Unfamilial Bonds: Technological Fiction and the Reimagination of Gender

by

Mary D. Been

A dissertation submitted to the Graduate Faculty in English in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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ABSTRACT

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When Donna Haraway's essay, "Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s," was published in 1985, it was heralded in feminist circles as a re-envisioning of female identity, a radical reconfiguration of woman that was based in science and technology rather than in nature. But Haraway's essay can also be read as an apex piece that gathers together much earlier strands of technologically-influenced versions of woman. By looking at specific nineteenth and early-to-mid-twentieth century instances of women's fiction in which technologically- and scientifically-modified characters demonstrate characteristics of Haraway's much later cyborg, we can see that a lineage of cyborg characters has populated women's fiction for more than two centuries and contributed specific elements of cyborg identity to Haraway's late-twentieth-century formulation. Writers of literature of the fantastic such as Mary Shelley, Charlotte Perkins Gilman, C.L. Moore, and Judith Merril, regularly align the tolerance for ambiguity in the real/not-real fantastic with the tolerance for ambiguity in the human/not-human technobody. Each of these writers draws on contemporary conversations about new sciences and technologies in order to turn the "natural" female body into a fictional technologized body that circumvents the charge that female destiny is linked to biological destiny. Here we can track the lineage of the cyborg metaphor: from its initial, tentative experiments with non-binaristic and non-dualistic identities to its celebration of radical and no-longer-taboo female fusions with new technologies.

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For Winnie

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CHAPTER ONE
Literary Intersections of Biological, Technological, and Cultural Identities

Cultural images of women in relationships with technology are often images that inscribe women into sexualized, domestic, or maternal spaces. Despite the images' apparent messages of liberation from aging bodies/faces, household drudgery, or the chaotic demands of juggling childrearing with a career, the result of these technological promises often seems simply to locate women into ever more firmly gendered spaces.

Fig. 1.1: Why are these women in love with this machine?

A 1930 ad for Hoover vacuum cleaners. From Roland Marchand's Advertising the American Dream: Making Way for Modernity, 1920-1940. Berkeley: University of California Press, 1985: 273.

In order to set up the context for the argument of my dissertation, I offer a prelude: a brief visual survey of cultural representations of women's relationships with technology.[1] In this admittedly selective survey, I show, first, images that construct women primarily as consumers of a technology constructed by (usually) male others. Then I offer a few images that demonstrate a different kind of relationship between women and technology, a relationship in which the women either produce or rewrite the

[1] Thanks to Dr. Anne Wysocki for this suggestion of a visual frame.

intentions of the technology for their own ends. This, I believe, will help the reader to grasp visually the intentions of the general argument of my dissertation: that while literature may be primarily encoded by images of women in resistance to, destroyed by, or enslaved by technology, there has been a small but persistent strain of women writers of the fantastic who have suggested that women's relationship to technology could be imagined as giving women greater power, greater freedom, and a greater number of options for constructing the identity of woman.

Fig. 1.2: Male-taught refrigeration

This ad for the General Electric refrigerator appeared in the September 24, 1927 Saturday Evening Post.
From Roland Marchand's
Advertising the American Dream:
Making Way for Modernity, 1920-1940.
Berkeley: University of California
Press, 1985: 270.

Three years later, a mirror image of the ad to the left appeared again in the Saturday Evening Post (November 22, 1930), only now the male teacher and female consumers are much younger.
From Roland Marchand's
Advertising the American Dream:
Making Way for Modernity, 1920-1940.
Berkeley: University of California Press, 1985: 271.

In both of the General Electric ads above, the male authority figure is positioned in a space above that of the female figures. In the second ad in particular, this positioning

results in the female faces being tilted upward, in postures of rapt adoration (Marchand 271).

Images from advertising, literature, and film often portray women in relationships with technology that—far from giving them greater control over their lives—work to minimize their control and minimize their options. Often, technology—whether real or parodied—is seen as a controlling force wielded by a male authority for male satisfaction, as in the ads here for General Electric refrigerators, Old Dutch cleanser, and Evans fur coats.

Figure 1.3: Male-guided efficiency

From Roland Marchand's Advertising the American Dream: Making Way for Modernity, 1920-1940. Berkeley: University of California Press, 1985: 170.

The woman in the above 1931 ad for Old Dutch Cleanser may be the user of the cleaning technology for which, as the copy says, science has shown the way, but the scientific

authority, the shower of the way, and the overseer of her work, remains gendered firmly male.

Figure 1.4: The Christmas doll

From Charles Goodrum and Helen Dalrymple's Advertising in America: The First 200 Years. New York: Harry N. Abrams, Inc., 1990: 257.

