." Such a construction undermines their very humanity, as a great number of PWD see very little wrong with living with a disability (Mitchell and Snyder 1997:1; Jennings et al. 2011; Withers 2011). This desire to "cure," positions these bodies as subordinate to the desirable healthy body (Beamish and Ritchie 2006; Magdalinski 2008; Gray 2009:318; Hughes 2009:200-402). Such coercive conceptions of health, with this emphasis on finding a "cure" is rooted in archaic formations of idealized bodies; "uncleanliness of mind and body act and react…and perfect health of one is incompatible with an unhealthy state of the 'other'" (Mitchell and

Snyder 1997:192). Health is constructed in contrast to disease or disability as the morally superior corporeal manifestation (Magdalinski 2008). The desire for health "embodies critical aspects of morality, civic order and national well-being, confirming that health is not merely a personal but a collective concern" (Magdalinski 2008:159). Expectations of "good" health, therefore, become the normative standard, establishing health as an "essential human trait" (Davis 2006:179).

Tara Magdalinski (2008) discusses the role of health and wellness in modern societal concepts of the Self in her book *Sport, Technology and the Body the Nature of Performance*. The definition of a "good" Self, she argues, is tied to both the charity and medical models, as "fitness and health movements have, since the nineteenth century, reminded citizens that it is their social obligation and personal responsibility to fashion a healthy body, free from disease and other contaminants" (Magdalinski 2008:71). This can be seen within the tenets of Muscular Christianity[18] (an ideology emerging in the Victorian era) that associated moral goodness and health (Magdalinski 2008:17). This helped to relegate "the disabled" to the margins of both morality and physicality simultaneously (Watermeyer and Swartz 2008). Magdalinski uses sport doctrine to demonstrate the hegemony of this ideology, however these ideals are espoused by both sport and non-sport related media with "good health" becoming universal concern.

Through both the individualizing charity and medical models, the white, able, upper-middle-class male became the standard by which corporeal excellence and national

[18] Wherein sport was viewed as the "antidote" to the ills of forthcoming industry and the ability to commune with the natural. This pastoral vision tied morality to sport with proponents arguing that this could "inspire and instruct human society" (Magdalinski 2008:16). See also the principles of de Coubertin's "amateurism" (Chapter 3).

health were (and remain) measured (addressed further in Chapter 3). Social and political repercussions therefore follow these bodies of difference, sometimes manifesting within a denial of human rights, "for their own good" (Landsman 2008; Siebers 2008). The PWD is deemed "unfit" to determine the fate of his or her own flesh, with external decisions resting with the authority of those "better suited" (Landsman 2008; Siebers 2008; Hughes 2009). This can have significant consequences for these individuals. For example, depending on how a disability is defined by a health professional, determines the amount of support the government is willing to offer (e.g. Ontario Works and the Ontario Disability Support Program, ODSP) (Bark 2010). Health and goodness, therefore, have become intertwined to construct the PWD as a problem, an abnormal or monstrous manifestation of corporeality. In the contemporary capitalist Western society (Canada and the United States) defects are located within the individual and therefore the individual must take personal responsibility for these issues (Rose 2007). This individualization performs a particular ideological function:

> Like deficit theory as an explanation for poor educational attainment, like sickness as an explanation of criminal behaviour, like character weakness as an explanation of poverty and unemployment and like all other victim blaming theories…personal tragedy theory has served to individualise the problems of disability and hence leave social and economic structures untouched (Oliver 1990:10).

In other words, both the charity and medical models blame individuals for their "bad" bodies, and ignore external socio-economic or political barriers that may prevent PWD from "curing" or "bettering" himself or herself. These frameworks represent the dominant standards that have operated historically with wide critiques emerging from the

new field of Disability Studies in the United Kingdom (UK) in the 1980s[19] (Meekosha 2004; Rose 2007; Mackelprang 2010:88-91).

The social model looks to critique the structures that "disable" bodies and separates physiological "impairment" from cultural, social and political stigmas that result in "disablement" (Goffman 1963; Davis 1995, 2006; Oliver 1990; Hughes 1999, 2007, 2009; Democracy Disability and Society Group 2003; Siebers 2008). This model looks at disability as constructed by external forces, bringing "insight to the fact that all bodies are socially constructed – that social attitudes and institutions determine far greater than biological fact the representation of the body's reality" (Davis 2006:173). This model dictates that there is something fundamentally flawed with the systems that currently operate which exclude PWD from participating in mainstream societal rituals, such as formal employment and various types of informal socialization. According to the World Health Organization (WHO) because of this exclusion PWD are underpaid, undereducated, overweight and less "healthy" than the average person (2010). These bodies do not have equal access to the resources that are meant for all humans as basic rights (Landsman 2008; WHO 2010). Therefore, "inclusion" becomes a vitally important tenet of this human rights focused model (Cobigo and Stuart 2010).

The social model finds its humble beginnings in a pivotal work by Michael Oliver published in 1983, entitled "Social Work with Disabled People" where he first coined the

[19] There are a number of "waves" (or stream) of disability theory emerging first from the United Kingdom (UK) in the 1980s. The first wave refers to theories of "disablement" anchored in the UK and the second wave exists in North America. These streams are however, not recognized universally; therefore it is here we draw on a unified (though superficial) vision of these streams of research as they cover the charity, medical and social models; for greater detail on the subject see the work of Helen Meekosha (2004).

term "disablement" (Barnes 2000:444). Disablement is based on the premise that physiological manifestations, or "impairments," exist as the material conditions of life. However, "disability" merely represents a socially constructed label that, social model proponents argue, can be conquered and redefined. The separation of these two spheres imbues an individual with humanness before their impairment; therefore the monolith of "the disabled" becomes a "man (or woman) with a disability"[20] (Withers 2011). This illustrates, theoretically, that it is not necessarily the individual who is inherently "disabled" but rather the environment which "disables" them (Hughes 1997, 1999, 2009; Shakespeare 1998; Withers 2010, 2011). "Disability" therefore is the result of impairment being treated as a deviant bodily manifestation and the stigmas that accompany this designation. Disablement is an example of a social constructivist approach where the, "physician *creates* illness just as the lawmaker creates crime" illness (and disability) are therefore, "not biological but social, stemming from current social conceptions of what disease is" (McGrattan 2006:67). Matthew McGrattan's essay, "The Social Construction of Disease: Why Homosexuality isn't like Cancer," expresses that those things that are taken to be undeniable "truth" are often situated within certain social, political, economic and cultural locations (2006). This is a central tenet of social constructivism, which attempts to redefine stakeholders by legitimizing individual-level narratives instead of relying on the supremacy of "experts" (such as the Church or State) (Saaltink, Dutra and Cork 2011). Through this lens wide varieties of knowledge are considered valid including lived-experience (Rose 2007). Disability, therefore, becomes a

[20] This is an example of people first language

catalyst for the recognition of body privilege and the reality of human frailty (Hughes 2009). It is from here that disability can be argued as a universal human condition:

> There are, for example, nearly fifty million disabled in the United States, but this number does not include people who wear eyeglasses, those who take medication for hypertension, the learning disabled, or people with AIDS or HIV. Neither does it include the elderly, many of whom cannot climb stairs or open doors with ease, nor children whose physical and mental abilities fit uncomfortably with the adult world (Siebers 2008:71).

This argument of "universality" expresses the need for greater inclusion of all bodies. Whether a body is white, or non-white, male or non-male, able or disabled – each is deserving of equal access and inclusion.

This application of the social model is exemplified within contemporary policy initiatives in both Canada and the United States (US), which attempt to break down barriers for PWD. Through the usage of a universalized perspective on disability, which aim to make the environment (socially, politically, economically and physically) "accessible" for every(body). On the provincial level, Ontarians have recently established the Accessibility for Ontarians with Disabilities Act (AODA). This legislation follows the example set by The Americans with Disabilities Act (ADA), which was one of the first pieces of legislation to create a national standard for the treatment of PWD. The AODA, like many other pieces of disability-cantered legislation, looks for practical improvements set across a timeline (AODA 2005; WHO 2010). However, though this initiative was undertaken as a highly altruistic endeavour, beginning with a with the consultation of PWD, the recently ratified document merely consists of a general set of guidelines for the removal of barriers as well as a Customer Service Standard (Ontario Regulation 429/07) and has lost its proverbial "teeth" (McColl 2011). This is due to a vast array of lobbyists

for the private sector that are uneasy with the massive investments required to make the majority of environmental spaces "accessible," as well as a misunderstanding of the "negative" affects this will have for the able bodied (see Chapter 3) (McColl 2011).

Contemporary policy-makers, governed by the social model, argue that by creating a standard measure of disability, groups that require aid can be helped, while simultaneously preventing others from trying to take advantage of the system (McColl 2011). This results in a vast array of bureaucratic barriers, which can, in fact, prevent those in need from receiving services (Bark 2010).[21] Therefore, if one does not fall into the correct category, no services will be rendered, resulting in even greater exclusion of "the disabled" from mainstream society.

The International Classification of Functioning, Disability and Health (ICF), created by the WHO, governs legislative definitions of disability. This document attempts to reinforce the social model methodology by universalizing the experiences of impairment:

> [E]very human being can experience a decrement in health and thereby experience some degree of disability. Disability is not something that only happens to a minority of humanity. The ICF thus 'mainstreams' the experience of disability and recognizes it as a universal human experience (WHO 2010).

This marks one of the benefits that come with this universalization of disability. General recognition that occurs through the legislation of accommodation versus the needs of a

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[21] Further, those who take advantage of this system are subject to severe punishment upon discovery. This is exemplified in the ODSP fraud report initiative, which includes a phone number and email address to alert authorities, tips can be made anonymously, and the onus is placed on the recipient of funds to prove that they are not guilty of any and all accusations. This is a prime example of the criminalization of the poor (Bark 2010).

niche group which heightens the chances that these measures will be adopted by the private and public sectors alike (WHO 2010; McColl 2011). On the other hand, if all bodies are (or may become) "disabled," permanently or even temporarily, this presents a problem for establishing disability as a minority identity (Oliver 1990; Barnes 2000; Siebers 2008; Hughes 2009). Here the social model runs into an inherent contradiction, wherein this tenet negates the realities that it had attempted to comprehend, namely the material consequences that PWD confront in their daily lives and the unique space inhabited by this oppressed identity politic. Social constructivism therefore receives heavy criticism (by both the able-bodied and PWD) for denying the unique material realities of disability, such as pain, discomfort and physical limitations. It is argued by critics of the social model, that these exist with or without the label of "disability" being imposed upon an individual (Oliver 1990; Barnes 2000). Another issue faced by the social model is the dominance of inaccessible, academically-based research that does not centralize PWD, but rather uses theory in the place of practice. As argued by the Union of the Physically Impaired against Segregation (UPIAS), research done by those without disabilities undermines the principles of inclusion and access that it purports:

> We already know what it feels like to be poor, isolated, segregated, done good to, stared at, and talked down to – far better than any able bodied expert. We as a Union are not interested in how awful it is to be disabled. What we are interested in is the ways of changing our conditions of life, and thus overcoming the disabilities which are imposed on top of our physical impairments by the way this society is organized to exclude us…We look forward to the day when the army of 'experts' on our social and psychological problems can find more productive work to do (Shakespeare 1998:68).

Criticism of this nature is not unfamiliar to the social model (Stone and Priestly 1996;

Dewsbury et al. 2004; Hughes 2009). The major success of this paradigm (model) lies in the repositioning of popular consciousness. Through restructuring the ideas around "disability" and "impairment," the social model makes an attempt to enable the voices unheard by critiquing expert knowledge. Through repositioning understandings of disability, specifically victim-blaming and other individualizing ideologies, it was a success. However, it has become evident there are extreme problems with this work, the majority of which was and still is done by able-bodied social theorists (Stone and Priestly 1996; Dewsbury et al. 2004). Through the separation of disability from impairment the entire experience of embodiment is ignored, including the unique lives of PWD. Therefore expert knowledge is privileged above the PWD themselves. Social constructivism provides little comfort to those who require experts to sign forms and provide support (Maris 1996; Dewsbury et al. 2004; Bark 2010; Jennings et al. 2011; McColl 2011; Withers 2011). Furthermore, those who find themselves faced with the very real challenges posed by ignorance, cruelty, passivity and even stairs, continue to grapple with these barriers, as they cannot merely be re-defined. The social model has, therefore, merely privileged the knowledge of sociologists instead of doctors, "addressing sociological, rather than social issues and producing credentialized stories as professional improvements on everyday analysis" (Dewsbury et al. 2004:146). Therefore "disability" becomes a socially constructed phenomenon, only comprehensible by the "experts." This again negates the tasks for which the social model was established.

In response to these failings a series of other models have emerged. The most critical of social model epistemologies are the "anti-social" and "radical models"

(Dewsbury et. al. 2004; Withers 2010, 2011). The anti-social model includes the major criticisms of the social model and then calls for an "embodied" approach to disability.[22] The concept of embodiment concerns the physical manifestations of the human frame, as many theorists from the anti-social school are PWD themselves. Ethnography becomes a centrally important methodology for this kind of scholarship (Shildrick 2009:3, 5). Disability from this model is seen as "intersectional," a method that first emerges from black feminism in the 1980s (Hill-Collins 1989; Fleras and Elliot 2006). A perspective that materializes in response to an increased need for analysis that moved away from stringent categories of race, class and gender:

> Currently, we are all enmeshed in a complex web of problematic relationships that grant our mirror images full human subjectivity while stereotyping and objectifying those most different than ourselves. We often assume that people we work with, teach, send our children to school with, and sit next to in conferences such as this, will act and feel in prescribed ways because they belong to a given race, social class or gender categories. These judgments by category must be replaced with fully human relationships that transcend the legitimate differences created by race, class and gender as categories of analysis (Hill-Collins 1989:3).

An example of the perspective of disability studies that draws upon intersectionality to engage with the multitude of experiences that face disabled bodies is Robert McRuer's book *Crip Theory: Cultural Signs Of Queerness And Disability* which examines intersections of non-heteronormative sexuality with non-normative bodily manifestations (2006). McRuer argues that this intersection of, "critical queerness and severe disability [is] about collectively transforming…a system of compulsory able-bodiedness, about

[22] Margrit Shildrick defines this as the merger of "phenomenological experience of the disabled body and the psycho-social dimensions of what constitutes an excluding normativity" (2009:5).

insisting that such a system is never good as it gets, and about imagining bodies and desires otherwise" (2006:32). McRuer speaks to the necessity of engaging with the material realities of bodies, which is a central tenet of the anti-social model. Further, the anti-social model is meant to comment on the current conceited state of Disability Studies, which often excludes individual-level narratives, rejecting such experiences as imprecise and merely conventional and therefore non-academic (Shakespeare 1996). The rejection of this ideology expresses a desire (and need) to move away from traditional methods that exclude the lived-experiences of PWD from dominant discourse (Dewsbury et al. 2004; McRuer 2006). This leads to a discussion of a grassroots level model, the radical model, which is even more critical of the central tenets of the social model.

The radical model comes from the grassroots level and includes 'zine[23] writers, activists and academics. Unlike the anti-social model, which is still rooted in the academy, this model has a more bottom-up approach, arguing that the social model is an ableist ideology, founded by the able-bodied for the able-bodied (Withers 2010). One activist argues that inventions that come with the social model are things like "people-first language," was merely created to make the able-bodied "feel better about themselves" (Withers 2010). These initiatives avoid bureaucracy and ivory tower ideologies by rejecting formal terminologies (as well as methods of publishing and therefore use blog and 'zine formats which are non-profit and barrier free) and utilize

[23] "Zines" are not-for-profit, self-published works of art, literature, fact and or fiction that enable subverted voices to share their ideas, examples of this can be seen in the works of David Roche volume 1 – 3 of *About My Disappearance* which is a narrative of his thoughts and feelings when he was diagnosed with Crohn's disease. The price of a 'zine usually merely covers photocopying, printing or shipping costs (http://microcosmpublishing.com/catalog/title/1533/).

individual's perspectives to enrich the conception of disability. This perspective attempts to engage the vast multitude of identity politics, not only race, gender and class, but educational level, age and even ability. Explained simply: "It's society that's fucked up. Not our bodies" (Lictawoman 2010; Withers 2010, 2011; Jennings et al. 2011:8).

