

The Posthuman Cyborg

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The Enchanted Village, written by A.E. Van Vogt (1979), is a short story that provides a metaphorical transformation that is seemingly paralleled in our modern society. This piece of fiction revolves around an ill-fated mission to Mars, where a crash landing leaves one surviving astronaut. The man, seemingly doomed, comes across an alien village where he finds materials essential for alien survival but not human survival. The food and water are indigestible, the air is poisonous, the temperature is too hot. However, as the story progresses, the astronaut slowly becomes more suited to his surroundings. By the conclusion, the man realizes that the buildings have begun to provide for his needs, but also is seemingly unaware of a fundamental change- he has scales and drags a long tail behind him. Essentially, the man became an alien. This story is interesting because it provides a thought-provoking argument not necessarily about the astronaut, but about the buildings themselves. Vogt's purpose is not to maintain that the man adapted to the building, rather he claims the building adapted the human being. I find this provocative, particularly because it directly applies to technology in our world today. As the human race hurdles into the technological future, our very natures are changing. In fact, Haslam & Wilson (2009) argue these rapid advances have already altered both our human nature and as well as our understanding of it. Thus, how do we seek to answer encompassing questions such as: where will the line between human and machine be blurred? Or, will a human being retain its intrinsic humanness even if technology incorporates itself into the very center of control and life of the human- the brain? Even still, will the progression of therapeutic technology that assists bodily function ultimately create a moral dilemma by obscuring the line between healing and cosmetic upgrades? Thus, to provide clarity, I will explore four different ways of thought concerning

human interaction with technology. Firstly, I look to provide a definition of the cyborg to be used moving forward in the essay. Secondly, I strive to gain an understanding of the benefits that the human adaptation per technological interaction can bring, with respect to the cyborg. Thirdly, I examine the negative effects that this cycle of interaction confers, also with respect to cyborgs. Lastly, I seek to prove that modern technology is profoundly altering the human experience, and is ultimately paving the way to a “cyborgian” reality by adapting the human being.

Defining the Cyborg

To begin, it is imperative that the definition of the cyborg is described, as it is central to the understanding of this specific vision of the posthuman future. Gillet (2006) defines the cyborg as part human and part machine, but this combination ultimately functions as a single being. Klugman (2001) takes this definition even further by examining the two roots of the word “cyborg”. He states that both “cybernetic” and “organism” were fused to describe this technological creation. “Cybernetic” is a term that examines the human physiology and neurology, and looks to mechanically replace these human systems with electrical ones. “Organism” is a living being in which numerous bodily systems function independently, but collectively provide for the life force of one being. Thus, the fusion of the words provides “cyborg”, which drawing from these two meanings is defined as follows: a structured collective of human, mechanical, and electrical systems functioning as one, living being. Furthermore, in their revolutionary manifesto *Cyborgs and Space*, Clynes & Kline (1970) detail another key concept in the operation of the cyborg- it must be self-regulating. In order for this process of self-regulation to occur, these two scientists argue that the organism must pair a non-conscious function with a body’s own autonomous homeostatic controls. This symbiosis of living and non-living prevents one system from overpowering the other, and ultimately allows for a smooth

operation of the system with the uninhibited ability to self-regulate. Thus, the accumulation of the above descriptions provides an image of the cyborg being all of the following: a blend of human and machine, an intertwined composition of living organism and cybernetic being, a self-regulating and interdependent existence. This is exactly what Clynes and Kline (1970) asserted the cyborg represented at the culmination of their studies for *Cyborgs and Space*, stating that the cyborg "...deliberately incorporates exogenous components extending the self-regulatory control function of the organism..." In conclusion, these definitions outline the cyborg identity I am referring to, and will be the foundation for the "cyborgian" and posthuman future I seek to explore.

Positive Outcomes of the "Cyborgian" Identity

For the second part of this paper, I will explore the benefits of an intertwined relationship between technology and the human, with respect to the "cyborgian" identity.

