Posthuman:
Identity at the Close of the Mechanical Age

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As technology becomes more important to Western society, we become more concerned about the consequences of that dependence. The more we use computers, the more we need to use them, as though they are infecting us with their presence, as though we are the hosts through which computers propagate their species. Technology has always merged with and transformed society, grafting itself inextricably onto the social body. As factory machinery developed, making mass production easier throughout the eighteenth and nineteenth centuries, factories relied more on that machinery just to compete with the production rates of their competitors. Technology permanently altered not just the way in which these companies operated; it also altered the way in which they were able to operate. Technology integrates; it fuses with its host until the two become indistinguishable. In his book *Orality and Literacy*, Walter Ong expands on this idea: “Technologies are not mere exterior aids but also interior transformations of consciousness, and never more than when they affect the word.”¹ What holds true for the factory adapting to assimilate new technologies then remains equally true for the individual. The more we use a technology, the more we need to use it. As digital technology becomes more accessible, this same technology makes itself more necessary.

The information age is transforming because the means of manipulating that information become *digital*. The analog computer, the only model existent
previous to the development of the transistor, stored information by means of physically measurable variables, such as electric charges or holes in punch cards. While ‘analog’ initially referred to those systems relying on a physical measurement, the term has become analogous with any system requiring a physically measurable storage system. This includes the aforementioned punch cards and even the sound waves recorded onto tape, but not digital information. Digital information is able to exist within the computer without the bulky data storage methods of the past.

When data become digital, information stops being something solid or physical. Instead of a text, a series of punch-cards, an analog waveform carved into the groove of a record, data evolves into the realm of the conceptual, where information is stored invisibly as electronic impulses and magnetic traces. We can no longer see the information we are producing in the form of piles of cards and spools of tape. In other words, the program which controlled the machine no longer rests outside of the machine in physical form. Instead, it moves within the machine as pure electricity, no longer requiring a physical representation external to the system itself. Allucquère Rosanne Stone sees us living at "the inception of the virtual age, when everything solid melts into air, [when] we have other, far more subtle devices that don't do for us but think for us."² Where the Enlightenment introduced to us ways of
defining and delimiting ourselves, the virtual age demands that we question those means by which we define ourselves. Where the information age marked the beginning of digital technology’s increased importance to our society, the virtual age shows us new ways to manage that information conceptually. The solid mechanical tools “melt” away, and our workspace becomes metaphoric.

Instead of simply operating as an obedient tool directed by human minds, “ubiquitous technology, which is definitive of the virtual age, is far more subtle. It doesn't tell us anything. It rearranges our thinking apparatus so that different thinking just is.”³ Like a word processor which transforms the way an author produces text, the new technology shifts our thoughts to new modes, modes dependent on that technology. The processor, in affecting the word, has affected thought itself, reshaping the way in which we think so that we are better able to write in ways the processor can address. The processor becomes a sort of collaborator, telling us how we can write, and in doing so, shapes how we can think. As J. G. Ballard writes, the typewriter “types us, encoding its own linear bias across the free space of the imagination.”⁴ Any tool we use to create and communicate shapes that communication, so that it is no longer truly accurate to say that two versions of the same text, one written by hand and the other written on a computer, are the product of identical thought processes. We can no longer think of ourselves as distinct from our
technological tools, as they construct within us a different thinking. Thus we become conceptual cyborgs, with the fusion of human and mechanical parts occurring on the level of thought and process rather than on the level of flesh and action. The cyborg demonstrates a reliance on technology so fundamental that the organic cannot be removed from the mechanical, and any distinction drawn between the two is artificial.

As we become more reliant on technology, as technology becomes more integral to our daily operation, we fear losing something of ourselves, of our humanity in the process (or perhaps to the process). The cyborg operates as a metaphor for this development of the virtual age, a physical artifact of the fusion between the body and the machine, literally reliant on technology in the same way in which we see ourselves becoming ideologically reliant on technology. As developing technology keeps our rapt attention, the implications of those developments emerge, like a dark mirror’s reflection inverting our relationship with that technology, fusing to the flesh the machines currently extending our minds. In this sense, the cyborg body represents the human mind, transformed by technology to become something new, something that cannot be addressed by our old definitions of self, of being and identity.

Seeing the fusion of the body and the machine as an inescapable evolutionary phase, Australian performance artist Stelarc describes a purpose
behind the cyborg: “We need to see the body as a 'structure.' It is only by modifying the body's architecture that we'll be able to reshape our consciousness of the world.” Stelarc implies that we currently see our bodies as fixed, perfect in the original sense that the body is thoroughly completed, and cannot be improved upon. Certainly we can replace parts of the body, as long as those new parts perform the same function as the originals, but we cannot enhance the body. Donna Haraway, author of “A Cyborg Manifesto,” discusses the cause for this in an interview in Wired, an electronic culture and commerce magazine: “In conversation, when people describe something as natural, they’re saying that it’s just how the world is; we can’t change it.” We see the body as a “natural” thing. Stelarc argues that this assumption prevents us from being able to define ourselves in our new, information-saturated world.

For his own live shows, Stelarc reconstructs his body in order to extend its abilities. He adds extra limbs, one a mechanical hand and wrist, the other a digital arm hovering within a virtual representation of his body on the computer. Additionally, he has added various laser-sensors to his eye goggles, giving him a range of vision unavailable to the unaltered body. In enhancing his own body, Stelarc attempts to correct our misguided image of the body as a fixed natural form. If we see the body as a construct, as Stelarc wishes, then we are able to modify the body and improve upon it in a way that the old
understanding would not permit. By modifying the body, Stelarc argues, we also modify the way we perceive the world. While Stelarc believes this is a process that can only begin once actual body modification and enhancement becomes accepted, we already are in the process of reshaping our consciousness of the world, of reshaping our identities in terms of the technology we demand and desire. Stelarc’s statement remains true for the cyborg, in that only through these representations of the cybernetic can we prepare ourselves for the exchange that our technology demands and desires from us.

The most recognizable cyborgs come from television and cinema. These versions have driven the popular conception of the cyborg. This popular understanding of the cyborg carries hidden within it the recognition (or maybe simply the hope) that our interactions with technology, while superficially frightening, need not be harmful. Take for instance Robocop, whose flesh core comes wrapped in a layer of machinery, biology enhanced by technology: this version of the cyborg requires that the human subject die before he can be fused with the machine. The life of the cyborg is a life-in-death; Murphy, the man who died to be reborn as Robocop, must lose his memories and his identity in order to be remade. Once his identity has been removed, the machine moves in to replace it. He is given ‘codes,’ simplistic orders that can
be evaluated in a black and white, true or false manner. He loses all higher faculties to become the cyborg. On the other side of the equation stands the Terminator, whose machine core comes wrapped in a layer of flesh, technology enhanced by biology: this cyborg is fully machine, entirely driven by cold and emotionless code. The flesh and skin which surrounds the machinery serves solely to deceive other humans. Its life provides the machine with the opportunity to rob other humans of their own lives. These two cyborgs seem diametrically opposed, but both seem suitably “cyborg.” The identity of the cyborg is still fluid, and that which is cybernetic shifts with every new representation. The cyborg finds itself constantly re(configured)figured according to a new definition.

The emphasis is predominately on the physical, the appearance of the cyborg being key to identifying and defining the cybernetic. Beyond appearances, the personalities behind the masks (one of metal, one of flesh) are uniformly robotic. Robocop’s memories have been erased, according to its creators, and replaced with a set of instructions, digital code overwriting the social code, the identity Murphy the man constructed for himself before his death and rebirth as Robocop. Similarly, the Terminator contains simple instructions which motivate him, but in Terminator II the exchange is inverted, and the metal killer, identical to the first Terminator, has been programmed to
protect rather than to kill. Throughout the course of the movie, he gains enough humanity (perhaps by virtue of his fleshy exterior) to override his programming and destroy himself for the good of mankind.

Donna Haraway notes this shiftiness of the cyborg myth in her essay, “A Cyborg Manifesto,” defining it as a moment of transgression: “The cyborg appears in myth precisely where the boundary between human and animal is transgressed.” The cyborg marks the point between the animal and the human, the Cartesian body and spirit. It reminds us that we can be made again into a series of commands (call it instinct, where animals are concerned). Our fear is that the cyborg breaks the boundary, strips us of will and straps us into a set of commands, colonizes our bodies as it codifies our minds. It no longer aids us; it changes us, makes us like machines, soulless and precise (in the common representations). Witness the Borg of Star Trek’s The Next Generation: at the same time as they add machinery to the body, they strip will from the mind, leaving a soulless husk awaiting commands from an ant-like hive mind. In writing the cyborg, we write our changing reactions to technology, change the cyborg’s face to match our changing fears.