Both the anti-social and radical models, though different in their approaches, have attempted to move away from the unholy trinity of charity, medicine and sociology, avoiding dependence upon each of these experts. Therefore, each model has its limitations, whether rooted in research or philosophical tradition. The dominant models, charity, medical and social have effectively posed as many questions as they have answered. It is thus necessary to develop a more inclusive approach unifying both the grassroots and the academy (Nicholls 2011; Reisz 2011; Saaltink, Dutra and Cork 2011).

Historically each model has attempted to categorize the disabled body, yet disability itself defies definition. This provides academics and experts alike with an enigma, and yet, such resistance proves that this corporeality is of central import to the contemporary era (Foucault 1979; Davis 2006:173; Siebers 2008). The twenty-first century has been referred to as both (post)modern and even "Liquid Times" (Bauman 2007; Seidman 2008). This liquidity refers to identities, bodies, boundaries and the overall uncertainty that constitutes daily life (Bauman 2007; Hughes 2007, 2009). Liquidity permits the histories of the oppressor and oppressed to be deconstructed by breaking down modernist binaries – in this case those of ability/disability (Marx 1996:9).

Beyond the critiques espoused by the anti-social and radical models, an academically based but integrated (inclusive of grassroots methods) approach emerges.

This "interdisciplinary" model has become increasingly popular both within and outside of Disability Studies and has been seen as an effective, multifaceted methodology from which to engage with the diverse narratives of disability (Nicholls 2011; Saaltink, Dutra and Cork 2011). Interdisciplinary approaches look to disability to break down divides between academic disciplines which theorize disability in isolated silos of research (Jette 2006; Nicholls 2011). An early example of this approach can be seen in the "biopsychosocial" model which was designed to integrate the disciplines of biology, psychology and sociology to construct a more inclusive method to locate and address the needs of disabled bodies (Jette 2006). This method tried to overcome the restrictions of both the medical and social models, but instead of viewing disability as a consequence of body or culture, "disability is viewed as a consequence of biological, personal and social forces. The interaction among these various factors result in disablement" (Jette 2006:727). The creators of this model[24] looked to this paradigm to present a more complete recognition of the complexity of a disabled identity. The biopsychosocial model can help to demystify the "types" of disability, as these categorizations have a multitude of intersecting and relational "symptoms," recognizing that:

> [A]ll physical conditions have psychological implications and that all intellectual impairments have physiological consequences. Also, that labels are generally imposed rather than chosen and that they are politically and socially divisive (Barnes 2000:442).

[24] There are a great number of scholars that have contributed to the construction of this model, including Jerome Bickenbach (in disability studies) and George Engel (in psychiatry and medicine), here Alan Jette's review of the model is cited for an overview, but for a more detailed description of the model as well as its applications and aspirations see the work of Bickenbach and Engel.

However, this format merely brings "disablement" back to the forefront of Disability Studies and is truly only engaging within a limited sphere of analysis. Biology, psychology and sociology, though a reputable starting point, will not overcome the disciplinary divides that isolate researchers onto "ever-shrinking islands of competence" (Nicholls 2011:2).

Interdisciplinarity can go above and beyond expected alliances such as the outdated biopsychosocial model. A truly "interdisciplinary" approach must break down barriers between all disciplines and fully open the channels of discussion, maximizing the potential for breakthrough.[25] Gill Nicholls (2011) cites the design and implementation of new prosthetic devices as a necessarily interdisciplinary approach, as it makes use of robotics, sociology (military and sport), gender studies, technology (defence and health), nursing, cybernetics, psychology, rehabilitation therapy, and cyborg theory to fully understand the potential of human augmentation (Reisz 2011; Saaltink, Dutra and Cork 2011). Such an approach can help to shed light on the complex imagery that emerges from the unique life worlds of disability. Nicholls explains that specialization has become a side effect of Western doctrine, whereas, "Greek instinct was the opposite: to take the

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[25]Some examples of "interdisciplinary" approaches can be seen in specific research and discussion initiatives at Queen's and in the Kingston community. Firstly there is the Genera Research Groups (gRG) at Queen's University directed by Dr. Myra Hird, which consists of researchers from Anatomy and Cell Biology, Geography, Chemical Engineering, Obstetrics and Gynaecology, Family Medicine and Civil Engineering (http://www.generaresearchgroup.com/gRG_Home.html). There is also the Autism Spectrum Disorders Canadian-American Research Consortium (ASD-CARC) program directed by Dr. Helene Oulette-Kuntz, which consists of researchers, from across North America, in Rehabilitation Therapists, Psychology students, Molecular Geneticists, Epidemiology, Behavioural Phenotyping, Dysmorphology, Neurochemistry and Statistics (http://www.asdcarc.com/). Finally there are the less formalized Disability Brown Bag Seminars, established by Dr. Mary-Ann McColl at Queen's University under the Canadian Disability Policy Alliance (CDPA). Each of these is an example of funded initiatives that are attempting to break down barriers between disciplines and create meaningful conversations between academics to gain new insight into old problems (Nicholls 2011).

widest view and to see things in a more organic whole" (Nicholls 2011:6). Whether there is a true "whole" to be known is hotly contested, but through pigeonholing certain disciplinary activities the channels of communication are effectively severed. This therefore limits the potential of new fields of study, research and even new ideas or developments. Because of the numerous tropes embodied by disability, interdisciplinarity becomes the necessary approach for engaging with this subjectivity appropriately (as a body with a plethora of labels from abnormal to monstrous, disability requires a suitable paradigm for analysis) (Sutherland 1961; Davis 1995; Gould 1996). Disability Studies can be used to unravel the myths that contribute to the supremacy of physical ability and express the simple fact that the able-bodied experience body privilege (Foucault 1979; Davis 1995; Mairs 1996: 40-63; Lorber and Moore 2006:186; Magdalinski 2008). Idealized physicality exists only within the corporeal imagination: as the "ideal," by its very definition, is not "real" (Davis 1995:xv). The real, instead reveals that the image of "perfect" body is merely a myth; the "grotesque" or "monstrous" body that is fallible and mortal represents a "true" human frame (Davis 1995:25; Mitchell and Snyder 1997:xiii).

> The disabled body and the 'normal' body always exist in a diametrically opposed relationship with one another, dependent on the other for meaning. In reality, the idealized body may rarely exist, but the important point is that it represents a set of bodily standards to which people subscribe and aspire (Gray 2009:320-321).

These limits imposed on PWD are based on preconceived notions of the lack of utility of the Other, established through centuries of reading disabled bodies as problematic to normal/healthy frames or the "Self" (Said 1979; Davis 1995; Thomas 1999; Siebers 2008). Revealed through these oppressive ideologies is merely the fragile supremacy of

the able-body, fearful of the mortality and fallibility of the human frame. The phobia that confronts the "normal" in the face of "abnormal" is the potential of contagion, in this case: becoming disabled. Therefore, it can be said, that the able-bodied are merely haunted by:

> [T]he ghosts of the ageing, suffering and affliction that represent its most profound fears. The vulnerable, disabled body exposes the illusion of autonomy, self-government and self-determination that underpins the fantasy of absolute able-bodiedness (Hughes 2009:401).

Disability marks a highly contested identity politic, with a long and arduous history against the able-bodied majority. However, in the twenty first century, identity itself is recognized as fragmented; or at least, more-so than during modernist ideals of the Enlightenment era. Therefore, beginning with an intersectional analysis, and moving into true interdisciplinarity, is the only means by which "disability" and similarly marginalized identities will come to be known and accepted in these "liquid" times (Fleras and Elliot 2006:153; Bauman 2007; Seidman 2008). Physicality of the human frame is marred, scared, beaten, broken, monstrous, wounded, abject and Other(ed) throughout the life course. This requires the individual to admit that "humanness" itself, like the spectres of health and ability, is a construction that shifts with the political, economic and cultural acceptability in contemporary Canadian and American societies.

Chapter 3

Machine as Human

Postmodern War: the dominance of cybernetics, and the myth of AI

It's not Science Fiction. It's what we do, every day
- US Air Force Slogan

The history of military and technological development demonstrates the "Darwinian" nature of innovation and the ability of some pieces to "cannibalise" all that came before "in so far as only the most 'appropriate' innovations survive and only those nations and organizations that adapt to such innovations prosper" (Grint 2005:283; Bousquet 2009:112). However technology, though often-designated agency, requires human impetus: "Technology is about as capable of causing riots as a car is of driving a man" (Watson 2011). War acts as a catalyst for the development of these kinds of technologies. Warfare, as driven by humans, therefore becomes the ideal site from which to interrogate contemporary technological innovations such as the computer and computer network as it is these innovations that are responsible for the controversial introduction of robots into war. Robots are machines created in the image of humans, forged in an attempt to remove fragile frames from the frontlines (Singer 2009a; Bogue 2011; Meadows 2011). Robots therefore present a challenge to human supremacy on the battlefield, in fact some predict that "mankind's 5,000 year old monopoly on the fighting" may have come to an end (Singer 2009b). Whether or not this is true, a sharp shift has taken place in the transition from historic wars characterized by brute force and mass casualties to the development

and usage of advanced software and hardware (Haraway 1991; Gray 1997, 2003; Harris 2003; Bousquet 2009). Technology is a catalyst for change and with the introduction of robotics to the frontlines these developments are effectively re-establishing the rules of engagement (Singer 2009a). The changing face of conflict has been deemed "postmodern war" due to the pre-eminence of stranger than fiction technologies, from a PackBot named "Scooby Doo" to Unmanned Aerial Vehicles or "drones" (UAVs) named "Predators" (Gray 1997; Singer 2009a: 22, 32). These shifts have also altered the relationship between hu(man) and machine, on a global scale. Through a close analysis of the contemporary American Military (US Army) establishment, as well as cursory comparison to the Canadian Forces (CF) and healthcare technologies within Japan, we can begin to understand the capabilities of these inventions which were previously merely figments of the scientific imagination.

The Science Fiction Imagination: Realities of War

Military and war can be understood through their representations in both fact and fiction. Sci-fi provides a forum for extreme scenarios, such as infantry forces being augmented (aided) by non-human entities. Though the frontlines are a far cry from being dominated by machines the introduction of robotics on the battlefield is characteristic of warfare in the twenty-first century. The introduction of these technologies brings to the fore a great number of philosophical debates that are visited in sci-fi writings and film such as Stanley Kubrick's *2001: A Space Odyssey* (1968) or James Cameron's *Terminator* Series

(1984, 1991).[26] Science Fiction therefore presents an ideal groundwork from which to navigate these issues. This is due to the fact that not only are the frontlines the proper space for deep thought, but the speed of new technological innovations has accelerated far more rapidly than any physicists, technical engineers or computer scientists can account for. However, such issues are within the grasp of fictional characters and therefore the social value (and consequences) of such mechanization can be found in seemingly unlikely places, such as the work of a Czech playwright.

The definition of "robot" (or bot) is deceptively simple, merely referring to a pre-programmable automaton/device that feeds off digital information (Meadows 2011). However, this definition merely addresses basic functionality, whereas the real issues (and questions at hand) surround their potential. This is the void that sci-fi attempts to fill, by attempting to visualize the seemingly impossible. The very first instance of the word "robot" (in both fact and fiction) is said to appear in author Karel Čapek's play *Rossum's Universal Robot (RUR)*. This cautionary tale, written in 1920, reflects Čapek's fears of slavery, conflict and industrialization. In the play, RUR is a production company located on an isolated island that manufactures only one product: robots. The robots are produced to perform arduous and monotonous tasks that human beings find distasteful (Čapek 1920).[27] The factory is named after Rossum senior and his son, who were the

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[26] This is not meant to be an exhaustive list of such literature, see also the *Alien* or *Matrix* franchise for similar debates

[27] "Robot" is a derivative of the Czech term "robota," which roughly translates to "forced labor" (Meadows 2011:14). Čapek's work is critical of capitalism (via industrialization) as an uneven division of labor, which can be paralleled with Karl Marx's anti-capitalist works, such as the *Communist Manifesto* (Marx 1996). Čapek's play, in fact, begins with a call to Robots: "Robots of the world! The power of man has fallen! A new world has arisen: the Rule of the Robots! March!" strikingly similar to the call for workers to

designers of these human-like machines. The robots created at the Rossum factory are meant to look similar to humans but have been stripped of unnecessary frills to achieve the highest level of efficiency:

> DOMIN
> What sort of worker do you think is the best from a practical point of view?
> HELENA
> Perhaps the one who is most honest and hardworking.
>
> DOMIN
> No; the one that is the cheapest. The one whose requirements are the smallest. Young Rossum invented a worker with the minimum amount of requirements. He had to simplify him. He rejected everything that did not contribute directly to the progress of work — everything that makes man more expensive. *In fact, he rejected man and made the Robot*. My dear Miss Glory, the Robots are not people. Mechanically they are more perfect than we are, they have an enormously developed intelligence, but they have no soul (Čapek 1920:I. 9 *emphases added*).

Harry "Domin" is the President and CEO of RUR and is responsible for overall operations. Domin is the first character to appear on stage; the play opens on him dictating a letter (to a robot receptionist) about the company's inability to compensate clients for the loss of product (robots). Miss "Helena" Glory is explained as the daughter of the current President. She first comes to the RUR not as an ambassador but to save the robots from their oppression under Domin and the other factory managers. However Helena remains on the island and marries Domin, the very man she meant to dethrone. A number of other interesting characters populate Čapek's play. Such as Dr. Gall, the Head of the Psychological and Experimental Department, who is responsible for controlling the robots, for this reason he constructed a more complex nervous system for these machines.

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unite at the end of the *Manifesto* (Čapek 1920; Marx 1996).

He explains to Helena that there were some issues around obedience and customers were complaining; through programming them with the ability to feel pain, they were more easily controlled (Čapek 1920:I. 24). This is merely one of many "issues" (or glitches) that characterize these "perfected" machines. This is exemplified later in the play through a robot named "Radius." Radius has an "attack" and is deemed "mad" by the humans because of his strange "ravings" about the human/machine relationship:

> RADIUS
> You are not as strong as the Robots. You are not as skillful as the Robots. The Robots can do everything. You only give orders. You do nothing but talk.
>
> **[…]**
>
> RADIUS
> I don't want a master. I want to be master. I want to be master over others.
>
> HELENA
> I'm sure they'd put you in charge of many Robots, Radius. You would be a teacher of the Robots.
>
> RADIUS
> I want to be master over people (Čapek 1920:II.47).

Radius is, however, spared for this behaviour, at the behest of Helena; but as he leaves he criticizes Dr. Gall for his threats to destroy him claiming: "You do unnecessary things" (Čapek 1920:II.48). Helena's caretaker (handmaiden), Nana, explains that the humans are too cruel to the robots. She is especially critical of the way that robots are used in "men's wars" arguing that forcing them to fight by giving them weapons can only end in tragedy (Čapek 1920:II.40). Her prediction is right, as these few simple and cruel gestures inspire the robot revolution, led by none other than the spared robot Radius. His robot revolutionaries use the weapons they were given in war to attack the humans. The

entirety of the human race is thus destroyed except for one man: Alquist the Head of the Building Department of RUR. He is kept alive because the robots believe he holds in his mind the formula for their creation: Rossum's original design (blueprint). The reason they require this information is that the robots only live for a maximum of twenty years (Čapek 1920:I.10). The play closes on this lone human, living a lonely and depressed existence, arguing with two robots named Adam and Eve. He does not have the formula and therefore needs to carve open a robot to discover the secret of their inner-workings. Eventually however, he lets them go because the deep love they display for one another brings him to tears, "Go, Adam, go, Eve. The world is yours" (Čapek 1920:Epilogue.99).

Sci-fi representations of this nature consist of technophilic dreams and technophobic nightmares, taking inspiration from the natural (and supernatural) world. Čapek's play warns against the potentials of strong AI.[28] This play showcases a possible dystopic future of robotic supremacy, a tale that is echoed in a plethora of other science fiction media including Isaac Asimov's famous novel *I, Robot*[29] (and later substandard film) which was in fact, inspired by Čapek's play (Meadows 2011:14; Shelley 2011). Čapek was vehemently anti-war after seeing the violence of WWI firsthand (Klìma 2004). Therefore, RUR is meant to stand as a message against cruelty to others, a warning against slavery and capitalism (industrialization).

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[28] "Strong AI" refers to the ability of bots to perform like humans in the sense that the technology would be able to adapt to any situation; current AI is more "applied," as current bots are able only perform specific tasks on command (Meadows 2011:68).

