

**Darwin and the Digital Body: Evolution, the Posthuman, and Imaginative
Spaces of Possibility**

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For William Webb Lowe, granddaddy of them all.

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[T]he strange, the incoherent, that which falls “outside,” gives us a way of understanding the taken-for-granted world of sexual categorization as a constructed one, indeed, as one that might well be constructed differently.

~Judith Butler

INTRODUCTION

Talking about embodiment is a political act—whether the discussion is about race, gender, “ability,” or body modification, whether the body is imagined to be a stable entity or shifting and porous. Despite leaps forward in equality during the twentieth and twenty-first centuries, we still live in a world where beings are constrained—practically, intellectually, emotionally, sexually, expressively—by how we imagine bodies. For example, if we see bodies as “essential” objects, harboring fixed characteristics, it is easier to rationalize denying rights based on those characteristics. As posthumanism scholar Cary Wolfe points out in *What Is Posthumanism?*, we allow “rights” for beings we perceive to be able-bodied and -minded, what Immanuel Kant named the “community of reasonable beings” and in what Wolfe calls a “model of subjectivity and experience drawn from the liberal justice tradition... in which ethical standing and civic inclusion are predicated on rationality, autonomy and agency” (Wolfe 127).

But who is considered rational and autonomous? Up to the present, people have not been considered rational or autonomous because of physical characteristics such as sex, skin color, stature, size, or disability. As Wolfe explains in his discussion of animal science expert Temple Grandin, this literal dehumanization also can extend to the way minds process thoughts. Grandin, an autistic person who thinks visually rather than linguistically, notes that

she “would be denied the ability to think by scientists who maintain that language is essential for thinking” (129).

Feminist scholars, too, have long struggled with the implications of physical materiality, specifically the way bodies interact with the world and whether the body itself is a shifting or stable entity. For example, gender and technology scholar Eve Shapiro argues that technological innovation can produce reimagined parameters for human embodiment and being (Shapiro 2). Feminist scholar Judith Butler argues pointedly for a shifting embodiment where meaning is understood to be inscribed on the body rather than is an essential aspect of the body. For Butler, gender is a fictional performance and no person has an essential, gendered identity, an “‘I’ that pre-exists signification” (Butler 183). Postmodern feminist scholar Donna Haraway’s “A Cyborg Manifesto” sees the mythical cyborg as a philosophical vehicle to conceive of “unnameable,” culturally unimaginable bodies. By breaking down boundaries born of dualism between human and animal, man and woman, mind and body, and machine and human, Haraway hopes to subvert human constructions that mark “impossible others” — including people of color, genderqueer persons, women, and people with disabilities, among others—as targets for oppression (Haraway, *Simians* 175).

This project searches for the roots of a cultural shift toward a new paradigm of “body” — a shift that is by turns unsteady or grounded, subtle or shocking, hopeful or fearful. It unearths connections between two frameworks that hinge on the conceptualization of bodies: Victorian evolutionary theory, as represented by nineteenth-century naturalist Charles Darwin, and contemporary posthumanism, as represented by Cary Wolfe and cybernetics and literature scholar N. Katherine Hayles, for example. Both frameworks, specifically the concepts of

mutability and entanglement threading through them, will illustrate particular cultural representations of the body explored in the form and content of nineteenth-century speculative fiction and digital media presentations (such as digital novelist Shelley Jackson's 1995 hypertext creation *Patchwork Girl*).

Chapter 1 will identify and define concepts useful to the purpose of this project and delve into the thesis.

Chapter 2 will address links between Darwinism and posthuman theory through the pathways of mutability and entanglement, arguing that these specific Darwinian concepts are essential to posthuman thought. I will also argue that although the posthuman relationship to technology is divergent from what Darwin wrote about technology in *The Descent of Man*, Darwin catalyzed conversations about humans and technology and made the posthuman theoretical framework possible.

Chapter 3 will apply a close reading of nineteenth-century speculative fiction using the concepts of mutability and entanglement, showing that these works of literature created an imaginative space in which to struggle with Darwin's theory of evolution. In addition, this section will address the use of technoscience and biotechnology in such literature in response to the Darwinian ideas about technology.

Chapter 4 will analyze both the form and content of Shelley Jackson's *Patchwork Girl*, applying it to both Darwinian and posthuman contexts, showing that, like speculative fiction, digital media is able to provide an imaginative space in which to struggle with themes of embodiment, but takes it a step further through the inclusion of posthuman frameworks. By participating in digital media, readers/users/audiences are changing their embodiment in

Darwinian and posthuman ways, even if they do not directly recognize the shift as such. I will conclude the project by identifying potential new directions in research and iterating political implications for people, animals, and ecosystems.

Skeuomorph [skyoo-uh-morf]. A vestigial design or form enmeshed with evolving tech to increase user comfort. Decorative rivets in jeans. A “piece of paper” on which to insert “type” in processing programs. Digital representation of buttons or levers. “Turning pages” in electronic books. Linear narrative, story arc. “Pro-nouns.” The human form. Human thought.

~SecondJen

CHAPTER 1. DEFINING EVOLUTION AND THE POSTHUMAN

In concert with Darwin’s theory of evolution, nineteenth-century speculative fiction challenged Victorian conceptions of embodiment, specifically the idea that the body is unchangeable and separate from other bodies and the environment. Furthermore, just as speculative fiction demonstrated mutability (or changeability) and entanglement (lack of separation), certain works of postmodern digital media demonstrate mutability and entanglement of bodies originating from evolutionary and posthuman theory. In addition, the digital format of such media represents a radical shift in embodiment experienced by users of computer-mediated literature or communication.

Victorian speculative fiction and postmodern digital media or works of hypertext clearly connect. Not only do some present-day works of digital media borrow directly from Victorian fiction—such as Shelley Jackson’s *Patchwork Girl*—but they reimagine it through literary tropes and overall design. Also, just as speculative fiction created imaginative spaces in which to struggle with the implications of Darwin’s theory of evolution, so too do works of digital media continue to struggle with the implications of Darwin as well as posthuman theory.

Digital media—especially in concert with speculative fiction—provides content in interactive formats that create a shifting, always creative embodiment. Although digital media has been relevant to the general public since the 1990s, my hope is that new articulations among these elements will contribute to the conversation about embodiment in a fresh, heretofore unexplored, way.

But before considering the implications of Darwin’s theory of evolution and postmodern theory on nineteenth-century speculative literature and present-day digital media, both frameworks need background and definition.

Embodiment vs. identity

Communication and digital media scholars often talk about *identity* when discussing possibilities for technology, and the potential for confusing identity and embodiment is significant. For our purposes, *embodiment* is the state of being the form and function of our bodies, whereas *identity* is the meaning inscribed upon bodies.

In *When Old Technologies Were New*, technology historian Carolyn Marvin describes a curious late nineteenth-century fad: using electric jewelry to enhance women’s bodies. Marvin notes that “in 1884 the Electric Girl Lighting Company offered to supply ‘illuminated girls’ for indoor occasions” (Marvin 137) and goes on to describe the social significance of physical enhancement:

Decorating the human body with electric light was something more than an arresting item in the catalogue of novel electrical applications, precisely because the universality of the physical body offered a secure reference point for cultural experiments with new and strange technologies. The body was a known medium upon which to inscribe religious, civic, scientific, class, or sexual messages with the new instruments of electricity... (139)

For Marvin, the body is the “medium” through which to channel identity and experiment with new technologies, whereas identity itself consists of those cultural messages inscribed upon the body. Shapiro defines identity as “an individual’s sense of self. The answer to the question, ‘who am I’” (Shapiro 10)? whereas embodiment is, again, “the lived body... a site of meaning, experience, and expression of individuals in the world” (2). Both embodiment and identity are mutable, adding to the confusion: Famous communication scholar Stuart Hall breaks down the illusion of an “essential identity,” insisting that it is created within discourse due to myriad factors:

...we need to understand [identities] as produced in specific historical and institutional sites within specific discursive formations and practices. Moreover, they emerge within the play of specific modalities of power, and thus are more the product of the marking of difference and exclusion, than they are the sign of an identical, naturally-constituted unity—an “identity” in its traditional meaning (that is, an all-inclusive sameness, seamless, without internal differentiation). (Hall 4)

Embodiment and identity are thus entwined but distinguished; bodies are sites for the inscription of meaning (identity).

Defining evolution, mutability, and entanglement

Following Charles Darwin, evolution is defined as gradual change in the characteristics of species through deep time, over generations. In *The Origin of Species*, Darwin sets out to explain the means of “modification and coadaptation” that make evolution possible (Darwin, *Origin* 67). How, asks Darwin, is the woodpecker’s beak so well adapted to pick bugs out from under the bark of trees, for example? The answer is not, as some Victorian naturalists suggested, purely external conditions acting on a creature to change its characteristics, but natural and artificial selection.

Natural selection is the preservation of characteristics beneficial to a species, and the destruction of characteristics injurious to a species, through what Darwin calls the “struggle for existence.” Creatures with beneficial characteristics—such as the woodpecker with the well-adapted beak—are more likely to survive and reproduce than creatures without, and beneficial variants will be passed down (and further adapted) through generations (68, 131). *Artificial selection* is the human attempt to select beneficial characteristics—and eliminate injurious characteristics—through the breeding process (90).

Mutability and *entanglement* stem from the implications of natural selection and evolution. Mutability—the opposite of “immutable”—is the ability of a body/series of bodies to change over time. The concept of mutability is foundational to the theory of evolution, as physical change and variability are required to allow for natural and artificial selection. The word “entanglement” refers to Darwin’s use of the entangled bank—a river bank he once encountered, lush with animals and plants—as a metaphor for the interconnectedness of species (125). All species are at once dependent upon and struggling against other species for survival, and are thus “entangled.”

Defining posthuman (without “defining”)

Posthumanism is a contested term that resists grounding. Cary Wolfe’s project, *What is Posthumanism?*, attempts to capture the nuance of the posthuman *without* creating a fixed definition. In his introduction, he reveals that simply searching for “posthumanism” on the Internet generates disparate and irreconcilable definitions, many of which postmodern scholars such as Michel Foucault or Donna Haraway would not support (Wolfe xi).