Artificial Bodies

Firstly, I seek to demonstrate the benefits that artificially grown bodies can confer. To begin, I look to an article written by Ferguson (2012) who details an experiment led by Charles Lieber of Harvard University. Lieber's team successfully grew three different types of tissue in a lab by creating microscopic scaffolds composed of minute, intertwined wires. Extremely flexible, these wires snaked throughout the tissue and stimulated growth with controlled electrical pulses. The experiment proved to be largely successful, as the team was able to artificially grow rat neurons, heart tissue, and muscle tissue with these electronic pulses. This procedure has major implications for the "cyborgian" identity, and, quite frankly, is precedent-setting. Lieber envisions these artificial tissues being used in the human body to heal or replace

damaged tissues. The procedure could also be used to grow build biomimetic robots that operate within the body, or even more significantly, exist outside of the human body. In addition, this process could eventually morph into one where organs are synthetically produced, and could be largely beneficial to those seeking replacement organs, as they would have a guaranteed and effective source for a transplant. An article written by Ceurstemont (2016) describes a similar experiment performed by Harvard scientist Kevin Parker. Parker and his team created a cyborg stingray that responds to light stimuli. Composed of a golden skeleton and over 200,000 rat heart cells laid down in layers and altered to be light sensitive, the sting-ray of sorts uses a pump like motion to follow beams of light. The broader goal of the creation was to employ cells as a building block, as Parker seeks to create human organs from these smaller components. In addition, the combination of artificial and living parts gives researchers a glimpse into a future where a more durable form of human could be established, such as a bio-hybrid which has particular relevance when considering brain-machine interfaces. I once again argue that this interface between technology and the human being has advantageous implications. The possibility of artificially grown organs is monumental; Mantel (2011) writes that over 110,000 people in the United States are left on organ transplant waiting lists every year. Experiments of this nature could provide a solution to this issue of limited organs donation, and could guarantee survival for an otherwise doomed population. Second, this experiment has major implications for a fully operational cyborg, because, as Parker alludes to, a bio-hybrid system couple with a machine-brain interface would be the ultimate “cyborgian” identity.

Mobilizing the Immobilized

Another advantage of an intertwined, “cyborgian” relationship amongst humans and technology would be the ability to mobilize to the immobilized. Baudisch & Lopes (2017) detail

their study: in six different experiments, the scientists from the Hasso Plattner Institute were able to stimulate muscle contraction in subjects via electronic pulses delivered by electrodes. This combination of technology and the human being in one form, a cyborg, would permit the opportunity of movement to the immobilized. These electrical muscle stimulations would also grant the cyborg the power to exercise controlled motor movements from a computer or separate device. Thus, this technological progress, when combined with the human being, could permit a cyborgian identity to overcome physical limitation conferred by biology. This idea of overcoming physical disability is recorded by Ananthaswamy (2012), who explains a project undertaken by Joel Voldman and his team at MIT. This group successfully engineered a neural probe that could be attached to the ventral cord of an insect. The advance proved to be revolutionary, as the scientists were able to send impulses to the probe which altered the moths' direction of flight. As many insects have similar cylindrical bunches of nerve cords to that of the human, Voldman believes this technology could be used in humans to reintroduce mobility after a paralyzing event. Once again, the fusion of technology and the human in this instance could prove to be largely advantageous, as it could be used therapeutically to reintroduce mobility to those paralyzed in traumatic accidents.

Sensory Restoration

A “cyborgian” reality could confer another advantage- sensory restoration. Moore & Shannon (2009) write about efforts undertaken by a host of scientists to develop neural implants allowing deaf patients to hear again. Arguably one of the most effective neural prostheses ever developed, cochlear implants use direct electrical stimulation of the auditory nerve to restore sound to the central auditory system. Since their development in the 1950s by Djourno and Eryies, over 120,000 deaf people have been treated and thus restoring their auditory sense. In