Star Trek: The Next Generation’s (ST:TNG) Borg make an interesting model for the transformation of the myth of the cyborg. They have been a constant element in the Star Trek franchise, appearing in about ten separate
episodes. The Borg are popular with fans of the show, as suggested by the fact that a former member of the Borg collective is now a regular member of the crew in *Star Trek: Voyager*. In every appearance, the Borg change, slowly and subtly, to reflect a shifting approach towards the cybernetic. In their initial appearances, they seem (despite their biology) to be totally mechanical in their thinking. They share a hive mind, as noted above, constructed from the collective minds of the Borg “individuals” into which every single Borg is networked. Independence is impossible, as there is no individual to drive the Borg consciousness. Julia Witwer describes the Borg body as “a kind of living corpse; dead-white skin hints at an uncanny animation; it lives, though it should not.”\(^8\) The Borg seem stripped of life and have been stripped of individuality. They physically embody the psychological process they have undergone, the total fusion of the mind to the machine, and the subsequent loss of that mind, that individual to the control of the machine. Much like the first *Terminator*, the Borg are driven by a series of simple commands, a social code which overrides and overwrites the individual’s identity.

In their second appearance, we see more exactly how assimilation to the machine works, as Captain Picard himself is kidnapped and assimilated. Picard’s conversion horrifies the viewer. He is, as Witwer describes, “the champion of the cultivated individual.”\(^9\) In his assimilation we can see the
assimilation of us all. We can see the complete loss of identity with which the
intrusion of technology threatens us. Picard is transformed into Locutus, an
emissary for the Borg – an interesting position as he now acts as a mediator
between humans and cyborgs, which themselves ought to be the mediators
between humans and technology. The Borg have lost that position of
mediator; their flesh is dead, their humanity lost, and while they do retain their
bodies, their identity has been destroyed.

The cyborg threatens the definition of identity developed by
Enlightenment philosophers. The sense of autonomy, the idea of the self as a
distinct and autonomous entity, continues to have a profound effect on Western
culture to this day. The rights, the solidarity and the autonomy of the
individual mark our culture’s attitudes towards law and governance. American
government is supposed to favor the individual, founded as it is on a
constitution composed during the Enlightenment. That the individual exists is
a given; each person is an autonomous and independent, whole being. The
individual constructs him/herself with an ineffable, indestructible center
distilled from the literature and philosophy of the 18th and 19th centuries. The
Enlightenment’s emphasis on thought and the ability to reason produces beings
who define themselves mentally, in terms of thinking and of reason. This
mode of definition turns the individual’s gaze inward. He can only define
himself within the limits of his own body, within his own mind. But because of the speed with which technology has evolved over the past 40 years, we have begun to discover cracks in the autarchic selves we have constructed.

In the late 1960s, technology begins to evolve at an unprecedented rate with the development of digital circuitry and electronic communication, and this concept of the self begins to weaken. We cannot assimilate this technology into our concept of self (as we have with writing technology and the printed word). We have come to rely on this technology much more rapidly than we have needed to in the past. In doing so, we have brought the autonomous self to a critical point. Our reliance on technology shows us how important interaction is to identity. Technology can change thought because it changes the way in which we interact with our world, with people and objects around us. Technology’s rapid evolution has made this all the more apparent. The myth of the unified self shatters, and we are left with a self which is nothing more than the nodal point of a series of interactions and relationships. The self cannot be defined as a specific thing, but rather as both the product of those interactions active at any one moment, as well as of those interactions lying dormant, but still present. Our “self” is the sum of those interactions. The self is no longer limited to the body by this definition.
Identity extends outside the self to incorporate the tools on which we rely. Our awareness of the boundaries of the body extends when people interact with inanimate objects. If one car collides with another, the driver cries out "he hit me" rather than "That guy’s car hit my car!" The vehicle becomes an extension of the body. We expand our sense of self to incorporate the tools and ideas we use to operate and express ourselves. These inanimate objects are themselves a type of technology, albeit of varying degrees of complexity. Marshall McLuhan writes that "[d]uring the mechanical age we had extended our bodies into space." Identity extends beyond the limits of the body to envelop the tools we use.

Technology’s rapid evolution has taken this assimilation out of the shadows of our minds. McLuhan identifies an “implosion” of identity brought about by electronics and digital circuitry:

In the electric age, when our central nervous system is technologically extended to involve us in the whole of mankind and to incorporate the whole of mankind in us, we necessarily participate, in depth, in the consequences of our every action. Technology in the electric age, to which McLuhan refers as the “age of anxiety,” ties us into the “whole of mankind.” Because our sense of identity and of self extends into the technology and people around us, we begin to question the existence of an autonomous self.
The cyborg physically manifests the fear that technology will destroy mankind's autonomy. In the cybernetic body, we see machinery infecting the body. We are used to placing ourselves within our tools, providing them with a portion of our own identity. Now we see technology moving into our bodies, imbuing us with qualities we normally attribute to machinery. The cyborg threatens us because we imbue machinery with a different way of thinking, a sinister mechanical logic which denies the self-image of independence on which we rely. The fear the cyborg brings is that we will lose ourselves to the machinery. If we recognize that the self is not independent, but instead is constructed of a series of connections and interactions not only with other selves but with our machines as well, then (we fear) we will lose our autonomy and become simply appendages to the greater mechanism, some Ur-automaton controlling all mechanisms. The fear dissipates and the cyborg transforms into a positive image when the individual confronted with cybernascence, a birth into the cybernetic, realizes that his or her identity is composed of communications already. Cybernetics, the study of communication systems, becomes an appropriate metaphor in that the individual realizes that identity is heavily affected by communications, the networking of connections with other nodes. The cyborg embodies human assimilation of and being assimilated by
Rather than negating the self, cybernetics forces humans to rewrite their identity.

We become assimilators of technology ourselves, investing technology with our own attributes and making interaction with our computers all the more human. Our terminology invests computers with elements of the biological; in words like “virus,” “daemon,” “wizard” and “agent” we see a hint of humanity, of spirit, or anthropomorphism which indicates our feelings about technology when we ourselves cannot. It is this sort of anthropomorphism which opens the way for the cyborg initially. The first real use of technology to explain biology begins in earnest during the Enlightenment. When authors first begin to attribute mechanical properties to the biological, inventors in turn apply biological attributes to their mechanisms, as seen in the automatons of the 1700s and early 1800s. The origins of the cyborg are manifest in these early constructs, which attempt to reproduce the biological through purely mechanical means.

The literature and philosophy of the Enlightenment period introduce technology and mechanism as metaphors which serve to explain natural phenomena. Technology and nature exchange meaning freely in a semiotic system in which technology functions as a metaphor to explain the operation of
natural systems. Examples for these ideas can be found in the technological accomplishments of medieval Europe. The clock in Strasbourg, built in 1354, reenacted St. Peter’s denial of Christ by means of moving images, such as that of the wrought iron cock that announced the noon hour. The rooster would open its beak, stretch its neck and flap its wings, then let out a caw produced with the aid of a bellows and a set of reeds. This mechanism drew the attention of Locke, Hobbes and Descartes.

The interest in this and similar mechanisms may have led to the idea that God himself was a clockmaker, who builds the universe and establishes the laws for its interaction, who winds it up and lets it go. Rather than suggesting a constantly involved deity, ever-present and ever vigilant, this model defines a distant God, one whose involvement in the universe ended the day He set his creation in motion. Descartes demonstrated a lifelong interest in mechanisms like those of the clock-tower of Strasbourg. According to rumor, he even constructed an automaton himself, which he called Francine. Francine was lost, though, when a ship’s captain threw her overboard, thinking it was the work of some malevolent mage.

Technology like the Strasbourg clock sets in motion an approach to nature which heavily influences the mechanists working in the 18th Century. The clock mechanically measures the movement of the sun in order to provide
a scale with which to "read" time. A semiotic system evolves in the
Enlightenment in which technology serves as a metaphor, a complex of signs
signifying the functions of Nature. Roland Barthes describes part of this
metaphoric process in “The Plates of the Encyclopedia.” The objects portrayed
by the plates in Diderot’s Encyclopedia become “objects-as-image;” objects
which are “naturalized by [their] insertion into a large scale tableau vivant.”13
Barthes describes this as a process in which “Encyclopedic man mines all
nature with human signs.”14 The Encyclopedic plates first approximate nature
by their juxtaposition with natural environments and systems; the plates do not
show the machinery as separated and severed images out of context of their
working environment, but instead in the environment in which it ordinarily
operated.

Barthes understands that this establishes a semiotic relation with the
natural. Enlightenment man uses this system of technological signs (such as
those presented in the Encyclopedia) to understand and interpret nature; he
“mines” meaning, using the sign system established in the plates as a tool to
‘dig’ meaning out of nature, to understand nature’s operation. In effect,
Enlightenment writers establish a metaphoric relationship between nature and
technology, which the automatists, those artisans and mechanics who
constructed these mechanical interpretations of nature, then appropriate in their own work.