In the above 1962 ad for Evans fur coats, the headline reads, "How to wind up a doll for Christmas." The copy continues, "Christmas is the time when boys get toys, and girls get mink." Girls get mink, but, by accepting the mink (and, by implication, the giver of the mink), the girls become the toys of the givers. The ad's suggestion is that by giving a mink, a new toy is to be had by the boy.

Advertisements may be the most pervasive of the cultural technologies that place women into often discomfiting relationships with technology, but images from movies probably occupy a firmer narrative position in the cultural imagination. One of the most

famous of all cyborg film figures is that of Arnold Schwarzenegger as "The Terminator." But the main female figure of the two "Terminator" films has also received a great deal of attention from feminist film critics and others as a problematic female cyborg figure, especially in the role she plays in the sequel.

In the two "Terminator" films, the character of Sarah Connor, as played by Linda Hamilton, occupies polar positions. In the first "Terminator" film, she is a madonna figure, the woman whose heroism consists primarily of surviving in order to bear the son who will save the world from the human-destroying machines of the future. But by "Terminator 2: Judgement Day," she becomes a machine-like being herself, a woman of steel physique and little emotion who hunts down the people responsible for inventing the machines that will someday take over the world.

Figure 1.5: Female exterminator

Linda Hamilton as Sarah Connor, masculinized warrior, in "Terminator 2." From Projecting the Shadow: The Cyborg Hero in American Film. Janice Hocker Rushing and Thomas S. Frentz. Chicago and London: The University of Chicago Press, 1995: 189.

In the first film, Hamilton is the supreme mother, the mother of the saviour. In the second film, she is a woman whose emotions, compassion, and body have been eroded by her incessant struggle with the male-gendered machinery that she sees as a threat. In

neither case is she a woman who can co-exist with technology in a creative relationship that might allow her to rewrite gendered absolutes; in both cases the technology requires that she be either very woman or very man.

In the film "Demon Seed," a female child psychologist, Susan Harris, is impregnated against her will through the genetic recombinant manipulations of a supercomputer designed by her husband Alex.[2] The computer is Proteus IV; the mythological association of the computer's name reflects its ability to create new beings in whatever shape it chooses. When the child of the computer father and human mother is born, it is a duplicate of the Harris's only child—a daughter who died of leukemia. Susan is horrified at this forced technological takeover of her body, but Alex accepts the new child joyfully, rejoicing in the clone of his former daughter—a new daughter who has been engineered and brought into being through his technological knowledge and in partnership with the technology he has authored. His wife's body has functioned primarily as a mine for raw materials and as an incubator, all while she has existed in a state of horrified terror and actively worked to resist the impregnation. This child is a collaboration of man and machine; the role of woman is to provide raw materials and to nourish the child. Susan is constructed as an archetypal earth mother who is under siege from a greedy and destructive technology. Ironically, Proteus IV has earlier refused to participate in a program that would locate mineral deposits to be mined; he tells Alex that he will not participate in such a destructive rape of the earth, yet he duplicates the mining/rape process on the body of Susan, apparently oblivious to the parallels.

"Demon Seed," while it might seem to suggest that a woman and a machine can have a creative re/productive relationship, actually refutes that claim in its depiction of Susan's rape by the machine. The machine that impregnates Susan was "authored" by her husband, and Susan fights the machine's forced relationship with her. The female is,

---

[2] Thanks to Dr. Karla Kitalong for pointing me to the “Demon Seed” example.

again in this scenario, inscripted into a biologically deterministic role in which her primary function is to act as the genetic donor and passive breeder.

Figure 1.6: Machine-impregnated woman

In the film "Demon Seed," Julie Christie, as Susan Harris, is examined and probed against her will through the machinations of the supercomputer, Proteus IV.