For clarity in this project, Eve Shapiro's definitions of *embodiment* and *technology* are used to begin to articulate parameters for posthuman meaning through antithesis. Shapiro defines technology as "anything that humans develop to manipulate the natural environment... a wide variety of objects, knowledge, activities, and processes humans have developed to alter the material (and conceptual) world" (Shapiro 3). For Shapiro, this could mean anything, from simple tools to language to high-tech processors or chips implanted in the body. Embodiment, or "the lived body," is defined as "a site of meaning, experience, and expression of individuals in the world" (2).

Shapiro's definitions are a convenient jumping-off point—her definition of embodiment claims the existence of a "site," a closed system capable of retaining meaning and expression for a length of time, while her definition of technology assumes a separation between humans and the "natural environment"—for Shapiro, humans manipulate the environment through the use of technology. These definitions may imply a "liberal humanist subject" that interacts with nature and technology as separated, closed systems.

In *How We Became Posthuman*, a historical study of cybernetics and posthumanism, N. Katherine Hayles characterizes the *liberal humanist subject* as a construction of the eighteenth-century Enlightenment and defined by a set of values, specifically: "a coherent, rational self, the right of that self to autonomy and freedom, and a sense of agency linked with a belief in enlightened self-interest" (Hayles, *How We Became* 87). Hayles frames the liberal humanist subject as the cultural baseline for understanding a theory of posthumanism. This is not to say that the liberal humanist subject and the posthuman are completely antithetical for Hayles, who notes that they have "continuities and discontinuities," but that the traditional liberal

humanist subject is a flawed construction no longer adequate to understanding our rapidly evolving bio-technological world.

Some see this theory as problematic: Wolfe takes Hayles to task for what he calls the “net effect and critical ground tone of her book... to associate the posthuman with a kind of triumphant disembodiment” (Wolfe xv). He describes the pitfalls of transhumanism—often illustrated by robotics researcher Hans Moravec’s fantasy of downloading consciousness into a computer (Hayles 193)—and often confused with posthumanism. For Wolfe, “posthumanism isn’t posthuman at all—in the sense of being ‘after’ our embodiment is transcended—but is only *posthumanist*, in the sense that it opposes the fantasies of disembodiment and autonomy, inherited from humanism itself” (Wolfe xv). For her part, Hayles actually appears to agree:

If my nightmare is a culture inhabited by posthumans who regard their bodies as fashion accessories rather than the ground of being, my dream is a version of the posthuman that embraces the possibilities of information technologies without being seduced by fantasies of unlimited power and disembodied immortality, that recognizes and celebrates finitude as a condition of human being, and that understands human life is embedded in a material world of great complexity, one on which we depend for our continued survival. (Hayles 5)

It is important to this discussion that a definition of posthumanism need not include either disembodiment or a literal enmeshing with machinery. By both Wolfe’s and Hayles’ definitions, “Posthuman” doesn’t necessarily mean “after human,” “more than human,” or “non-human.” Instead, it relinquishes the idea of the liberal humanist subject so important to constructing bounded and fixed embodiments. Though the posthuman *can* be represented as a cyborg—as it is in Donna Haraway’s mythos—the cybernetic posthuman is more a distributed consciousness than an enmeshing of machinery and biology, a “we” rather than an “I,” spread among parts in any system that may include biological pieces and technological parts making up

a body, technologies surrounding the body (such as a computer screen and keyboard) and the body itself, or inter-species bodies. Says Hayles, “[T]he posthuman subject is an amalgam, a collection of heterogeneous components, a material-informational entity whose boundaries undergo continuous construction and reconstruction” (3).

The next chapter will address the interplay of Darwinian and posthuman concepts, and the above definitions will speak to one another more clearly.

What were ducks in the scientist's world before the revolution are rabbits afterwards.

~Thomas Kuhn

2. THEORETICAL FRAMEWORKS OF EMBODIMENT

New paradigms, as science historian Thomas Kuhn points out in *The Structure of Scientific Revolutions*, confuse and frighten even while happening incrementally. He notes that Einstein, in the middle of generating his own “extraordinary science” (Kuhn 82), wrote that “[i]t was as if the ground had been pulled out from under one, with no firm foundation to be seen anywhere, upon which one could have built” (qtd. in Kuhn 83).

Darwin's *The Origin of Species by Means of Natural Selection* and *The Descent of Man* were two such radical works. Both articulated emerging concepts and envisioned new ways of looking at the human relationship to ecology: Species are not individually created and set upon the Earth by God, but instead are mutable: they evolve over time and are modified by natural selection (Darwin, *Origin* 69). And most disturbing to other nineteenth-century naturalists was the implication that the peculiar seeds of a perfect—and present-day—man were not planted millennia ago as God's idea inside an amoeba or an ancient fish, that his book “recognized no set goal either by God or nature” (Kuhn 172). For Darwin, “Man” is not special or separate from other species, not the end result of grand evolutionary planning. “He” is—evolutionarily speaking—entangled with the flora and fauna.

Posthumanism also articulates emerging ways of looking at bodies and their relationship to environment, but reaches beyond organic beings such as plants or animals to technologies—which can include simple tools, prosthetics, biotechnologies or communications devices. As

discussed in chapter 1, the definition of “posthuman” is contested, but for this project posthuman bodies can be partially illustrated in a state of “always-becoming:” they possess no stable boundaries or essence, they are always changing by encompassing and releasing “other” bodies, and they are distinguishable from—but embedded in—systems of organic and technological ecology.

This chapter is a close reading of Charles Darwin’s *The Origin of Species* and *The Descent of Man* alongside philosophers of posthuman theory such as N. Katherine Hayles, Bruce Clarke, Donna Haraway, and Cary Wolfe. It posits that the Darwinian concepts of mutability and entanglement have everything to do with the emergence of the theoretical posthuman. Both Charles Darwin and scholars such as Donna Haraway have recognized prior scientific constructs as inadequate to understanding the world; both the concepts of mutability and entanglement questioned cultural understandings of embodiment and relationships between bodies and the environment. Both act as metaphors within Darwin’s work that have seeped into the Western cultural imaginary since the nineteenth century and now act in concert with new concepts in the cultural imagination—cybernetics and posthumanism—to create a shift in how we view embodiment.

In the end, this chapter will capture snapshots from each of two theoretical worlds—Darwin’s world of evolution, natural and sexual selection, and species’ entanglement; and the posthuman world of bio- and cybertechnological innovation—and in later chapters couple them to illustrate striking aspects of the twentieth-century pop-cultural world.

Rhizomatic reading: methods of connection

It's difficult to convey that the Darwinian theories of evolution were "in the air" in nineteenth-century Europe and continue to permeate West without drawing direct connections or assigning Darwin himself as the origin of thought and the posthumanist thinkers as some sort of utopian endpoint. Nonetheless, it is the aim of this project to prevent grounding in one theoretical framework and the illusion of progression to another, because such grounding reflects the Enlightenment, Neoclassical idea that a) all natural processes are fully knowable and replicable by human beings and b) that intellectual pursuits are marked by linear progress. I intend to resist both "a" and "b" through the spirit of Steven Brown's construct of rhizomatic reading.

A physical rhizome is a tuber much like crabgrass, with root clusters capable of off-shooting roots in every direction. As Brown points out in his discussion, Deleuze and Guattari mark the intellectual rhizome with the following characteristics:

1. Rhizomes lack foundation or grounding, connecting any point in the system to any other point. They are "[o]pposed to the binary logic of mimicry and resemblance, which always subordinates copy to model..." so that many heterogeneous elements can continuously intersect and create new life, ideas or "becoming-other" (Brown 8). Rhizomes are multiple, non-hierarchical and non-unified, and have no prescribed end-point or goal.
2. Rhizomes have no stable points or positions, only directional and dimensional movement.

3. A rhizome “overturns the notion of a stable model (or species) and outlines a map with multiple entryways,” meaning that “[i]nstead of invoking a vertical metaphoric of depth, the rhizome offers a horizontal image of thought where anything may be linked to anything else” (9).

Conceptual rhizomatic systems—constructed among theoretical works or cultural objects—act like the literal root systems: They are decentralized, multiple without being unified, and non-hierarchical.

This chapter uses Deleuze and Guattari’s rhizomes as a beacon for analysis in as simple terms as possible. Rhizomatic reading is apropos to analyze objects so disparate, yet so entangled, as Darwin’s theory of evolution and a theory of posthumanism. Rhizomes can be at once a specific ecological object, a metaphor for ecological activity and aspects of evolution such as the entangled bank, and a metaphor for a way to structure analysis around a group of texts. This project seeks to recognize—if not fulfill—all three.

To meet the challenge of containing such disparate ideas within the bounds of this project, I first deal primarily with only *two* nodes of thought: Darwin’s theory of evolution and the cybernetic theory of posthumanism. I draw connections between them, which is admittedly far from the multiplicity of “traditional” rhizomes—many “invisible” nodes are missing here. What is important is remembering the spirit of the rhizome: a resistance to labeling Darwin’s theory of evolution as a foundational “origin” and posthumanism as an “endpoint,” the recognition of “multiple entryways” into any text, and an attempt to consider these texts horizontally rather than assigning “vertical depth.”

A word about Darwin, evolution and technological development

Darwin's vision of ecology is not pre-technological; he questions whether the human intellect partially separates humans from the process of evolution through the ability to use technology. "Man," he writes, "is enabled through his mental faculties 'to keep with an unchanged body in harmony with the changing universe.' He has great power of adapting his habits to new conditions of life... He invents weapons, tools and various stratagems, by which he procures food and defends himself" (Darwin, *Descent* 95). Darwin then questions whether technologies prevent further evolution in humans by keeping the "body in harmony with the changing universe"—as Darwin's contemporary naturalist Alfred Wallace claimed in the embedded quote above—or whether technology itself is evidence that the human intellect is indeed evolving. Darwin suggests that the "intellectual and moral faculties of man" are inherited just like physical traits, and smarter humans (and animals) are more likely to survive and reproduce: "[T]he individuals who were the most sagacious, who invented and used the best weapons or traps, and who were best able to defend themselves, would rear the greatest number of offspring" (96).