The automatist inverts Barthes' relationship in constructing a real object from the textual image that is a metaphor for nature in terms of technology. The early automata attempt to recreate the literary metaphor by constructing nature out of technology. This metaphor collapsed when the types of automata being built changed. Instead of mimicking the behaviors of living beings, whether they be ducks or musicians, automata began to reproduce specific biological functions of those beings. The mechanical duck built by Jacques Vaucanson (1709-1782) serves as a convenient transition, because it attempts to reproduce both elements, but none of the automata which follow Vaucanson try so ambitious a project.

Roman Jakobson’s “The Metaphoric and Metonymic Poles” describes a counterpart to metaphor, one which I found helpful in describing the phenomenon in the automata constructed towards the end of the Enlightenment. Jakobson defines his terms carefully, using the impairment caused by two distinct forms of aphasia to explain by example these literary tropes. Metaphor, in Jakobson’s sense, is the art of substitution, of positional similarity. This is the ability to draw a correlation implied between one object and another. Metonymy, the pair-term for metaphor, is a correlation drawn
with semantic contiguity. The relationship here comes from a connection
drawn between a part and its whole; one word or phrase is substituted for a
whole, a concept or an object to which the fragmented concept or object is
related. In other words, in the case of metonymy, a fragment of an object
refers to the whole of that object, as opposed to metaphor, in which a complete
object stands in for and represents another distinct object.

In the case of the construction of automata, metaphor shifts to
metonymy as approaches to science and technology change. Automata built
earlier in the Enlightenment resemble humans or animals, a metaphoric
equation in which automata are built in the likeness of human or animal beings.
They are built to seem alive, a resemblance that operates on the metaphoric
pole, because there is a visual similarity to the objects they represent. These
automata reproduce actions, as in the case of Vaucanson’s mandolin player,
but they do so in a distinctly mechanical way. The mandolin player rests atop
a large stool, but that stool conceals inner mechanisms that operate the body.
The focus of these automata is on the reproduction of the action, regardless of
the actual biological process which controls that action. This is in effect a shift
to a metonymic relationship, as science now focuses more on the inner
workings of biology, and scientific knowledge about the biological
organization of bodies expands. The scientific gaze shifts from the
reproduction of the action to the reproduction of the process by which the action occurs.

Looking at Vaucanson’s mandolin player, this might mean reproducing the human hand’s musculature as it played the mandolin, rather than just reproducing the action of that hand on the mandolin. The automata built during this time recreate a specific part of a biological process, but in doing so they cease to seem like humans. Instead, they resemble a process taken from a biological system, a part of the large whole, a metonymy.

Descartes’ writing provides the philosophic foundation for the development of automata throughout the Enlightenment. In his Discourse on Method, Descartes establishes a dualistic approach to humanity; man is split into two parts, the mind and the body. Using this binary approach he distinguishes man, and specifically the mind, from the beast-machine, the purely physical natural system. The human body (as separate and distinct from the mind) operates by mechanical means; nerves are hollow tubes which manipulate valves in the brain, and these valves “direct the flow of ‘animal spirits’ from the brain to the muscles.”\(^\text{16}\) While there is still a distinct spirit, there is also a recognizably robotic element to this description. Already the
beginnings of the cyborg can be seen: the pure mind controls the machinery of the body in a fusion of the spiritual to the mechanical.

Julien Offray De La Mettrie utilizes Descartes’ description of the *bête machine*, the mechanical beast, and uses that imagery to establish a materialist approach towards the human body and its medical treatment. La Mettrie wrote *L’Homme Machine* in order to establish his materialist approach to medicine. Medical science and metaphysics were closely linked before the Enlightenment period, but La Mettrie thought that medicinal science should be a ‘harder’ science, one grounded in observation. These observations should inform surgeons’ decisions based on comparative biology – to fix an organism, La Mettrie advised, find out how it differs from other, healthy organisms and use this as a basis to determine the cause of the problem. *L’Homme Machine* establishes man as a sort of living machine; with this comparison, La Mettrie can justify the idea that all humans are similarly ‘constructed:’

Man is such a complicated machine that it is impossible to form a clear idea of it beforehand, and hence impossible to define it. For this reason, all the investigations which the greatest philosophers have conducted *a priori*, that is to say, by attempting in a way to use the wings of the spirit have been fruitless. Thus, it is only *a posteriori* or by seeking to discover the soul through the organs of the body, so to speak, that we can reach the highest probability concerning man’s own nature, even though one can not discover with certainty what that nature is.¹⁷
In this passage, La Mettrie establishes that man is too complex to permit scientists to make assumptions about its operation ‘a priori,’ or before any other knowledge. To know man (biologically, in this sense), one has to ‘seek the soul through the organs of the body,’ to try to understand the complex operations by observation. Only then can one draw probable conclusions ‘concerning man’s own nature’ – probable because they are based on such observations. La Mettrie establishes the primacy of observation in science here, and his use of technology serves this larger goal, but he also maintains and strengthens the metaphoric use of technology to describe nature which Descartes began in his work.

Later in L’Homme Machine, La Mettrie appropriates the machinery metaphor to explain even the workings of the mind, which Descartes’ work had separated from the body. “The human body is a machine which winds itself up, the living image of perpetual motion. Food nourishes the movements which fever excites. Without food, the soul pines away, goes mad and dies from exhaustion.”¹⁸ This passage details the damaging effects physiological changes can have on the psyche. Mind is directly linked to body, they are part of the same machine. With this type of thinking, La Mettrie discards Descartes’ dualism, and turns to a monistic, materialist approach, in which spirit/mind and body are not split, but are linked, bound together in a biological
system; physiological changes in the system will affect the whole system, including the mind. La Mettrie also reinforces the metaphor here, describing the body again in terms of a machine: “Let us conclude boldly then that man is a machine, and that in the whole universe there is but a single substance with various modifications.”

La Mettrie now points to the operation of nature. Comparisons with machinery suit La Mettrie’s purpose to eradicate superstition from medical treatment. In the same way that a machine with a broken part will function incorrectly, so does an animal with a broken limb. La Mettrie uses this comparison of the body to machinery in order to establish that a physiological function must be self-contained and cannot be influenced by supernatural forces. The metaphor allows La Mettrie to link physical causes to physical problems. However, he does not restrict himself solely to the physical. He extends the comparison with machinery towards the psychological, hoping that his pragmatic approach to science will drive superstition away from the study of the mind and psychological ailments as well.

While La Mettrie does not neglect the mind or the power of imagination in his work, he does make certain that they are mediated by the machinery of the body:

The imbecile may not lack brain, as commonly observed, but its consistency will be faulty, for instance, in its being too soft. The
same thing is true of the insane; the defects of their brains do not always escape our investigation... how can we hope to discover the causes of the diversity of minds in general? A mere nothing, a tiny fiber, something that the most delicate dissection cannot discover, would have made two idiots of Erasmus and Fontenelle.  

La Mettrie suggests that intelligence is a feature of the brain’s makeup. If it is too soft, its owner may be an imbecile. He describes the minute connections that make up the brain, and how the slightest alteration could result in a completely different mind. Here again, La Mettrie discusses the mind, and makes physiology responsible for its operation:

“Judgment, reason and memory are in no wise absolute parts of the soul, but real modifications of the kind of medullary screen upon which images of the objects painted in the eye are reflected as by a magic lantern.”

“Medullary” here refers to the inner core of body structures, such as the medulla oblongata, the lowermost portion of the brain, responsible for the most basic actions. In this case, imagination and reason are products of physical impressions on the brain in much the same manner as images are inscribed in light upon the eye. The mechanism of the eye, equated with a screen upon which objects are reflected, distorts or alters information it perceives (the modifications of which La Mettrie speaks). By equating the brain and the eye (and then the eye and a lantern), La Mettrie suggests that any mental activity or change is the product of a physical change in the organ. Biological changes
alter mental states, and by means of this comparison, another aspect of consciousness falls under the control of physiology. The mind is another aspect of the body. Any mental state or quality can be attributed to a physical and biological cause.

In doing this, La Mettrie denies the existence of Descartes’ binary split between mind and body. La Mettrie must dispose of the metaphysical in order to establish a set of rules for the study of the body. By describing the body as a complex of machinery, he is able to discard that problematic concept of the Cartesian mind, and focus directly on physiology. This split with Descartes returns the student of medicine to the material world and away from metaphysics.