addition, this fusion of technology and the human being is largely efficient, as modern patients with cochlear implants can process an estimated 90% of words spoken in quiet conditions. Once again, the “cyborgian” identity has proved to be largely advantageous as it has therapeutically restored the sense of sound to the deaf. To explore another case, Winter (2005) details a “cyborgian” technology called “Dobelle’s eye”. Invented by William Dobelle, this technology involves a camera mounted on a pair of eyeglasses, which in turn sends signals to a fixed pack on a person’s backside. The fixed pack then interprets the information and transmits the data to electrodes that are connected to the visual cortex of the user’s brain. While the image displayed in the user’s mind is crude, it provides a black and white picture and thus allows for a relative sense of sight. Once again, this fusion of the biological with the technological has tremendous implications, being that it has the power to restore sight to the blind within the parameters of a “cyborgian” identity.

Preservation of the Human Individuality

An argument frequently brought to the forefront of the debate surrounding “cyborgian” technology is whether or not the human identity is compromised or even invalidated when technology and biology are fused together. Geertsema (2006) provides a compelling statement against this common argument, claiming that the use of technology for therapeutic and healing purposes does not invalidate the categorical distinction between human and machine. In fact, Geertsema argues that the intricacy of existing human systems requires the utmost of complexity from the artificial systems. As the human being is amazingly complex, this need of artificial intricacy is necessary as to ensure a viable connection between the artificial and the living, as well as minimize the possibility of rejection of the artificial implant. Furthermore, Geertsema maintains that this presupposition of human nature as well as the uniqueness and complexity of

the human persona require a distinction when man and technology are combined. To disregard the individuality of both parties would largely discredit the function of the other, and thus, it is imperative to recognize the nature of both. Furthermore, this argument by Geertsema is critical in proving the benefits of a “cyborigan” identity as it allows for a continuation of both identities. Neither the human side nor the machine side are lost, and thus the “cyborgian” identity wholly incorporates and promotes the combined autonomy of both. A similar argument is furthered by Palese (2012) who maintains that the combination of a technological and biological state would allow the former to follow the rhythm of the latter. More specifically, the two distinct forces would maintain a homeostatic baseline, and would be understood as incorporation and embodiment of the two individualities. While this differs from Geertsema’s argument of two distinct but incorporated individualities, it relies on the same foundations. In both instances, the authors see the fundamental state of the human being as retaining its individuality. Once again, the “cyborgian” benefits are to be recognized. The human is able to retain its individuality, technology is able to retain its individuality, and the “cyborgian” blend of the two wholly incorporates the two natures into a shared identity.

Negative Outcomes of the “Cyborgian” Identity

For the third section of this essay, I will examine the negative effects of a conjoined relationship between the human being and technology, again with respect to the cyborg.

Destruction of Human Individuality

The first foreseen consequence of entering into a “cyborgian” reality would be the loss of human individuality. The first article I investigate was written by Graham (2016), where he makes an interesting argument against the human desire to enter into a “cyborgian” phase.

Graham argues that the chief danger of a symbiotically-based relationship between machine and man would ultimately permit the machine the ability to engulf the human spirit; essentially, technology would distort human action and intention. Furthermore, this ontological transformation, spurred by technological imposition, would fundamentally alter the human experience by stripping away what is in fact the human experience. This argument is fascinating because it sees technology eroding the fundamental and biological essence of the human being. Another instance of this loss of a fundamental human individuality is provided by Nancy (2008), who argues that the body is a mechanism which is constantly undergoing metamorphosis and adapting to the world around it. Furthermore, she asserts that our interactions with technology ultimately would result in a convergence of both natures- biological and technological- and thus they would be cancelled in favor of singular nature deemed “techne”. Once again, this “cyborgian” reality would be fundamentally destructive, as the individuality of the human nature would be overwhelmed and ultimately lost. Yet again, Clark (2001) argues that a similar destruction of the human individuality would occur in a “cyborgian” reality. He maintains that our world is rapidly integrating external technology into the routine of everyday lives- our tools are becoming extensions of our own bodies. Furthermore, these technologies are essentially transforming the human being into cyborgs. Clark posits that as transformation progresses, the line between human and technology blurs, effectively obscuring the individualities that both a technological nature and biological nature possess. Once again, this destruction of the human nature within a “cyborgian” reality would have dangerous consequences. Tampering with or obliterating the fundamental individuality could change the human nature at the most sophisticated level. Furthermore, I maintain that the destruction of human individuality is a dangerous side effect of the conjoined relationship between the biological and the technological.

