

Resistance is Futile: Cyborgs, Humanism and the Borg

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Of all the villains populating the *Star Trek* universe, none is perhaps more terrifying and threatening than the Borg. First introduced in “Q Who,” the sixteenth episode of the second season of *Star Trek: The Next Generation*, this collective of cybernetic organisms quickly became “the signature villains for *The Next Generation* and *Voyager* eras of *Star Trek*” (Wikipedia). Unlike any previous or subsequent antagonist—the cold war era Klingons and Romulans of the original series; the various evil geniuses like Khan Noonien Singh, Lore, Tolian Soran, Nero, and Shinzon; or the different alien empires threatening the integrity of Federation space such as the Cardassians, the Dominion, or Xindi—nothing comes close to the threat represented by the Borg.

What makes the Borg so terrifying is probably best illustrated at the end of the famous cliffhanger to season three of *Star Trek: The Next Generation (STNG)*, a two-part episode called “The Best of Both Worlds” (episodes 74 and 75). Here Captain Picard is kidnapped by the Borg and transformed into the cybernetic organism Locutus of Borg. This has been done, as the Borg explain in a direct address to the captain, because “it has been decided that a human voice will speak for us in all communication. You have been chosen to be that voice.” In the final moments of the episode’s first part, a visibly transformed Picard confronts his former crew. As the entity we once knew as “Picard” walks slowly into view, what appears is no longer an individual human person with thoughts and actions of his own. Instead what stands before us has become little more than a “mouth piece,” quite literally the locus of locution, for an ominous, posthuman future. And what this monstrous figure has to say is thoroughly disturbing: “I am Locutus of Borg. Resistance is futile. Your life, as it has been is over. From this time forward, you will service us.”

In this chapter, I will argue that Locutus of Borg is absolutely correct. Life as we have known it is over and resistance is, in fact, futile. But I want to take things one step further and argue that the cyborg assimilation announced by Locutus is not some impending event racing toward us from the future. It is here, and it is now. Like all good science fiction, therefore, the Borg of *Star Trek* are not a kind of prediction of what might happen in the not-too-distant future. Instead they help us visualize, examine, and understand the present. Or as Cory Doctorow once explained, “science fiction writers don’t predict the future (except accidentally), but if they’re very good, they may manage to predict the present.” In the following, therefore, I want to demonstrate how the Borg predict the present. In particular, I want to examine how we are already Borg, what this cyborg assimilation means for us, and how, precisely because of this, the real threat comes not from these hybrid cybernetic organisms but from the enlightenment humanist ideology that underlies and powers the entire *Star Trek* enterprise.

1. We are Already Borg

The Borg are, in both name and appearance, a cyborg or cybernetic organism, and the fact that they come from the outer reaches of the galaxy is not a coincidence. The neologism *cyborg* actually originated in space, specifically in an article about manned space flight written by Manfred Clynes and Nathan Kline and published in the September 1960 edition of *Astronautics*, one of the leading scientific journals of the “space age.” In this short essay, entitled “Cyborgs and Space,” Clynes and Kline advanced a rather innovative proposal. Because human beings are not capable of surviving in the vacuum of space, astronauts need to be enclosed in a capsule that contains everything necessary to sustain life (i.e. oxygen, water, food, etc.). All of this not only added considerable weight to the launch vehicle but is, according to Clynes and Kline, dangerously unsustainable: “Artificial atmospheres encapsulated in some sort of enclosure constitute only temporalizing, and dangerous temporalizing at that, since we place ourselves in the same position as a fish taking small amounts of water along with him to live on land. The bubble all too easily bursts” (30). As an alternative solution to this fundamental problem, Clynes and Kline argued that “altering man's bodily functions to meet the requirements of extraterrestrial environments would be more logical than providing an earthy environment for him in space” (29).