As mentioned before, La Mettrie’s goal is to eliminate superstition from the sciences. If the body can be represented in terms of its mechanism, then La Mettrie can demonstrate that all bodies are similar. Difference from the model defines illness. For example, if the liver of the patient differs from the doctor’s understanding of a healthy liver, then that liver must have been damaged. La Mettrie determines that a standardized approach to the human body allows the physician to diagnose more accurately. In using a technological metaphor, La Mettrie demarcates the body as a structure.
Contemporary understanding of the body remains influenced by La Mettrie’s project: the body is a fixed thing, not something fluid and alterable. The cyborg, as a technological and biological body unravels this image, forcing us to recast our understanding of the body. Changing the way we think about the body will change the way we think about the world. If we see the body as an architecture, we can see the ways in which we are able to reshape and reconstruct ourselves. Similarly, Haraway discusses how the body is seen as *natural*, meant to imply that it cannot be altered. The cyborg forces the individual being to confront the body *out of nature*, and re-experience the world through that confrontation. By directly altering the body, the cyborg opens the way for us to *conceive* of altering the body. It changes the way we construct our sense of self and identity. If the body can be recast and re-determined by outside information (in the form of technology which expands or enhances nature’s designs for the body), our identities must be recast in terms of an *outside*, or more accurately, in terms of our interaction with and reaction to that outside information. Individual identity ceases to rely on the myth of the autonomous self constructed in the Enlightenment.

Wellman’s biography of La Mettrie in her account of *L’Homme Machine* states that “the use of mechanical analogies is perhaps best considered as simply a reflection of the common descriptive language of the
experimental tradition of the eighteenth century." She indicates that this metaphor is not just an anomaly, used by La Mettrie and then forgotten, but is instead representative of contemporary writing. In other words, technology as a metaphor for nature is not unique to La Mettrie. The metaphor describes nature as technology; the automatists appropriate this metaphor.

Automata represent an inversion of the metaphors which describe nature as a technological system. Vaucanson, creator of a fully automated Mandolin Player, built many automata during his lifetime. These automata had the semblance of life; they could reproduce the look, but not the actions of the bodies they tried to emulate. The Mandolin Player, for example, strummed the strings of his instrument, but gears and turning rods drove his fingers, so that superficially the player performed upon his mandolin in a manner most strikingly human, but in a manner entirely foreign to human movement and musculature. Many automata could not truly play musical instruments. Usually there was a hidden mechanism, like that in a music box, which actually performed the music. The visible parts of the automata simulated play, so that their fingers would move across the harpsichord’s fingerboard. Vaucanson attempted to reproduce the movements which would allow his automata to play their instruments.
Vaucanson spent many years studying the flute before constructing another device, his flute-player. He worked to find the correct placement of the lips and fingers and the best way to drive air through the mouthpiece. The player plays the flute like a human, but the mechanism that delivers the air is “a system of levers... [and] a number of bellows of different weight [which] supply the requisite amount of air at different pressures.” While it does produce the desired effect, this system of bellows and levers does not even attempt to present the manner in which one plays the flute accurately. The flute player emulates the action, but not the way in which the action is generated.

Another automaton, constructed by the father-son team of Jacquet-Droz operated similarly to Vaucanson’s flautist. “The trunk, head, eyes, chest, shoulders, hands and fingers of the figure are worked by a complicated system of levers similar to that of Vaucanson’s flute-player. One of the many levers produces the effect of breathing, the bosom rises and falls.” The Clavecin Player creates the effect of breathing, but not the actual process of breathing. Appearance is key to these automata. They seem like the thing they represent, but that semblance is superficial, as the scientific gaze looks to the appearance rather than the process at this stage of automata.
Where literature uses machinery as a way of explaining the operation of biological systems (like human beings) in nature, automata recreate nature entirely out of machinery. This is why appearance is so important: an automaton must *look* as natural as possible in order to complete this metaphor. Machinery replicates the appearance of nature during a time in which scientists are trying to understand the physiology that lies behind that appearance. By reproducing an appearance of action, like the playing of musical instruments, science might come a step closer to understanding the general operation and movements of the body.

In 1783, the Academy of Sciences of St. Petersburg offered a prize for an automaton that could pronounce the five basic vowel sounds. Most of the entries *looked* like human heads, and they made sounds by means of bellows and reeds, but their speech sounded more like a woodwind instrument than a human being. The way in which they reproduced sound was nothing like the way a real biological system produces sound, but the machines did bear a metaphoric connection to their subjects.

The Baron Wolfgang von Kempelen took a new approach, one which redefined the development of automata in terms of the metonymy described above. His automaton looked nothing like a human head, but it reproduced the
process of speech more accurately than any other entry. It was a voice box with bellows, and a sort of mouth that could be moved by the operator, and rather than simply produce vowels, it could speak whole words clearly and recognizably. The voicebox automaton won the contest because it sounded more human than did the other automata. Baron von Kempelen designed his automaton with an approach different than that used by his fellow artisans, one which reproduced the process by which humans speak, rather than the appearance of a human speaking. This device marks a paradigm shift in the development of technology.

Thomas Kuhn explains that problems which could not adequately be resolved under one scientific model suddenly seem easy as the paradigm shifts to account for new scientific knowledge. The other entries in this contest, products of the older paradigm in which similarity of appearance reigned over reproduction of function, could reproduce sounds, but they could not really speak. Von Kempelen, who had studied speech for some time and was familiar with the human speech organs, used a different approach in making his device. He reproduced the functionality of the speech organs. His bellows served as lungs to push air through the set of vibrating strings which created the sound, and then shaped those sounds with a bell-shaped mouthpiece at the other end of the box. While this box looked nothing like a human speech
organ, it accurately reproduced the process by which man speaks. Once von Kempelen had created a working model of the human speech system, he found it was easy to reproduce not only those vowel sounds, but also whole words, clearly and distinctly.

As technology became a more specialized field, scientists and mechanists of the eighteenth century focused more on the details of nature and biology. However, as long as science focused on reproducing the appearance of nature, it would be unable to divine the actual process as it occurs in nature. This metaphorical approach to the physical world, in which technology could construct movement regardless of the process that physiologically produces that action, formed a paradigmatic approach to biology that could not adequately mimic the biological processes themselves. Scientists had reached a stalemate of sorts. The information that they had no longer adequately described the world around them. As a result, science needed to alter its approach to physiology in order to arrive at and incorporate new discoveries into how the body actually operates.

This incorporation of new ideas presents problems for Romantic authors, whose works seem to respond directly to the conceptual union of mechanics and biology. Authors during the nineteenth century saw the world being colonized by machinery. The Luddite rebellions occurred early in the
nineteenth century: farmers and workers destroyed machinery, afraid that the machines would rob them of their livelihood. Karl Marx saw that the newly developed machines used in factories dehumanized the workers, making them into just another part of the engine of production. In short, Romantic authors saw the world that technology created and felt that it reduced humanity to another piece of machinery.

Baron von Kempelen attempted to sustain the mysticism of the machine. His speaking machine helped to redefine science’s approach to technology and biology. At this time he constructed another automaton which seemed to mimic not just human action, but also human thought. His chess-playing Turk, described in one of Walter Benjamin’s “Theses on the Philosophy of History,” was built early in the Romantic period, and traveled Europe for several decades, even after von Kempelen’s death:

“A puppet in Turkish attire and with a hookah in its mouth sat before a chessboard placed on a large table. A system of mirrors created the illusion that this table was transparent from all sides. Actually, a little hunchback who was an expert chess player sat inside and guided the puppet’s hand by means of strings.”

This machine toured for over 50 years, from around 1800 until 1854, when it was destroyed in a fire. It toured for this entire time, even though drawings exist as early as 1832 which expose it as being a hoax and describe its operation. Part of its popularity must therefore have been due to its power to
restore a mythology of the machine, to create the illusion of a mechanism with a soul.

Edgar Allen Poe shattered the myth of the chess player by explaining how a human being powered the device and controlled its moves. In the essay “Maelzel’s Chess Player” (1836), Poe exposes the machine as a lifeless husk and raised the individual above the machine by presenting something which the machine could not emulate: the human mind itself. Poe responds to the argument that von Kempelen’s automaton is a pure machine. He condemns intellectuals who “make no scruple in pronouncing the Automaton a pure machine, unconnected with human agency in its movements.” In order to unravel the mystery of the chess-playing Turk, Poe interrogates the elements of the exhibition, from the physical layout and lighting of the show to the actions of Maelzel and of his automaton during the chess match itself. He then interprets the automaton’s behavior as being either mechanical or human.

In his analysis, Poe investigates the seamless integration of man and machine, rather than on the mysticism of the chess-player’s operation. By introducing the human element, Poe implies that a “pure machine” simply could not “think”, could not reproduce human thought processes. Poe writes that if the machine could truly play chess, it would always win:

“The principle being discovered by which a machine can be made to play a game of chess, an extension of the same principle
would enable it to win a game; a further extension would enable it to win all games.”