Much later, in the twentieth and twenty-first centuries, some have seen rapid biotechnological advancement—or the further adaptation of humans—as a new type of evolution, because our cultural imagination is so deeply rooted in evolutionary theory (Gurak 23). Communications and rhetoric scholar Laura Gurak asserts that this kind of "technological Darwinism" is a mistaken assumption, because human choice guides how the "evolution" advances, rather than the process of natural selection (25).

Left unconsidered is the possible coevolution of humans and technologies. Cary Wolfe illustrates this concept in his discussion of the complicated and shifting definitions of the posthuman: “[I]t names the embodiment and the embeddedness of the human being in not just its biological but also its technological world, the prosthetic coevolution of the human animal with the technicity of tools and external archival mechanism (such as language and culture)...” (Wolfe xv). If one rethinks the parameters of beings and technologies to include each other as a shifting system or system(s), and the technology changes, the embedded being has also changed or “evolved.” Intellectual evolution that spurs technological development further complicates the matter. Darwin, just beginning to think about mutability and entanglement within evolution, did not necessarily see such a complex system, but rather likely imagined humans as “liberal humanist subjects” acting upon technologies or vice versa.

All that said, the aim of this chapter is not to prove that Darwinian and posthuman visions of the relationship between technology and beings somehow “match.” Rather, the theoretical concepts of posthumanism may not have been possible without the shift in cultural vision created by Charles Darwin. Darwin’s vision of how biological systems change and entangle mirrors the posthuman vision of how biological and technological systems change and entangle. Darwin’s discussion of technology is worth noting, but is not necessarily the focus of this discussion.

Mutability in being

Literary theorist Bruce Clarke explores physiological hybridity in narratives like H.G. Wells’ *The Island of Dr. Moreau*, Stanislaw Lem’s *The Cyberiad*, and Octavia Butler’s *Xenogenesis* trilogy—naming them “narratives of posthuman metamorphosis,” where bodies

and technologies converge to create new forms of life (Clarke 7). For Clarke, change in bodies is central to posthumanism in narrative, which acts as an allegory for cybernetic systems theory (11). This is an example of latterday mutability, even of coevolution.

The idea that bodies are capable of change over time is central to both Darwinism and posthuman theory. This connection arises not only from theoretical similarities, but from a mutual antithesis of a paradigm in the eighteenth and nineteenth century. Darwin notes that before the cultural and scientific paradigm shift toward evolution, most naturalists argued for a model wherein humans and all [God's] creatures were separate acts of creation—humans were perfect, unchangeable beings set upon Earth as stewards of the animal kingdom, or at least at the pinnacle of evolutionary change. Darwin himself, before his research, believed this, writing that “the view which most naturalists entertained, and which I formerly entertained—namely, that each species has been independently created—is erroneous” (Darwin, *Origin* 69).

Darwin warms his audience to the mutability of bodies through natural selection by citing variation via *artificial* selection in domesticated animals—or breeding. Plants and animals being bred, Darwin notes, are variable due to a variety of conditions. Variability can be caused by the “conditions of life” on the embryo or “male and female reproductive elements having been affected prior to the act of conception” (72). Or, use or disuse of a specific part can lead to a strengthening or loss of that part over many lifetimes. For example, Darwin points to the drooping ears of many domestic animals as evidence of variability: “Not a single domestic animal can be named which has not in some country drooping ears; and the view suggested by some authors, that the drooping is due to the disuse of the muscles of the ear, from the animals not being much alarmed by danger, seems probable” (74).

Likewise, through artificial selection, breeders can encourage certain characteristics within animals and plants by pushing for reproduction by creatures with those traits. Writes Darwin: “We cannot suppose that all the breeds were suddenly produced as perfect and as useful as we now see them; indeed, in several cases, we know that this has not been their history... Breeders habitually speak of an animal’s organisation as something quite plastic, which they can model almost as they please” (90).

For Darwin, a breeder’s ability to control the conditions of a creature’s reproduction is the intellectual gateway to evolution through natural selection. If people can cause changes in the characteristics of plants and animals produced, why couldn’t the chaotic and powerful forces of nature? Through natural selection—defined by Darwin as “the preservation of favourable variations and the rejection of injurious variations” (131)—small, useful variations are preserved from one generation to the next, while less useful variations fade out.

All species change throughout deep time. Darwin’s *The Descent of Man* is a response to naturalist critics who argued that although natural selection may be occurring in the “animal” kingdom, human beings are excluded from that process. But Darwin argues that humans are similar, especially in embryo, to other mammals. Humans carry similar diseases and parasites to other mammals, and are behaviorally and intellectually similar to other species, all which carry a capacity for imitation, attention, memory, imagination and reason (Darwin, *Descent* 23).

Darwin expresses hesitation even about writing about humans separately, writing that “When we confine our attention to any one form, we are deprived of the weighty arguments derived from the nature of the affinities which connect together whole groups of organisms” (xxv).

Darwin's point is that it is a mistake to intellectually separate human beings from a wider ecological system because of the vast similarities between them. The fact that natural selection acts on human beings implies a human capacity for a shifting embodiment, the ability to play with the borders of the human body through body modification. This shift in vision rippled into other areas of thought, including an early—possibly “posthuman”—fascination with technology, the body, and prosthetics.

Darwin's particular evolutionary theory allowed for further human mutability, or change in human bodily structures. Once this paradigm shift occurred, it became possible to imagine fundamental changes in bodies by internal and external means. A body's mutable nature, the ability to change, is essential to posthuman theory. Through the lens of posthumanism, bodies necessarily shift and evolve, though quickly instead of the slow motion of Darwinian evolution. As described in chapter 1, posthumanism implies that bodies interact with nature and technology as porous, communicative parts embedded within systems. That means the boundaries of the human body are ill-defined and shifting, and can include surrounding technologies and organisms—such as parasites and bacteria within and on the body, or technologies such as cell phones, laptops, vehicles, and prosthetics.

Entanglement in being

Friedrich Kittler also describes technological development in relation to the body. Kittler's chosen technologies—gramophone, film, and typewriter—begin as enhancers for the body but end breaking free from human control as automata. For Kittler, these communications technologies represent the metaphorical death of the human “Subject” and consciousness as human “essence escapes into apparatuses” (Kittler 16). Bruce Clarke views Kittler as a pre-

cursor to posthuman theory, as Kittler's reading and writing machines "render the natural world and all the bodies of its predigital revolution obsolete" (Clarke 5).

Like Kittler, posthumanism here implies subjectivities that still interact with nature and technology, but as porous, communicative parts embedded within those systems, rather than a subjectivity "escaping into"—and eventually being dominated by—a technology. For the posthuman there is no separation among beings, natural environments or technologies. Because environments evolve as systems, beings (including animals, plants and humans) are always interacting and entangled with other beings and technologies.

Edward Hutchins' study of the navigational systems of oceangoing ships illustrates this idea without falling into an apocalyptic cyborg fantasy or dispersing the human subject altogether. His research shows that it isn't human beings who singularly tell ships where to go; it is the "complex interactions within an environment that includes both human and nonhuman actors... the prospect of humans working in partnership with intelligent machines is not so much a usurpation of human right and responsibility as it is a further development in the construction of distributed consciousness environments, a construction that has been ongoing for thousands of years" (Hayles 288).

Darwin, of course, views the world in organic, rather than technological systems: All bodies and behaviors evolve in interdependence—or entanglement—with other bodies and behaviors. Using the entangled bank as synecdoche for ecological systems, Darwin points to interrelatedness and natural balance. The entangled bank is, of course, literally "entangled:" vines and other plants grow around and through each other, providing spaces for small animals and insects, organisms feed from and on each other. Relationships between creatures are so

close, writes Darwin, that the introduction of a single tree into an ecosystem changes that entire system:

In Staffordshire, on the estate of a relation where I had ample means of investigation, there was a large and extremely barren heath, which had never been touched by the hand of man; but several hundred acres of exactly the same nature had been enclosed twenty-five years previously and planted with Scotch fir... not only the proportional number of the heath-plants were wholly changed, but twelve species of plants flourished in the plantations, which could not be found on the heath. (Darwin, *Origin* 123)

But the entangled bank is also a metaphor for the way beings interact with each other on a large scale, as well as the way structures are formed on an evolutionary level.

Darwin's struggle for existence is closely tied to entanglement. The struggle is far from being only the metaphor of two "canine animals" actually fighting for food to live, although "the struggle almost invariably will be most severe between the individuals of the same species, for they occupy the same districts, require the same food, and are exposed to the same dangers" (126). Darwin uses "the term Struggle for Existence in a large and metaphorical sense, including dependence of one being on another" as well as the struggle to survive and populate (116). Struggle among species and individuals exists in the service of ecological balance: many individuals attempt life, and few will survive it, because a high survival rate would overrun the ecosystem with species. Says Darwin, "[a]lthough some species may now be increasing, more or less rapidly, in numbers, all cannot do so, for the world would not hold them" (116).¹

Destruction of life is part of the system: Creatures and plants are restricted by too little space,

¹ Misguided students of evolution have used Darwinian ideas to justify destructive social policies such as the Eugenics Movement, which proposed to "control human breeding so that people with the best genes would reproduce and thus improve the species." Eugenics often involved sterilizing mentally ill, disabled, alcoholic, and other people to prevent them from reproducing and causing the human race to degenerate. This in turn encouraged the Jewish Holocaust (Public Broadcasting). Not only is this horrific social policy, it is bad Darwinism: Darwin noted that although we theoretically have the power to prevent reproduction among persons with "undesirable" traits, human decency and compassion rightly prevents us from doing so (Darwin, *Descent* 102).

too little food, predatory animals, and unfavorable climate (which Darwin muses is “the most effective of all checks,” as, he says, the winter of 1854-55 killed off four-fifths of the birds on his grounds) (121). Dependence of some species upon others is also crucial. For example, Darwin points out that mistletoe depends upon the flight of birds for the dissemination of its seeds, and orchids depend upon visits from moths to remove pollen and fertilize the flowers (125).