Within the course of this proposal, the duo suggested the word *cyborg* to name this kind of corporeal augmentation, or as they described it, “for the exogenously extended organizational complex functioning as an integrated homeostatic system unconsciously we propose the term cyborg” (Clynes and Kline 30-31). Since the time of this initial formulation, however, the word has come to be employed more generally to name any form of integrated synthesis of organism and technology into a hybrid, homeostatic system.¹ And when it is characterized in this manner, we can say that there are at least three ways that cybernetic organisms like the Borg already appear among us and occupy a place in contemporary culture:

1.1 Technical Cyborgs. Although traditionally a figure of dystopian science fiction, cyborgs already live among us and can be seen, for example, with recent innovations in medical prostheses and other forms of corporeal augmentation. Demonstrating this fact, *Wired UK* recently profiled what they called “five living cyborgs,” including Jesse Sullivan, who is equipped with robotic arms, Kevin Warwick, who at one time implanted an RFID chip under the skin of his forearm, and Rob Spence, the so-called “eyeborg” who replaced a missing eye with an eyeball sized video camera. Such a list would also include individuals with cochlear implants or other forms of augmentation designed either to replace or enhance corporeal functions (i.e. dialysis machines, pacemakers, or artificial joints). For this reason, N. Katherine Hayles, the author of *How We Became Posthuman*, estimated that somewhere around ten percent of the current U.S. population are technically cyborgs (115).

But cyborg augmentation may actually encompass a much larger percentage of the current world's population.

Anyone with an artificial organ, limb or supplement (like a pacemaker), anyone programmed to resist disease (immunized) or drugged to think/behavior/feel better (psychopharmacology) is technically a cyborg. The range of these intimate human-machine relationships is mind-boggling. It's just not Robocop, it is our grandmother with a pacemaker. Not just Geordi [la Forge] but also our colleague with the myoelectric prosthetic arm. Not just the cyberwarrior of a

hundred militaristic science fiction stories, but arguably anyone whose immune system has been reprogrammed through vaccination to recognize and kill the polio virus (Gray, Mentor and Figueroa-Sarriera 2-3).

Characterized in this fashion, “cyborg” would apply not only those individuals with easily recognizable forms of corporeal augmentation, like artificial limbs and prosthetics, but also chemical modifications via psychopharmacology and even immunizations. Although we typically do not consider immunization as a kind of technological enhancement or machinic augmentation, it is, in fact, a way of reprogramming the immune system by artificial means in order to develop anti-bodies against disease. And Clynes and Kline had, in fact, already included this kind of pharmacological enhancement as part of their initial proposal. Consequently, if *cyborization*—a term initially used by Stanislaw Lem in his 1964 book *Summa Technologica*—includes things like immunization and other forms of pharmacology, then Hayles’s estimate of ten percent will need to be significantly revised upwards. In fact, a good number of the so-called human population of planet earth would already be a kind of hybrid. For this reason, the assimilation ominously announced by Locutus of Borg is not some impending event situated in the future. It is already present; the Borg are here and currently live among us, or (more precisely) are us.

1.2 Metaphoric Cyborgs. “A much higher percentage,” Hayles continues, “participate in occupations that make them into metaphoric cyborgs, including the computer keyboarder joined in a cybernetic circuit to the screen, the neurosurgeon guided by fiber optic microscopy during an operation, and the adolescent game player in the local video-game arcade” (115). Here we are not talking about prostheses or invasive forms of corporeal augmentation, but various types of technological co-dependency. This way of thinking is further developed by Amber Case, the self-proclaimed cyborg anthropologist, who argues in a TED talk from December of 2010, that “technology is evolving us as we become a screen-staring, button-clicking new version of *homo sapiens*. We now rely on ‘external brains’ (cell phones and computers) to communicate, remember, even live out secondary lives.” In other words, as human beings come to rely increasingly on various technological devices (i.e. smart phones, cloud storage, Google Glass, etc.)—to help organize their increasingly complicated lives, to access large amounts of data for work and entertainment, or to interact and collaborate with each other—they develop a symbiotic relationship with their technology that goes beyond mere tool use. In fact, it seems as if the tool is beginning to have an affect on us, evolving us, as Case argues, into a new version of *homo sapiens*—a kind of humanity 2.0.

For this reason, Kevin Warwick argues that the Borg invasion is neither a future event nor something that could or should be resisted. It has already taken place.

The earth is dominated by cyborgs—upgraded human/machine combinations that have managed to harness the new-found super intelligence of machines and use it for their own ends. The cyborgs were formed not by direct physical enhancements, such as powerful arms and legs, but by mental hook-ups. Their brains are linked, by radio, directly with the global computer network. They can tap into it, call on its intellectual power, its memory, merely by thinking to it. In return, the global network calls on the cyborg nodes for information to carry out a task. The network operates as an entire system (298).