Poe’s essay suggests that a chess-playing machine, if it could play at all, would necessarily win all games. If the rules of the game were built into the mechanism, then the extension of those same rules ought to allow it to beat any human player. This argument implies that a player only wins because his or her opponent has made a mistake in the application of the many rules of chess. In a game with rules which carefully dictate movement and victory conditions, a machine which knows these rules should win consistently. A machine’s “thought” is restricted to routine, to a “point (of regularity), so important in all kinds of mechanical contrivance.” A machine could not improvise, but rather needs to remain true to the behaviors built into it. Poe knows that the machine must be motivated by a human mind because it does lose: “the fact of irregularity, when regularity might have been so easily attained, goes to proves... that the Automaton is not a pure machine.” Poe exposes the hoax by demonstrating the behaviors which are distinctly non-mechanical: the automaton cannot be irregular or unpredictable, and this reveals the human agency of the chess-player.

Poe’s study of the chess-player divides mechanical traits from human ones. The final purpose of his text is to debunk the idea that Maezel’s automaton is a pure machine. However, in order to achieve this goal, Poe must
deny that a machine can improvise. Poe suggests a way in which machines can "think." He looks at indications in Maelzel's demonstration which violate this mechanical thought. Poe isolates an aspect of nature which machinery cannot mimic. Like Poe, many other writers in the nineteenth century saw in Enlightenment philosophy the same mechanization of the world which we find embodied by the cyborg today. Romantic authors grapple with the repercussions of Enlightenment attitudes towards science and technology.

E. T. A. Hoffmann embodies this 'Romantic' reaction to technology and thought in his short story, "Die Automate." Hoffmann's characters describe their feelings towards automata:

All figures of this sort... which can scarcely be said to counterfeit humanity as to travesty it - mere images of living death or inanimate life - are most distasteful to me... When I see the staring lifeless, glassy eyes of all the potentates, celebrated heroes, thieves, murderers, and so on, fixed upon me, I feel disposed to cry with Macbeth 'Thou hast no speculation in those eyes/ which thou dost glare with.'

Hoffmann indicates something 'missing' from automata, some element that cannot be reproduced. He places this something in the 'lifeless, glassy eyes,' but his quote from Macbeth indicates that it is not so much the eyes as the 'speculation' within them, some indefinable sentience that manifests through the eyes, an idea which conjures up the cliché that "the eyes are the window to the soul." Macbeth refers to the baleful eye of the ghost whose stare condemns
him. Macbeth is responsible for this ghost; he arranged for Banquo’s murder, and now faces Banquo’s accusing spirit. In using Macbeth’s speech, Hoffmann suggests a similar responsibility of man to his creation, the technology which looks back into the creator with empty eyes, threatening all the more for their lack of emotion.

These empty eyes suggest something that the machine lacks which humans possess. The mechanical eyes lack “life”, “speculation” or perhaps spirit. Many authors at this time privilege some human quality that cannot be reproduced by machine or explained by reason and logic. Hoffmann’s automaton is lifeless; while it imitates the appearance of life, it can never really be alive. Humans have a spirit, visible through the eyes in Hoffmann’s tale, which technology cannot recreate.

The course of the nineteenth century is marked by a pervasive spread of industrial technologies. These technologies affected more than simply the modes of factory production. The nature of language and of thought also changed as the typewriter, telegraph and automated typesetting machine all contributed to the industrialization of language itself. Nietzsche comments in a (typewritten) letter from 1882 that “Our writing materials contribute their part to our thinking.” Much later, Walter Ong expands on this idea, writing that external changes to writing technologies lead to an internal changes in the
nature of consciousness. The continued industrialization of society, as Karl Marx notes in *The Communist Manifesto*, accelerates the process of stripping the members of the working class of their humanity.

Karl Marx appropriates the metaphor of the machine to demonstrate the dehumanizing effects of factory production and of machinery. Marx writes that new technologies permit new abuses of the individual. The fruits of Enlightenment discoveries in automation, industrial machinery transforms the worker into a machine himself. “Owing to the extensive use of machinery and to division of labor, the work of the proletarians has lost all individual character.” Marx notes here that industrialized machinery has robbed labor of a privileged element which he defines as “individual character.” In creating this phrase, Marx also creates something which the machine cannot reproduce. In much the same way as Kant uses “imagination”, Marx uses “individual character” to establish an human element that sets human labor above mechanical labor.

Because of the loss of the individual character of work, the worker becomes nothing more than a part of the machine of production. Marx adds to his earlier sentiment, writing that “[the proletarian] becomes an appendage of the machine, and it is only the most simple, most monotonous, and most easily acquired knack, that is required of him.” The worker is assimilated into the
machines for whom he then must work, rather than the reverse. We become a prosthetic, an artificial limb to the industrial machine.

Dr. Silas Mitchell, as paraphrased by Hillel Schwartz, announced in his Injuries of Nerves and their Consequences (1872) that amputations were never truly clean cuts. He described the sensations of phantom limbs as signs of this; the body and the nerves are still convinced the limb exists even if the extremity itself has been completely severed. Part of the mind refuses to accept the loss. In the 19th Century, and most specifically during and after the Civil War, the need for prosthetics climbed drastically. Schwartz notes that approximately 5 percent of all American males between the ages of 18 and 45 were wounded, and that this lead to a subsequent increase in prosthetic limbs in the US, as well as a number of innovations in the field of prosthetics.

Machines destroy the self by destroying an indefinable quality, “individual character.” Much like Poe, Marx presents something that the machine cannot reproduce, and in doing so, lays the foundation for the construction of the Cyborg myth, and for the antagonism of the machine and the man, something which does not appear in Enlightenment thought.

As Marx suggests, machines are transforming us (although he refers specifically to the machines of production), making us into appendages of the machine itself, and stripping us of our individuality. After the Civil War,
prosthetics establishes itself as an important industry in America. George Marks, whose father had founded a prosthetics corporation in the late 1800s, once said that “the mowing machine and the reaper have cut off more limbs than the scythe..., dynamite has mutilated the human body far more than the black powder of former days.” As technology advances, it seems to claim its pound of flesh from us. It seems that we had to replace that flesh with more machinery. What Karl Marx states metaphorically happens literally here, as the machinery of production rips limbs off, only to replace them with more technology. Where once the prosthetic marked the human as unique, it now marks him as generic. The corporations mass produce prosthetics with the aid of industrial machinery. Mass production leads to a uniformity of those prosthetics, since factory machinery can only produce a generic model limb, not one custom built to suit an individual. Once unique prostheses (represented, e.g., in Captain Ahab’s peg-leg or Thomas Hood’s Miss Kilmanssegg and her golden leg) are replaced by generic limbs. The wearer of the prosthetic himself becomes a product of the assembly line, if he can no longer operate as a part of it, and the replaced limb is now just the first step in a process of assimilation.
Despite the basic similarities between the contemporary cyborg and the Enlightenment's automaton, the figure of the cyborg tells a very different story about our relationship with technology than the one established during the Enlightenment. The cyborg transforms the fixed metaphoric usage of technology into a shifting (allegorical) expression of our own fears of becoming too dependent on technology. Because the appearance and operation of machinery changed as mechanical engineering moves from the cumbersome artifacts of the industrial age to electronic technology and digital circuitry, our own views of technology changed. “Electric circuitry has overthrown the regime of time and space... its message is Total Change,”\(^{35}\) as Marshall McLuhan writes.

McLuhan attributes this trend specifically to "electric circuitry" because it can be hidden from the eye and made invisible beneath the “skin” of the machine. Mechanical technology comforts us with its solid surety. The physical process of production is transparent, in that an observer can deduce the means by which a machine operates. With the introduction of electric circuitry, however, one can no longer see the process. Circuitry is minuscule to the point of being invisible, stripped of the visible physicality possessed by the mechanical. It is "disconcertingly wraithlike"\(^{36}\) in its presence: felt but seldom seen, possessing motivations too complex to comprehend in the form
of code beyond the pale of the average user. We read intent and will into the machine: when its mechanisms cannot be seen, it cannot be trusted, it seems. Digital circuitry is disconcerting because we cannot see it physically working anymore.

McLuhan adds that electric circuitry's "goal is Total Change" (the capitals are his), that it encourages unification and involvement" in ways mechanical technology apparently resisted. McLuhan also imbues machinery and circuitry with will. A machine cannot truly want change, but when the machinery is hidden, we see a hidden menace. This may explain why Poe needed to explain von Kempelen's automaton. By exposing the mechanism, Poe reassures readers of their own uniqueness – a pure machine could never surpass a human. Marx blames mechanization for the disintegration of the individual, because it allows us to reduce man to a machine. McLuhan then sees electric circuitry by virtue of its invisibility as the savior, the resolution of Marx's fears as it binds humanity together again. What McLuhan attributes to electric circuitry is doubly true of digital technology: the information is now hidden, one more step removed from the viewer, buried within the electric circuitry which itself hides function from the casual viewer. Confronted with "Total Change," Western society enters into an age of anxiety, as McLuhan phrases it.
The cyborg first appeared in 1960, shortly before McLuhan publishes *The Medium is the Massage.* The term arose in reference to the hypothetical fusion of man and machine who would be able to endure the rigors of outer space. The originators of the word, Manfred Clynes and Nathan Kline, both research scientists at Rockland State Hospital in New York, defined cyborgs as "self-regulated man-machine systems." Literally, the word refers to a CYBernetic ORGanism – cybernetics referring to control systems for advanced technologies. A Cyborg, then, would be one who/that can control and communicate directly with technological systems, and the simplest way to achieve direct communication seems to involve the direct fusion of technology with the organic, with the body.