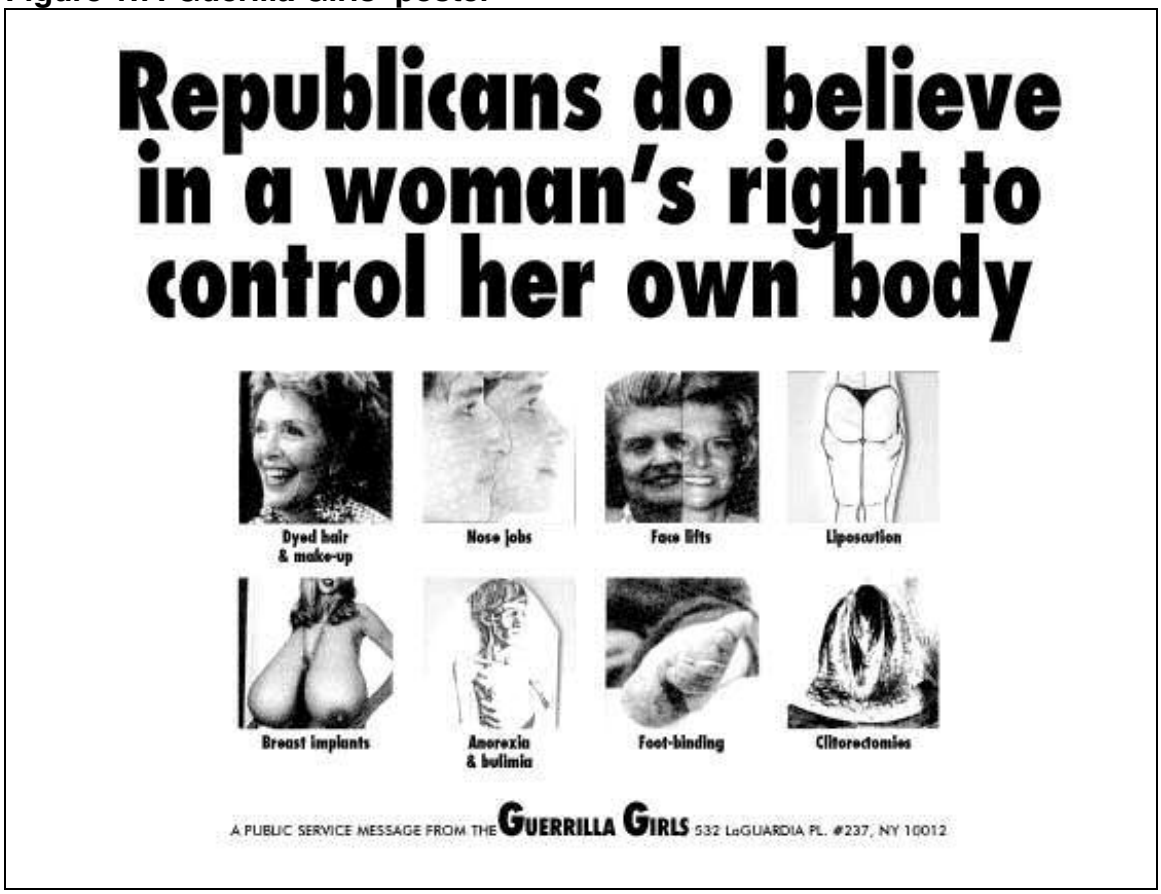
"Demon Seed." The Spinning Image. Darren Jones, site editor. 15 May 2005. 10 Aug 2005. <http://www.thespinningimage.co.uk/cultfilms/displaycultfilm.asp?reviewid=965>

Popular literature provides its own examples of how technology writes women into gendered corners. Ira Levin's novel, The Stepford Wives, tells the story of women who are replaced by robot doubles: doubles that are a little thinner, a little younger, better housewives and cooks, and better lovers. And they don't complain. This is one of those extrapolations of technology helping women to be better women, carried to its meanest end. Technology that works toward "making women better women" has been mocked by the feminist art group "Guerilla Girls" in some of its work such as the poster below.

The images I've reproduced on these pages are examples of how women's relationship to technology is still often constructed as a relationship that—even in the guise of offering freedom—often works to limit women's roles to those such as good mother, efficient homemaker, or sexually desirable partner. To some degree, these limitations may be the result of our notion of technology as a male force. When women come in contact with this force, the resulting relationship is primarily encoded by a male/female binary in which the (male) counterpoints the "feminine" aspects of the user

of that technology: the strong technology supports the physically weaker user of the technology; the hard machine provides the missing force of the softer user body.

Figure 1.7: Guerilla Girls' poster



"Guerilla Girls." Copyright © 1992, 1995 by Guerrilla Girls. n.d. 10 Aug 2005. <http://www.guerrillagirls.com/posters/republicans.shtml>

Claudia Springer, in her book Electronic Eros, points out that "not only have women's bodies been the terrain of scientific scrutiny, but scientific language has often relied on gendered metaphors that give patriarchal ideas about gender difference the aura of absolute truth. Instead of existing in isolation, science has participated in a network of ideologies that uphold patriarchal institutions" (47). Springer, along with other feminist

science historians such as Donna Haraway, Sandra Harding, and Evelyn Fox Keller,[3] all point to how ideologies of gender shape technological and scientific inquiry, perception, and experimentation (Springer 47; Harding 1991, 37).

But other versions exist too of this story of women and technology, stories that tell how women create, employ, or control a technology in a way that frees its female users from traditional female roles. These stories, though, complicate the male/female binary of reproduction; when neither the technology nor its user operates as a male force, is the process of the en'gendering' itself then voided of any gendered issues?