The Uploaded Consciousness

For the next article, I transition to a different yet equally destructive version of the posthuman and cyborg identity – the uploaded consciousness. Harle (2002) details the serious concerns with this field of thought, which seeks to transfer the contents of a brain into either a computer or a robotic body. The being would then live on in the matrix of this computer generated world, and theoretically would not be subjected to the natural limitations of the human biology. Quite contrarily however, there are numerous dangers that arise with uploading. To begin, the brain is not the repository of the mind, nor of the consciousness. Thus, solely uploading the brain could have unintended yet serious consequences when considering the state of being. The human person could essentially lose their animating life force, and thus this procedure would fail. The second serious concern arises when considering the existence of feedback loops within the brain. These pathways react to both internal and external stimuli, and subsequently allow the brain to create an encoded memory map of the body and its surroundings. This map is essential to brain and body function; it supports the necessary mechanisms to maintain homeostasis. Subsequently, should the brain be removed from the physical body, this encoded memory map would be wholly destroyed, thus fundamentally altering the structure of the brain. This process, known as sensory deprivation, brings about significant changes in the chemical composition of the brain and has been observed to be largely detrimental to the existence of the human being. Furthermore, the process of uploading would have dire consequences for the human being and is a radically disadvantageous vision that has been presented in the “cyborgian”, posthuman future.

“Cyborgian” Destruction in Literature

A common thread present in modern “cyborgian” literature focuses on the degradation of the human experience. In broad strokes, the authors have created futures where human individuality has been obliterated, technology has come to dominate reality, and the human spirit is oppressed by the onslaught of a “cyborgian” vision. The first novel that delivers this foreboding image of a ravaged society comes in the dystopian *Brave New World*. Huxley (1932) creates a society of manufactured cyborgs that are grown in test tubes and brainwashed to conform to a rigid caste system. The characters in the novel fail to experience the totality of human nature, as technology dominates their existence. Huxley’s twisted future is a grim reminder of the dangers of a “cyborgian” future. The intersection of biology and technology sees the eradication of the former, as the technological component comes to define the standard of life. The next novel that envisions the consequences of a “cyborgian” society is *Feed*. Anderson’s (2002) cyborgs are connected via the Feed- a chip implanted in the head of users to allow constant connection to a global internet system. While this technology provides numerous possibilities for the characters of the novel, it also conveniently provides their downfall. Not only does the technology constantly bombard their freedom and limit their uniqueness, but it is also a physical debilitation as hackers come to attack the neural-implants within the characters and thus damage key functions of the brain. Once again, Anderson’s futuristic society demonstrates just how dangerous a “cyborgian” reality could be. Yet another novel that captures a society at the pinnacle of techno-biological revolution is *Neuromancer*. Gibson’s (1984) futuristic earth is even more depressing, as the “cyborgian” reality hardly lives up to its potential. Dominated by technology, humans within this vision are largely upgraded; eye-enhancements, robotic limbs, and neural implants are just some features characterizing these cyborgs. However, despite this

technological progress, the human condition is in shambles. Even more potent, the human race is subjected to increasingly brutal opposition from “cyborgian” entities that seek to conquer the human nature and oppress the human spirit. Therefore, as demonstrated in modern “cyborgian” literature, the consequences of a conjoined relationship between technology and the human being can be terribly destructive.

Radically Changing the Human Experience

In the final portion of this paper, I assert that technology in the modern world is profoundly altering the human experience, and thus is ultimately allowing us to enter into a “cyborgian” posthuman future.