But one can take this argument one step further, because it is not just with the recent proliferation of networks and mobile devices that we have been assimilated. We—we who had, perhaps incorrectly, called ourselves human beings—have always and from the very beginning been engaged in efforts to extend our natural capabilities by technological means of all sorts. As Marshall McLuhan famously described it, “media are the extensions of man,” and his examples have become iconic: the wheel as the extension of the foot, the telephone as the extension of the ear, and global information networks as extensions of the entire human nervous system. Consequently, it can be argued that it is the activity of technological extension that defines the human being, specifically what Hanna Arendt and others called *homo faber*. In this way, we are, as Andy Clark describes it, “natural born cyborgs.” From this perspective then, the assimilation announced by Locutus would not be some kind of recent occurrence caused by the proliferation of new technological devices and opportunities. It would be definitive of the human species as such. Consequently, resistance futile not because the Borg are stronger than the human but because the term “cyborg” already describes who and what we are from the very beginning.

1.3 Ontological Cyborgs. There is, however, an even more profound and fundamental way that we are (already) cyborg. This “cultural cyborg,” as Brenda Brasher (813) calls it, constitutes simultaneously an extension of the concept developed by Clynes and Kline and the ontological ground upon which their work first becomes possible. This particular formulation was introduced and developed in Donna Haraway's “A Cyborg Manifesto,” an influential essay first published in 1985 and reprinted (in an expanded form) in 1991. “By the late twentieth century,” Haraway argues, “we are all chimeras, theorized and fabricated hybrids of machine and organism; in short we are cyborgs” (150). According to Haraway, however, this assimilation has little or nothing to do with technical augmentation or even metaphoric forms of technological dependency. Instead, a cyborg exists when at least two kinds of boundaries are simultaneously problematic: 1) that between animals (or other organisms) and humans, and 2) that between self-controlled, self-governing machines and organisms, especially humans (Haraway 151-152).² And these boundary breakdowns are, as Haraway illustrates, particularly evident in contemporary, postmodern culture:

- By the late twentieth century in United States, scientific culture, the boundary between human and animal is thoroughly breached. The last beachheads of uniqueness have been polluted, if not turned into amusement parks—language, tool use, social behavior, mental events. Nothing really convincingly settles the separation of human and animal (Haraway 151-152).
- Late twentieth century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert (Haraway 152).

For Haraway, then, the cyborg names a dual-faceted breakdown in the ontological category “human.” The impact of this is perhaps most evident in the Human Genome Project (HGP), a multinational effort of the late-20th century to decode and map the totality of genetic information comprising the human species. The project takes deoxyribonucleic acid (DNA) as its primary object of investigation. DNA, on the one hand, is considered to be the fundamental and universal element determining all organic entities, human or otherwise. Understood in this

fashion, the difference between the human being and any other life-form is merely a matter of the number and sequence of DNA strings. Geneticists, for example, now estimate that there is a mere 2 percent variation in the chimpanzee and human genomes (Marks 2002). Consequently, HGP's emphasis on DNA, the "building blocks" of all organic life, effectively dissolves the rigid boundaries that had once categorically distinguished the human from the animal. On the other hand, HGP, following a paradigm that has been central to modern biology, considers DNA to be nothing more than a string of information, a biologically encoded program that is to be decoded, manipulated, and run on a specific information-processing device. This procedure allows for animal bodies to be theorized, understood, and manipulated as mechanisms of information, which was an approach that had already been theorized and developed by Norbert Wiener in his post-war efforts with the science of cybernetics. For this reason, Haraway concludes that "biological organisms have become biotic systems, communications devices like others. There is no fundamental, ontological separation in our formal knowledge of machine and organism, of technical and organic" (177-178).

But Haraway, it is important to point out, does not encourage, produce, or invent these boundary breakdowns. She simply traces the contours and consequences of border skirmishes or untenable discontinuities that have been underway within and constitutive of Western intellectual history. The cyborg, therefore, does not cause this ontological erosion of the human; it merely provides this dissolution with a name. For this reason, "cyborg" names not just an enhanced human being—either technically or metaphorically. It already defines the rather unstable ontological position in which human beings already find themselves. Therefore, we can say, performing something of a remix on Bruno Latour, that we have never really been human. We have always and already been Borg, insofar as the difference between human and animal and animal and machine have been and continue to be undecidable, contentious, and provisional. Consequently, the Borg threat that is initially visualized in *STNG* is not some possible future but a description of the present, if not a characterization of "human" history in general. Resistance is futile, because we—not just human beings but a much broader conceptualization of the first person plural that would also include animals and machines—have always been Borg. Resistance to cyborg assimilation is futile, because it is, as Hayles describes it, nothing less than "nostalgic attempts to recover a unity that never was" (117). Understood in this way, it is not the Borg, but the human that is science fiction.