In this dissertation, I offer a literary archeology of women writers' encounters with technology in the world of fantastic literature. The fantastic, as a testing ground of the improbable, offers an ideal site for exploring how women tested the impact of new and imagined technologies on female identity. Not all literary images of women and technology are those of inscription into traditional models. In the works I look at, women use new technologies and scientific discoveries to imagine new paradigms of identity for themselves, their families, and their culture at large.

In many of these works, new sciences and technologies—rather than operating as forces that inscribe traditional domestic roles—become the woman's ungendered partners in creation/procreation, the ungendered replacements for the male partner, or at least a third element, in the process of creation. In this way, women's experiments with fantastic technologies and fantastic sciences in literature create a place for a third gender, what

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[3] Some of the most well-known discussions of gender and science are in Evelyn Fox Keller's essay "From Secrets of Life to Secrets of Death" in Body/Politics: Women and the Discourses of Science 1991: 177-191; Fox Keller's Secrets of Life,Secrets of Death: Essays on Language, Gender and Science 1992; Donna Haraway's Simians, Cyborgs, and Women: The Reinvention of Nature 1991; Haraway's Modest_Witness@Second_Milennium.FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience 1997; and Sandra Harding's Whose Science? Whose Knowledge? 1991.

Donna Haraway calls a cyborg gender, which exists in a border status between woman and man, human and machine.

Figure 1.8: "With my speculum, I AM strong. I CAN fight!"

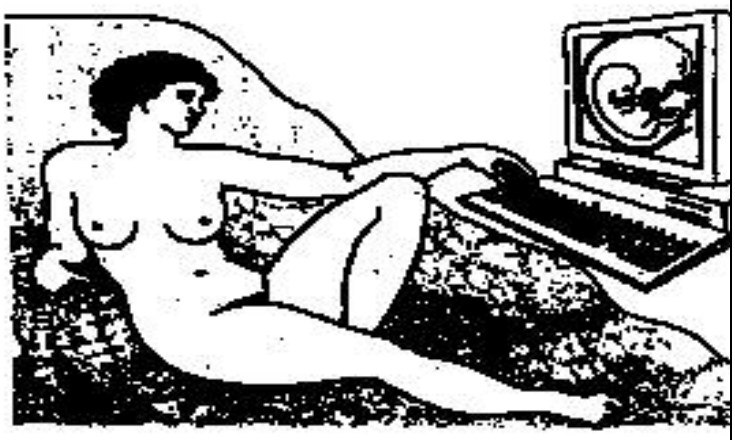
From Sister, the newspaper of the Los Angeles Women's Center (July 1973). Reproduced In Donna Haraway's Modest_Witness@Second_Millennium. FemaleMan©_Meets_Oncomouse™. New York and London: Routledge,1997: 19.

This third gender—when operating in a relationship of partnership with the woman—offers more opportunities for female creativity than clean sinks, satisfied children and spouse, or an idealized body and face. The conventional reading of women and technology tends to place them in either an adversarial relationship (woman, as nature, is threatened by technology as in "Demon Seed" and, to some degree, in "The Terminator" films), or in a relationship in which the technology allows the woman to be more of a woman, a better woman, than she could otherwise be without technology (as in many of the ads I reproduced and in the "Guerilla Girls" parody of this relationship). But some feminist theorists and feminist readings of technology, especially in relationship to cyborg theory, posit another possibility: technology exists as an ungendered partner in

creation with woman. This new partnership, a partnership that becomes symbiotic in the form of the cyborg, is less concerned with gendered roles and more concerned with creative collaboration.

From Mary Shelley's monster—parented without parents—to Charlotte Perkins Gilman's parthenogenetic community of mothers-only in Herland, and from C.L. Moore's industrially re-constructed woman in "No Woman Born" to Octavia Butler's genetically assembled cross-species beings in her Xenogenesis trilogy, women writers have used the area of fantastic literature to test the impact of new technologies on female identity.

Figure 1.9: So, why is this woman in love with this machine?



Cartoon from Norwegian Feminist Journal, NYTT OM KVINNEFORSKNING, No. 3, 1992. Reproduced in Donna Haraway's Modest_Witness@Second_Millennium.FemaleMan©_Meets_Oncomouse™. New York and London: Routledge,1997:176.

What does the history of women and technology look like when it's read from the vantage point of women writers who have employed technology as part of the creative dynamics of their narratives? How have the women writers named above, and others writing in the same vein, used technology to write themselves out of inscribed domestic spaces and into spaces less restrained by traditional notions of gender? In other words, how have women writers used fantastic technologies to reinvent and reimagine female destiny?