No longer an autonomous creature, the cyborg’s identity relies on interaction with elements outside of what we normally consider the body. It has assimilated machinery. The appearance of the cyborg at this particular time comes wrapped in the anxieties of the cultural crisis McLuhan describes. When Clynes and Kline first write about the cyborg, their driving idea is that man can take hold of evolution in order to propel himself into space:

> In the past evolution brought about the altering of the bodily functions to suit different environments. Starting as of now, it will be possible to achieve this to some degree *without alteration of heredity* by suitable... electronic modifications of man’s existing modus vivendi.
The cyborg is the next stage of evolution, triggered not by nature's demands but by man's will to expand his world. Electronics will change our way of living, changing us so we can adapt to changing environments. The existence of the cyborg implies the obsolescence of the human body. If the cyborg is the next evolutionary step, an ideal form for the new shape of the world, then the current human body becomes an artifact of the past, unsuitable in a Darwinian sense. The individual cannot survive an environment for which the machine can be customized. In order to resolve the "threat" of obsolescence, the individual must *rethink* identity.

The cyborg appears at a point of time in history when we suddenly find ourselves facing a new way of thinking about technology. Technology is shrinking to the point of becoming invisible. As our technology shifts, our ways of communicating and storing information shift. Nietzsche reminds us that "our writing materials contribute their part to our thinking." Technology becomes electronic and information becomes digital, the average person can no longer fathom the logical operations of the machine. Once it was possible to track physically how a machine operated. If you looked, you could follow the gears and cables and tracks to the end product, and understand at least a portion of its operations. The physical operation of the machine was
transparent – if you wanted, you could see the machine work, physically. Electric circuitry eliminated that possibility. The machine has become invisible and magical. With the innovation of computer coding, the transformation has become complete. We are now completely estranged from the machine’s processes. We can never look deep enough into the machine to see how it is really operating. More significantly, we project this process upon ourselves, and begin to wonder if the technology which vanished inside the machine to control it discreetly from within might not do the same to us.

Martin Caidin’s book *Cyborg* arrived in 1972, shortly after the creation of the term cyborg itself. Caidin’s cyborg seems inspired by Clynes and Kline’s article. His cyborg is a former astronaut, Steve Austin, who is crippled in a flight accident and reconstructed so that he would be able to fly again. Already Caidin works from the assumption that the human body is not strong enough to perform the tasks we require. Also we see in Austin a theme which appears often in cyborg literature. The enlightened individual, intelligent, talented, and well-defined by his actions and thoughts must endure the process of becoming a cyborg. In doing so, he questions his own humanity in light of his mechanical enhancements.

Steve Austin, hero and victim of *Cyborg*, appears at first to be the idealized autonomous self. His almost extraordinary individuality makes him
among all the available test-pilot victims the best candidate for cybernetic transformation by an unnamed government department specializing in espionage. Oscar Goldman, the head of the department, explains why he chose Steve Austin, stating that Austin is “not simply a man in whom we are interested, but specifically a man so unusual, extraordinary, in fact, as to command our attention”\textsuperscript{42} (emphasis in original). Austin is an individual, as Goldman’s emphasis indicates. Not every man can endure this transformation. Austin is special because he \textit{is} individual, separate from “man” as a mass, considered as a whole. He is extraordinary and set apart from the others. Caidin emphasizes Austin’s uniqueness in order to strengthen the allegory he constructs. Austin as an individual must come to terms in a very real and physical way with the technology which will sustain his life, but which will inevitably separate him from his old life, from his old identity.

Steve Austin’s individuality separates him from others. Goldman states that Austin “has no immediate family”, something which is “another advantage, one we had not counted on.”\textsuperscript{43} Austin is totally self-sufficient (something which Clynes describes to be the goal of becoming a cyborg in the first place). His only other human contact, his fiancé, seems perpetually distanced from Austin in her brief appearances early in the text. Before Austin’s final test-flight, she walks alongside him, “hating the thick material
separating them." Austin’s flight suit serves as a (trite) metaphor for an emotional threshold the two cannot breach. Caidin seems intent on constructing Austin as a total individual, reliant on no other human for his identity. This makes Austin all the more suitable a subject for the cyborg process. He is the ideal self which must confront the identity-obliterating effects of the cyborg. In enduring the process of becoming cyborg, Austin will demonstrate the “new type of man” which Caidin predicts science can produce.

By the end of the novel, Austin repositions his identity in terms of the technology running throughout the body. In Caidin’s rather clichéd ending, Austin’s doctor sees Austin and his newfound girlfriend (a fellow spy he rescues in the course of the novel) and notes that “[t]hese two had found one another. And Steve Austin had found himself.” Trite as this ending is, it serves Caidin’s purpose. Austin, the autonomous individual, now relies on other human beings, on relationships and networking. In this mesh of social interaction, Austin can ‘find himself,’ can reestablish his identity. This recalls Clynes’ comments in “Cyborg II” that a cyborg is a union, rather than an isolated individual. Austin’s real-world physical and emotional relationship marks technology’s power to socialize man once again, to return him from his isolated state. As Austin is reliant on his homeostatic systems to sustain his life, so too is he reliant on his interactions with outside “systems” to define his
identity as cyborg. The transition Austin experiences is an allegory of that which we confront when we interrogate our own relationship with technology in the digital age.

If the cyborg is a physical manifestation of our growing fears towards our increasing reliance on technology, both physical and psychological, then Caidin’s cyborg is able at the end of his transformation to transcend these fears, retaining his identity without sacrificing his machinery. Caidin seeks “to create out of the mutilated human wreck not only a new man, but a wholly new type of man. A new breed” (the italics are my own). Caidin hopes to describe the process of becoming a cyborg. This process requires the mutilation and destruction of the human, the individual’s definition of self, but it also brings about the construction of a new type of human, carrying with it a new type of identity.

Caidin states very plainly that creating a cyborg requires first a “mutilated human wreck.” Steve Austin’s body has failed, or rather, has been so damaged that failure is inevitable. Technology can only enter through a wound in Caidin’s world. Caidin touches on the common fear of technology, that it will “infect” us, transforming us into a machine. In Steve Austin, Caidin constructs a unique individual, the perfect “volunteer” to become a cyborg. Austin, a man totally separated from the world, whose identity relies on no
outside information or influences must suddenly redefine himself in terms of dependency, in terms of an outside whose influence he never before needed to acknowledge. There is no way to separate the man from the machine once Austin’s transformation is complete. Like a virus, the technology has infiltrated his body completely, entering through the wounds opened in Austin’s accident. Austin, as the refined and isolated individual, confronts the infectious machine directly in his own cybernetics. A cybernetic self must in a sense already be a shattered self, much like Steve Austin, a broken man.

“We can rebuild him. We can make him better than before.” So begins The Six Million Dollar Man, the television show based on Cyborg. This title and The Bionic Man are interchangeable, and do in fact switch back and forth between the various spin-off shows following in its wake (The Bionic Woman, most obviously). With this change in naming, the focus of the show has already shifted: the cyborg of Caidin’s book is now a bionic47 man, a title which twice affirms his humanity in favor of his machinery, first with the addition of the word “man” to the title and again with the primacy “bio”, the organic takes over the mechanical. Remember that in the case of the cyborg, cybernetics form the first part of the compound, while the organic appears at the ending of the word. Martin Caidin’s Cyborg is an early piece of cyborg
fiction, and it helps construct a myth so engaging that Cyborg is converted into a fairly successful TV show. Television’s Star Trek: The Next Generation provides a more sinister representation of the cyborg, one which interrogates the problems that the relational identity of the cyborg (presented so optimistically by Caidin) introduces.

The ending of Caidin’s novel supports the idea that a networked self provides a solution to the problems the cyborg presents. Caidin writes that cybernetics will create a new type of man. Caidin’s cyborg reconstructs his shattered identity much like the cybernetics themselves reconstruct his shattered body. The new man is able to incorporate these foreign parts into his identity. Steve Austin’s body had been divided by the accident. His identity relied on the structure of his body. The body demarcated his identity, so that nothing outside got in.