Entanglement goes further than behavioral dependence. “The structure of every organic being,” that is, the material physical structure, evolves with the physical and behavioral structure of all other creatures: A tiger’s talons evolved to be sharp in order to catch prey, a parasitic insect’s legs evolved claws to hold on to the tiger’s fur, the fuzzy seeds of the dandelion need to catch flight to reach unoccupied land (128). Put into Darwin’s own words:

[T]he structure of every organic being is related, in the most essential yet often hidden manner, to that of all other organic beings, with which it comes into competition for food or residence, or from which it has to escape, or on which it preys. (127)

This kind of entanglement relates to the posthuman: as Darwinian theory entangles species with each other and environment, posthuman theory entangles human beings with each other, technologies, and other species.

Currently, Darwinian and posthuman mutability and entanglement play out across bodies in peculiar ways—through assistive technologies, elective body modification or reconstruction, gene mapping and manipulation, in-vitro fertilization, for example. Threads between the two concepts suggest undercurrents of scientific and philosophical discourse beneath the Western cultural landscape that has been changing how we view ourselves, other creatures, and technologies for more than 150 years: again, if we view embodiment as “fixed,”

it is easier to group characteristics and generalize bodies into categories, paving the way for exclusion.

But how have these ideas seeped into our cultural imagination? In the following chapters, I argue that speculative fiction and digital technologies are primary examples of a culture struggling with these issues.

The three creatures engaged in this mysterious rite were human in shape, and yet human beings with the strangest air about them of some familiar animal. Each of these creatures, despite its human form, its rag of clothing and the rough humanity of its bodily form, had woven into it, into its movements, into the expression of its countenance, into its whole presence, some now irresistible suggestion of a hog, a swinish taint, the unmistakable mark of the beast.

~H.G.Wells

CHAPTER 3. DARWIN AND SPECULATIVE FICTION

Since its beginnings in the nineteenth century, speculative (or science) fiction has provided means for oppressed individuals and groups to imagine radical pathways to a different life via an altered embodiment—some authors, such as Ursula K. LeGuin and Octavia Butler, have created such fiction as a clear and conscious political act. In some works of science fiction, “altered embodiment” is synonymous with the cyborg—machines imbued with human characteristics or some combination of humans and machines enmeshed. Well before Haraway’s “A Cyborg Manifesto,” the cyborg has often been envisioned as a bio-mechanism of political resistance: a way to question our natures or re-envision ourselves. Cyborgs also need not contain metal or mechanism: Science historian Jay Clayton writes that Frankenstein’s monster—a purely biological, though man-made, creature—is the first of a long history of “literary constructs that transgress the boundary between the human and nonhuman: robots, cyborgs, androids, replicants, and clones” (Clayton 123).

The previous chapter focused on the intertwining theories of Darwinian evolution and late-twentieth and early-twenty-first century posthumanism. Darwin's concepts of mutability and entanglement were cultural undercurrents in the nineteenth century which mirror emerging and still-contested visions of posthumanism as defined by Hayles, Wolfe, Clarke and others. Chapter 2 also emphasized the spirit of rhizomatic structures that connect ideas in non-linear, sometimes untimely ways, in the hopes of uprooting the idea that one framework (in this case, Darwin) was foundational and set off a progression of thought to another, "endpoint" idea (in this case, posthumanism). Cultural notions of the body post-Darwin have changed—from immutable to mutable, separated to entangled—as discourse about the body continues to change.

Of course, this shift in perspective did not happen all at once, and people had to struggle—are still struggling—with the implications of bodies evolving over time and embedding within their environments. Thomas Kuhn maintains that during periods of shifting scientific paradigms, scientists must learn to see in new ways: "[A]t times of revolution, when the normal-scientific tradition changes, the scientist's perception of his environment must be re-educated—in some familiar situations he must learn to see a new gestalt" (Kuhn 112). Darwin's shift in vision required a change in the perception of environment, and as his vision seeped into the surrounding cultural landscape, non-scientists would have been confronted—and would have struggled—with this shift in perception as well.

One of the ways this historical-cultural struggle is visible to us in the present is through speculative fiction, which can grapple with the implications of this kind of "double-vision." Chapter 3 illustrates Darwinian themes of mutability and entanglement in nineteenth-century

speculative fiction through a close literary reading of Mary Shelley's *Frankenstein*, Jules Verne's *20,000 Leagues Under the Sea*, and H.G. Wells' *The Island of Dr. Moreau*, and to some extent *The Time Machine* and *War of the Worlds*.

A word about biotechnology and outer mechanisms

The oft-presumed line between bio-technology and “external” technology deserves addressing; its relevance really depends on where one believes the body's boundaries to be. If the subject (the body) and the object (technology) are at first “naturally” separate, there is a big difference between technology external to the body and technology entangled with or embedded within the body. If the body has already expanding and contracting boundaries and is entangled with its environment, the gap between external and embedded technologies becomes much smaller.

I would argue that nineteenth-century speculative fiction about external technologies is as relevant to this discussion as text about biological forms, because both stem from Darwinian concepts and foreshadow posthuman theory. For example, *The Island of Dr. Moreau* and *Frankenstein* both struggle with evolutionary ideas—mutability and entanglement—imagining what these ideas mean for bodies through surgery, vivisection and revitalization. *The Time Machine*, *War of the Worlds* and *20,000 Leagues Under the Sea* explore, in part, technological extension of bodies.

This chapter first addresses technological extension and its implications for mutability and entanglement in *20,000 Leagues Under the Sea*, before moving to surgical modification and reconfiguration in *Frankenstein* and *The Island of Dr. Moreau*.

A word about nineteenth century fiction and posthumanism

It would be a mistake to fully project twenty-first-century posthuman concepts backwards onto works of nineteenth-century speculative fiction, as though Victorian writers were thinking about bodies in clear “posthuman” terms. Even so, in the spirit of rhizomatic reading, I propose that just as Darwin’s theory of evolution was “in the air” in the late eighteenth and early nineteenth centuries, even before Darwin had published his theories, there is evidence that threads of posthuman thought may have been “in the air” in the nineteenth century.

Jay Clayton’s assertion that technologies in the nineteenth century foreshadowed similar technologies in the twenty-first century may provide some insight into this delicate balance. He identifies echoes of the Victorian in the present, but is careful not to label nineteenth-century thinkers and inventors “pioneers” or “visionaries” of the present computer age, since twentieth-century inventors had little knowledge of their nineteenth-century counterparts or their inventions. Instead, he prefers the language of literary criticism, using “foreshadow” and “anticipate” as alternative terms that avoid the implication of continuity between the nineteenth century and the present (Clayton 130). Examples include similarities between Charles Babbage’s Analytical Engine in the nineteenth century and Alan Turing’s computing machine in the mid-twentieth, as well as the invention of the telegraph’s similarity to the invention of the Internet (Standage 212). Fictional nineteenth-century technologies—like the crude, surgical creation of beings from the bodies of the dead in *Frankenstein* or from living animals in *The Island of Dr. Moreau*—could arguably foreshadow posthuman scientific projects

like the creation of transgenic creatures or plants, elective body modification, and other surgical procedures.

This chapter approaches nineteenth-century speculative fiction with the above thoughts in mind in an effort to recognize the posthuman possibilities within Victorian frameworks *without* forcing nineteenth-century writers to “recognize” them as developed ideas; the posthuman acts as a complicating undercurrent to chapter 3.

Technological extension, evolution, and its effect on the body

The entire premise of *20,000 Leagues Under the Sea* is a “life-like” technological enhancement to the human body that initially leads to confusion among naturalists, the press, even Captain Nemo himself, creator of the machine. Verne twice references the *Nautilus* as a biological creature rather than a ship powered by electricity and (questionable) scientific theory. After an exhaustive tour of the ship, Captain Nemo exclaims “I love [the *Nautilus*] as if it were my own flesh and blood” (Verne 109) implying a paternal relationship with the machine rather than a scientific one. Because of its oblong shape and metal “scales,” the ship is widely mistaken for a gigantic sea monster by the press:

Even ordinary newspapers... printed articles about every huge, imaginary monster one could think of, from the white whale, the terrible “Moby Dick” of the far north, to the legendary Norse kraken whose tentacles could entwine a five-hundred-ton ship and drag it to the bottom. (19)

Nemo, effectively the “mind” of the deep sea-ship *Nautilus*, breaks with humanity to inhabit and explore oceanic waters. The *Nautilus* is a prosthetic, an extension of the body allowing Nemo and his crew to enter otherwise inaccessible spaces—in this case, under the depths of the ocean. The naturalists aboard are able to view creatures they never would have had access to without the *Nautilus*, which prevents them from drowning or being crushed in

the ocean. Similarly, the men walk along the bottom of the ocean with the aid of helmets that counteract water pressure and provide oxygen (235).

One could argue that Verne's scientific fantasy illustrates the body as "changeable" through technological wonders like the *Nautilus*; but perhaps more accurately, the bodies of Nemo and the crew remain *unchanged*. Technology allows the crew to explore extreme environments, bypassing the millions of years of evolution it would have taken to adapt to living under water. Verne's technological vision of men exploring the depths of the ocean reflects Darwin's consideration of technological invention—that it may be possible for bodies to remain relatively "unchanged" in a changing environment through the use of technology (Darwin, *Descent* 95).

In a sense, Verne's work also reflects forward in chronological time to Edward Hutchins' thoughts about the "distributed consciousness environment"—that "complex interactions within an environment that includes both human and nonhuman actors..." are quite normal in the operation of an oceangoing vessel (Hayles, *How We Became* 288). Of course, Captain Nemo is so intimately entangled with the *Nautilus* that it becomes pathological: he cannot sever the connection even as the ship is being pulled into the maelstrom (Verne 435).

That said, the book also questions whether Nemo's scientific and engineering brilliance—his ability to modify his body and inhabit extreme environments—has outstripped his mind's ability to remain stable within such a technology. While Captain Nemo's madness is partially caused by disgust with human civilization on land (as well as a mysterious event that makes him crave revenge), his use of and entanglement with the *Nautilus* affects him negatively—mad with rage, he and his crew eventually go down with the ship (435). In this way,

20,000 Leagues grapples with the consequences of such technologies on a human mind that has perhaps not evolved to meet the particular challenges of those technologies or environments.