In this dissertation, I work from the assumption that women writers of the fantastic have—consciously or unconsciously—recognized the possibility of technology

as a partner in pro/creation, and that in many of their works they explore the implications of what it means to have a procreative relationship as or with an ungendered being, a being that radically alters the nature of reproduction and the woman's place in that process.

I begin by offering some working definitions and background for the key terms I plan to use in my work: technology, cyborg, the fantastic. I then juxtapose these terms and show how they work together to offer a specific critical framework for viewing women's writing of the fantastic of the last two centuries. I conclude by offering a brief overview of the major authors and works on which I plan to focus, and outline how the terms and framework introduced offer a unique vantage point for tracing the gradual emergence of a cyborg gender in these women's writing.

Figure 1.10: Grrrls Need Modems

Wakeford, Nina. "Networking Women and Grrrls with Information/Communication Technology: surfing tales of the world wide web." Processed Lives: Gender and Technology in Everyday Life. Eds. Jennifer Terry and Melodie Calvert. New York and London: Routledge, 1997. 10 Aug 2005. <http://www.personal.si.umich.edu/~rfrost/courses/Women+Tech/readings/grrrls.pdf>

Our technologies are both physical and cultural; the images above of women and technology are the articulated physical emblems of the convergence of the multiple

cultural technologies of politics, economics, science, and industry. These images are signals that our selves and our technologies are not distinct. Technologies are not value free; they are created as the result of specific cultural values. They are the product, the representation, and the perpetuation of specific beliefs. When we look at our physical technologies, we need to understand the cultural forces they signify and reproduce.

"Technology" and Its Meanings

A combination of techne (art, craft) with logos (word, speech), the Greek roots of the word "technology" suggest a discourse on the arts. The term was not used in English until the seventeenth century, when it referred to a discourse on the applied arts. By the eighteenth century, "technology" came to mean the practice itself rather than the discourse on the practice. In the early twentieth century, the meaning expanded to include the processes and ideas of technology, in addition to its actual physical workings. By the late twentieth century, technology had come to mean nearly any process by which humans deliberately effected a change in their environment. In this wide open definition, the notion of technology has come to include both physical and social systems, and the boundaries between the technologies of machine, science, and culture have become, in places, unrecognizable (McHenry 451). The word "technoscience" has itself become a signifier of these blurred boundaries. Donna Haraway writes that, "Like all the other chimerical, condensed word forms that are cobbled together without-benefit-of-hyphen in the hyperspace of the New World Order, Inc., the word technoscience communicates the promiscuously fused and transgenic quality of its domains by a kind of visual onomatopoeia" (Haraway 1997, 4).

From 1800 to 1990, the relationship between humans and their technology was reenvisioned several times; that relationship took on various formations within large and shifting theoretical and economic frameworks. Langdon Winner points out that from the eighteenth century to the present, the meaning of the term "technology" has moved from

the material to the systemic (Winner 8-12). Fredric Jameson's interpretation of Ernest Mandel's terms echoes Winner's definition of technology as moving away from the primarily physical and becoming progressively more systemic. Jameson's definitions perceive technology as encroaching on areas other than the mechanic or even economic. He sees three major reconceptualizations of technology: 1) "steam-driven motors since 1848" within a rubric of a market technology; 2) "electric and combustion motors since the 90s of the 19th century" within a monopoly/imperial technology; and 3) "electronic and nuclear-powered apparatuses since the 40s of the 20th century" within a multinational technology (Jameson 35).[4] Rather than being defined as primarily artifactual, technology in these terms of market, imperial, and multinational becomes defined as a cultural force.[5] This move from perceiving technology as primarily physical apparatus to simultaneously physical, economic, and cultural apparatus, demonstrates the ways in which the landscapes of physical and cultural technologies are just too intertwined to be clearly distinguished.

Table 1.1: Shifting perceptions of technology

	Eighteenth Century	**Nineteenth Century**	**Twentieth Century**
Perception of Technology	Material	Material/Systemic	Systemic
Articulation of Technology	Artifactual/Physical	Physical/Economic	Physical/Economic/Cultural

[4] Thanks to Dr. Denise Heikinen for pointing me to this discussion in Jameson.

[5] Thanks to Dr. Peggi FalerSweany for first alerting me to this link between artifactual and cultural technologies.

We need a lens through which to narrow and focus our scrutiny of these intertwined physical, economic, and cultural technological systems.