A Reimagination of the Body

One facet of the human experience that has been radically changed and thus has allowed humans to enter into a “cyborgian” reality is a reimagination of the human body. To begin, I look to an article written by Bloustien and Christie (2010) which examines how one human in particular has been changed by technological interaction. Born partially deaf, Elizabeth Christie experienced a further decline in her hearing capabilities until the age of 33, when she was declared medically deaf. To counter this process, Christie underwent surgery which placed a cochlear implant in her skull and thus allowed her to gradually hear again. However, after implantation, Christie experienced a month of resistance, as her brain had to re-learn how to respond to auditory input. This process is fascinating, as Christie wrote that even the smallest of noises were torturous, because her neural pathways had to be reformed to accommodate the sound. This is known as ‘neural plasticity’, which is the progression by which neurons and their networks undergo change in response to bodily experience. This concept revisits the thesis, as I

argue that this technology is deeply changing the human experience by altering brain composition and operation, and further demonstrates how this “cyborgian” future has become a modern reality. Next, I look to an experiment conducted by University of Reading professor Kevin Warwick. What is fascinating about this article is that Warwick himself offered to be the subject of the experiment, which implanted a microelectrode array in the median nerve of his wrist. Kaebnick (2002) writes that Warwick intends to study these nerve signals corresponding to arm movement in order that he may record them on a computer, and then transmit them to a robotic arm which would mimic this movement. Interestingly, Warwick also provided an inspiration for why he is passionate about his field of study. Kaebnick (2002) details that Warwick believes being born a human was an accident of fate, but this accident is within our power as humans to change. In other words, Warwick believes that we as humans have the ability to improve our inherent condition by upgrading to a “cyborgian” form. Once again, the human experience is quite literally being redefined through technological interaction.

An Emotional Reconstruction

With respect to our “cyborgian” realities, the human emotional complex is being largely modified by the imposition of modern technology. To start, I first examine Francis Fukuyama’s *Our Posthuman Future*. Fukuyama (2002) maintains that the human ability to experience emotions is what connects us to potentially all other human beings; pain, death, and suffering are three natural evils that evoke the most powerful of human responses. Without them Fukuyama posits, there would be no sympathy, no solidarity, no heroism. I think this point is particularly relevant, because he goes on to assert that the goals of modern biotechnology seek to reduce and even eliminate these evils. I argue that this “cyborgian” reality, which allows for humans to escape these evils, is fundamentally altering the human experience. No longer do human beings

encounter the very natural effects that all biological beings experience. This radical departure from our own biology is redefining our entire array of emotions and has the potential to have serious and unforeseen consequences. And, as Fukuyama makes clear, this ability to alter human behavior with either genetic engineering or the use of chemotherapy is still developing. This means that this emotional alteration has only just begun, and will only continue to evolve. Thus, I again contend that modern technology has conferred upon humans the ability to make these fundamental changes to our emotional states, and furthermore is redefining the human experience per this “cyborgian” reality. To provide more evidence, I look to Atwood (2011), who provided a modern review of Aldous Huxley’s *Brave New World*. She questions that as we look in the mirror, do we as modern humans reflect the characters of the *Brave New World*? Do we see within ourselves a crazed society, drunk off the possibilities of a technology-laden world, looking to ever alter our current state? Atwood argues that the similarities between the soma-induced masses of Huxley’s dystopian vision are not far off of our current and contemporary societies. I assert that she is correct in her claim. We as “cyborgian” humans constantly seek to use modern technology to alter our current states. For one example, Talbot (2009) writes that the net sales of Provigil, a drug that alters the emotional state, climbed to over \$988 million in 2008. Albeit one example, this trend is being observed across the modern human population. And the culprit- technology. Our “cyborgian” realities have conferred upon us the ability to manipulate our emotional states, and this change is radically altering our fundamental human experience.