Speculative fiction writer H.G. Wells also creates a pronounced tension between horror and possibility in his technological extensions of human or alien, a tension bound to Wells' grim ideas about evolution. For example, Wells' *The Time Machine* considers the implications of a mechanical time machine allowing the time traveler to move backwards and forwards in time (but not space), a feat impossible except through mechanical extension. In the year 802,701, the time traveler encounters the future of mankind: the Eloi and the Morlocks, both species that have, because of the technology, degenerated to a lower intelligence because technologies allowed them to remain "unchanged"—in the absence of struggle, the Eloi's intelligence decreased while the Morlocks became more brutal, feeding on the Eloi at night (Wells, *Time Machine* 46).

In *War of the Worlds*, Wells positions humans at the beginning (and Martians at the end) of an evolutionary continuum in which the technological mechanism actually overcomes the biological body, causing the biological body's degeneration. The narrator quotes "a certain speculative writer of quasi-scientific repute" who envisions that "the perfection of mechanical appliances must ultimately supercede limbs" such that the biological body, other than the brain or "hand" (tentacles), would become vestigial or disappear (Wells, *War of the Worlds* 102):

Yet though they wore no clothing, it was in the other artificial additions to their bodily resources that their great superiority over man lay. We men, with our bicycles and road-skates, our Lilienthal soaring-machines, our guns and sticks and so forth, are just in the beginning of the evolution that the Martians have worked out. They have become mere brains, wearing different bodies according to their needs as men wear suits of clothes and take a bicycle in a hurry or an

umbrella in the wet. (103)

Like the journalists in *20,000 Leagues*, Wells' narrator briefly confuses Martian machine with Martian body, noting that "the handling machine did not impress me as a machine, but as a crab-like creature with a glittering integument, the controlling Martian... to be simply the equivalent of the crab's cerebral portion" (99). In the end, the Martians' technological superiority does not save them, as they are wiped out by an Earthly infection to which they have no developed immunity—an interesting biological twist.

Wells' vision of alien technological evolution and biological degeneration grapples with Darwin's theory that bodies can change over deep time by juxtaposing alien bodies and technologies—beings Wells sees as "ahead" of humans on the evolutionary continuum—and human bodies and technologies. Also, in a way this is a darker version of Cary Wolfe's theories about posthumanism. In both *The War of the Worlds* and Wolfe's ideas, bodies and technologies co-evolve (or "co-degenerate") because of the human body's "embeddedness"—or entanglement—in the technological world (Wolfe xv).

The next section addresses technologies such as surgery and revivification in Mary Shelley and H.G. Wells' work, or the use of external technologies to build or modify biological beings.

Frankenstein's monster

Author Mary Shelley's frightening and pitiable monster in *Frankenstein* is the most famous literary example of the early nineteenth-century automaton-gone-rogue, as well as the most famous early literary examination of the possibilities of human (or non-human) embodiment. The text demonstrates physical mutability through a detailed examination of

death's effects on the body as well as a rough reconfiguration of a being comprised of the parts of dead beings. Bodily entanglement is demonstrated through the entanglement of Frankenstein's various parts.

Frankenstein's monster-automaton is a biological creature born of surgical and secret revivification technologies. An amalgam of "bones from charnel-houses and... the tremendous secrets of the human frame" (Shelley 33), the monster is constructed into a human-like creature, part of Frankenstein's ambition to cheat death by creating a "man" from freshly dead body parts. The monster's body occupies a liminal space, unacceptable to his contemporaries and his creator—thus his rage and thirst for revenge.

As a result of his mother's death, Frankenstein seeks to—if not reverse—at least understand the process of human life and decay, what prevents or enables decomposition: "One of the phenomena that had particularly attracted my attention was the structure of the human frame, and indeed, any animal endued with life. Whence, I often asked myself, did the principle of life proceed?...To examine the causes of life, *we must first have recourse to death* [emphasis mine]" (30).

Again, for Darwin, "mutability" generally refers to change in form and function over deep time, part of the idea that human beings and all other creatures were not set upon Earth "finished," in God's image. Change is evolutionary, between generations, rather than finite changes that occur within a lifespan or at a creature's death. But changes in the physicality of one being are companion to conversations about change between generations. Death is the ultimate short-term change in physical form, undermining the idea of a reliable, physical stasis (in God's image), because in death, bodies decompose into sustenance for other life forms.

Frankenstein's ambition, "recourse to death," throws him into the heart of the mutable being—he watches "how the worm inherited the wonders of the eye and brain" (30) or worms eating human flesh. His view of this kind of change is that it is an assault on the perfection of the body—he refers to death as waste and degradation (30) or "corruption" (32). In chapter 5, just after he brings the monster to life, Frankenstein dreams of his love interest, Elizabeth "in the bloom of health," but as he kisses her "her features appeared to change, and I thought I held the corpse of my dead mother in my arms; a shroud enveloped her form, and I saw the grave-worms crawling in the folds of flannel" (35). In his dream, Frankenstein witnesses heart-wrenching change: his beloved Elizabeth to his dead mother, her dress into a burial shroud, life into death. Physical change is the original horror for Frankenstein. Ironically, he tries to find "recourse to death" by piecing together parts of dead bodies—creating a more pronounced change that convinces him he has violated the "sacred."

The scientist Frankenstein is the ultimate "breeder" or artificial selector, even an early genetic engineer. By choosing the pieces and supposed traits of his creation, Frankenstein is participating in the trait-building of creatures. As noted in the previous chapter, Darwin wrote that "breeders habitually speak of an animal's organisation as something quite plastic, which they can model almost as they please." Of course, as with both artificial and natural selection, Dr. Frankenstein learns it is impossible to predict what will occur biologically, even though he is scientifically gifted enough to learn how to bestow "animation upon lifeless matter" (31).

Darwin, who writes in *The Origin of Species* that "[t]here are many laws regarding variation, some few of which can be dimly seen" (Darwin, *Origin* 74) recognized that even among the most talented breeders it is impossible to predict variation among creatures—

evolution, even artificial selection, is too complicated to be completely within the breeder's control:

Variability is governed by many unknown laws, more especially by that of correlation of growth. Something may be attributed to the direct action of the conditions of life. Something must be attributed to use and disuse. The final result is thus rendered infinitely complex. (100)

Finally, the creature's pieces imply an ability of pieces of our bodies to be incorporated (though crudely) into another conscious being. Although Shelley does not address it directly, there's a conceptual framework here making "hive consciousness"—or a collective consciousness made up of disparate beings—possible in the future, as will be discussed in chapter 4.

Frankenstein explores embodiment while questioning the outcomes of scientific progress. The premise of the novel—that science could possibly create life and therefore outsmart death—represents an early examination of the body and its relationship to the life cycle, science, and other bodies.

The beasts of Dr. Moreau

In H.G. Wells' *The Island of Dr. Moreau*, the best demonstration of mutability is Moreau's discussion with Edward Prendick about the techniques and implications of his surgical experiments in the chapter "Dr. Moreau Explains." Moreau begins by outlining small triumphs of surgery—"amputation, tongue-cutting, excisions"—then explains what more can be accomplished through vivisection:

"There is building up as well as breaking down and changing. You have heard, perhaps, of a common surgical operation resorted to in cases where the nose has been destroyed. A flap of skin is cut from the forehead, turned down on the nose, and heals in the new position. This is a kind of grafting a new position of

part of an animal upon itself. Grafting of freshly obtained material from another animal is also possible...

“These creatures you have seen are animals carved and wrought into new shapes. To that—to the study of plasticity of living forms—my life has been devoted...” (Wells, *Moreau* 65).

Moreau’s discussion of plasticity is a reflection on Darwin’s discussion of artificial selection, in which breeders change animal characteristics over generations by controlling the conditions of a creature’s reproduction. Both are attempts to speed up the process of evolution, but Moreau tries to bypass evolution altogether in an attempt to remove all “animal” characteristics from each creature, which he assumes will result in a creature like a human being: “Each time I dip a living creature into the bath of burning pain, I say, This time I will burn out all the animal, this time I will make a rational creature of my own. After all, what is ten years? Man has been a hundred thousand in the making” (72).

Like many Victorians, Moreau appears to believe that “Man,” is at the end of an evolutionary continuum, the pinnacle of “progress,” because of his intellectual faculties and—so Moreau believes at the beginning of the novel—the ability to reason away residual animal instincts. For the scientist, intellect and reason separate Man from beast, and Moreau’s experiments are designed to force animals to make the leap to “reasoned” human beings. He attempts to train the altered creatures to retain “human” qualities via a kind of religion, “the Law” (52). When Prendick first encounters the results of Moreau’s experiments in the dim hut, the creatures attempt to teach him the rules for being human:

Not to go on all Fours; *that* is the Law. Are we not Men?
Not to suck up Drink; *that* is the Law. Are we not Men?
Not to eat Flesh or Fish; *that* is the Law. Are we not Men?
Not to claw Bark of Trees; *that* is the Law. Are we not Men?

Not to chase other Men; *that* is the Law. Are we not Men? (53)

Unfortunately for Dr. Moreau and his assistant Montgomery, the creatures ultimately “regress”—as Moreau views it—back into a partial animal state. This is the cause of their deaths in the end (96, 108).

According to Darwin, entanglement is the concept that bodies and behaviors develop in interdependence, and he worked hard to theorize human beings back into his idea of ecology in response to naturalists who insisted humans were separated. In the introduction to *The Descent of Man*, Darwin makes it clear that in spite of his subject—humanity—he wants to be careful not to separate out “Man” as a distinct or superior species, noting that “[w]hen we confine our attention to any one form, we are deprived of the weighty arguments derived from the nature of the affinities which connect together whole groups of organisms...” (Darwin, *Descent xxxvi*).

In an effort to describe a whole ecology rather than just the evolution of humanity, Darwin argues that the traits we normally think of as “human” are present in many species. Dogs, cats, horses, and some birds have vivid dreams, which Darwin sees as evidence of imagination (25). Dogs and primates are capable of reason and logic (26). Animals have love and compassion for each other. For example, Darwin cites the experience of a Captain Stansbury in Utah: Capt. Stansbury found on a salt lake in Utah an old and completely blind pelican, which was very fat, and must have been long and well fed by his companions” (44). The implication is that human beings are not superior or separate, but similar to and embedded in the ecological system.