2. What it Means to be Borg

2.1 Dehumanization - No matter what form it takes—technical, metaphoric or ontological—the cyborg constitutes a threat or challenge to what has been traditionally called "human." It is for this reason that the cyborg inevitably and unavoidably appears in the form of "dehumanization." As Haraway points out, following the analysis of Zoe Sofia, "from one perspective, a cyborg world is about the final imposition of a grid of control on the planet, about the final abstraction embodied in a Star Wars apocalypse waged in the name of defense" (154). Popular visualizations of the cyborg, as deployed in both science fiction film and literature, generally conform to this apocalyptic and dystopian configuration. From the mythical golem of Jewish legend to *RoboCop* and the Borg of *Star Trek*, from Mary Shelley's *Frankenstein* to the *Terminator* and the replicants of *Blade Runner*, cyborgs have customarily been represented as a catastrophic counter force to human dignity and survival. What makes the Borg so threatening, within the narrative structure of *Star Trek*, is that they announce a challenge not just to individual human entities, like Picard, and human communities, like planet earth, but to the very concept of humanism. The Borg, therefore, target and directly challenge the operative assumptions of the human enterprise, understood here as both the philosophical

enterprise of enlightenment humanism and the humanist philosophy that powers not only the starship *Enterprise* but the entire *Star Trek* franchise.

Captain Picard, who Diana Relke characterizes as “a harmonious blend of Renaissance Man and Enlightenment humanist” (23), provides an accurate account of these values in response to the initial Borg threat: “My culture is based on freedom and self-determination.” These are, whether we explicitly recognize it as such, the fundamental principles of Western humanism, and the *Star Trek* franchise, as many commentators have acknowledged, supports, celebrates, and advocates for this philosophical perspective. This is precisely what makes the Borg so terrifying. They are not just another alien culture with plans and aspirations that differ from or are in conflict with that of the Federation, like the Romulans, Cardassians, or Klingons. They threaten the most profound and essential values that make *Star Trek* what it is. And cyborg science fiction—whether it be *Star Trek*, the *Terminator* films, *Battlestar Galactica*, *Dr. Who*, etc.—is all about resisting and putting up a fight against this horrific dehumanization. Although resistance often appears to be futile, it is nevertheless necessary to protect the humanist tradition and legacy. And what makes these narratives so compelling is that the puny humans always, in some surprising and completely unexpected way, eventually manage to win.

2.2 Transhumanism - For others, like Amber Case, who follows Clynes and Kline in her analysis, the cyborg does not threaten humanity, but promises vast improvements in human life. In direct opposition to the prevailing image of dehumanization, she offers an alternative formulation: “Machines are not taking over. They are helping us to be more human, helping us to connect to each other.” For Case, the cyborg is not a threat to our humanity; it is a more evolved kind of human entity that is “more human” than human. This particular formulation is, in fact, more attentive to the scientific concept originally proposed by Clynes and Kline. “This recent film with this Terminator,” Clynes told Chris Hable Gray in an interview from the mid-1990’s, “with Schwarzenegger playing this thing—dehumanized the concept completely. This is a travesty of the real scientific concept that we had. It is not even a caricature. It’s worse, creating a monster out of something that wasn’t a monster. A monsterification of something that is a human enlargement of function” (Clynes 47).