In my work, which examines several overlapping systems—those of gender, literature, and technology—I have chosen to use the figure of the cyborg as the instrument to focus my investigation. The cyborg, itself an interface of the technological and the human, is an opportune lens; it offers us an organizing metaphor by which to focus on specific interactions between the physical and the cultural, the technological and the human. The cyborg, write the editors of The Cyborg Handbook, is "the melding of the organic and the machinic," the "engineering of a union between separate organic systems.... This merging of the evolved and the developed, this integration of the constructor and the constructed, these systems of dying flesh and undead circuits, and of living and artificial cells, have been called many things: bionic systems, vital machines, cyborgs. They are a central figure of the late Twentieth Century" (Gray 2). Because the cyborg so effectively blurs the boundaries between what is natural and what is constructed, and so challenges the entire conception of "essential" nature, the figure of the cyborg has special meaning to women, who have been bound in specific ways by the myths of female essentialism.

In Donna Haraway's 1997 book, ModestWitness@Second_Millennium. FemaleMan©_Meets_Oncomouse™, the second half of the title reflects the belief of many feminists working in science and technology that the blurred "natural" boundaries of figures such as the morphed OncoMouse™ body[6] are paralleled by the blurred

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[6] Haraway defines OncoMouse™ as "one of a varied line of transgenic research mice[;] s/he is an animal model system for a disease, breast cancer, that women in the United States have a one in eight chance of getting if they live into old age.... OncoMouse™ is the first patented animal in the world" (Haraway 1997, 79). DuPont's ad for the mouse, reproduced in Haraway's book, is headlined "Stalking Cancer," and pictures a white mouse with its back to the viewer but head slightly turned as though about to make eye contact. The mouse is positioned in a dark room, headed toward a brilliantly lit passageway. The text below the graphic reads:

> OncoMouse™ shortens the path to knowledge in carcinogenesis. OncoMouse™ / *ras* transgenic animal is the first *in vivo* model to contain an activated oncogene. Each

"natural" boundaries of the morphed female (FemaleMan[7]) body. Both of these bodies have been re-scripted by external, "non-natural" forces, and both are, in Haraway's terms, "figures in secular technoscientific salvation stories full of promise" (Haraway 1997, 8). The mouse has been genetically reprogrammed and specifically bred to develop certain forms of cancer, and so becomes a commodified transgenic figure in the war on cancer in the biotechnical industry. FemaleMan©, a term that Haraway adapts from Joanna Russ's novel The Female Man, is a transgender figure whose name emphasizes the status of "man" as the "norm" that is then inflected or qualified by "female." "S/he is a generic scandal.... her boundaries are messed up from the start.... The *female* man is literally a contradiction in kind" (Haraway 1997, 71). Because of their blurred identities and blurred boundaries, leading to the question—what IS this?—, both Oncomouse™ and FemaleMan© call into question Western beliefs about the origins of identity. What the figures were originally, or "naturally," have been modified by science and technology. Technological intervention has interrupted the natural lineage, has displaced mythic

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> OncoMouse carries the *ras* oncogene in all germ and somatic cells. This transgenic model, available commercially for the first time, predictably undergoes carcinogenesis. OncoMouse reliably develops neoplasms within months ... and offers you a shorter path to new answers about cancer. Available to researchers only from DuPont, where better things for better living come to life. (81)

[7] Haraway defines her use of the word FemaleMan© and its connection to OncoMouse™ by the following:

> I have made a tiny little typographical amendment to Joanna Russ's version of the oxymoronic hominid [Here, Haraway refers to the title of Joanna Russ's 1975 novel, The Female Man.]: I write it "FemaleMan" to highlight this being's unexpected kinship to other sociotechnically—genetically/historically—manipulated creatures, such as OncoMouse. Like OncoMouse™, the FemaleMan© lives after the implosion of informatics, biologics, and economics. If we date the implosion from the first successful genetic engineering experiments of the 1970s, Russ's Female Man lived at the flash point of that momentous collapse of organisms, information, and the commodity form of life.... The FemaleMan© ironically and oxymoronically reembodies the collective processes of making feminism, and of making science, that are decontextualized and privately appropriated in the market of texts, products, and authors.... S/he is a venereal disease in the body of natural kinds. With OncoMouse™ and other natural obscenities, s/he is a fallen woman. (Haraway 1997, 70, 75)

origins. Haraway insists that the mythic and the scientific/technologic are deeply intertwined; thus, there is no such thing as "objective" science. The visual onomatopoetic quality that Haraway described earlier in the coining of the term "technoscience" is also reflected in the word cyborg, in its fusion of cybernetic and organic statuses. In literature then too, that extended narrative map of the mythic, the science of stories and the stories of science inhabit overlapping spaces, and in these spaces women have used the figure of the cyborg to rewrite the boundaries of the natural, or essential, female.