[29] Synopsis: the work *I, Robot* explores a futuristic world in which Robots are self-aware, intelligent and some even have a sense of humour. Many of these creations have replaced humans, and in the novel a series of stories are interlinked to explore the difficult terrain that must be navigated in this troubling posthuman era: through intersections of humanity, robotics and mortality (Asimov 1991).

Some of the greatest scientific achievements have been inspired by this scientific imagination, and so too has fiction and other media been created in response to new technical achievements. However, the fears of robotic supremacy rest in an *imagined* potential for robotics. Such lofty ideals of android autonomy and violence against humans, as expressed in *RUR* and *I, Robot*, stray quite far from the reality of contemporary advancements in the field (Čapek 1920). In his half-autobiographical, half-research based book *We, Robot* (2011) Mark Stephen Meadows visits Japan to see the latest and greatest in hardware and software available within the world of robotics and finds impressive advancements in war, healthcare, gaming and even some robots that could be pets; but nothing that could rival human intellect or appearance. The robots of the twenty-first century are actually described by Meadows as "stupid" [30] as many showcase extremely limited technical capabilities (2011:47). The inability of contemporary technologies to deal with simple tasks is well known by designers and practitioners alike (Singer 2009a, 2009b; Meadows 2011). One venue that attempts to gauge the abilities of autonomous robots is the annual robot soccer tournament the "RoboCup." The simple governing premises being that, if a team of autonomous robots can score a goal they are demonstrating "intelligence." However, watching footage of the robots on the pitch reveals the truth that there is a long way to go. Aldebaran robotics humanoid robot "Nao," a competitor in RoboCup 2010, presents the most humorous performance. This includes repetitively falling down and missing the ball, footage that

[30] Many Robots perform well in controlled environments, but most are unable to navigate the "real" world outside the lab, for example, "HERB has a digital bicycle horn that he honks to let people know he's getting near them; if a room is busy and crowded, he takes the safest course of action and simply stands there, honking at everybody" (Carroll 2011).

can be seen on the company's website. Contrary to this evidence, "The tournament founders' goal is a robot team that will defeat the human World Cup champs by 2050" (Caroll 2011). This is an extremely lofty ideal as the majority of autonomous robots have difficulty simply navigating environmental spaces, such as corners and stairs; however, these innovations are merely in their infancy and perhaps the best is yet to come. Though the physicality of robots has a long way to go, AI improvements are clear when looking at current (stationary) supercomputers, such as IBM's "Watson." With impressive, but imperfect trivia skills, Watson is most famous for appearing on Jeopardy, the machine is capable of beating human opponents in most rounds. However, his operations also came up with very bizarre answers to certain questions and the robot even failed to come up with the correct answer in a round of final Jeopardy against Ken Jennings and Brad Rutter.[31] Watson, as well as other examples of artificial "intelligence," proves that when it comes to AI it is not just the capabilities of the machine that come into question but the fact that "they are only as good as the information that has been programmed into them" (Weeks 2011). Designers warn that it is not necessarily the threat of these machines themselves but rather a blind faith in the effectiveness and accuracy of such creations (Singer 2009b; Meadows 2011). Therefore there is a necessity to review the efficient calculations of these machines as they are not and cannot be fully autonomous from

[31] The Associated Press covered the incident where "Watson" answered a Jeopardy question incorrectly. The question, part of a round of Final Jeopardy was, "Its Largest Airport is Named for a World War II Hero; Its Second largest for a World war II Battle," the correct answer is Chicago. Watson functions based on "reason" and percentage of perceived correctness, a skill practiced through prior Jeopardy questions. When in "doubt" the computer places a "?" for every degree of uncertainty. When the computer answered "Toronto" this wrong answer was accompanied by "?????" (IBM 2011). Watson's inability to answer all questions correctly stems from a lack of full comprehension around human reasoning, as computers (super or otherwise) are only as intelligent as their creators (Caroll 2011; Weeks 2011).

humans anytime soon. In *2001: A Space Odyssey* even the HAL 9000 is capable of error. Kubrick's' film stands as a warning against unchecked technophilia, and blind faith in machines (1968). In short, immense discoveries must be made before anything similar to Rossum's robots could ever emerge; as admitted by another science fiction writer, Hans Moravec: "We still don't have the computer power…We'd like to build a 747, but we only have a rubber band to power it" (Hawaleshka 2000). Similar to the fears of "the monster" the "evil robot" too fills a space in the scientific imagination, versus reality.

These fears of mechanical supremacy emerge, in truth, from fears of violating "essential humanness" for if machines can act as humans, then the binary between human and machine becomes fractured causing the realm of exclusive "humanity" to shrink. It is this spectre that haunts the able-bodied who are often threatened by the abilities of the non-normative (especially the "disabled", see Chapter 3) (Watermeyer and Swartz 2008). As robot "replicants"[32] become more and more similar to human beings their appearance will bring forth a plethora of questions about the constitution of humanness itself. These humanoids (androids)[33] will act as "imperfect mirrors designed to reveal what is fundamentally human by creating ever more accurate approximations, observing how we react to them, and exploiting that response to fashion something even more convincing" (Carroll 2011). Even though their autonomy is still a great many decades away from actualization, the intimate interface of human with machine renegotiates the role that

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[32] Phillip K. Dick's novel *Do Androids Dream of Electric Sheep*, adapted into the film *Bladerunner*, uses the term "replicant" to refer to androids that are indistinguishable from humans. Ironically enough, one of Hanson Robotics first models was shaped in the likeness of the science-fiction author himself (Hanson 2009).

[33] Both terms refer to a human-like (in appearance and actions e.g. bipedal motion) robotic entity

prosthetics play in the contemporary era. In short, it is undeniable that robotic (specifically cybernetic interface) has altered the nature of warfare, both within new tactics and on the soldiering body itself.

Cybernetics and Chaoplexity: Fleshwork to Hardwired Network

Within its contemporary Military Industrial Complex (MIC), the US has called for major ideological shifts in the face of new threats on an international scale. This Revolution in Military Affairs (RMA) is governed by another global initiative embodied in the Project for a New American Century (PNAC). These projects have laid the groundwork for major technical and philosophical changes evident on the fronts of Iraq and Afghanistan (Harris 2003:55). Such initiatives exist even beyond the US, on a global scale (see also, Canada and the United Kingdom). Each is based on very clear changes to rules of engagement, seen when comparing classic warfare to its contemporaries.

WWI was comparatively low-tech by today's standards. However, the technologies available at the time were extremely effective, "the greatest and bloodiest war the world had ever seen, a war featuring all the inventions of modern science and technology: bombs, poison gas, machine guns, airplanes and tanks" (Klìma 2004:ix). Furthermore WWI was characterized by the horrors of the trenches which "was an alien world that sapped a man's strength and wits with each passing day" (Berg 2011). The atrocities of this war were also surrounded by the stories of heroes that "went over the top" and the subculture of the brave and proud patriotic soldier (Eksteins 1989:153; Berg 2011). However, beyond these tales of heroism lay the violent realities of conflict. Casualties were extremely high for all participating nation states, which is a major

commonality between the First and Second World Wars (WWII). WWII presented even greater technological innovation, specifically through novel implementation of technologies such as the tank: "The British and the French invented the tank, the Germans figured out how to use it right" (Singer 2009b). Then in August of 1945, the greatest war-based technical achievement to date was dropped on the Japanese cities of Hiroshima and Nagasaki.

Following the tragedies and psychological warfare of WWII, two decades of "Cold" War ensued (Eksteins 1989; Kundnani 2004:116). Though characterized by two easily recognizable nation-states (the now failed USSR and the US), the conflict was missing the visceral clashes characteristic of the two world wars. This, however, did translate to high armament build up in both the US and the USSR including the infamous "Space Race," with Americans working at a lightening fast pace after being embarrassed by the USSR's launch of Sputnik (the first satellite to be launched into space). Furthermore, the very project that established the World Wide Web (known at the time as ARPAnet) was also launched at this time. In short, there is no question that war begets technology; however, whether this is merely a positive manifestation is hard to say. Lying common to the short-list of twentieth century conflicts mentioned here, domestic and international, is the existence of clear-cut enemies and nation states. Both of these elements are absent on the fronts of contemporary (postmodern) conflicts.

The so-called American "postmodern" war began on September 11th, 2001 and moved from Afghanistan, to Iraq and finally into Pakistan (Gray 1997). However the clash has still not ended (contrary to "Mission Accomplished" speeches and the

assassination of Osama Bin Laden). Unlike wars of the twentieth century the enemies of the US in the contemporary era lie across the globe and have embodied the principles of chaos and complexity in far more effective ways than the blunt American war machine[34] (Nixon 2007:161; Bousquet 2009). Researchers cite the ability of organizations such as the Taliban to construct small, interconnected cells which make it difficult for the US Army to match them in their small size and stealth (Harris 2003; Kundnani 2004). Though the chaos of war is well known, it is now virtually impossible for the contemporary "allied forces" (especially the US and Canada) to have any certainty

> about the state and intentions of the enemy's forces; certainty about the manifold factors that together constitute the environment in which the war is fought, from the weather and the terrain to radioactivity and the presence of chemical warfare agents…about the state, intentions, and activities of one's own forces (Bousquet 2008:918).

Chaos is exemplified through the numerous instances of friendly fire. Oftentimes the chaos of the battlefield makes distinguishing friend from foe extremely difficult, resulting in tragedy.[35] In contemporary conflicts even the parameters of war itself are unclear (Gray 1997; Bousquet 2009). Lines of trenches, which once governed the spaces of organized warfare, are absent from contemporary battlefields. Instead soldiers are confronted with a vague conception of what the enemy *should* look like and where the threat should be. This in turn requires warriors to be alert at all times, as the threat of attack is ever-present, simultaneously everything and everyone, anything and anyone

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[34] This has also been argued about the Vietnam War (Bousquet 2009:215)

[35] An example of this occurred on April 18th, 2002, when the American Air Force (USAF) killed four and wounding eight Canadian soldiers (Miklaszewski 2011). A US pilot had mistaken them for enemy combatants; shot first, with deadly accuracy and asked questions later (CBC 2006). The US loses more casualties to friendly fire than the CF, but both struggle with the complexities of the **modern (?)** front.

(Harris 2003). This makes it impossible for even the most disciplined body to conform to the need for constant awareness as even when some semblance of control seems to exist, chaos abounds.[36] In response to these issues modern military establishments (US Army and the CF) have deployed machines to augment the human: the robot.

Robots, as they appear today, do not spring magically to "life" but are the handiwork of generations of scientific achievement. Working under this assumption we can begin with Antoine Bousquet's (2009) *The Scientific Way of Warfare*. Bousquet breaks the twentieth century into four eras, and in each era he focuses on a single technology, which at the time revolutionized military strategy and also provided the impetus for more extensive social change. Chronologically, the clock, the engine, the computer and the network emerge from what he labels as the "four regimes" of: mechanism, thermodynamics, cybernetics and chaoplexity (see Table in Bousquet 2008:917). This historical materialist perspective embraces the central role of technology as the explanatory model for the material forces of change. Bousquet's regimes shift from fully collaborative systems, such as the clock and the engine to the emergence of semi-autonomous systems: the computer and network (Marx 1996; Grint 2005; Gray 1997; Joenniemi 2008). Whereas the clock and engine were merely tools of soldiering bodies, technologies that have emerged within the eras of cybernetics (1950s – 1970s) and chaoplexity (1980s – present) focus instead on developing technologies able to operate autonomously, away from the bodies of soldiers. These technologies, such as the

[36] CF member, Captain Trevor Greene was attacked from behind by an insurgent, and received a violent axe blow to the head resulting in severe neurological injuries. The reason he had taken off his helmet was a sign of respect for the village elders. After years of excruciating rehabilitative therapy retired Cpt. Greene has been able to stand up and even walk (W5 2010).

computer and network, are able to surpass average human potential in strength, speed, stealth and accuracy (Singer 2009b). Such advances have, in turn, revolutionized both the public and private sectors (Bousquet 2009; Meadows 2011).

Though the time of the first emergence of computer technology is hotly debated, the majority of the impetus for its production occurs as part of military strategy during WWII[37] and is then perfected in the Cold War era (Gray 1997; Harris 2003; Kundnani 2004; Bousquet 2009:98, 107). The computer is based on principles of cybernetic interface. A simple definition of "cybernetics" refers merely to the science of communication and automatic control systems in both organic and inorganic systems (Bousquet 2009).[38] "Smart" innovations follow basic cybernetic principles, including the "feedback loop, which "allows the system to respond to changes in the perceived environment and adjust behaviour accordingly" (Bousquet 2009:109). In the beginning, computer technology was created merely to make multiple calculations at higher speeds (Bousquet 2009:97). However, as it evolved from a goliath that took up an entire room, (e.g. the Colossus series[39]) to the personal computer, this technology has become the platform for exponential applications of humans and machines. Computers provide vast potential to both augment and improve the human condition. Furthermore, these

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[37] IBM's systems were essential for the Nazis to keep track of their actions during WWII, for a close analysis of this relationship see Edwin Black's (2001) non-fiction work *IBM and the Holocaust*

[38] Bousquet uses three further criteria to define "cybernetic interface," including, "(a) receptors or sensor that can absorb informational input from its environment, (b) a processing unit which can record and process this output, compare it with the desired state of the input, and issue the necessary instructions onwards to (c) an output mechanism which can impact the environment in the required way" (Bousquet 2009:208).

[39] The "Colossus" computer systems were used during WWII by the British to break the Enigma code used by the German army. These first "computers" used to take up entire rooms, but behemoth or not are the precursor to the first electronic computer "ENIAC" and all other contemporary PCs (Singer 2009a:51).

technologies of war have had a trickle-down effect that permits civilians to carry the equivalent of over fifty years of technological warfare in the palm of their hand. Innovations such as iPods, Kindles and Blackberrys would not exist without this "scientific way of warfare" and the advances that have followed (Bousquet 2009; Singer 2009a). However, the true technological supremacy of the computer is not established until the introduction of the network, as "Suddenly one had a much more powerful concept than either one working by itself" (Piper and Baker 2010:322-323).

The first computer network emerges in the form of a project entitled "Arpanet" (ARPAnet) in the 1960s (Singer 2009a:95). The project was initiated by and organization named ARPA (which later became Defence Advanced Research Projects Agency, now known as DARPA). The system was established in 1965 as a way to connect computer terminals (specifically those of the American military) from Cambridge, Massachusetts as well as Santa Monica and Berkeley, California (Singer 2009a:52). "Darpanet" (DARPAnet) sent the first message across its network in October of 1969 and subsequently crashed (Singer 2009a:53). However, by 1973 the project had established formal operating procedures for all networks involved (Serf, Dalal and Sunshine 1974; Singer 2009a:53). This eventually led to the huge advancements in networking across the globe, establishing both military and commercial successes on the platform we know today as the "Internet"[40] (and later the World Wide Web[41]). The computer network, therefore, represented opportunity.

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[40] The term "Internet" emerges from a paper on Transmission Control Protocol or Internet Protocol (TCP/IP) (Serf, Dalal and Sunshine 1974).

Contemporary warfare is now dependent upon networks to engage air, ground and sea forces, as well as headquarters (local and international). Contemporary advanced networking capabilities (including satellite imaging, Global Positioning Systems (GPS) and other feedback loops) permit soldiers to simultaneously connect to both a drone and their home base:

> For example, a soldier in Iraq using laser binoculars with a global positioning device could transmit the coordinates of a target back to military headquarters in Qatar from a field computer, via Boeing satellite. An unmanned predator drone was then able to capture a video of the same target, thus giving commanders in Qatar a live picture. Using a satellite, the command centre would quickly send the coordinates to a nearby B-2 bomber whose pilot, using a Lockheed Martin global positioning satellite, then dropped his bomb, correcting its course and guiding it to the target (Harris 2003:59).

Network Centric Warfare (NCW) is the wave of the future and already at work within the US Army. However, integration of the computer network within warfare has indeed become a global phenomenon (Harris 2003:57). Network Enabled Capabilities (NEC) is the system operating currently in the United Kingdom, Network Enabled Operations (NEOps) currently operates in Canada and even NATO has its own Network cantered system entitled NATO Network Enabled Capabilities or NNEC. These capabilities centralize command, control and communication (C^3) far beyond military capabilities even a decade ago (Haraway 1991; Bousquet 2008:929). Therefore the computer and network have become central to the daily functions of postmodern, or "cybernetic warfare" (Gray 1997:22). This is the arena in which robotic innovations, or machines as

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[41] The difference between World Wide Web and Internet is platform. The Internet uses apps (such as Skype or Instant Messaging) (Anderson and Wolff 2010).

humans come to the fore.