A Cultural Shift

Another component of the human experience that is being radically altered by “cyborgian” technology is our culture. Firstly, I explore the groundbreaking and precedent-setting essay that created the “cyborgian” culture as we know it- *A Cyborg Manifesto*. Harraway (1991) argues that mankind has been established on hierarchical structures, and thus our society could not exist without them. She then makes the assertion that these hierarchical structures have led to inherent dualisms present within our societies- the most significant of these being man versus technology. Finally, however, Harraway details that the introduction of the cyborg into modern culture has redefined these dualisms. In fact, it breaks down the barriers between them. Because the human biology has inherently been fused with the technological, no longer are these two separated by a categorization of nature. Rather, the barrier has been blurred, which in turn has monumental implications. I affirm the argument made by Harraway, as it effectively describes my thesis. The cultural shift being observed within the parameters of the modern human existence can be attributed to the breakdown of barriers between man and machine. Ultimately, the cyborg has become a relevant and even glorified cultural entity, and I assert that this entrance into the modern limelight has altered our basic human experience with emphasis on culture. To further explore this cultural concept, I look to an article written by Cranny-Francis & Hawkins (2008), who argue that the body is a responsive and malleable frontier with respect to technology. In studying the cultural response to the human-technology relationship, these two scientists assert that the human body has flexibly responded to the technological imposition. In one particular study, Cranny-Francis and Hawkins partnered with Yuji Sone, a performance theorist who specializes in humanoid-human interaction. Their study focused on the cultural response of the Japanese people to android creations. Sone concluded that religious and cultural backgrounds of the Japanese people influenced their interactions with the androids. The androids

then made the appropriate adjustments in order to be better tailored to operate with the cultural archetype. In other words, the androids underwent a process of adjustment in order that they may not be tailored to fit a pan-human subject; rather, they became streamlined to appropriately respond to a culturally-sensitive population. This cycle of interaction and readjustment is exemplary of the human experience being redefined by technology, as the robots are quite literally being reprogrammed to better suit the human being. Furthermore, the human culture has largely been altered by these cyborgs as they continue to streamline the human experience.

Changing the Human Identity

Another category of the human experience that is being radically reimaged by modern technology, with emphasis on the cyborg, is the human identity. I examine an article by Masters (2005), who contends that the image of the cyborg is a product of human subjectivity. In other words, our natural desire to explore a post-human future is reflected in our visions of the modern cyborg. Spurred by the possibilities of technology, humans have transferred our own ways of reasoning and thinking to this blend of biology and technology. Thus, I claim that modern technology is fundamentally changing the human experience. It has drawn out our deepest of human desires and provided us a template with which we can alter our own reality. The product of this redesign- a “cyborgian” identity. Macdonald (2016) reaffirms this shift that the cyborg embodies; she writes that the image of the cyborg reflects a historical transition in human perception. We no longer see a “cyborgian” reality as one which a machine has acquired humanity; rather, our vision is one in which we recognize the cyborg as an enhanced human being. This fundamental shift is reflective of a transition in how humans observe their own identities. We are becoming increasingly connected with the machine. This process has changed

our natural perceptions of ourselves as human beings, and has ultimately driven us to find solace and comfort in the idea of the cyborg. Once again, I assert that this shift has been spurred by modern technology. It has given human beings the power and the creative capabilities to redefine their own experience, to dream of the impossible, and to make the cyborg a reality. Thus, the modern human experience has been drastically redefined as we consider our human identities in a “cyborgian” future.

Conclusion

With the cumulation of the essay, I hope to have provided a better understanding of our impending posthuman future. Firstly, I explored the origins of the “cyborgian” identity and delved into the etymology of the word “cyborg” in order to provide a definition to use throughout the essay. Secondly, I explored the benefits of a symbiotically-defined relationship between humans and technology, with respect to the cyborg. Thirdly, I examined the detrimental consequences that the cyborg identity could impose upon the human race. Finally, I sought to prove that the human experience is being fundamentally altered per our technological interaction and is ultimately driving us towards a “cyborgian” reality. As Accardi (1995) once wrote, one of human’s oldest dreams is to create a living machine, one that reflects our very own humanity. As we hurdle into the “cyborgian” future, we must consider every implication that this “living machine” brings with it.

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