Like Darwin, in *Dr. Moreau* H.G. Wells draws human beings back into the entangled bank via a variety of methods. First, he creates confusion about who is human and who is animal by swapping linguistic identifiers in characters' speech. Second, he cites behavioral differences between animal and human at the beginning of the novel, then gradually narrows the gap between them until characteristics are partially swapped. Third, the "humanity" of both man and restructured animal seems to depend upon environment—that is, both human and hybrid creature "regress" to animal states after being consistently surrounded by "animal" characteristics.

Wells' novel therefore contains a reversal—it is both the injection of "human" qualities into "animal" creatures—which Dr. Moreau believes rescue his creatures from their animal nature—and the degeneration of these qualities in humanity that render him, Montgomery, and Prendick "animalistic."

Wells creates linguistic and behavioral confusion throughout *Moreau* about who is animal and who is human. In chapter 3, "The Strange Face," Edward Prendick meets Montgomery's personal attendant on a ship, a "misshapen man, short, broad and clumsy, with a crooked back... He turned with animal swiftness" (Wells, *Moreau* 7). Later, while talking to Montgomery, he sees the attendant again:

It may seem a little thing to you, perhaps, but it came like a sudden blow to me. The only light near us was a lantern at the wheel. The creature's face was turned for one brief instant out of the dimness of the stern towards this illumination, and I saw that the eyes that glanced at me shone with a pale green light. I did not know then that a reddish luminosity, at least, is not uncommon in human eyes. The thing came to me as stark inhumanity. (14)

In this passage, Prendick—although he'd previously assumed the creature was a man—calls him "it" and "the creature," unsure of whether the attendant is human or animal. Later,

frightened by the green glow in the attendant's eyes, Prendick expresses confusion again, admitting that while at the time he was struck with the sense that the creature was inhuman, it is "not uncommon in human eyes" to have a glow. Chapter 8, "The Crying of the Puma" and chapter 10, "The Crying of the Man" also illustrate this confusion, as Prendick tries to put the animal into a category—man or animal—unaware at the time that the creature is a sort of "in-between," an animal-becoming-man. In "At the Schooner's Rail," Prendick tries to thank Montgomery for saving his life, who brushes him off, saying "Thank no one... I injected and fed you much as I might have collected a specimen" (13), implying that Prendick's own humanity was questionable or unimportant to Montgomery.

Acceptable human behaviors are delineated at the beginning of *Dr. Moreau*, only to be broken down toward the end of the novel among both animal creations *and* humans. The clearest way to illustrate this is the chant the creatures recite to remember the Law of Men, quoted above. "Men" do not "eat Flesh or Fish," walk on all fours, "suck up" drink, claw bark, or chase other men (53). Montgomery makes it clear to Prendick that this is partially for the protection of the humans at the camp—forbidding the experimental creatures from eating flesh or chasing other men may prevent them from hunting, killing, and eating the scientists: "'You see,' he said, almost in a whisper, 'they are all supposed to have a fixed idea against eating anything that runs on land. If some brute has by accident tasted blood...'" (82). However, the Law becomes a marker against which to measure the scientists' behavior as well as the creatures'.

Although Moreau and Montgomery forbid the creatures from hunting and killing others, expecting them, essentially, to be vegetarians, they show no compunction about hunting and

killing either animals or hybrid creatures—or causing them great pain. In his discussion with Prendick, Moreau brushes off questions about the pain animals experience in transitioning to hybrids, preferring to believe that the pursuit of high science is worth their torture. He scolds Prendick that:

So long as visible or audible pain turns you sick, so long as your own pain drives you, so long as pain underlies your propositions about sin, so long, I tell you, you are an animal, thinking a little less obscurely what an animal feels. (67)

Through Prendick, Wells appears to question whether intellect, when it causes such a cruelty as vivisection, can be a positive “human” characteristic, as well as the wisdom of assigning pure reason as the pinnacle of human traits.

Late in the novel, Wells again raises the question of the “humanity” of the scientists through Montgomery’s constant drinking. Montgomery, drunk, attempts to give Prendick a bottle of brandy, then gives it to one of the creatures when Prendick refuses. When Prendick tries to prevent him, Montgomery bellows at him: “‘Beast!’ said he. ‘You’re the beast. He takes his liquor like a Christian. Come out of the way, Prendick.’” To which Prendick responds: “You’ve made a beast of yourself. To the beasts you may go” (101).

These two examples of human behavior in the novel illustrate how “human” characteristics and “animal” traits are not so easily teased apart. It’s clear that not only do the *animals* in Dr. Moreau revert to what the scientists consider “animalistic” traits, but so do the *humans*.

In *Dr. Moreau*, Wells struggles with what it means to be a human—essentially an animal with the power to reason, experiment, and create—as opposed to an animal, and comes to the conclusion that the line between is at least blurry, if the two categories aren’t indistinguishable.

Through his hybrid creations, Wells is able to illustrate Darwinian mutability and entanglement: bodies are mutable for Moreau in the short term through surgery, vivisection, and a certain amount of training, but they revert to their animal characteristics because they are entangled with their ecology. Humans, also entangled with their ecology, revert to their animal natures under pressure as well.

All of these fictions grapple with Darwinian concepts on different levels and scales, and in a way foreshadow discussions of posthuman possibility within literature and culture. In the next chapter, I will discuss a twentieth-century iteration of these ideas, Shelley Jackson's hypertext novel *Patchwork Girl*.

We exist in a sea of powerful stories: they are a condition of finite rationality and personal and collective life histories. There is no way out of stories; but no matter what the One-Eyed Father says, there are many possible structures, not to mention contents, of narration. Changing the stories, in both material and semiotic senses, is a modest intervention worth making.

~Donna Haraway

CHAPTER 4. PATCH WORK AND DIGITAL MEDIA

Many works of printed literature, especially in the multiple genres of speculative and science fiction, might have been appropriate for analysis in light of Darwinian and posthuman themes. Weird fiction author China Miéville's *Perdido Street Station* and *The Scar* both deal directly with human-flora, -fauna and -machine hybridity in their rich portrayal of cactus-men, insect-human hybrids, and the terrifying Remade—creatures forcibly modified by a police state.

That said, purely *digital* literary creations—works of electronic literature—fantasize about our relationship to bodies, technologies and the environment in starker relief than print. While (possibly) reading about a shifting physical boundary in characters, our own physicality is shifting through our interaction with technological devices. Digital literature tends to maximize this interaction through novel interface. For example, generative art uses an algorithm to “generate texts according to a randomized scheme or to scramble and rearrange preexisting texts” (Hayles, *Electronic* 18) “Code work” creates an experimental interplay of human language and machine-readable code (21).

Although it is a little more than fifteen years old, *Patchwork Girl* was chosen as the primary cultural object for this chapter because of its alignment between form and content, its homage to nineteenth century literature while attempting a new format, and its heavy emphasis on embodiment. As a work composed of text arranged and connected by hyperlinks, *Patchwork Girl* is simple relative to more current hypertext works, many of which are located at the Electronic Literature Organization Web site. However, the complexity of the work itself is less important than how well it demonstrates the themes of embodiment isolated in this project.

Whereas chapter 3 is a demonstration of Darwinian themes in nineteenth-century literature, chapter 4 demonstrates both Darwinian and posthuman themes in the form *and content* of *Patchwork Girl*, a hypertext homage to Mary Shelley's *Frankenstein*. The text of *Patchwork Girl* is grounded in the Darwinian concepts of embodied mutability and entanglement, both in content (it is about a body, patched together from other bodies) and form (hypertext, for Jackson, a "body" patched together from her original writing and the texts of Mary Shelley, Jacques Derrida, and Donna Haraway among others).

The first section of this chapter demonstrates the Darwinian/posthuman concepts of mutability and entanglement within *Patchwork Girl*, as a literary text. The second section will analyze the work's digital format of the hypertext and how it entwines with its content/concept. This analysis of the media format will demonstrate how electronic literature and other digital texts, when viewed through the lens of posthuman and Darwinian systems, can change our conception of human embodiment.

Content

Published in 1995 by Eastgate Systems and written in Storyspace, a writing program popular in the 1990s, *Patchwork Girl* reimagines the story of *Frankenstein* from the perspective of the female monster—destroyed by Dr. Frankenstein in the original novel out of fear that she and the male monster would reproduce—and author (and here scientist) Mary Shelley, who gives the creature life and becomes her lover. Passages of *Patchwork Girl* can be read in any order but are also arranged in clusters at several levels of depth to imply a sort of loose chronology: near the “beginning” of events, the creature is created, and near the end she dissolves. The novel also employs (and cites in various Notes sections, though not in the text itself) passages directly from Mary Shelley’s *Frankenstein* and L. Frank Baum’s *The Patchwork Girl of Oz*, as well as post-modern theorists and philosophers such as Donna Haraway and Jacques Derrida. In this way, Jackson creates a pastiche of her original work, postmodern/posthuman theory, and nineteenth through early-twentieth-century literature.