When the limits of the body were broken, the limits of the self were lost. Steve Austin could not see himself as a whole man without a whole body, but the introduction of cybernetics did not restore him to his original sense of an indivisible self. Instead, Austin had to learn to define a self which relied on outside technologies. His cybernetics form the point of entry for this new way of constructing identity because, while Austin’s cybernetics clearly are not the same as his original body (in fact, they are “better than before”), they work in
unison with his body. He must assimilate technology into his psyche in order
to move and function as he could before his crash. The Borg, of *Star Trek: The
Next Generation*, demonstrate a problem in Caidin’s conception of the cyborg.
Caidin describes his “wholly new type of man” as a glimpse of the future. His
approach is optimistic *because* his new breed is a preview of something which
Caidin sees as a necessary, if not inevitable evolutionary step.

Interestingly enough, Q, the seemingly-omnipotent prankster of *Star
Trek: The Next Generation*, describes the Borg in terms much like Caidin’s in
their first appearance within the series. At the start of the episode “Q Who,” Q
asks Captain Picard if he can join the Enterprise as a member of her crew.48
He offers his omnipotence as a “safety net” – with his powers, he could rescue
the ship from any danger it encountered. Picard refuses; he argues that
humanity prefers its independence and self-determination. Q’s presence would
undermine the human project that is the Federation. Picard and his crew would
rather encounter and resolve problems on their own than let an omnipotent
force guide them parentally through the dangers of the universe. When Picard
refuses to allow him to join the ship’s crew, Q launches the Enterprise,
explorer vessel of the Federation, into unknown, uncharted territory for a “taste
of your future, a preview of things to come.”49
That future for the crew is the Borg, a horrifying combination of technology and dead flesh, the most nightmarish incarnation of technology demonstrable to a culture that so privileges the individual. Q sends the Enterprise beyond the farthest reaches of known space. The Borg occupy a territory beyond understanding. They represent a machine consciousness which the individual, struggling for autonomy, cannot comprehend. Their bodies bear the marks of their difference, of the threat that they represent. The crew’s (and Picard’s) desire for self-determination leads them directly to the Borg, devastator of the individual, assimilator of identity.

As the crew first sees the Borg ship, it is a simple cube, a meshwork of pipes which has more in common with a crushed automobile than with the sleek, stylized starships common to the Star Trek universe. Android crewmember Data describes the ship as being “very generalized in design. There is no specific bridge, no command center.”50 The ship lacks any individuality. It has no external stylistic design, as these features do not make space travel any more efficient. A cube serves just as well as any other shape, and calls to mind order and efficiency itself. The ship has no outer hull. The mechanisms of the ship are exposed and visible, as there are no concerns about air drag or inertia in space. It has no specific internal departments: no head, no
single location for control. The ship mirrors its crew, menacing in its mechanical purity, ominous and silent.

The Borg present a far less pleasant cyborg than does Caidin’s protagonist – their technology fuses uncomfortably with the body: tubes run outside the body unprotected by any “skin” and the mechanism is exposed to any viewer. The Borg body looks like a re-animated corpse – its skin is white, its movements are slow and clumsy, stiffened with rigor mortis but jerked about by the mechanics fused to the dead flesh. The most noticeable cybernetics are attached to the Borg face, covering at least one, and at times both eyes, and sometimes covering the mouth and ears. The main organs of communication are blocked, replaced by machinery – these creatures are totally separated from man. They appear dead, they are unapproachable and uncommunicative. They go about their tasks with pitiless efficiency. While they physically seem cyborg, their life-in-death appearance imbues them with a machine’s consciousness.

The Borg are frightening because they are the totally foreign. In the anthropocentric Star Trek universe, every species is unique, every culture is prized for its differences. Even the Klingons, whom the original Star Trek series portrayed as being simple warlike thugs, are developed to such degree that one can now buy Klingon dictionaries and books which detail the Klingon
codes of honor. The Borg are defined by their lack of culture and lack of individuality. For a television series whose cultures are “based on freedom and self-determination[,] who would rather die”\textsuperscript{51} than lose that freedom, the Borg represent the ultimate threat of technology. This is McLuhan’s anxiety made flesh. The Borg as technology threaten to absorb (and in that absorption, to destroy) individuality – the assimilated individual has lost all color, literally and figuratively as that individual no longer is unique. Any personality, anything to distinguish him or her from another member of the society has been leech-ed out of his or her system. Where this process is suggested in the Borg’s first appearance, the audience see it firsthand when the Borg assimilate Picard, Captain of the Enterprise and “champion of the cultivated individual”\textsuperscript{52} in their next appearance.

In the Borg’s next appearance, curiously entitled “The Best of Both Worlds,” they seek out Picard, the only individual to distinguish himself to them. In “Q Who,” Picard alone speaks to the Borg; it is his speech which defines him as an individual. The Borg seek out Picard deliberately, setting a course directly for the Enterprise as soon as they reach Federation space. They hail Picard by name, calling out “Captain Picard... you speak for your people. Surrender your self or you will be destroyed.”\textsuperscript{53} I place a space between “your” and “self” because, when the Borg speak, they particularly emphasize
this word. Picard’s (and in a larger sense, an autonomous individual’s) selfhood is being challenged by technology. When Picard refuses, he is taken by force from his ship while his crew stands by helplessly. The Borg cannot be avoided, cannot be resisted. As they tell Picard, “Freedom is irrelevant. Self-determination is irrelevant… Death is irrelevant…” — conditions which define the autonomous self. Once again, cyborgs stand in opposition to the natural, as seen in the technological revenants that compose the Borg collective. In the end, the individual and the natural are devoured by technology. The Borg body violates the natural, violates the structure of the body.

When the Borg kidnap Picard, his final words to them are: “I will resist you with the last ounce of my strength.” The sourceless voice of the Borg hivemind responds: “Strength is irrelevant. Resistance is futile. We wish to improve ourselves… Your culture will adapt to service ours.” Our cultural drive to technologize given form in the Borg does not concern itself with human mental traits. The Borg represent a vast monoculture which absorbs individuality, constructing a homogenous, uniform species. This is what we fear technology will do – Marx saw technology destroying the individual character of work. Haraway and Stelarc both see technology fixing the body, restricting our capacity to rethink our bodies in terms of the increased flow of
information around us. They both see the cyborg as a solution to that problem, a dissolution of the mental block preventing mankind from comfortably incorporating technology to generate that new species of man which Caidin, Clynes and Kline all describe. If the Borg are this cultural problem given form, then where is the true cyborg, the one which will resolve these problems?

When Picard returns to the story after his kidnapping, he has been transformed. He wears black, and tubing runs across the outside of his clothing, connecting cybernetic attachments across his chest and arms. Along the right half of his face there is a metal plate which surrounds, but does not cover his eye. His skin is still pink and fresh, unlike the Borg, but his eyes are simultaneously emotionless and cruel. In Picard’s first appearance as Borg, he confronts his former crew via a view-screen through which he addresses not only the members of the Enterprise, but also the members of the audience. “I am Locutus, of Borg. Resistance is futile. Your life as it has been is over. From this time forward, you will service us.”55 We the audience see the idealized individual succumb, and be lost to the machine. Picard becomes Locutus, or rather, Locutus comes into being when Picard is lost. If a unique name is the marker of a unique identity, then Locutus already stands apart from his race. He can refer to himself as an “I” rather than a “we”. As Locutus,
Picard is reconstructed as the “one who speaks.” Locutus has identity, but he is also networked into the collective.

When Locutus addresses us/the Enterprise, there is a red laser attached to his right temple. It flashes directly into the camera, drawing in light the link between the crew and their captain, the audience and their hero. When Picard becomes Locutus, his “networking” becomes visible. We know he is connected to the Borg, and we see that he is still connected to us. It is this connection that inspires Riker, first officer on the Enterprise, to lead a risky rescue attempt even when Starfleet’s admirals have written Picard off as a casualty of war.

Locutus, as a networked member of the Borg collective, provides a pathway back to the Borg ship. Data, the android, connects with Locutus’ neural net, the digital mind superimposed on Picard’s own. Data uses the network which connects Locutus to the Borg to find a way to stop the Borg. In this moment, when friend Data connects to Locutus, Picard as an individual is able to return from the collective. In an emotionless voice, but one which is distinctly Picard’s own, he tells Data “sleep” – he speaks as Picard for the first time since his transformation. Data finds a basic “sleep” subroutine in the Borg command structure, and is able to trigger this command. The Borg ship immediately shuts down and halts its progress towards Earth.
Picard’s connectedness to the Borg hivemind allows the Enterprise to shut down the collective. By putting the collective to sleep, the Enterprise unwittingly (though not unpleasantly) destroys the Borg. When the Borg ship enters sleep mode, the normally regenerative process which charges the ships energy cells activates. Since the Borg collective does not require regeneration, the energy cells overcharge, then explode. Picard returns with a jolt to the full control of his body.