The "Softening" of Times: Oh, Canada

Less than a month after September 11th, the Canadian military mobilized air strikes against Afghanistan, targeting the Taliban, "Given Canada's proximity to the US, the impact of 9/11 was felt immediately north of the 49th parallel, most significantly with the deaths of 24 Canadians who perished on that day in September" (Scherer and Koch 2010:5). A small number of troops were deployed to Afghanistan a week later to join the British and American troops on "Operation Apollo," with the first major Canadian, troop-driven operation beginning in February of 2002 (CBC 2006). However, since 2001 the CF has mobilized more than just troops on the frontlines in Afghanistan. Robotic devices of in all shapes and sizes have joined the fight. The CF will maintain a non-combat presence until 2014, filling the roles of training and rebuilding. This is the same time commitment as the US Army, but the purposes of this presence differ drastically (CBC 2009-2011). This will be achieved with the assistance of non-agential robotic companions to make the work done in Afghanistan less prone to the loss of human life. This drive towards the inclusion of robotic counterparts for troops therefore emerges from a number of areas.[42] Firstly, robots are able to replace troops in this risky business, usually the work of Explosive Ordinance Disposal (EOD) teams (Singer 2009a; Bogue 2011). Further, this follows a call for "modernization" in all sectors in government follows the American trend in robotics, "[We must be] guided by new fiscal, technological and strategic

[42] As early as 2003, large fiscal commitments towards technologies were established in the Report on Plans and Priorities (RPP). Further, current technologies that were operating in the theatre of war had been under criticism for an inability to protect troops against prime threats, such as the IED (Patzkowski et al. 2011).

realities" (Doyon 2005:33). In fact, the Canadian commitment to continuing on in Afghanistan is conditional upon support by NATO troops and technologies.[43] Joining the CF on the rest of their tour are a series of semi-autonomous systems (including drones) commissioned by the department of Defence Research Development Canada (DRDC). Robotics seems to be the more viable option going forward, removing both human error (fatigue, inaccuracy, etc.) and preventing the loss of life. Modern conflict is, therefore, no longer solely a matter of fleshwork but of the intersection of flesh with the computer network. Infantry and other troops are being augmented by stranger than fiction technologies with semi-autonomous systems such as airborne and on-the ground drones.

Where have all the Cowboys Gone?

The intersection of human bodies and intellect with machines reigns supreme over classical forms of war (Haraway 1991:150; Grint 2005; Bousquet 2008, 2009). This has had an effect on the contemporary soldiering body. Instead of simply augmenting flesh with gargantuan mechanical tools the soldier has become a cybernetic organism or "cyborg" merged intimately with contemporary technologies. Unmanned systems can be used for a wide variety of tasks, from landmine (or IED) detection to surveillance. Remote Operated Vehicles (ROVs) are being highlighted as superior alternatives to risking the lives of soldiers in the uncertain terrain that characterizes this postmodern war (King 2009).[44] Projects such as the Improved Landmine Detection System (ILDS)[45]

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[43] "The extension was contingent on whether NATO allies provide 1,000 extra troops and Ottawa secures access to unmanned surveillance drones and large helicopters" (CBC 2009-2011).

[44] ROV technologies emerge in the1960s, but development tapers off within the 80s. However within the 1990s these developments are attempted with a new vigour, "A new thing we're going to look at in the

developed by General Dynamics Canada and the Shape-shifting Tracked Robotic Vehicle (STRV) are merely a duo of the many technologies currently utilized by the CF (CBC 2007). Canadian troops are heavily reliant on American-based systems, as both the budget and the size of operations there permit greater innovation (Fisher 2003; CBC 2009- 2011). American robotics developer iRobot's PackBot and Warrior drone are currently being used by both the Canadian and American military, the latter of which is where we now turn.

The US Army far surpasses the Canadians in the massive numbers of robotic technologies that have been mobilized. The contemporary "War on Terror" has, in fact, been called a war against and of networks (Harris 2003:62). Technologies used in theatre by the US Army in Iraq, stand as a salient example of this cybernetic interface (Gray 1997). This is both established through external drones (or avatars) as well as technologies such as exoskeletons that extend the limits of a human frame (Singer 2009a: Meadows 2011:95-100).

Firstly, there are a wide variety of unmanned drones for all terrain, on land (UGVs – Unmanned Ground Vehicles), in the air (UAVs and UCAVs – Unmanned Combat Ariel Vehicles) and even in the water.[46] These robots cannot only perform surveillance

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military is the K-Ster," Lockyer said. "The K-Ster is an innovative mine-killer with a tiltable warhead. We can add this to our arsenal to help us in our bid to defeat mines worldwide" (King 2005).

[45] The ILDS is used to "locate and destroy landmines is a highly modified, unmanned armoured vehicle with a collection of black cylinders housing sensors mounted behind a four-metre wide cow catcher-like flail. These sensors trick a mine into thinking it has encountered a vehicle and explode it seven metres ahead of the flail" (Fisher 2003).

[46] See the American initiative Space and Naval Warfare Systems Centre's initiatives (SPAWAR) (Singer 2009a: 114). This includes plans (and prototypes) of UUVs (Unmanned underwater vehicle) and USV (unmanned surface vessel) which are used for Littoral Combat Ships (LCS) (Singer 2009a: 114 – 132, 225 – 228). However, naval warfare exceeds the scope of this analysis.

and disposal, but posses the capabilities to carryout search and destroy missions. Other land rovers include Special Weapons Observation Reconnaissance Detection Systems (SWORDS) and TALON (from the same "family") PackBot, Big Dog and Crusher projects (Singer 2009a). One SWORDS bot was nicknamed "Scooby Doo," by the troops, and was one of the first robots Killed in Action (KIA). Surprisingly, his fellow soldiers felt this absence[47] as "Scooby Doo" was said to have saved human lives "dozens of times" (Singer 2009b). The SWORDS, PackBot and TALON drones all have the appearance and functionality of a remote controlled car, on steroids. The "Big Dog" is merely a carrier, and a large awkward one at that, with four gawky legs which protrude from its sides, permitting it to navigate a multitude of terrain whilst carrying five times the weight of the average soldier (Singer 2009a, 2009b; Meadows 2011). The "Crusher" is a "six-ton truck mounting a .50 calibre machine gun" which is the German tank version 2.0, and "can even be controlled remotely with an Apple iTouch music player" (Singer 2009a:68). On the side of UAVs there are the Raven, Predator and Reaper (Hunter/Killer) models, which are most often used to perform reconnaissance (Meadows 2011). Initially the military was highly skeptical of putting these drones in the air, however they now clock so many hours of footage that there are not enough soldiers to sort through it all (Singer 2009a:216-217).

Both the Americans and Canadians have engaged in similar debates, from feasibility to ethical issues surrounding the proliferation of drones. Canadians have

[47] The unit was a companion to the soldiers of the US Army. Upon the loss of this unit a soldier stated that "He didn't want a new robot, but 'wanted Scooby-Doo back,'" this makes it clear that these initiatives are well received; soldiers even send thank you post-cards to the developers of these devices – these innovations are truly saving lives (Singer 2009a).

specifically investigated the superiority of UAVs as early as 2005, through a comparison of the Joint Strike Fighter (JSF) with a UCAV (Doyon 2005:38). The UCAV was found to score the same "excellent" ratings in all areas compared with the JSF, at a third of the cost (Doyon 2005). However, even though robots are able to surpass human capability, they "are emotionless, they see an 80 year old grandmother in a wheelchair the same way they see a T80 tank. They're both just a series of zeros and ones" (Singer 2009b).[48] Too often, it seems, drones have the nasty habit of attacking their human compatriots; incidents have occurred across the globe, that have caused the deaths of both soldiers and civilians:

> Now sometimes these are just "oops" moments, which is how the head of a robotics company described it "You just have oops moments." Well what are oops moments with robots and war? Well sometimes they're funny. Sometimes they're like that scene from the Eddie Murphy movie, *Best Defense*,[49] playing out in reality, where they tested out a machine gun armed robot and during the demonstration it started spinning in a circle and pointed its machine gun at the reviewing stand of VIPs. Fortunately the weapon wasn't loaded and no one was hurt. But other times oops moments are tragic, such as last year in South Africa, where an anti-aircraft cannon had a, quote, "software glitch" and actually did turn on, and fired, and nine soldiers were killed (Singer 2009b).

As examples of removing the person from the machine, these drones presents a newer (and safer) mode for attack by eliminating human costs while keeping "humans-in-the-loop" (Singer 2009a; CBC 2007). However, this also tips the balance of war, as risking

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[48] Aforementioned, because of the weak AI showcased by contemporary models, contemporary robots are unable to distinguish between targets. However, robots are "becoming" more intelligent, as some designers are attempting to integrate "guilt" and "remorse" codes into contemporary models (Caroll 2011).

[49] "Run away, we've got a problem with the tank," screams Murphy as the tank charges onlookers. This film is filed under the comedy/war genre, similar to other productions as *ShortCircuit* where the "good" robot (Number Five) fights against the "bad" company NOVA. Both films explore the divergent roles that researchers and the military often play, pitted against one another in a battle for the future of humanity (Badham 1986).

lives has often acted as deterrence and fuelled anti-war sentiment (Nixon 2007:162). Many wonder if in attempting to remove the human there is the potential to remove the costs of war (Singer 2009a, 2009b). However, for now, the visceral realities of war are still felt, and soldiers are required to maintain their presence on the frontlines. This is because these machines must be connected to humans and therefore these bodies are still put at risk (Gray 1997; Meadows 2011).[50] The American military represents a small minority of those that believe the human will truly be able to leave the frontlines. Peter Singer shares a quote from a news editor in Lebanon, as a drone flew above him, "This [the drone] is just another sign of the cold hearted, cruel Israelis and Americans, who are cowards because they send out machines to fight us. They don't want to fight us like real men…they're afraid to fight. So we just have to kill a few of their soldiers to defeat them" (2009b). Even with drones in place human costs of war will remain, as is said in the street wisdom of the seventies rock band, Styx: "The problem's plain to see/Too much technology/Machines to save our lives/Machines de-humanize."

Drones, of course, are not the only success as forged by innovations in cybernetics. "Super-enabling" technologies are changing the appearance of the contemporary soldier and allowing these brave men and women to go beyond their corporeal limits. The US Army has a number of development programs that focus on adaptability, comfort and overall "survivability" (PEO 2011). The "PEO Soldier" program is an acquisition agency responsible for these technologies and currently has

[50] Though soldiers who operate remotely are still being diagnosed with PTSD, in fact, some studies have shown that the rates of PTSD are higher in these special operations than in the rest of the soldering population (Singer 2009b).

four streams of innovation: Soldier Protection and Individual Equipment, Soldier Sensors and Lasers, Project Manager Soldier Warrior and Soldier Weapons (PEO 2011). These technologies, unlike robotic drones, provide only positive outcomes, which can, in fact, reach beyond the frontlines. There are innumerable examples of projects currently being undertaken by the US Army, innovations that could easily be torn from the pages of famous sci-fi novels and films.[51] Current projects include "Warrior System" technologies such as: the "Land Warrior" and "Future Force Warrior Gear." These technologies are meant to connect the soldier to the "Battlefield Network," creating complete visibility by lifting the "Fog of war":

> Over the past 10 to 15 years, the Army has been digitizing vehicles, but Soldiers would lose all of their situational awareness when they exited the vehicles. Land Warrior allows soldiers to maintain this awareness and improves the commander's ability to manage the battle (Dawson 2007).

In other words contemporary advances emerging from developers allied with the US Army are attempting to conquer the challenges presented by unfamiliar terrain, in a sense attempting to conquer the very nature of war itself. The titles of these projects bring to the fore images of the *Terminator* or the *Six-Million-Dollar-Man* but promise real benefits in the near future (Johnson 1974; Cameron 1984, 1991; Singer 2009a, 2009b; Meadows 2011). The Land Warrior technology literally embodies the capabilities of *RoboCop* as some "experts envision a squad of seven soldiers able to dominate an area the size of the Gettysburg battlefield - where in 1863 65,000 men fought" (Verhoeven 1987; Harris 2003:62-63). The "Future Force Warrior Gear" is an innovation in body

[51] Inventions by the American military include the Phased Hyper-Acceleration for Shock, EMP, and Radiation (PHASER) and the Personnel Halting and Simulation Response (PHaSR) ideas struck from the pages and screens of the *Star Trek* franchise (Singer 2009a:164).

amour which can help prevent death through monitoring body function; but cannot prevent severe injuries such as limb loss (Singer 2009a; Meadows 2011). Other technologies include the Berkeley Lower Extremity Exoskeleton (BLEEX), and the Human Universal Load Carrier (HULC) (Singer 2009a, 2009b; Meadows 2011; Patzkowski et al. 2011). Exoskeleton systems, such as those created by Berkeley Bionics, are meant to augment a soldier's ability, making it much simpler to carry the large loads that are expected of those on foot (PEO 2011; Wilken 2011).[52] However, cybernetic technologies are unable to fully replace humans. Aforesaid, strong AI is required to replace human reasoning, advances that are currently beyond the grasp of contemporary robotics (Singer 2009a; Meadows 2011). The Canadian and American militaries, though groundbreaking in their approaches to machines as humans, do not provide a solution to contemporary conflicts; instead, they raise even more questions. The removal of the human from the frontlines has very real implications, which will require the re-negotiation of the frontline land forces for both war and peace.[53]

Each of these technologies is intimately integrated with the human frame, in a symbiotic relationship, with one dependent on the other. Berkeley's BLEEX exoskeleton is used for casualties to augment limb function. Through merely affixing these prosthetic technologies to a soldier's body one warrior is able to do far more than previously imagined. There are hopes that in the near future these kinds of innovations may even

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[52] There is also a Japanese exoskeleton, the Hybrid Assistive Limb (HAL) developed through university of Tsukuba and produced by Cyberdyne, http://www.cyberdyne.jp/english/robotsuithal/ (Sankai 2010).
[53] The Canadians are focusing on peacetime technologies, far superior to the "hands-and-knees" searches being carried out by Afghanis, who are searching for, "Yugoslav, Italian, Egyptian, Israeli, American, British and Soviet mines" part of the countries sordid and violent history (Fisher 2003).

enable casualties to return to service after severe injury, with Berkeley Bionics demonstrating this potential by helping Paraplegics to walk again (PEO 2011; Wilken 2011). Beyond initiatives for war, the very meaning of "ability" is currently being contested through the very technologies that are also used to disable.

Japan's War for Health: Domo Arigato, Mr. Roboto

In 2003, the American Film Institute (AFI) aired a show on the "100 Greatest Heroes and Villains" in movie-making history. The only character to appear on both lists was the Terminator, for his role in the first film, *The Terminator* as a villain (#22 on the list) and for his role in *Judgment Day* the second film, as a hero (#48 on the list) (AFI 2003; Cameron 1984, 1991). This is extremely revealing of the dual potential of robotic technologies, to present either harm or help to humanity (Singer 2009b). Just as the *Terminator* performs dual roles as both good and evil in Cameron's two films, so too are these technologies of war being used for both war and peace.

The Americans have very few designs that are utilized purely for healthcare. However, this can be seen in the "HelpMate" Robot. The HelpMate is a robotic carrier that is utilized in hospitals to transfer medical supplies between wards. However, these little healthcare professionals have received mixed reviews (HelpMate 1999). One compiled by the National Institute of Standards and Technology (NIST), found that the HelpMate received only two out of four stars on a Composite Performance Score (HelpMate 1999). The newer version, the Pyxis HelpMate ® SecurePak, has improved from the initial model but the robot still faces a number of challenges. Even though this is

a major achievement for the Americans, it seems that the health-driven robotics sector is much more robust in Japan.