Patchwork Girl is full of crude biotechnology and the sewing together of pieces. Mary (the author, character in Jackson’s work) sews together the female creature from component parts she rescues in a basket that Dr. Frankenstein tried to abandon at sea, plus other pieces appropriated from animals, such as a cow. In “dispersed,” the monster’s introduction, the creature lists generally her parts: “I have a good head on my shoulders. I have muscle, fat, and a skeleton that keeps me from collapsing into suet. But my real skeleton is made of scars: a web that traverses me in three-dimensions. What holds me together is what marks my dispersal” (Jackson, “dispersed”). In this passage, the monster identifies her embodiment through what

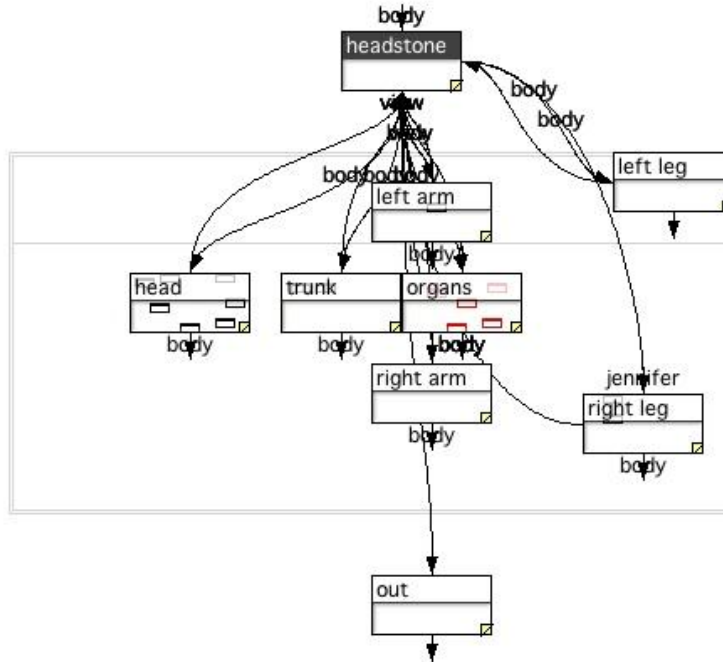
most of us think of when we think of bodies—muscles, fat, bones. But she also identifies herself as a being in-between, held together by scars, connections between tissues.

The concept of mutability—in both the Darwinian and posthuman sense—entwines closely with the concept of entanglement via a discussion of the monster’s changing boundaries. In the section “Journal,” Jackson’s Mary examines the changing boundaries of the body—human or monster—and suggests that the “whole” figure is not a foregone conclusion. In “cuts,” she writes “that a head attaches to a neck and not a wrist seems less obvious when the pieces lie in a jumble on the laboratory floor, and there is no skeleton in the corner to sneak a look at. Even joined I feel the fragments swimming farther apart. The links hold, stretching with me, and I can still reel them in, but when I let them go again they begin immediately to drift” (“cuts”). In fact, Jackson’s Mary insists that internal cleavages and external boundaries of bodies are, as in the monster’s case, *necessarily* shifting and porous. In “join,” Mary Shelley and the creature demonstrate this by literally exchanging patches of skin, sewing pieces of each other to themselves, blurring the boundaries between beings. Later, in “dotted line,” Jackson writes that “The dotted line is the best line: It indicates a difference without cleaving apart for good what it distinguishes. It is a permeable membrane: some substance necessary to both can pass from one side to the other” (“dotted line”). In “hazy whole,” the creature warns readers to:

Keep in mind, though, that on the microscopic level, you are all clouds. There is no shrink-wrap preserving you from contamination: your skin is a permeable membrane... Come closer, come even closer: if you touch me, your flesh is mixed with mine, and if you pull away, you may take some of me with you, and leave a token behind. (“hazy whole”)

The multiplicity of creatures in one body, as well as the porous relationship between bodies is analogous to Darwin’s concept of entanglement—each part is individual but also, as they are sewn together, dependent upon the other pieces for the creature’s survival. The monster is a mirror of the “entangled bank,” wherein all pieces are interdependent.

Deeper into the narrative, under the tab “Graveyard,” Jackson lists the monster’s body parts, where each part leads to a description of the human or animal who owned it before (mostly women). Each part contributes to the “whole” its particular personality and past:



For example, the monster’s right leg belonged to Jennifer, “who buried herself in layers of petticoats, flounces, and furbelows.” Her left leg belonged to Jane, a nanny who “harbored under her durable grey dresses and sensible undergarments a remembrance of a less sensible time: a tattoo of a ship and a legend, Come Back to Me.” That particular leg is “always twitching, jumping, jogging. It wants to go places.” Her trunk belonged to a dancer who danced

with abandonment and concentrated hard on social advancement. As a result, “My body is both insinuating and naïve: moments of knowingness of art manipulative and interested punctuated my abandonment, and knowingness opens into chaos” (“trunk”). The creature’s head is made of many pieces of skull patched together, “like an ancient vase scratched from the dust with toothpicks and paintbrushes and reassembled on a desk...” Acknowledging that her body (and head) is made piecemeal, the creature writes that “Sometimes when it’s quiet I hear in my ears the roaring of a crowd” (“head”).

Because the creature is a patchwork of the body parts of others, the eighteenth-century “liberal humanist self” identified by N. Katherine Hayles disintegrates into pieces—literally—under Shelley Jackson’s watch (the creature falls apart in the final depths of the story). Instead of an essential “whole,” the creature is made up of pieces that function in relation to one another. Like the cybernetic posthuman, the creature is a distributed consciousness, “we” rather than “I,” a mass of subjectivities communicating with other subjectivities inside the creature and out. As Hayles notes in *My Mother Was a Computer*, for Jackson’s monster, it is “mere common sense to say that multiple subjectivities inhabit the same body, for the different creatures from whose parts she is made retain their distinctive personalities, making her an assemblage rather than a unified self” (Hayles, *My Mother* 148).

The monster in *Patchwork Girl* isn’t empty metaphor. The creature’s “collective” body is representative of *all* bodies for Jackson, even the seemingly non-patchwork kind. In her companion essay to *Patchwork Girl*, “Stitch Bitch: the patchwork girl,” Jackson cements this idea of collective bodies made up of particulate entities:

The body is a patchwork, though the stitches might not show. It’s run by committee, a loose aggregate of entities we can’t really call human, but which

have what look like lives of a sort... Watch white blood cells surround an invader. Watch a cell divide. (Jackson, "Stitch Bitch")

For Jackson, individual parts of a body have a life of their own even without a traditional consciousness or liberal "self." Through the content of texts like *Patchwork Girl*, it is easier to imagine self as multiplicity rather than unity. As Hayles writes, "*Patchwork Girl* not only normalizes the subject-as-assemblage but also presents the subject-as-unity as a grotesque impossibility" (Hayles, *My Mother* 150).

Form

For at least fifteen years, communication scholars have also questioned how computer-mediated communication and cyberspace changes or challenges our perception of embodiment. Sherry Turkle's *Life on the Screen* famously explores the world of computer-mediated communication through Multi-User Domains or Dungeons (MUDs), 90s-era chat- and game-spaces where participants could choose and change the characteristics of their online "embodiment"—spaces where the "self is multiple and constructed by language" (Turkle 17). Turkle's analysis of computer-mediated communication centers on identity play in online worlds using different embodied characteristics—a woman "becoming" a male, for example (211). What she calls the "culture of simulation" provides spaces for play with identity and the user's imagined embodiment. Echoes of posthuman thought, which Turkle often identifies as the "postmodern," permeate Turkle's early work:

These ideas are difficult to define simply, but they are characterized by such terms as "decentered," "fluid," "non-linear," and "opaque." They contrast with modernism, the classical world-view that has dominated Western thinking since the Enlightenment. (17)

Turkle's work begins to unravel modernist, Enlightenment thinking via computer-mediated communication, and contains shades of the "grotesque impossibility" of a unified subject in Shelley Jackson's work. The format of digital literature continues this work by forcing us to question presuppositions about embodiment and linear narrative.

Under "written," Jackson's Mary likens writing to sewing to stitching together a body: "I had made her, writing deep into the night by candlelight, until the tiny black letters blurred into stitches." The metaphor is intentional, as Jackson writes in "typographical," "The comparison between a literary composition and the fitting together of the human body from various members stemmed from ancient rhetoric." The "stitching" is much more like a quilt—a patchwork, of course—than a linear narrative. In hypertext, the reader must jump from link to link, square to square, without necessarily conceptualizing a "next."

Electronic literature, per the Electronic Literature Organization, is defined as "works with important literary aspects that take advantage of the capabilities and contexts provided by the stand-alone or networked computer" (Electronic Literature Organization). Electronic literature does not generally include works that were originally published as print then converted to electronic format, such as texts converted for electronic readers like the Kindle or Nook. Jackson's work, in particular, was created specifically as a digital literary work and is delivered on CD as an application. It is designed as a series of links, shaped as boxes (Figures 1 and 2), that when clicked upon, open either another series of links or small windows filled with text (Figure 3), traditionally called "lexia" (Hayles, *Electronic* 6).