Understood in this fashion, the Borg, despite the way they have been depicted in *STNG*, are not a monstrous figure of dehumanization. Instead they offer us an improved version of humanity, what one might call “humanity 2.0” or what the transhumanists refer to as “humanity+.” As James H. Hughes, argues “transhuman technologies, technologies that push the boundaries of humanness, can radically improve our quality of life, and that we have a fundamental right to use them to control our bodies and minds” (xii). From this perspective, then, Borg assimilation is not a dehumanizing threat but an opportunity for upgrading the fragile human species. By becoming Borg, we improve our “human all too human” condition and become, continuing the Nietzschean allusion, *das Übermensch*. And this is, in fact, the explicit goal of the transhumanist movement. The term “transhumanism,” as Nick Bostrom points out, was originally coined by Julian Huxley, the brother of novelist Aldous Huxley, in the 1927 book *Religion without Revelation*: “The human species can, if it wishes, transcend itself—not just sporadically, an individual here in one way, an individual there in another way—but in its entirety, as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature” (quoted in Bostrom 6). Understood in this fashion, cyborg assimilation is not something that is antithetical to the human being, but is an integral part of being human and a natural extension and elaboration of the humanist project.

Transhumanism can be viewed as an extension of humanism, from which it is partially derived. Humanists believe that humans matter, that individuals matter. We might not be perfect, but we can make things better by promoting rational thinking, freedom, tolerance, democracy, and concern for our fellow human beings. Transhumanists agree with this but also emphasize what we have the potential to become. Just as we use rational means to improve the human condition and the external world, we can also use such means to improve ourselves, the human organism. In doing so, we are not limited to traditional humanistic methods, such as education and cultural development. We can also use technological means that will eventually enable us to move beyond what some would think of as ‘human’” (Humanity+ 1).

2.3 Posthumanism – Dehumanization and transhumanism appear to be on opposing sides concerning cyborg assimilation. The one seeks to defend humanity from this monstrous incursion, while the other welcomes it as the means for upgrading and improving the human condition. What is interesting, however, is not what makes these two positions different, but what they already and necessarily hold in common. Despite their many differences, both sides of this debate continue to value and seek to protect the human and what Jean-François Lyotard called “the humanist prejudice” (1). It is this persistent attachment to the human and to humanist values that Haraway specifically targets in her “A Cyborg Manifesto.” For Haraway, the cyborg is neither a denatured human being nor an improved or upgraded version of humanity. It is simultaneously more and less than what has been traditionally defined as human. It is the product of an erosion of the ontological category “human.” For this reason, the cyborg is neither human nor its dialectically opposed others, that is, that in opposition to which the concept of the human has been traditionally defined and delimited, specifically the animal and the machine. On the contrary, the cyborg comprises a deliberately monstrous hybrid that, as Haraway explains it, holds incompatible things together without resolving into larger wholes (149) or seeking unitary identity (180). What we see in the strange apparition of *Locutus*, therefore, is neither human nor its opposites but something that is simultaneously neither and both.

Formulated in these terms, the cyborg is neither a dystopian figure of dehumanization nor a utopian promise for human improvement and perfection. Instead it comprises a posthuman figure that, as Claudia Springer describes it, “undermines the very concept of ‘human’” (33). This effort is crucial insofar as the “human” and the ideology of humanism are not entirely neutral nor innocent. Despite what one might initially think, the term “human” is not some eternal, universal, and immutable Platonic idea. In fact, who is and who is not “human” is something that has been open to considerable ideological negotiations and social pressures. At different times, membership criteria for inclusion in club “anthropos” have been defined in such a way as to not only exclude but to justify the exclusion of others, for example, barbarians, women, Jews, people of color, etc. This “sliding scale of humanity,” as Joanna Zylińska (12) calls it, institutes a metaphysical concept of the human that is rather inconsistent, incoherent, and capricious. Justifying her employment of the figure of the cyborg in an essay on AIDS, for example, Allison Fraiberg makes the following argument: “By using the cyborg as a starting point, I’m saying that—and this is by no means an astounding observation—rhetorics of humanism and organicism have produced, are currently producing, and, I dare say, will probably always produce, radical material inequities for the vast majority of people” (65). It is

precisely for this reason that Haraway introduces the cyborg as a blasphemous figure who can interfere in and even avoid contributing to the logic and legacy of these violent forms of exclusion. "Perhaps," she suggests, "we can learn from our fusion with animals and machines how not to be Man, the embodiment of Western Logos" (173). Understood in this fashion, the cyborg is neither opposed to nor an elaboration of the human but provides a way for thinking outside the box of humanism altogether. Consequently, "the posthuman," as Hayles accurately characterizes it, "does not really mean the end of humanity. It signals instead the end of a certain conception of the human, a conception that may have applied, at best, to that fraction of humanity who had the wealth, power, and leisure to conceptualize themselves as autonomous beings exercising their will through individual agency and choice" (286).