Designers of healthcare hardware differentiate themselves from the military-initiated programs of the US Army and instead take a health based interdisciplinary approach exemplified by the "Cybernics" program at the University of Tsukuba (Sankai 2006). From the National Institute of Advanced Industrial Science and Technology (AIST) located in Tsukuba, Tokyo, a number of innovations have emerged. The majority of these are healthcare technologies are based on exploring the potential of Human-Robot Interaction (HRI). One of these is the animatronic baby seal named "Paro" (Meadows 2011:127-131). Paro was designed to help elderly individuals with cognitive disorders, as a therapeutic aid; it responds to touch, by making (very odd) squeaking sounds, as well as opening and closing its big seal eyes and moving its head, fins and tail. The device used to charge this (health)bot has the same appearance as a child's pacifier (soother) and therefore adds to the animatronics' (person)ality. The elderly are not the only ones who are being targeted with new technologies, as across the globe in Germany the "BARTHOC," an interactive robot, has been seen as a possible aid for children who appear on the autism spectrum (Hackel, Schwope, Fritsch, Wrede and Sagerer 2006).[54] An exoskeleton has also been designed by the University of Tsukuba, the Hybrid Assistive Limb (HAL) similar to the BLEEX and HULC, models but was created

[54] This ingenuity not only proposes immense successes in the field of prosthetics in the near future, but also brings more possibilities for disabled bodies (beyond the physical) in the near future. This can be seen in the BARRTHOC, a Germany invention, through interdisciplinary ingenuity reimagining the potential of robots in the near future (Caroll 2011). Examples of this can be seen in the ALIZ- E program, http://www.aliz-e.org/

exclusively for healthcare purposes (Sankai 2006). Requisite for the usage of this type of hardware is limited mobility. Disability, therefore, has become a new platform[55] for the use of robotic technologies, from therapeutic furry friends to wearable robots (exoskeletons) (Meadows 2011). However, not all of the technologies emerging from this sector are merely altruistic; a series are being built purely for entertainment. This proves that some predictions of Čapek's have, indeed, come to fruition.[56]

Robots for entertainment are seen mostly in the household industry, such as the vacuum bot by iRobot, the "Roomba." The *National Geographic* August 2011 issue covered an entire series of robots that were created by humans, for humans; many of which come from the Korean institute of Science and Technology (KIST) (Caroll 2011). The list includes, HERB the Robot Butler, Actroid-DER (aka Yume) and other "Actroids," the Geminoid-DK series androids, PR2, Bina48. Actroids are "human-like" in appearance and adored with costumes and "personalities," specifically bring to the fore the potential for robotic technologies to be used purely for consumption. However, leaving the uncanny valley[57] we revisit Nao, a miniature pet(bot), which is reminiscent of the robotic dogs from the 90s (such as AIBO created by Sony which were discontinued in North America in 2006) (Sony Europe 2006; Meadows 2011:35). Aforesaid, Nao

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[55] Canadian filmmaker Rob Spence replaced his damaged eye with a camera, and subsequently filmed an "Eyeborg" documentary. See eyeborgblog.com for more details on the project.

[56] "Orders for industrial robots in North America skyrocketed 60 percent last year [1999], totalling $2.1 billion" (Hawaleshka 2000).

[57] The concept of The Uncanny Valley was first created by Masahiro Mori in 1970. Mori explains that we encounter a sense of "strangeness" when faced with artificial creations are *too* lifelike, "In this case, there is no longer a sense of familiarity. It is uncanny. In mathematical terms, strangeness can be represented by negative familiarity, so the prosthetic hand is at the bottom of the valley. So in this case, the appearance is quite human like, but the familiarity is negative. This is the uncanny valley" (1970:34). Designers of robotics do their best to avoid this negative reaction, which is the reason that the vast majority of innovations do not share similarities with humans, yet.

presents huge leaps for robotic mobility and environmental navigation. However, the robot that blurs all these lines of utility must be Honda's celebrity(bot) ASIMO, which is the result of over fifteen years of research, and three unsuccessful prototypes (Hawaleshka 2000; Meadows 2011:169). It sings (not unlike HAL 9000), it dances and it even performs household tasks (Kubrick 1968). ASIMO even had his own show in Disneyland in the Disney Innovations Centre, however as Meadows explains it is both surreal[58] and exploitive, just as Čapek warned, "essentially a remote-controlled *karakuri ningyo* [Japanese for gag mechanism e.g. whoopee cushion] designed to deliver the illusion of autonomy" (2011:119, 156).

The question remains: are there, and will there be robots better than humans? The short answer is yes and no. some will be better at certain tasks but contemporary robots lack strong AI. They are imperfect and can make mistakes and some of these failures or "oops moments" are more dangerous than others (Singer 2009b; Meadows 2011). Robots are fast, stealthy, accurate and deadly but they still have a great many hurdles to climb (literally and figuratively) before they will challenge human supremacy in all areas. Furthermore, robots utilized for entertainment bring forward questions beyond utility, and concern relevance. In *On War* Carl von Clausewitz explains that: "Every age has its own kind of war, its own limiting conditions, and its own peculiar preconceptions" (1976:593). For the soldiers of the twenty-first century this leads to the very reconstitution of humanness (Haraway 1991; Hayles 1999; Bousquet 2009:x;

[58] In response to Honda's older version the P3, "Not everyone is impressed…Nobody diminishes the achievement in it… '[but] what use is that robot?'" (Hawaleshka 2000).

Watermeyer and Swartz 2008). Therefore, even though robots bring into question the possibility of superior capabilities, human versus machine, it will be a great many years before any "bot" will be able to pass a Turing Test.[59] The perfected trial of such would, in fact permit a paradigm shift; "You believe I'm real, and you believe that thing is not human…But this distinction will become more difficult as the technology advances. If you finally can't tell the difference, does it really matter if you're interacting with a human or machine?" (Carroll 2011; Meadows 2011). This potential is what many fear with further distance "humans" from one another, with some pessimism forecasting the further fall of human interaction (and social capital) (Hawaleshka 2000; Meadows 2011; Caroll 2011). For now, however, robots will retain their space as the tools of humankind.

To conclude, one may wonder if such technologies can be used to help, instead of harm, then why use them for the military *at all*? Ironically, DARPA has provided the answer in its Revolutionizing Prosthetics Program (RP2009) (DARPA 2011). Paradoxically, the same cybernetic interface both maims and reframes damaged bodies and tissues. Bodies of the military amputee are now "flagged" by state-of-the-art prosthetic limbs, cyborging organism with machine (Haraway 1991; Gray 2003; Grabham 2009; Masters 2010). The body of the soldier, like the high-performance athlete, is a body that represents not only the individual but also the state (Atkinson 2005; Magdalinski 2008; Beamish and Ritchie 2006). The future of robotics can be seen in the military amputee, where the cyborg trope of Sci-fi is made flesh, effectively collapsing

[59] This is a test that would be administered to a human and a robot. In a successful scenario a human judge would not be able to tell the difference between the AI and the human (Meadows 2011:74, 114).

the human/machine binary. This not only re-imagines the potentials of robotic technologies, it also redefines the limits of the human body. Advanced cybernetic technologies are therefore embodied not only remotely by new strategies for war but literally and viscerally by the contemporary cyborg soldier/tactical athlete, a facet of Postmodern War (Gray 1997; Masters 2010).

Chapter 4

HumanMachine

Cyborg Corpo(Reality): The CyborgSoldier/TacticalAthlete

They've been watching too much terminator
- Dean Kamen

In the twenty-first century a vast array of modern robotic technologies are being brought forth to augment failed flesh. However, less than ten years ago effective prosthetic technologies were extremely difficult to find. This change has been brought about by a series of drastic shifts that have affected the production and acceptance of technologies for disabled bodies. The Olympic and Paralympic Games have an intimate historical relationship with the military and more specifically the soldiering body. This can be seen in the histories of both war and high-performance sport. George Orwell speaks to this parallel in his 1945 essay *The Sporting Spirit*, when he notes that sport is merely "war minus the shooting." The Paralympic Games, in fact, emerge from the intersection of military, acquired disability and sport. Historically, the sports available to PWD were very limited but as technologies have improved so too has the array of activities (at both the recreational and elite levels) that individuals are able to participate in and, in a few cases, even dominate (Lagacé 2010; Oscar Pistorius 2011). These technologies would not exist as they do now if it was not for the casualties of war and financial commitments made by contemporary military establishments (DARPA 2011). This demonstrates the positive benefits of military technologies designed to aid injured soldiers and civilians,

even beyond the prosthetics themselves; and are renegotiating the very meaning of disability, through the realization of "cyborg" corporeality (Haraway 1991). Here, the trope of the cyborg is crafted through the history of disability, technologies of war (and peace) and high-performance sport. The cyborg presents a transgression against conceptions of ability and the "natural" human body (Haraway 1991; Bailey 2008; Watermeyer and Swartz 2008; Legg, Fay, Hums and Wolff 2009; Lagacé 2010; Masters 2010). The soldiering body living with acquired disability is "cyborged" by modern prosthetics which not only reveals the fragile future of "humanness" but also confronts the reality of a "posthuman" era (Haraway 1991; Hayles 1999; Gray 2003:216)

Crafting the Olympic Ideal: *Fastest Highest and Strongest* [60]

Baron Pierre de Coubertin was fearful of the mass industrialization spreading through Eastern Europe towards the end of the nineteenth century (Brown 1996; Beamish and Ritchie 2006). To combat the diminished influence of nature in everyday life he crafted his philosophy of "Olympism," which included principles of embodied fulfilment, "eurythmie" and amateurism, a set of aesthetic principles based on both high art and physical culture (Brown 1996:122 – 123; Beamish and Ritchie 2006:49). De Coubertin believed that high-performance sport had redemptive potential for bodies of his era against the forces of industrialization. His ideals were meant to engage with the pastoral vision of bodies in "unity" which would transcend conflict-ridden industry and the succeeding principles of capitalism through the intrinsic enjoyment of physical exertion,

[60] For a more in-depth analysis of the Olympic Games, see Rob Beamish and Ian Ritchie's *Fastest, Highest, Strongest, a critique of high-performance sport* (2006).

"The athlete enjoys his effort. He likes the constraint that he imposes on his muscles and nerves, through which he comes very close to victory even if he does not manage to achieve it" (de Coubertin cited in Beamish and Ritchie 2006:13). This "sporting spirit" would embody "a moral beauty" or "goodness" cultivated through physical, mental and spiritual health (Orwell 1945; Brown 1996:124; Beamish and Ritchie 2006; Bailey 2008; Magdalinski 2008:9). De Coubertin's principles of Olympism constituted a "moral aesthetic movement" heavily based on tenets of modernism which set a utopic vision and direction not only for the future of sport and the body but humanity as a whole. De Coubertin believed that sport would bring individuals together in perfect unity: "Olympism is a type of universal humanism; that is, a social and political ideology with a central tenet that all humankind shares common values such as peace and respect" (Brown 1996:122; Beamish and Ritchie 2006). Therefore de Coubertin believed in the potential of sport to alleviate all the ills of his era, for all peoples.

The principles of Olympism were adopted within the Olympic movement and were utilized not only historically but are continued within the modern Games.[61] However, de Coubertin's ideals of altruism are weakly reflected in these Games. The Olympics of the contemporary era would in fact be unrecognizable to the French idealist, as his project has since been used to discipline and constrain bodies in the same ways that he feared that industry would. The aesthetic potentials of Olympism have since become

[61] "Olympism" is still the terminology utilized by the IOC, however they have shifted from de Coubertin's triad to "excellence, respect and friendship," with the same underlying message for universal humanism, "to build a better world through sport." This contemporary treatise has "six fields," including the, "grassroots level," "women in sport," "environment" as well as peace, development and education "through sport" to achieve these lofty goals (IOC 2009).

commercialized, "buried in the so-called 'cultural component' of the modern Olympic Movement, and has been embraced without so much as a pause to contemplate its origin or significance" and his desires for aesthetic performance has instead been reduced to mere spectacle (Brown 1996:121).[62] Today the body of the athlete is measured and manufactured, crafted through interventions in diet; exercise and even the use of banned substances and therefore are more artificial and crafted than natural and pure (Magdalinski 2008).[63] This body of the twenty-first century is commodified, defined merely by the sum of its parts (Sharpe 2000). This commodification is exemplified in the medical model (discussed in Chapter 1) which sees the limits of the body as calculable. Entire modern franchises are based on the measurement and "perfection" of the human frame. The body is described as an object, one that can be controlled and contained (Sharpe 2000:292). Michel Foucault sees the disciplining of bodies as a systemic pattern of power and control throughout both historic and contemporary western societies (1979). His work, *Discipline and Punish,* illustrates how a major historical shift from retributive to rehabilitative justice models emerged throughout a history of surveillance and punishment of bodies within the prison system (Foucault 1979). Historically defined by harsh physical punishments the prisons moved towards a less overt disciplining of the body (technologies of self) resulting in self-surveillance (Shogan 1999). Foucault

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[62] The opening and closing ceremonies of the Olympic Games have come under heavy criticism in the past decades. For example, the Vancouver 2010 ceremonies made liberal usage of Indigenous art, dance and imagery, though excluded these peoples from participation. Furthermore, these games were shrouded in debate about the ownership of the land, and the idea of a "Canadian" culture itself.

[63] Donna Haraway's definition of "cyborg" engages with both the visible and invisible infiltrations of non-human (artificial) entities. Therefore athletes who take any sorts of supplements (licit or not) or utilized digital technologies to monitor their level of performance are "cyborged" (Haraway 1991:163).

explains that the ideal body was one that could be moulded like clay, a "docile body" objectified by the powerful institutions of both sport and the military. The subject was expected to internalize standards and expectations with compliance garnered through the fear of being caught. Foucault described that these compliant (docile) bodies could "be subjected, used, transformed and improved" (1979:136; Shogan 1999; Magdalinski 2008). He expresses that the soldier is an exemplary model of this docility, as "he bore certain signs: the natural signs of his strength and courage" (1979:135). It is here, too, that the embodiment of "docility" can be seen in the elite athlete, where both human strength and civility are seen as cultivated through disciplining the body for the purposes of sport. Therefore "athletic discipline is indistinguishable from the training of soldiers" as each body is flagged as a representation of both personal and national health (Shogan 1999:13; Grabham 2009; Scherer and Koch 2010). Discipline acts as a central link between Marx, Foucault, sport and war:

> [T]he modern economy is built on treating other people as if they were in fact machines. I suppose it originated in army drill in the 17th century, where the appalling, unnatural demands of standing up to artillery bombardment demanded men who could stand and march like robots (Brown 2010).

Soldiers and athletes are held to the same ideals of mental, spiritual and corporeal discipline and have thoroughly linked histories. This becomes evident through both shared corporeal ideals and when looking at sport and the military in both the US and Canada (Scherer and Koch 2010). In Canada during WWI, "organized senior and amateur hockey leagues were 'effective instruments of recruitment' for the Canadian Expeditionary Forces" (Scherer and Koch 2010:3). Jay Scherer and Jordan Koch's 2010

article: "Living With War: Sport, Citizenship, and the Cultural Politics of Post-9/11 Canadian Identity" use the Tickets for Troops[64] event as a case study to look at discourses that intersect with both sport and war. Often war is used as a metaphor for sport competition as well as sport being used to explain warfare. This is illustrated quite clearly in comments made by a young soldier (interviewed at the game) that parallels the two: "The same way as it is in hockey, no matter what happens out in front of your goalie, you're gonna get the guy outta there" (2010:20). Therefore, Orwell's keen insight into the histories of high-performance sport and war seems to hold true in contemporary North America (1945). The ideal frame espoused by high performance sport is that of the hard, toned, able frame of the athlete and soldier which is then placed in opposition to the soft, fat and weak (Magdalinski 2008). Masculinity also dominates both the arena and the frontlines. Historically women were not included in sport, and even today merely fifteen percent of US Army and CF consist of women.[65] Therefore both the military and sport establish the normal participant as both: "masculine and heterosexual" and necessarily exclude "A disabled female athlete, a black female athlete, or a lesbian athlete are" which are, "produced as 'other' to the norm" to maintain the status quo (Shogan 1999: 61, 47; Connell 2001; Magdalinski 2008; Watermeyer and Swartz 2008). Many have, and are still, denied entry into the arena if they fail to conform to long-established rules of the

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[64] This was done in 2007 for an Edmonton Oilers game, where seat holders were encouraged to donate their ticket to a CF member, or value of the ticket. For "enlistment" the generous donors were given a tax receipt (See press release: http://www.army.gc.ca/lfwa/photos_hockey_tickets-troops.asp).