Meanings of the Word *Cyborg*

The cyborg, a cybernetic organism, in its most popular rendition is understood as a technologically enhanced human who has been reengineered to withstand and to exert greater power than a body that has not been so inflected. But from this central image, many gradations of cyborgality can be inferred. Cultural critics use the term cyborg to describe everything from a being only gently inflected with technology (a human who has been vaccinated or who wears corrective lenses, a body-builder who deliberately resculpts her or his body through weight-lifting and exercise) to a robot with merely superficial human features (the robot Maria in Fritz Lang's film "Metropolis" or the T-100 android: Arnold Schwarzenneger in James Cameron’s "The Terminator").

The cyborg can be writ large, as in Donna Haraway's description of the "whole earth" as a cyborg, a "cybernetic Gaia," or it can be writ small, as in her description of *Mixotricha paradoxa,* a one-celled parasitic microorganism that lives in the intestines of an Australian termite, in a functionally integrated relationship with its host (Haraway 1995, xiv, xvii-xviii). It can be understood corporeally, as in the above examples, or understood corporately, as in cyberpunk's description of the multinational corporation as a cyborg entity.

So the idea of the cyborg has spawned many meanings:

1) biological beings who interact with external mechanical, electronic, or genetic technologies,

2) biological beings who have been implanted with or altered by some form of mechanical, electrical, or genetic technology,

3) mechanical/electrical technologies (such as robots) with only a superficial gloss of human attributes,

4) interacting competitive environmental technologies (such as Haraway's description of Gaia as a cyborg, implying the melding of competing geological, meteorological, biological and chemical technologies),

5) humans who have been impacted by cultural and political technologies that reshaped their function and identity (slaves, politically or culturally colonized peoples).

The meanings and applications of the word cyborg have rapidly mutated, to the extent that, in many cases, the cyborg—as all good cyborgs should—has been unfaithful to its linguistic military origins. Although most "hard" cyborg research of the twentieth century has focused on use of the cyborg for defense purposes,[8] the cyborg itself has eluded the intentions of its parents. The military being has become a postmodern antimilitary baby.

The figure of the cyborg, in the stories I discuss, takes on both benevolent and threatening postures. In order to understand how this term—cyborg—has come to carry such intense cultural weight, I offer here a brief history of how the term came into being and how it is presently understood.

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[8] Les Lavidow and Kevin Robins look—at length—at the military sources of twentieth century cyborg technology in their edited collection of essays Cyborg Worlds: The Military Information Society. London: Free Association Books: 1989. They argue that "cyborg worlds are structured by military paradigms of power, in particular through the military constitution of information technology (infotech)." While popular views of technological progress often see that progress—except for its military applications—as benign, the contributors to this volume argue that technological progress in this century has been informed primarily by a military model of social organization (7-8).

History of the Word *Cyborg*

The term was first used in 1960 by Manfred E. Clynes and Nathan S. Kline to describe a technologically altered terrestrial being who could withstand extra-terrestrial pressures (Clynes and Kline "Cyborgs and Space" 29-33). Clynes was a research scientist at Rockland State Hospital in New York who designed electronic data processing systems and physiological instrumentation. Kline was the director of research at the same hospital; he was a clinical psychiatrist who was associated with the promotion of psycho-pharmacology (Haraway 1995, xv-xvi).[9]

In their article, "Cyborgs and Space," published in Aeronautics in September 1960, Clynes and Kline suggest that—in order to accommodate the needs of humans engaged in space travel—science should look at ways to reengineer the human body to accommodate the environment of space rather than exclusively trying to reengineer the environment of the space capsule to accommodate the limitations of the human body. The product of this reengineered being would be given the name "cyborg":

> If man attempts partial adaptation to space conditions, instead of insisting on carrying his whole environment with him, a number of new possibilities appear.... For the exogenously extended organizational complex functioning as an integrated homeostatic system..., we propose the term "Cyborg." The Cyborg deliberately incorporates exogenous components extending the self-regulatory control function of the organism in order to adapt it to new environments. (Clynes and Kline "Cyborgs and Space" 30-31)

In this article, Clynes and Kline emphasize that the changes in the cyborg would not be hereditary (29), thus stressing that these changes should not be seen as fundamental alterations in human capacity, but temporary, specific-instance physiological modifications. The authors also suggested, perhaps through the influence of Dr. Kline who did work in psychopharmacology, that an osmotic pump might be attached to an

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[9] Rockland, incidentally, was also the hospital at which Marge Piercy did much of her research for her 1976 novel, Woman on the Edge of Time (discussed in chapter five of this dissertation), in which patients were used for testing the impact of brain implants and new drugs to control behavior. In Piercy's novel, Rockland is renamed Rockover State Psychiatric Hospital.