The Real Problem

Let's end by returning to the ominous appearance of Locutus of Borg. Those last moments of the first installment of the "Best of Both Worlds" is, we could say, the point at which *Star Trek* achieves its most radical possibilities. With Locutus, *Star Trek* opened up and let us peer into a terribly deep but also potentially liberating abyss. In the ominous warnings issued by Locutus, we can perceive how we are already Borg and how the cyborg future that is supposedly threatening us from the outer reaches of time and space is already a *fait accompli*. At the same time, we can also see played out for us the significance of this assimilation: the persistent worry about human nature and the apparent threat of dehumanization, the opportunities offered by technologically enabled enhancement and the project of transhumanism, and the possibilities for a posthumanist questioning of the assumptions and legacy of the humanist ideology that informs both. Consequently *Star Trek*, like all good science fiction, helps us conceptualize and understand the complexity of the present—a present in which technology and theory are already at work challenging and reformulating who and what we think we are.

But, as one might anticipate, the *Star Trek* enterprise (understood in the double sense of the eponymous starship and the entire undertaking that comprises the franchise) does not and cannot sustain this radical insight. In fact, it subsequently and almost immediately recoils in the face of the very radicality that it initially exposes and makes available. In other words, *STNG* takes us to the brink of almost absolute disaster and then, instead of investigating where that might lead, follows up with considerable efforts to domesticate and reform this terrifying insight. The effort begins immediately in the second part of "The Best of Both Worlds," which works to recuperate Picard's humanity and reaffirm the Federation's (and the audience's) essentially humanist values. By the time the episode concludes, Picard's human dignity has been restored, the Borg threat cleverly neutralized, and our faith in humanity, despite fragility and vulnerabilities, once again celebrated and affirmed.

This assimilation of the Borg threat continues in both subsequent *STNG* episodes and the sequel *Voyager*. In "I, Borg," episode 123 of *STNG*, the *Enterprise* crew find and domesticate an abandoned Borg drone that Geordi La Forge affectionately names "Hugh." Even though the *Enterprise* eventually has to return this "pet" Borg to the collective, the crew of *Voyager* take the effort of domestication one step further by successfully assimilating 7 of 9. Seven, as she is affectionately called, is a sexy female Borg who can, from her unique position within the family of Captain Janeway's crew, provide interesting outsider commentary on the human experience in a way that is substantially similar to what the character Mr. Spock had provided for the original series. Finally, and coming at the issue from opposite side, there is the Borg Queen of *Star Trek: First Contact*, *Voyager*, and a number of the novels including David Mack's trilogy *Star Trek Destiny*. The queen has the effect of condensing the ambiguous and

disseminated Borg threat in the figure of a single, easily identifiable antagonist or “bad guy,” and criticism that this effort completely ruined the ambiguous and decentralized collectivity of the Borg have circulated widely on fan websites (Borders; MegaBearsFan).

Each one of these subsequent appearances of the Borg have the effect of re-assimilating the radical possibilities initially exposed in the encounter with Locutus and of retro-fitting the Borg threat to the humanist project and essentially anthropocentric vision of *Star Trek*.

Consequently, the real terrifying aspect of the Borg episodes is not to be found in the emotionless faces and denatured bodies of these “dehumanized” cybernetic organisms but in the virtually unquestioned totalitarian ideology of humanism, which assimilates all others into its hegemony and incorporates every conceivable form of opposition as a component serving the success of its own project. It is in the face of this seemingly indefeatable humanist assimilation that strength seems irrelevant and resistance futile. What makes the Borg truly interesting and compelling, therefore, is the way that this character, unlike any other figure in the *Star Trek* universe, allows us, at least for a moment, to glimpse and to question this operation and its legacy.

NOTES

¹ For a survey of the development of the concept of the cyborg in the wake of Clynnes and Kline's influential article, cf. D. S. Halacy's *Cyborg: Evolution of the Superman* and David Rovik's *As Man Becomes Machine: The Evolution of the Cyborg*.

² This numbering is in accordance with Haraway's initial publication from 1985. In the reprinted version from 1991, she adds a third boundary breakdown, that between the “physical and non-physical.” This third class of boundary breakdown, however, is characterized as “a subset of the second” (153).

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