[65] For more extensive writings on the role of gender (and gender performance) within sport (also "embodiment") please see Anne Balsamo, Debra Shogan, Tara Magdalinski, Lisa Jean Moore and Judith Lorber. See also the book written about the first female KIA in Afghanistan, *Sunray: The Death and Life of Captain Nichola Goddard* (2010) by Valerie Fortney

Olympics. Such discriminatory practices are based on sex, gender performance, class, age and ability. These prejudices are echoed in the creation of the Paralympic Games, though elite disabled sport permits athletes to enter the arena, this entrance is conditional and by no means establishes them as "equals" to able-bodied competitors (Norman and Moola *forthcoming*:6).

Initially casualties who survived the war returned home only to live "two or three years at the utmost as a rule" (Bailey 2008:15). Individuals with Spinal Cord Injury (SCI) would suffer complications such as sepsis and pressure sores which "were considered inevitable" by medical professionals (Bailey 2008:15). Involvement in sport was found to dramatically increase the stability (and longevity) for these casualties, enabling them to enjoy a much higher quality of life (Bailey 2008; Dunn and Brody 2008; Lagacé 2010; Soldier On 2010). Guttmann was the first to implement a sport-oriented physiotherapy program at his Stoke Mandeville facility in Aylesbury, England (Legg et al. 2009:247). His first project sparked great interest in veterans wanting to participate in recreational and later elite sport (Bailey 2008 15-23; Legg et al. 2009).[66] In the fall of 1944 Guttmann's patients engaged in their first competitive event: wheelchair polo. Based on this early success he declared in 1948 that these "Stoke-Mandeville Games" would become the disabled equivalent of the Olympic Games. In 1952, this dream became a reality as the first international Games took place in competition between the English facility (Stoke-Mandeville) and the Netherlands (Legg et al. 2009:247). After the formal

[66]The very first example of "disabled sport" seen in the First International Games for the Deaf in 1932 (Vanlandewijck and Thompson 2011:6)

establishment of these Games, Guttmann was identified as the father of the Paralympics, Pope Paul XXIII even called him: "the de Coubertin of the paralyzed!" (Bailey 2008:24; Legg et al. 2008:248). The International Paralympic Committee (IPC) was then established in 1989,[67] presenting these Games as supplementary[68] to the able-bodied events (Legg et al. 2009:248). The contemporary Canadian program: Soldier On/Sans Limités, commemorates Guttmann's achievements and acknowledges him in its history (Lagacé 2010).[69] Both the soldier and the sportsman have, therefore, become the canvases of intense discipline and are held as exemplars of human potential, even after acquired disability. Jeffrey Gambel, the chief of Walter Reed Veterans Hospital in Washington, notes that casualties "are otherwise healthy young people who have suffered devastating injuries. We use all of our energies to help them recover to do whatever they want to do" (Janofsky 2004). It is the inclusion of non-normative bodies in elite sport that begins to establish a redefinition of what constitutes a "good" and long life for individuals living with a range of disabilities (Dunn and Brody 2008). However, controversy has a great tendency to haunt disabled sport, encouraged by an ever-present spectre of ableism which is located within historic fears of the monstrous Other (see Chapter 1) (Said 1979; Bailey 2008; Shaw 2008; Legg et al. 2009; Watermeyer and Swartz 2008; Norman and Moola *forthcoming*).[70]

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[67] The term "Paralympic" had existed colloquially since the mid 1950s, but was not institutionalized until the establishment of the IPC (Vanlandewijck and Thompson 2011:6).
[68] "Para" is directly translated to state "beside-of," however, for a long time, the Paralympics were treated more as an "unwanted sibling" than a brother Shaw 2008:79)
[69] The work at Stoke-Mandeville is also commemorated in the strange mascot for the 2012 Paralympic Games appropriately named "Mandeville" http://www.london2012.com/mascots
[70]Even with legislation protecting the rights of all bodies there are instances where freedom of speech

Instead of embracing the spectrum of abilities present in professional sport the International Olympic Committee (IOC), the IPC, as well as the International Association of Athletics Federations (IAAF)[71] often place a variety of barriers in the way of full inclusion, attempting to standardize and control all bodies that enter the arena. The exclusionary policies established by these institutions reinforce the conception of a mutually exclusive duality between the value systems that support the able-bodied and disabled Games. Paralympic athletes are forced to navigate the difficult terrain of corporeal expectations with great care, as the arenas of high-performance sport permit very few to enter and where "disability, and the conditions for participation are still heavily policed, surveilled, and guarded; ability functions as the gatekeeper and final arbiter into a world of legitimate and privileged sport participation" (Norman and Moola *forthcoming*:6). For example, Paralympic champion Oscar Pistorius is able to conform to contemporary ideals of high-performance sport. However, his body presents a challenge to the classical conception of the Games (Berger 2008; Watermeyer and Swartz 2008;

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permit blatant intolerance. In February of 2011 a DJ from New Zealand, who has a reputation for provocative comments, described sports for people with a disability as "ludicrous." He also claimed it was "crazy" that Para-athletics should be eligible for New Zealand's Halberg Awards which recognize top sporting achievements. His reasoning for this statement was, "If you have had your legs chopped off, you shouldn't be in there at all." He later questioned the competition levels of Paralympic Sport by adding, "The fact that a guy was able to fall down, get up again and still win, shows that there wasn't really a lot of competition in his field was there." The IPC responded that it was "utterly disgusted" with such commentary. Complaints leveled at the radio station were met with words of defense of their man, "As to the content of his comments, the Committee [MediaWorks – Radio Standards] concedes that while they could, by some, be considered to be somewhat immoderate they were clearly distinguished as his opinion" and "…it supports his right to voice opinion in this context provided always that it is done so within the limitations of the Radio Code, and in this instance, the Committee contends it fell within these limitations" such permissive language reifies the Othered space that disability occupies, and also that if it is "opinion" then it is completely acceptable (IPC 2011; Wilson 2011).

[71] In 2007 the IAAF passed this clause in their Competition Rules, "any technical device that incorporates springs wheels or any other element that provides a user with an advantage over another athlete not using such devices" (Davies 2008; Extraordinary People 2008).

Messinger 2009; Norman and Moola *forthcoming*). Through a deconstruction of his trials and tribulations it becomes evident that the disabled body in sport is indeed breaking down the boundaries between the disabled and the able-bodied, armed with modern technological innovations. However, located at the very heart of this debate is nature of (dis)Ability itself, as elite disabled sport and the elite disabled athlete questions the constitution of "humanness" (Watermeyer and Swartz 2008; Norman and Moola *forthcoming*).

The Blade(Boundary)Runner

Pistorius, an athlete from South Africa, is a sprinter; he is strong, white and male. However, his performance on the track continuously violates conceptions of the "naturalness" of sport (Magdalinski 2008). This is not due to a lack of skill or other personal defect but the fact that he runs on two Flex-Foot Cheetah© below-the-knee (BTK) prostheses.[72] Pistorius was born missing bones in both his legs and subsequently his parents opted for elective amputation when he was only eleven months old (Oscar Pistorius 2011). At issue with his prosthetics, which he requires to function on a daily basis, are the central tenets of "natural" competition, as "technology [is seen] as a threat to the sanctity of sport" (Magdalinski 2008:16; Watermeyer and Swartz 2008; Oscar Pistorius 2011; Norman and Moola *forthcoming*). Pistorius' body brings forth "cyborg anxiety" due to archaic pastoral visions of the "natural" or "pure" sporting body which

[72] Pistorius actually has fifteen other pairs of prosthetics, three of which he actually uses regularly. He is celebrated by employees at Össur for his commitment to improving prosthetics, "When you find an individual who is willing to take the technology further, the engineers love it" (Extraordinary People 2008)

govern both the Olympic and Paralympic Games (Magdalinski 2008; Watermeyer and Swartz 2008; Norman and Moola *forthcoming*).

There are two main normative conceptions that his body is considered to profane: ability, because he is considered "disabled," and humanity because his carbon fibre feet are seen as "inhuman." Because of these "violations" he has been accused of having a mechanical advantage (Watermeyer and Swartz 2008; Christie 2009). The reason that Pistorius is often placed under scrutiny is due to the binary divisions that govern popular conceptions of ability and disability, as well as human and machine. His superior skills on the track make him an exceptional Paralympic athlete. Equally troubling to officials is the appearance of his sport prostheses, which diverge a great deal from the appearance of an intact human foot, ankle and calf. His body therefore creates an unusual spectacle for those who see sport in a more traditional sense (Christie and McHugh 2007; Magdalinski 2008:122-126).[73] Because Pistorius is using mechanical legs, he is perceived differently than whole, able-bodied athletes including other disabled athletes with less severe[74] disabilities (Magdalinski 2008; Watermeyer and Swartz 2008; Christie 2009; Kram, Grabowski, McGowan, Brown, McDermott, Beal and Herr 2009; Weyand and Bundle 2009, 2010; Norman and Moola *forthcoming*). It is also his ability to surpass expectations of the disabled body which strikes fear in competitors, who have claimed that he has an

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[73] He has long been the poster-boy for Nike, and is the self-proclaimed "fastest man on no legs" (Oscar Pistorius 2011).

[74] The IPC has system of classification, by which "a single group of entities (or units) are ordered into a number of smaller groups (or classes) on the basis of observable properties that they have in common and taxonomy is the science of how to classify" (Vanlandewijck and Thompson 2011:2,4.4). The ICF acts as the foundation for classification in two areas (Performance and Selective) this system was put in place to ensure that competition will never be "one-sided" (Vanlandewijck and Thompson 2011). Pistorius therefore, because of his high performance, is often placed with athletes who have less severe injuries.

"advantage" over other runners (Magdalinski 2008; Christie 2009; Weyand and Bundle 2009, 2010).

These claims came to bear just before the 2008 summer Olympics in Beijing when Pistorius was invited to try-out for the South African relay team as their fourth member (Magdalinski 2008:122-127). In response the IOC and IAAF pushed for further inquiry as the sporting community clamoured that there had to be something "unfair" about Pistorius' odd-looking carbon-fibre feet (Magdalinski 2008; Christie 2009; Watermeyer and Swartz 2008; Weyand and Bundle 2009). This tense atmosphere is exemplified in statements made by a Canadian track coach, Les Gramantik, when he said: "He does not have calf muscles that get tired… My gut feeling is that he has an advantage... But I cannot give you the proof for it" (Christie 2009).[75] The controversy instigated a series of studies to establish, scientifically, whether or not the athlete held an advantage (CAS 2008; Kram et al. 2009; Weyand and Bundle 2009).

Pistorius willingly subjected himself to testing in 2007, undertaken by Professor Peter Brüggemann at the Institute of Biomechanics and Orthopaedics at the German Sport University in Cologne at the request and sponsorship of the IAAF[76] (CAS 2008). The results demonstrated that the energy return of the prosthetics surpassed biological legs and Pistorius was therefore banned from competing against able-bodied competitors

[75] The coach continued, "The prostheses are so good, so well designed now ... you don't want to have a war with robots" (Christie 2009)

[76] One of the chairs (Dr Elio Locatelli) that had accused Pistorius of having an unfair advantage, after recording his running style, "The initial scientific analysis of the videotapes by the Italian laboratory indicated that neither Mr. Pistorius' stride-length, nor the length of time that his prosthesis was in contact with the ground, was significantly different from those of the other runners," this individual was present during the two days of grueling tests (CAS 2008:3; Extraordinary People 2008)

because of this "advantage." However, after an appeal through the Court of Arbitration for Sport (CAS) the decision was overturned. The IAAF supported this decision and released a statement complimenting Pistorius: "Oscar will be welcomed wherever he competes this summer. He is an inspirational man and we look forward to admiring his achievements in the future" posted in May of 2008 (Davies). The irony of this debate was the athlete's inability to meet the qualifying time of 45.55 seconds in the 400m. In fact, at that time, his personal best time was 46.25 seconds. Failing to meet or exceed the qualifying time by nearly a second makes the scrutiny of his body and exclusion far more suspect. If his prosthetic legs had indeed given him an undue "advantage" would he not have been capable of achieving this qualifying time? (Magdalinski 2008; Oscar Pistorius 2011; Norman and Moola *forthcoming*).

Scholars at the University of Wyoming later revisited the results of the study and placed all major debates back on the table. The summary of this tense debate is contained within articles of the *Journal of Applied Physiology*[77] (Kram et al. 2009; Weyand and Bundle 2009). Pistorius again volunteered to help with the research. Upon completion all researchers claimed that Pistorius had no "clear" advantage. In fact, some of the results suggest that he could in fact hold a "disadvantage" mechanically, with no measurable difference present in physiological exertion when compared with able-bodied athletes (Christie and McHugh 2007; Magdalinski 2008; Kram et al. 2009; Weyand and Bundle

[77] November 2009: *Point:Counterpoint "Artificial limbs do / do not make artificially fast running speeds possible"* With the team against Pistorius arguing: "Point: Artificial Limbs Do Make Artificially Fast Speeds Possible" and the rebutting team arguing: "Counterpoint: Artificial Limbs do not Make Artificially Fast Running Speeds Possible" (Kram et al. 2009; Weyand and Bundle 2009)

2009). Whether Pistorius truly presents a challenge to the "sporting spirit" is still unclear (Kram et al. 2009; Weyand and Bundle 2009). What is clear, is that his mere mention as an equal seems to cause the able-bodied to shift uneasily in their seats and even Pistorius himself has felt as though he was the target of ableism, believing that the IAAF was sending a very clear message: "you don't want disabled people in sport" (Extraordinary People 2008; Watermeyer and Swartz 2008; Christie 2009; Norman and Moola *forthcoming*). Amidst this controversy is the implication that there are different games for fundamental reasons. Pistorius explains the need to push the boundaries between able-bodied and disabled sport to a reporter, who asked: "They say the Paralympics exist for people like you. How do you answer that?" To which Pistorius replied: "I think it does exist for people like me, but if I can cross the boundary than why not?" (Extraordinary People 2008). This demonstrates both the perseverance of the athlete and the anxiety that his body causes to the able-bodied. This "cyborg anxiety" is a response commonly associated with figures that are able to flout the binary of ability and disability (Watermeyer and Swartz 2008:187). Pistorius' body transgresses boundaries and brings to light the fact that, "The domain of 'exclusive humanness'…seems to be shrinking" (Watermeyer and Swartz 2008:187). Though he poses no material threat, his body breaks philosophical boundaries which threaten a paradigmatic shift in the realm of elite disability sport (Singer 2009a; Norman and Moola *forthcoming*). The precariousness of this debate reveals the fragility of the ideals that surround "natural" performance (Magdalinski 2008:126). In the contemporary era, de Coubertin's ideals are consistently being tested, as many have found that there is neither a true "amateur athlete" nor pure or

natural athlete, and instead: "athletes are hybrids, the product of a number of diverse and often competing disciplines" (Shogan 1999:16).[78] Sporting bodies are raced, classed, gendered, and quantified along a spectrum of (suit)ability. The belief, therefore, that all bodies enter the arena on an equal footing ignores the diversity of lived experiences and furthermore the wide varieties of embodiment (Shogan 1999; Magdalinski 2008). Ideals of health, wellness, fitness, athleticism and ability, though perceived and portrayed as objective, in reality, constitute centuries of constructed standards produced to discipline and exclude (Brown 1996; Shogan 1999; Watermeyer and Swartz 2008). These constructions encourage an oppressive regime of Othering, a grand narrative that excludes those seen as "sick," "ill," "unfit" or "disabled" from being included in sport (Davis 2006). Magdalinski reminds us poignantly of the futility of ableist arguments against Pistorius by pointing out an obvious fact that is clearly forgotten in the spirit of competition:

> The zeal with which the "unfair" and "advantaged" labels have been applied in this case seems, ironically, to overlook the fact that regardless of how efficient his prosthetics may be, Pistorius is still missing his two lower legs (2008:126).

This sentiment, that he is exceptional and by no means the rule is easily recognizable; even by the arguing research teams from the *Journal of Applied Physiology*, who celebrate his aberrant success: "We conclude by noting that objective scholarly analysis does not diminish the unprecedented athletic and unique personal accomplishments of

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[78] Amateurism was based on competition between men on equal footing, however today different sports are subsidized by both the government and private sector, something that de Coubertin would have never agreed with, therefore his "amateur" is no longer a facet of the contemporary Games. All elite level athletes must make sport their full-time profession, living off endorsements and subsidies if they expect to compete effectively at the Olympics (Beamish and Ritchie 2006).