Figure 1. Home Page

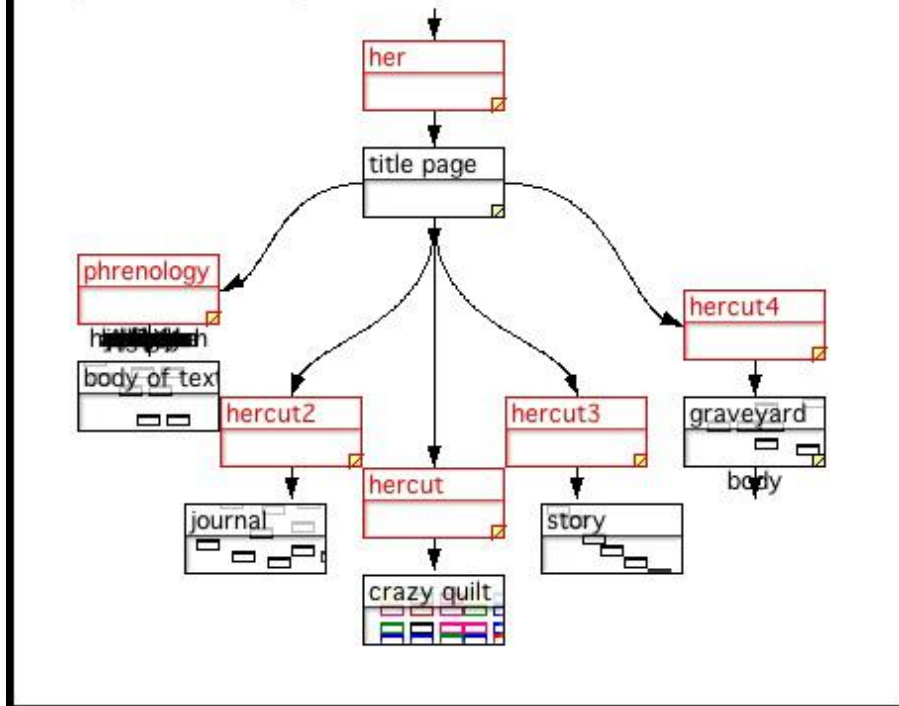
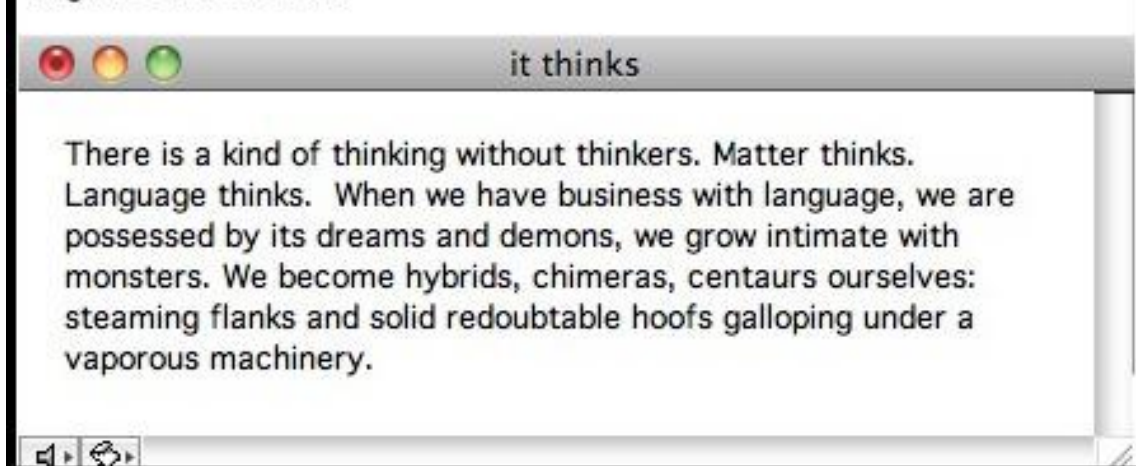
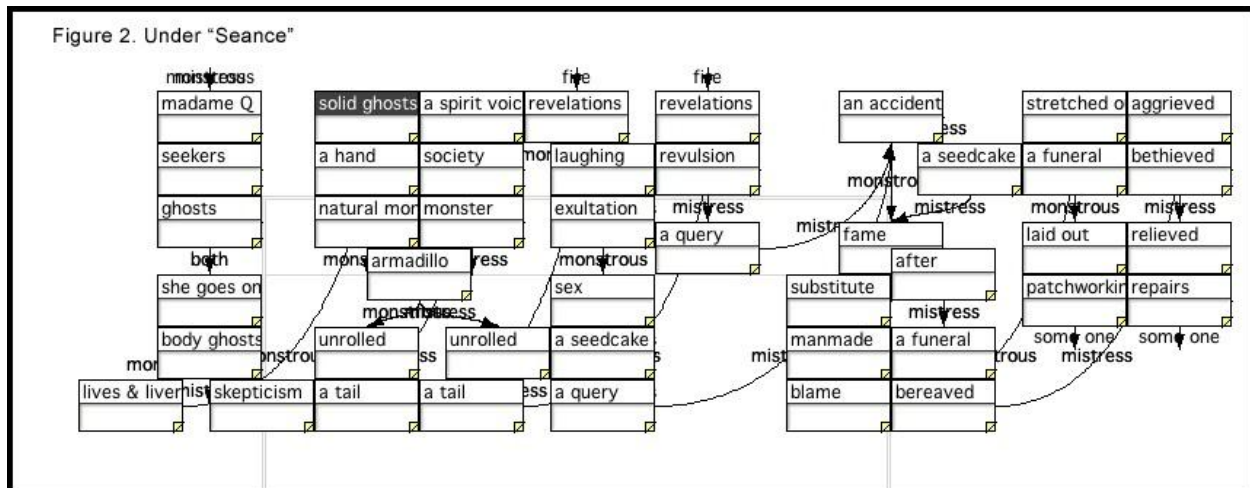


Figure 3. Text Box





In Jackson's hypertext, the linear tale is partially abandoned in favor of clusters of story, forming around each other like organic compounds. For the reader, the text shifts and forms/reforms with fewer constraints than the linear, paper novel with an ascending/descending story arc. Meaning grows from relational patterns among pieces of content, presenting a multiplicity rather than a unified story. Pieces are necessarily multiple, mutable, and entangled. For Jackson, the content and form are entangled as are the pieces themselves. Links within Jackson's text aren't entirely random, but lead to one another in patterns, with a beginning group of links followed by deeper and deeper groups of texts.

In posthuman theory, narrative begins to break down as "narrators" become shifting subjectivities rather than "whole" persons. Without a "whole" narrator, narrative in the traditional sense—with a linear story or an arc—becomes difficult. For example, Hayles cites the popular cultural trope of the hacker to illustrate a new structure to storytelling: "The narrator is not a storyteller and not a professional authority, although these functions linger in the narrative as anachronistic allusions and wrenched referentiality. Rather the narrator is a keyboarder, a hacker, a manipulator of codes" (Hayles, *How We Became* 46). In *Electronic*

Literature, a primer on computer-mediated texts, Hayles posits that electronic literature tends to be layered rather than linear, with a fractured temporality (Hayles, *Electronic* 163).

From *Patchwork Girl's* content, it's clear that Mary Shelley's female creature is less an "I" than a "we," a mass of entangled subjectivities. Add to that the voices of the original Dr. Frankenstein (in "a promise"), the character Mary Shelley in her "journal" entries, and Jacques Derrida (in "interrupting D"), and it's clear that Jackson's narrative form has multiple paths and entryways through its voices alone. Shelley Jackson, structuring her work as she does through storyspace as a series of branched pieces of text, "narrates" via these multiple voices, "hacking" them in some cases, such as "interrupting D," where she uses the text of Jacques Derrida to hold a conversation with him.

In Shelley Jackson's *Patchwork Girl*, form deliberately follows function: as she reads about Jackson's patchwork creature, a user's consciousness may change slightly to accommodate a different kind of story in a different format.

Human technologies have produced a hypercomplex environment for which humanist distinctions between the natural, the human, and the technological are increasingly non-functional.

~Bruce Clarke

THE FUTURE OF EMBODIMENT

The politics of inclusion leave us—whether on the “inside” or “out”—on shaky ground, no matter the intentions behind it. This project suggests that when we see ourselves as “humanist,” we too often claim autonomy and reason, presuming ourselves to be the benevolent purveyors of “rights.” But the number of individuals with rights is not an ever-expanding universe of reasonable beings; there is constant contention over which embodiments are considered rational and autonomous—which individuals deserve the honor of being “human,” or control over their bodies, or sometimes life itself.

If we perceive the body to be mutable, it cannot be saddled with “essential” characteristics. If we perceive the body to be entangled with other beings (and even technologies) we might be more aware of how we affect the delicate balance of our surroundings. A digital media format, often in concert with speculative fiction, can create an environment of such possibility for multiple subjectivities.

The leap from Darwin to the posthuman, speculative fiction to digital literature is wide until one takes into account the thrumming—or sometimes thready—undercurrents of embodiment among them. This project has attempted to spin together these sometimes disparate ideas—Darwinism, posthumanism, speculative fiction, and digital media—to

articulate a history of and new possibilities for embodiment. By tracing the changing perception of human bodies, other beings, and the environment, I hope to help disintegrate and re-purpose Immanuel Kant's "community of reasonable beings" into a wider civic community that includes what Donna Haraway might call an "odd world of promising monsters, vampires, surrogates, living tools, and aliens" (Haraway, *Modest_Witness@* 52) realized through fantasy and technology. Both of these, I believe, change perceptions of who we "are" and who we are always becoming.

I would never suggest that posthuman thought is somehow a utopian vision, that speculative fiction and digital media are its unlikely vehicles. I would definitely not suggest avenues for posthuman "activism," because the creative possibilities are endless and I would not know what that would look like. I only suggest that the undercurrents of the posthuman—made visible through works of science, speculative fiction, and digital media—may be eroding the monolith of the liberal humanist subject from beneath. Just as evolutionary ideas were "in the air" in the nineteenth century until today, the possibility for the post-modern, posthuman multiple subjectivities—for inclusion—is "in the air" today, whether most of us recognize it or not.

Limitations and Further Research

Because the primary impetus for my work has been Charles Darwin and a foundation of posthuman thinkers, I have focused almost exclusively on Western texts and theorists. Also throughout this project, I have been acutely aware of my position as a particularly privileged, educated, white American, and although I have tried to avoid it, my position alone increases the potential for ethnocentric bias. Greater understanding of the subject of shifting human

perspectives would certainly be gained by including non-Western sources such as Buddhist teachings, for example: Like posthumanism, certain facets of Buddhism also understand the world as a confluence of systems. In Japanese, “esho funi” means that “self” and environment are non-dual; “funi” means “two but not two”—self and environment are “two integral phases of a single reality” (Soka Gakkai) which sounds awfully familiar after spending so much time with Darwin and the posthumanists. I am certain that other non-Western religious and philosophical traditions would have something to say about this as well.

Also, as mentioned in chapter 1, scholarship would also benefit from delving further into the realm of “identity”—province of communications theorists Sherry Turkle, Stuart Hall, and feminist scholar Judith Butler—which might easily be confused or conflated with “embodiment.” Teasing the two concepts apart and researching their respective relationships to posthuman and communications theory would be interesting and informative, as the two disciplines seem to know little about each other.

Final thoughts

In “A Cyborg Manifesto,” Donna Haraway maintains we are already cyborgs, not only because of our integration with machines—such as pacemakers, cell phones, lap tops, or artificial joints—but because “[t]he dichotomies between mind and body, animal and human, organism and machine, public and private, nature and culture, men and women, primitive and civilized are all in question ideologically” (Haraway, *Simians* 163). Haraway was writing in 1983, after the birth of cybernetics and the burgeoning of a posthuman philosophy—partially (and simplistically) the idea that we might get beyond our Enlightenment “selves” and connect to

each other, other beings, and machines in previously unimagined ways. This is even more relevant in the twenty-first century.

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