Picard’s bond with the crewmembers of the Enterprise motivated them to rescue him. This networking now allows Picard to escape the world of the purely mechanical that the Borg represent, but only by destroying the very network which had sustained him as cyborg. When Picard returns from being Borg, it is due to his community, due to his interaction rather than his individuality. His own voice (which must be distinguished from Locutus’) can only be restored when Data connects to him, allowing Data access to the Borg ship, and allowing Picard access to individuality once again.

The cyborg marks the restoration of social needs to the autarchic individual in order to escape from the possession of the machine. The autonomous self exists in isolation, is defined by its independence and ability to survive alone. Self-determination and independence are key concepts on which Caidin relies in describing Steve Austin, and they are key words Picard
uses in defying the Borg. However, confronted with the reliance on technology imposed on Austin by his accident and on Picard by the Borg (technology per se), neither man could endure in isolation, nor could they survive without the help of community, of the social. Picard would be totally lost to the Borg were it not for the social network that he established with his crew. At the same time, this renewing of social exchange creates new dependencies. The Borg are destroyed by these dependencies; even as Picard is saved (or perhaps salvaged) by his connections to the crew, those connections allow the crew to destroy the Borg because they allow the crew access to controlling functions of the collectives consciousness of the Borg.

Picard’s return to individuality is not total. At the end of the episode, his Borg pieces have been removed and he is restored physically to his former state. Psychologically, he cannot be the same man, independent and self-sufficient. As the episode ends and the camera pulls back, we leave Picard alone in his quarters, drinking tea (earl grey, hot – a personal trademark, a sign of his recovery) and staring into space. The desolation of the scene is intentional. Picard stands alone for the first time in the two-part episode. Reflecting on the emptiness of space, he must see that emptiness reflected in himself. His transformation at the hands of the Borg has taken his independence from him. He has returned from the machine as an individual
reliant on connections, a self defined in interdependencies and interactions rather than in isolation. To underscore this moment, Picard returns to Earth and to his family in the very next episode, so that he can recover from his trauma and restore those connections which are so important to his definition of self.

In constructing the cyborg, we see ourselves re-constructed. By projecting a self into the machine, by meshing the human body with technological enhancements, we do more than just predict a future self. We comment upon ourselves in the now. We describe our otherwise unspoken connection to our tools, and draw our reliance on those tools into the open. Once we see that we are already cyborgs, we can reconstruct our understanding of ourselves into more a useful structure. Donna Haraway writes that “our bodies… aren’t as natural as the Body Shop would like us to believe. Truth is, we’re constructing ourselves.”56 The image of the cyborg helps shatter the myth of the naturalness of the human body. This is important because “when people describe something as natural, they’re saying that it’s just how the world is; we can’t change it.”57 “Natural” implies a fixedness that the cyborg undermines by virtue of its being a body moderated by technology, the natural and artificial hybridized into something new. The cyborg breaks the
boundaries established between the fixed and the malleable, nature and the artificial.

The cyborg myth allows us a way to change what the Enlightenment enforced – a resolute belief in the autonomous self. The cyborg shows us that we are already defined in part by our tools. The model of the autonomous self cannot operate when confronted with the cyborg. As Stelarc demonstrates through his performance art, we are able to reconstruct ourselves, as we are constructs already. The model of the autonomous self prevents us from seeing that we can rewrite ourselves, reconstruct our identities in terms of our new environment. Autonomy transforms into interconnectivity. We no longer are isolated selves, but instead become extended selves. We remain individual, but are now networked, in a very literal way. We are defined not by the boundaries of our skin, but by the boundaries of our information. If part of that information exists elsewhere (online, or with another person), then we must include that relationship in our definition of self. McLuhan describes a “global village” to describe the influence of digital technology’s infusion into our world. In this sense, information is managed through relationships, like in a small village in which each member of the society is integral to the life of the other. The cyborg provides a way to realize that networked self while
maintaining the individuality and identity that the Enlightenment has made so desirable.

If Kuhn’s comments about scientific revolutions apply to sociological revolutions as well, the cyborg represents a crisis in context. In other words, the status of knowledge has changed, the way in which information moves is not the same as during the Enlightenment. This is the latest major defining moment in the constructions of identity. Identity is a means of containing information, information about the self. As the context in which the information changes, the content of the medium changes to suit the new shape of information.

We are compelled to mechanize, it seems. As Gary Chapman writes in his article *Taming the Computer*, “the public generally seems to accept the existence of a ‘technological imperative’ that compels us to automate wherever and whenever possible.”58 We are caught up in a type of *Manifest Destiny* of technology, where we must colonize every tool, every operation with digital technology. We are trapped in “[a] ‘techno-logic’59 which projects a historical course for society plotted along points marking marginal improvements in the features of our technological artifacts.”60 Technology becomes a driving force for history, a way of determining our progress as a species by measuring our progress with machines. While technology weaves itself deeper into the
operation of society, it looms over the body and we find that we cannot unravel ourselves from our tools. Electronic circuitry weaves itself into our world physically, built into every small appliance. We then find ourselves forced to judge our society, our history, in terms of the technology we have struggled so hard to develop.

Technology becomes invasive, ubiquitous to the point that we cannot imagine a world without it, or if we could imagine one, we certainly could not realize it. Our reliance on technology is not just actual, but psychological. The machine has affected us. “Ubiquitous technology, which is definitive of the virtual age, is... subtle. It doesn't tell us anything. It rearranges our thinking apparatus so that different thinking just is.” We cannot help but be changed.

Chapman allows that we are being changed, but adds that this change is not an easy one. We move through a “process of adjustment to the incremental progress of the technology” much reminiscent of McLuhan’s period of anxiety. During this process we face technology with a “practical apprehension” – we use computers, but only because we must. This point of practical apprehension marks the entry of the cyborg. The cyborg is the logical extension of the technological imperative; it is the actual invasion of technology into the human body. At the same time is also a reaction to that invasion. The apprehension we feel towards technology, combined with the
relentless development of technology creates for us a very mixed image of the cyborg.

Western culture is comfortable with information traveling much more slowly than it does now. Despite the fact that several generations have passed since the beginning of electronic communication, the desire for community and the desire for oral communication suggests our continued tendency to expect information to travel slowly. While more information is at our disposal more rapidly, the communications technology which conveys that information has developed too rapidly. Our representations of the cyborg convey a fear that our technology will surpass and consume us. At the same time, the cyborg carries with it a resolution of those fears. This is not necessarily a positive resolution. The autonomous self confronts the machine, but is able to remain an individual after the process of assimilation. The individual survives because he or she redefines the self in terms of an outside rather than solely as an internal process. Constructing the self requires the existence of an outside in relation to which the self acts. The cyborg moves the outside in. Technology infiltrates the body, and the self which was once limited by the boundaries of the body finds those boundaries blurred. What is inside, what is out? In light of this meshing of the two, identity is being changed from something
autonomous and isolationist, to something relational, reliant on interaction and community.
Endnotes

3 Ibid.
9 Ibid. 273.
10 Cognitive theory has as its object of study not thought itself, but our relationships with objects and people. According to this school of thought, consciousness becomes the product of the compilation of these relationships, rather than the center of a unified and independent whole.
12 Ibid. 4.
14 Ibid.
18 Ibid. 205.
19 Ibid. 208.
20 Ibid. 206.
21 Ibid. 207.
22 Wellman, Kathleen. *La Mettrie: Medicine, Philosophy, and Enlightenment.* (Durham: Duke University Press, 1992)
24 Ibid. 86.
26 While the piece is entitled "Maezel's Chess-Player", Poe explains that Maezel is simply the current owner of the Chess-playing Turk originally constructed by Baron von Kempelen.
28 Ibid. 282.
I see a flaw in Poe’s logic here— if a machine is predictable, restricted to routine, then a human player should be able to trace the pattern the computer uses and beat it consistently by exploiting the routine.

Ibid.


Ibid.


The title is an intentional wordplay on McLuhan’s most famous proclamation, “the medium is the message.”


As a point of comparison, Vaucanson’s mechanical duck had perforated wings, so that a spectator could view the internal mechanism of the duck’s digestive system.

Ibid. 51-52.

Ibid. 52.

Ibid. 16.

Ibid. 282.


An aside: my word processor knows the word “bionic” but not “cyborg.”

Q has, in the past, put the crew of the Enterprise on trial for the “crimes” of the human race (brutality, a warlike nature, the usual). His modus operandi is to torment the crew for his own entertainment, and his requests are not to be believed. But that’s a story for another paper.


Ibid.


Witwer. 273.

“Best of Both Worlds, Parts I & II.”

Ibid.

Ibid.

Ibid.

Kunzru.

Ibid.


This differs from the “techno-logic” as I used it earlier, in that Chapman uses the term to refer to the inevitable mechanization of anything and everything. I use the term to identify a mistaken anthropomorphism that occurs when discussion turns to machinery and humanity.

Chapman. 302.


Chapman. 302.
Bibliography