Oscar Pistorius," showcasing him as an commendable athlete (Berger 2008; Weyand and Bundle 2010:1019). In sum, the idealized sporting frame presents a historically contingent figment of the corporeal imagination constructed from the ideals of a natural and pure mind, body and spirit. This ideal stands at odds with the reality of bodies which are mapped by forces external to them, from cultural labels and stigmas, to the physical scars of war.

The Para(military)athlete: Soldier On, Wounded Warrior

In the wake of postmodern war, more men and women are losing limbs while keeping their lives. They not only require but deserve advanced prosthetics and effective rehabilitation practices (Nessen et al. 2008; Lagacé 2010). Sport and disability have been inseparable since WWII and, at the behest of the military, today's programs are combining high performance sport with more traditional methods. The Canadian Solider On/Sans Limités program and its American counterpart the Wounded Warriors Project attempt to break down barriers that confront casualties. For this reason the military amputee provides a centrally important link between sport and war as these individuals are at the height of physical fitness when they are tragically struck down. Both of these programs are founded on the ideal of the "supercrip" [79] and aim to help bodies living with acquired disability redefine their corporeal limits (Lagacé 2010; Janofsky 2004). In the place of the traditional charity, medical and social models of disability, the "sports model" is used for this style of rehabilitation, which:

[79] "Supercrips are those individuals whose inspirational stories of courage, dedication, and hard work prove that it can be done, that one can defy the odds and accomplish the impossible" (Berger 2008:648)

> [E]merges out of innovations in orthopedic and rehabilitative medicine that emphasize the linkage of biomechanical interventions, life-style wellness education, and occupation or work specific training. Patients are often referred to as 'tactical athletes' and emphasis is laid on restoring them to their preinjury levels of functioning (Messinger 2009:1).

The sports model can first be seen at Guttmann's Stoke-Mandeville facility but has been able to reach new heights as assistive devices extend the capabilities of bodies far beyond basic functionality.

The soldiering body is "flagged" in the image of the state; "these 'heroes' signify corporeal belonging through technological transcendence within the context of US post-9/11 nationalism" (Grabham 2009:65). Each damaged body is encouraged within the sport inspired rehabilitation model to be "the best they can be." Programs in the US and Canada each embody the core tenets of the sports model itself (Lagacé 2010). Just as in the history of the Olympic movement, a great deal of scouting for the Paralympic team occurs within the ranks of war veterans; following in Guttmann's footsteps, "The unprecedented number of [US] troops who are returning from Iraq with missing limbs has given the US Paralympic Team an unexpected boost and the chance to become 'unbeatable' at the next Games in Beijing in 2008. More than 60 potential recruits have already been identified in sports as varied as power lifting, archery and table tennis" (Grabham 2009:70). This was also true of the 2010 Winter Olympics in Vancouver and will certainly be true of the 2012 Summer Games in London (Lagacé 2010). This potential is exemplified in the narratives of determined individuals such as CF member Master Corporal (MCpl.) Paul Franklin and US Army Lieutenant (Lt.) Greg Gadson who are both exemplary models of the tactical athlete, worthy of supercrip status. Each of

them is “hooked-up” to bionic hardware (and software) that enables them to participate in recreational and elite activities (McKie 2011; Fischman 2010).

The Long Walk Home by Liane Faulder (2007) profiles MCpl. Paul Franklin, Canadian veteran and hero to the CF, who lost both his legs, above the knee (ATK), in Afghanistan in 2006. Since then Franklin has been the site of a great deal of publicity around his steadfast position on recovery, specifically setting his sights on running after hearing his doctors tell him that he would never walk again (Faulder 2007:5). This is a familiar psychological manifestation in many returning troops now living with acquired disability, an unending drive to supersede the medical model’s corporeal expectations (Kamen 2009; Lagacé 2010). Other “poster children” for the Soldier On/Sans Limités program include Jody Mitic, Andrew Kinsley, Karen McCoy, Steve Daniel, Mark Fuchko and Dominic Larocque (Soldier On 2010). Each competes in a range of high-performance sport: from downhill skiing, marathon running, and sitting volleyball to rally racing at both recreational and elite levels. Participation in this array and level of activities was unimaginable only a few decades ago, especially for the “severely” injured, the same bodies that were issued a short life expectancy in the 1930s and 40s (Lagacé 2010).

The Wounded Warrior Project has produced similar results, boasting the slogan: “the greatest casualty is being forgotten” (2003-2011). The Americans host a far greater force than their Canadian counterparts in international conflict and have the casualties to match. Lt. Greg Gadson, also an ATK, has similar goals to Franklin’s. Images of his rehabilitation were featured in *National Geographic* in an article entitled “bi-on-ics” in January of 2010 (Fischman). As stated by Gadson, he is able to aim for such high goals

because of his new PowerKnees a product produced by the same company that fashioned Pistorius' carbon-fibre feet (Össur 2011). Gadson recognizes himself as a cyborg body, explaining that his bionic prosthetics "mesh my 43-year-old body with a machine" (Fischman 2010:53).

These bodies express the postmodern reality of cyborg soldiers as it is this emphasis on the naturalness of the strong form in military fatigue, augmented by the latest in cybernetic technologies which creates a renewed vision for ability (Haraway 1991; Gray 1997; Bousquet 2009; Masters 2010). Modern military amputees complicate, the aforementioned orthodox measurement of health and strength. The resiliency of these bodies is aptly explained by Brian Macpherson the COO of the Canadian Paralympic Committee: "they are young, fit individuals, who just now happen to have a disability, so they have a great starting off point" when compared to "the general population" (Soldier On 2010). In the wake of injury, military casualties aspire to conform to similar bodily expectations as their pre-injury selves. Therefore the robotic technologies, though based on the same principles of war machines, have been redesigned and affixed to fragile frames.[80]

Prosthetic technologies redefine the limits of bodies, both figuratively and literally. This is clearly evidenced in the trials of Pistorius and the IAAF where the prosthetic can be said to have agency over the bodies of the individual:

[O]n the one hand, the man can hold the cane tightly so that it functions as

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[80] Norbert Weiner, one of the "fathers" of cybernetics, "Concerned about the military applications of his ideas after the war…turned to seemingly more benign uses and showed great interest in prosthetics, viewing improvements in the condition of the invalid as one of the most immediate promises of cybernetics" (Bousquet 2009:113).

> an instrument of observation (an extension of the person trying to negotiate the room); on the other hand, he can hold it loosely so that it becomes an object of observation. The cane is neither inherently part of the object nor the agencies of observation. The line between subject and object is not fixed and it does not preexist particular practices of their engagement, but neither is it arbitrary. Rather, object and subject emerge through and as part of the specific nature of the material practices that are enacted (Barad 2007:358-359).

It is this complicated subjectivity that invigorates the cyborg trope in the contemporary corporeal imagination (and reality). Technology seen in the field of prosthetics provides a catalyst for the redefinition of ability. This is exemplified through DARPA's RP2009 program, and is especially prominent in the work of one of the inventors: Dean Kamen, who is the president of DEKA Research and Development (2011).

A Segway: Advancing Human Potential

Pistorius, Gadson and Franklin's abilities, as well as a vast majority of PWD, are limited by available technologies. Both basic functionality and high-performance require the proper tools (prosthetics), which should not only meet their needs but exceed their desires. This fact was recently recognized in a most unlikely place, the American military. These experts in destruction, with an arsenal of warbots to match, recently turned their sights to the reconstruction of their soldiers. In 2005, DARPA launched the RP2009 program and requested a series of researchers to develop a product as similar to a "real" human arm as possible in only four years (Kamen 2007, 2009, 2010; DARPA 2011).[81] The researchers were encouraged to make use of soldiers and get their input.

[81] When DARPA first approached Kamen, their requests were so vast (efferent, afferent, haptic response, fine motor control, flex at the wrist, flex at the elbow, abduct and flex at the shoulder, 32 inches from the long finger, and weigh less than nine pounds), so he told them they were crazy, and that "They've been

Many have established new capabilities for upper-extremity prosthetics. The products that emerged from this represent "the first major step in a very challenging program that spans four years and involves more than 30 partners, including government agencies, universities, and private firms from the United States, Europe, and Canada" (APL 2006).[82] From the Rehabilitation Institute of Chicago's Biomechatronics Development Laboratory (with help from researchers at John Hopkins, The University of New Brunswick, Otto Bock, Chicago PT, Northwestern University, the University of Southern California, Sigenics Incorporated, Northwestern University Prosthetic Research Lab and finally the Alfred Mann Foundation) came the Proto-1[83] (APL 2007). The Proto-1 marked a huge improvement for bionic limbs and was the precursor to the Modular Prosthetic Limb which uses residual nerve ending to power the arm "naturally" (Fischman 2010). Furthermore the modular limb is able to achieve up to twenty-two movements, the closest yet to an in-tact human arm; this is also far better than previous models (Proto-1) of only six or seven (Fischman 2010). However this triumph pales in comparison to the success and public presence of Kamen's DEKA Arm (Kamen 2007, 2009, 2010; DEKA 2011).

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watching too much Terminator" (Kamen 2009).

[82] Arizona State University, the BioSTAR Group, California Institute of Technology, The Johns Hopkins University, National Rehabilitation Hospital, New World Associates, Northwestern University and the Northwestern University Prosthetics Research Laboratory, Oak Ridge National Laboratories, Otto Bock Health Care (Austria), Rehabilitation Institute of Chicago, Umea University (Sweden), University of Michigan, University of Rochester, University of California, Irvine, University of Southern California, University of Utah and Vanderbilt University. Second-tier subcontractors and other collaborators include Chicago P/T, the Fraunhoffer Institutes for Biomedical Technology and Reliability & Microintegration (Germany), FLEXSYS, Harvey Mudd College, Martin Bionics, Punch Communications, Ripple, Scott Sabolich Prosthetics and Research, the Scuola Superiore Sant' Anna (Italy), Sigenics of Lincolnwood, and the University of New Brunswick (Canada) (APL 2007).

[83] The Proto-1 was highlighted, along with a series of other "bionic" (robotic/digital) prosthetic technologies versus traditional static prostheses (which also includes Pistorius' Cheetah Blades), in the January 2010 issue of *National Geographic* (Fischman 2010)

In fifteen months Dean Kamen designed his DEKA Arm, affectionately known as the "LukeArm" after the protagonist in the *Star Wars* series (Lucas 1980). Kamen explains that he was inspired by the fifth of George Lucas' sextet *The Empire Strikes Back* when Luke Skywalker gets a new hand that looks, operates and feels just like the biological one he lost (DEKA 2011). Kamen cites this sci-fi image as the pinnacle of prosthetic technology and therefore holds it as a goal for his future developments (Kamen 2009).[84] The inventor also cites the soldiers as being his motivation to produce a product as quickly as possible. Soldiers are not only strong and determined, providing researchers with a well-equipped group of willing test subjects, but are extremely inspirational in their perseverance (Gray 2003; Janofsky 2004; Messinger 2009; Masters 2010).[85] In accordance with Kamen's own innovative spirit, and the initiative fronted by DARPA, the word "disability" is coming under harsh scrutiny. DARPA has expressed the idea especially when speaking about soldiers that these individuals living with a disability deserve to define what activities they can and cannot participate in, and should not be

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[84] "You know, the first airplane went 100 feet in 1903. Wilbur and Orville. But it wouldn't have made an old pigeon jealous. But now we got Eagles out there, F15s, even that Bald Eagle. I've never seen a bird flying around at Mach 2. I think eventually we'll make these things extraordinary. I'll stop, when your buddies are envious of your LukeArm, because of what it can do, and how it does it…I'm not going to stop working until we do that" (Kamen 2010).

[85] "I told a bunch of my engineers, 'Look we're going to walk into Walter Reed, and you're going to see people, lots of them, missing major body parts. They are probably going to be angry, depressed, frustrated. We're probably going to have to give them support, encouragement, but we're to extract from them enough information to make sure we're doing the right thing.' We walked into Walter Reed and I could not have been more wrong. We did see a bunch of people, a lot of them, missing a lot of body parts, and parts they had left were burned, half a face gone, and ear burned off…After a half an hour, maybe [of discussion] there was one guy at the far end of the table who wasn't saying much. You could see he was missing an arm…he was leaning on his other arm. I called down to the end, 'Hey, you haven't said much, if we needed this or this what would you want?' And he said, 'You know…I'm the lucky guy at this table. I lost my right arm, but I'm a lefty.'…And the meeting ended. We said goodbye to all these guys. And that guy pushed himself back from the table, he has no legs…universally, these people that have been through this had astounding attitudes. And jus the fact that people care makes a huge difference to them" (Kamen 2009).

limited by a lack of devices available. When the project began, DARPA looked at the available upper extremity prosthetics for war veterans and was appalled; Kamen quotes a frustrated senior military surgeon:

> Why is it, at the end of the Civil War they were shooting each other with muskets, if somebody lost an arm we gave them a wooden stick with a hook on it. Now, we've got F18s and F22s, and if somebody loses an arm we give them a plastic stick with a hook on it (2010).

Kamen's work on the LukeArm has since enabled many to complete a wide variety of tasks they could not successfully full carry out before. One of his test subjects, a man who had lost his arms after being electrocuted at work, is videotaped feeding himself, a daily activity that he was unable to do for nearly twenty years because his loss (Kamen 2010). This is merely the very beginning of the "prosthetic revolution" exemplifying a larger trend towards enabling the disabled, elderly and infirm, through reconstructive technologies (Kamen 2010). It is Kamen's own philosophy that reminds us of this. His innovations, even before the DEKA Arm, have greatly augmented (not surpassed) human potential. Kamen's first brush with the limelight comes from a far more famous invention, the Segway.[86] This personal mobility device was meant to revolutionize transportation in the twenty-first century but beyond that has redefined the potential of a modern mobility aid (Kamen 2007).

In a presentation in 2002, Kamen retells the story of his pilot study of this product and a conversation he had with an elderly woman on the Venice Beach boardwalk in California. He explains how this interaction reframed the potential of these technologies

[86] The Segway is an electronic two wheeled propulsion device that adapts to the users movements, upon its' first release it was meant to revolutionized personal transport (Kamen 2007).

for those who may not want to go higher, move faster, or be stronger, but merely desire basic functionality for daily life:

> A few weeks ago, after we launched it, we were here with a news crew…meanwhile bicycles are zipping by, and skateboarders are zipping by, and a little old lady…came by me…and she just stops, and the camera is there, and she looks up at me and says, "Can I try that?"…So I get off, and she gets on…she turns around, and she goes about twenty feet, and she turns back around, as she's all smiles…she comes back to me and she stops, and she says, "Finally, they made something for us" (Kamen 2007).

This, as Kamen describes her, "little old lady" demonstrates the necessity of paying closer attention to the needs of these populations. In North America, the aging of the baby-boomers provides incentives for corporations and services at all levels (private and public, municipal, national and international) to shift the focus of their output, to accommodate this large cohort. This little old lady is the poster-child for the need to create a more accessible environment, which includes all persons. These can be seen in technologies that are even more mundane and much simpler than robotics. Curb cuts, ramps, automatic doors and elevators are simple accessible technologies that are often overlooked in the construction of modern buildings. Curb cuts and ramps are ideal for strollers, bikes and other wheeled devices (e.g. wheelchairs) and automatic doors and elevators are ideal for transporting awkward and heavy objects. Therefore, enabling technologies do not require the sacrifice of the needs of the able-bodied for "the disabled" but rather requires recognition that these technologies, life-altering to some, can be beneficial to all. Assistive technologies, in this way, defy conceptions of a *Terminator*-style dystopia and instead bring forth the antithesis of these fears, through the reality of renewed abilities (Cameron 1984, 1991). The "little old lady" was ecstatic about the

Segway, as it presented her with an alternative to grappling with an ableist society. She explained that the majority of mobile devices were not effective for her needs, such as skateboards, rollerblades and even cars (Kamen 2009). The Segway, to this woman, represented an opportunity to improve upon her eighty-year old frame and help with completing simple tasks, such as getting groceries (Kamen 2009).

It is often difficult for the able-bodied to comprehend the "simple" tasks that become incredibly difficult with a series of environmental, social or even political barriers in the way. Nancy Mairs' autobiographical work *Waisthigh In The World: A Life Among the Nondisabled* (1996), attempts to expresses the difference between a body that is disabled and a body that is able by using the word "trouble." The able-body has the liberty of not concerning itself with certain aspects of its environment socially, economically, politically, physically or otherwise, whereas a disability brings to the fore a diverse array of issues, and therefore can be defined as a "body in trouble" when confronting these barriers (Mairs 1996:40). The able-bodied inhabit a privileged corporeality that "may impinge so little on [their] sense of well-being that [one] may believe [themselves] separate from and in control of them" (Mairs 1996:41; Lorber and Moore 2006:185). Troubled embodiment, however, necessitates forward thinking and endless patience, not only for their bodies, but for the able-bodied who often cannot or do not comprehend the daily difficulties that confront a fractured frame.

"Disabled" bodies are in fact an essential space for an analysis of postmodernity; as it is disability theorists who must take into account the personal and political along with the material realities of a fractured frame (Corker and Shakespeare 2002; Davis

2006; Siebers 2008). The emergence of robots, and the cyborging of soldiers on the battlefield, is paralleled with more benign manifestations on the homefront (Haraway 1991; Masters 2010). The intersection of the soldering body with disability re-establishes the space in which disabled bodies are permitted (Norman and Moola 2010 *forthcoming*). It is argued therefore, that "disability is the ultimate postmodern concept" characterized by both the literal and figurative fragmentation of identity (Corker and Shakespeare 2002:15).

Todd Kuiken, a physician and biomedical engineer at the Rehabilitation Institute of Chicago (RIC), holds a pessimistic view towards the actual potential of these biomedical advances. He claims that contemporary bionic devices such as the new C-Legs "are still crude, like a hammer, compared with the complexity of the human body. They can't hold a candle to Mother Nature" (Fischman 2010:53). A great number of these advances are difficult to navigate at first, though the long-term benefits are vast. In a close study of C-Leg "users" by Georg Schiller, one can see that both the utopic (super-abled) and dystopic (advantaged) visions of cyborg corporeality are met by a vast array of material limitations (Sielke and Schäfer-Wünsche 2007:106-118). Even though the C-Leg is the "Porsche" of the bionic world, a technology created by Otto Bock (in 1997), there are still a series of limitations articulated by the "users" (amputees) interviewed for his study:

> As long as the C-Leg is working, it is super- that goes without saying – but as soon it does not fulfil its function, I look for something else. That is technology…I know very well is a fragile business. This is why I don't go into raptures: 'Hurrah technology!' and 'Hurrah C-Leg!' … Any kind of technology can fail. As long as we are not able to grow legs and actually sew them to the body, so that you really get back precisely what you have lost, it will remain imperfect – and everybody involved knows that (Sielke and Schäfer-Wünsche 2007:112).

Overall, the complexity of the real cyborg narrative navigated by the individuals mentioned here, including those interviewed by Schiller, Lt. Gadson, MCpl. Franklin and Pistorius, redirects popular conceptions of ability. Each of these narratives demonstrates the fragmented identity of the disabled body. The image of a C-Leg user easily embodies the futuristic conceptions of augmenting the limited mortality of the human frame with advanced biomedical devices. However, the human body does not naturally embrace the usage of these new pieces of artifice. Simply stated, it takes time for these users to get accustomed to the transition (from DISability to increased abilities) offered by these pieces of technology and *no* current product available is without limitations (Sielke and Schäfer-Wünsche 2007; Extraordinary People 2008; Oscar Pistorius 2011). Contrary to the claims by the IAAF, it seems that most PWD as well as designers of prosthetics are well aware that there is no such thing as a "superabled" human being. The myths of strong Artificial Intelligence, such as HAL 9000, and superhuman strength, such as the *Terminator*, are just as fictitious as the ideal body (Connell 2001; Davis 1995). Aforementioned "ideal" by its very definition is a fiction itself (Davis 1995). Unlike the "fictional" caricatures of sci-fi, these figments have no material reality. Instead there is Watson, a robot that can win Jeopardy, but also has trouble distinguishing between the cities of Toronto and Chicago. Further, we are also lucky enough to have Oscar Pistorius who will not challenge Usain Bolt for the title of the fastest man alive but will prove to an ableist society that a man with no legs can run (Oscar Pistorius 2011). The monster and the evil robot are figments of the scientific imagination, just as the runway model and the high-performance athlete are merely figments of the corporeal imagination (Connell

2001; Beamish and Ritchie 2006; Magdalinski 2008). This truly brings to question the "disabled" as a figure in popular consciousness: is there really such thing?

In short, the scientific and artistic imagination is only a partial representation of the realities of contemporary warfare, and society as a whole. Art and imagination can only progress insofar as there are the material manifestations to support such idyllic and surreal corporeality, the "Artistic activity proves to be an interplay between subjective intentions and the obstinacy of the material...Artistic intention is always constrained by what the material prescribes, allows and prevents" (Becker 2000:364). Casualties and veterans, indeed provide the ideal space for the trial and error of new prosthetic technologies as they present the largest at-risk community. However, it is not merely the technologies that are being tested by this corporeality, but the reality of "cyborgs" which are "*the* postmodern icon," bodies of our present and future (Kirkup, Janes, Woodward and Hovenden 1999:149; Gray 2003:216). PWD, be they a military amputee, a Paralympic champion, or a little old lady provide a challenge not only to ability but to high-performance sport and the central tenets of humanity itself.

Chapter 5

Conclusion

I'm wishing my legs away, 'cause they're taking me to nowhere safe
- "Legs Away" by *Mother Mother* (2007)

War has always brought with it technological innovation, however it is only now in the twenty-first century, through the realities of advanced cybernetics (especially robotics), that the cyborg body moves from the pages of fiction to the rehabilitation facilities of injured veterans (Haraway 1991; Gray 1997, 2003; Hayles 1999). This indeed illustrates the "profound interrelationship between science and warfare" with each driving the other in deliberate ways (Bousquet 2009:3). The solder's body is "cyborged" in a dual-fashion (Haraway 1991; Masters 2010). Primarily they are heavily armed for combat with the latest technological innovations but also made vulnerable when their bodies are "flagged" with the vestiges of war (Grabham 2009). The image of the "cyborg" is a creature of both nature and artifice and therefore challenges stark binaries of ability/disability (Haraway 1991; Grabham 2009). External prosthetic technologies, such as planes, tanks and ships are meant to protect the human form, whereas other military technologies such as landmines and the major contemporary threats – such as the IED – are designed explicitly to break them apart (Nixon 2007). Conversely modern assistive prosthetic technologies (both static and bionic) are provided to injured veterans in an attempt to augment fallible flesh (Haraway 1991; Gray 2003; Kamen 2009; Fischman 2010; Masters 2010). Like

Robocop,[87] cyborg soldiers embody the dialectic of strength and vulnerability, a body under constant stress. The disabled soldiering body becomes a prime example of the integration of advanced technologies into a unique lived experience, both within and beyond the fronts of postmodern conflicts (Gray 1997, 2003; Masters 2010). Prosthetic technologies have in fact emerged directly from the needs of injured veterans as well as from the scientists behind other battlefield hardware/software. The centrality of network interface has re-imagined the soldiers' corporeality. Within this new "body-machine-complex" is the reality of the "posthuman" (Halberstam and Livingston 1995; Hayles 1999). The soldiering body is transformed into a body that promises "the opportunity to do better than the human" (Gray 2003:225). These are the "material consequences" of war seen in technological weaponry and the injuries incurred on the battlefield.

Cyborg bodies can thus be viewed as bodies that, in fact, challenge stringent conceptions of corporeal limitations (Haraway 1991; Halberstam and Livingston 1995; Magdalinski 2008:33; Masters 2010).

> Both social and biological bodies are not given but only exist in the constant process of historical transformation, then there are only hybrid bodies, vulnerable bodies, becoming bodies, cyborg bodies; bodies, in other words, that always resist definition both discursive and material (Shildrick cited in Hughes 2009:403).

This is evident in the body living with acquired disability, most viscerally portrayed in the narratives of amputees but is also embedded within the stories of athletes and even the able-bodied.

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[87] Officer Alex J. Murphy is gruesomely gunned down, and then rebuilt as *RoboCop* to hit the streets and again fight crime in Detroit (Verhoeven 1987).

Who is the Fastest Posthuman?

The military amputee brings to the homefront the question of "humanness." We have indeed entered an era by which archaic definitions of "human" must be undone. Technology permits the transcendence of fleshy bodies into the realm of the posthuman:

> Posthuman bodies are the causes and effects of postmodern relations of power and pleasure, virtuality and reality, sex and its consequences…a technology, a screen, a projected image; it is a body under the sign of AIDS, a contaminated body, a deadly body, a techno-body…a queer body. The human body itself is no longer part of 'the family of man' but a zoo of posthumanities (Halberstam and Livingston 1995:3).

Therefore the posthuman merely presents a challenge to the human, in the same sense that postmodernity presents a challenge to modernity. If human is seen as flesh, then posthuman is artifice. However, in the postmodern era, these definitions go beyond the binary. The cyborg, both human and machine, is therefore the ideal posthuman subject.

Bodies are hybrids of physical manifestations and applied ability (Shogan 1999). The fastest "human" could be argued to be Usain Bolt who holds the world record in the 100 metre (heralded as the pinnacle of human performance). However, the fastest man in water has been shown to be Michael Phelps and there is no human who can conquer the air, which reveals the limitations of these categories. Pistorius is the fastest man with no legs, and very recently, after crushing world records at the Paralympics and shattering his old personal best on July 20th, 2011 with 45.07 in the 400m he competed for South Africa at the IAAF World Championships in Daegu, Korea, in two events 4 x 400m and 400m (Davies 2011; Oscar Pistorius 2011). In the 400m race Pistorius made it to the semi-finals with a time of 45.37, however, he did not make it to the finals when he added two

milliseconds onto that time: 45.39 (Davies 2011). His achievements here are staggering, and even Pistorius himself sees the potential to qualify for both the disabled and able-bodied games: "Yes, most definitely. I've already run one qualification time. I've got to do another between January and June next year but I feel that's very much in reach. I've just got to keep doing what I'm doing" (BBC 2011b). Therefore, who is the fastest posthuman? The answer is: no one, because the definition of humanity is contingent on the definition of ability. This reality brings renegotiation of ability and in the near future, hopefully, the elimination of its useless semantic binary: disability.

Disability impresses too much of a limitation on bodies. This is painfully clear when opening Webster's New World Thesaurus (from 1982), which reveals that disability means a lot of things:

> Crippled, helpless, useless, wrecked, stalled, maimed, wounded, mangled, lame, mutilated, run-down, worn-out, weakened, impotent, castrated, paralyzed, handicapped, senile, decrepit, *laid up, done *done up, *done for, *done, in, *cracked up, *counted out; see also **hurt, useless and weak.** *Ant. Healthy, strong, capable*;

A lot of negative things (Mullins 2009). Pistorius, the fastest man with no legs is clearly none of these. No matter how many times he has been counted out, he comes back, to reaffirm his position as a superb supercrip.

Another Paralympic champion, supermodel and advocate Aimee Mullins used this thesaurus entry in a presentation, explaining that it brought her to tears (2009). Mullins also destroys this archaic thesaurus definition through her work both on and off the track. Furthermore MCpl. Franklin and Lt. Gadson cannot truly be "disabled" as they also defy each of these negative and hurtful terms. Disability therefore, when paired with modern

prosthetic technologies, engages a drastic paradigm shift.

Future Directions: The Need For Collaboration – Prosthetics As Interdisciplinarity

Disability Studies requires an interdisciplinary approach. This can be seen in principles of "Cybernics," a new method of cybernetics (the defining principle in robotics) (Sankai 2005, 2006, 2010). Cybernics looks to interdisciplinarity for answers and involves the central goal of "upgrading human capabilities" (Sankai 2005). Disciplines from: "cranial nerve science, behavioural science, robotics, IT, system integration technology, physiology, psychology, microelectromechanical (MEMS) technology, neuroscience [and] bio-system theory" focus on developments in the fields of: "cybernetics, mechatronics and informatics" (Sankai 2006). The ideology here suggests that a series of disciplines (almost limitless) can be engaged with to bring the best product to those who both need and deserve these assistive technologies. The creators realize that to further both human capability and rehabilitation science, these fields have to engage with one another. Cybernics calls for multiple "experts" to work on the same projects, in order to produce the necessary innovations that will change the very connotations of ability itself. Robotics may seem to be a field that does not require the same "soft" sciences but rather the "hard" engineering and technical capabilities, however it is the softer side of the academy that makes life worth living:

> The Huggable robot, from MIT's Personal Robotics Group, is usually covered with the fuzzy head and pelt sitting behind it. With more than 1,500 sensors throughout its body, the robot is capable of extensive

> interactions with people. It's being tested as a 'telepresence'[88] robot: a physically responsive telecommunication device that could, for instance, mirror movements of a person on the other end of the line. It's also being studied as a possible therapy tool for autistic children, some of whom shrink from contact with people but enjoy interacting with robots (Caroll 2011).

Therefore, it is not ASIMO nor the PackBot ScoobyDoo which deserve the attention of robotic designers and inventors, but the C-Leg and all other technologies that will permit the brave men and women who risk their lives and limbs for a multitude of causes to live fuller lives and also for the civilians who can benefit from these innovations.

The body of the cyborg soldier merely becomes a springboard for further developments and comprehensions into the potential linkages forged with unlikely allies. Frankenstein's monster and Rossum's robots teach us to be wary of the promises of technology and to think critically. In a capitalist marketplace the body and technology are both commodified. The example of a young man in China, who sold one of his kidneys for money to buy an iPad and iPod, reifies the dominance of the capitalist mode of production (BBC 2011a; Conway 2011). The gothic horror and science fiction novels and movies each bid one warning: be careful. They explain to us, through the tropes of killer robots and mad scientists that technology can be a great redeemer, but only if we turn a critical eye and remain aware of its limitations: "Is science making us merely passive recipients of imagination? Does it take too damn long to read a book? Do we really think we get as much from a tweet?" (Conway 2011). Cybernics calls for all disciplines to

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[88] A "teleprescence" bot refers to a robotic avatar, that combines communications technologies with robotics "you can be anywhere, ""you don't need to depend on people." The most disturbing of these robotics is the suggestion that one can visit an infirm loved one, "from the comfort of your own home." (http://www.vgocom.com/)

come together and evaluate the possibilities at hand, and to consider the vast potential of interdisciplinary approaches (Sankai 2005, 2010; Meadows 2011; Nicholls 2011).[89]

Moving from the stringent barriers of "humanness" as established by Enlightenment ideals of masculinity, ability, virility and "fitness," will permit all beings deserving of this designation to enjoy the rights that are imbued within basic humanity (Landsman 2008). The cyborg, specifically the military amputee with a narrative written by the histories of disability and war, reveals the truth behind prosthetic hardware: it is not bodies of difference that require limits, but our mundane and archaic psyches that require expansion. To believe in essential humanness will only lead to despair at the fantastic achievements of a "disabled" sprinters such as Pistorius or Mullins or war heroes such as MCpl. Franklin or Lt. Gadson (Magdalinski 2008). If the supercrip truly undermines our conceptualization of Self, then perhaps it is the Self that requires renovation. Bodies are mapped and inscribed by social forces. The fact that hegemonic forces such as the Church, medicine or even sociology have historically defined "appropriateness" of any corporeal manifestation is highly problematic. These systems require dismantling to demonstrate that the reality of the pure "human" body is, in fact, myth.

This genealogy of physical ability, not disability, demonstrated (through the multiple narratives of (dis)abilities) that abilities are only as limited as our imagination. If we can take a lesson from sci-fi and go beyond the plausible we can discover that a man with no legs can compete in the Olympic Games, and furthermore that soldiers will come

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[89] Examples that utilize the intersection of such as cyborg anthropology and robot philosophy (Case

back to the homefront and share with civilians in the spoils of war. Disability brings insight into the realities of "broken" bodies but it is the military narrative armed with the realities of modern prosthetics that is the fulcrum in this dismantling device.

Therefore, through this strange alliance, from the Modern Prometheus to Pistorius, the "fantastic" and "different" may not be "human" but they are our future: "Kitts is one of 'tomorrow's people,' a group whose missing or ruined body parts are being replaced by devices embedded in their nervous systems that respond to commands from their brain" (Fischman 2010:39). This is the reality of our posthuman future, and if this were the case, then, quoting Haraway, "I would rather be a cyborg than a goddess" (1991:181).

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