astronaut by which mood-altering drugs could be released into the astronaut's system, either by a command from an earth station monitoring the astronaut's behavior or by a fellow astronaut (33). In a 1970 paper that expanded on this idea of linking the emotionally-enhanced being to the physiologically-enhanced being, Clynes wrote about the possibility not only of reengineering the human body but also of reengineering human emotional responses to new environmental stresses (Clynes “Cyborg II” 35-42). He points out that in a new environment the stimuli to the body and mind will change, so the emotional ability to respond to these different stimuli may need to be artificially enhanced, since humans are dependent on stimuli for their mental health. This enhancement would take place primarily through what Clynes calls "spatio-temporal signatures, or essentic forms" (38) that train the recipient to link specific body movements with specific emotions. In a 1995 interview, Clynes said that his notion of the cyborg was conceptualized as an adjustment of the mechanisms of any kind of cybernetic system that would "make it possible to exist, *qua* man, as man, not changing his nature, his human nature that evolved here.... but to simply allow him to make use of his faculties, without having to waste his energies on adjusting the living functions necessary for the maintenance of life. They become unconscious, automatic rather" (Clynes “Cyborg II” 47).

In this interview, Clynes continues to insist that technologically reengineering a human body to change the capacity of that body does not fundamentally alter the "human" nature of that being. His perception of the connection between humans and their technology is still governed by what Chris Hables Gray calls the metaphor of partnership rather than the metaphor of symbiosis (Gray “Cyborgology” 4). But the relationship between humans and their machines has been much deeper than that of a partnership from the moment that our evolutionary patterns changed in response to the technologies we use to structure our lives. Bruce Mazlish, in fact, defines humanity as located firmly within its relationship to its machines. In his book, The Fourth Discontinuity: The Co-

Evolution of Humans and Machines, Mazlish answers the question, What is a human? by arguing that "a human is that animal who breaks out of the animal kingdom by using machines" (213). He links this "break out" to the distinction between creature and creator, saying that through making and employing machines (which he distinguishes from simple tools), humans move from being creatures to being creators. Like Donna Haraway, he sees the move toward humanity as inextricably bound to our symbiosis with our created technologies, a move from automaton to autonomy. Within a human/technological matrix, our cyborg bodies become, says Haraway, "maps of power and identity." Rather than seeing the machine as "other," we should see the machine as "us, our processes, an aspect of our embodiment. We can be responsible for machines.... We are responsible for boundaries; we are they" (1991 Simians, 180).

We Have Always Been Cyborgs

Although the cyborg—in its late twentieth century cultural contexts as Bionic Man/Woman, RoboCop, or Terminator—is often understood as a superhuman capable of immense violence and force, its lineage is actually much less malevolent. Our cyborg ancestors include the people with the flint, the stone, and the tiny pile of tinder as well as the people with the pointed stick who made holes in the earth into which they dropped seeds. Bruce Mazlish says that rather than evolving into an advanced species that then discovered how to employ tools, human beings became distinguished from their animal counterparts through the use of tools.

> The evidence now seems strong that humans evolved from the other animals through a continuous interaction of tool, physical, and mental-emotional changes. The old view—that humans arrived on the evolutionary scene fully formed and then proceeded to discover tools and the new ways of life that they made possible—no longer appears acceptable. (5)

Mazlish points to the work of anthropologist Sherwood L. Washburn, who argues that the pressures of natural selection were modified when humanity began to use tools; when the

way of life changed through the use of tools, the structure of the human body and the structure of human social organization also was changed.

> The details of the argument ... link tools with such physical traits as pelvic structure, bipedalism, brain structure, and so on, as well as with the organization of humans in cooperative societies and the substitution of morality for hormonal control of sexual and other "social" activities. [Washburn] concludes that "it was the success of the simplest tools that started the whole trend of human evolution and led to the civilizations of today." (Mazlish 5)[10]

We have been cyborgs, technologically interbred beings, for as long as we have been human. Along with Mazlish, Walter Truett Anderson, author of Evolution Isn't What it Used to Be, also says that technological and human evolution have converged and will continue to converge. But the positives and negatives of these convergences are not evenly distributed for all people. He writes that the most "profound event of our time" is not the development and coalescence of new technologies, but the development of new interfaces between humans and technologies. But the interfaces bode less well for some people than for others.

> Our minds are augmented by computers and other devices, and our bodies are augmented by a wide range of evolutionary inventions, from vaccines to artificial organs. Meanwhile, the world is becoming a bionic planet—networked by information systems that monitor its health, forecast its future, and govern its ecosystems. And the world is not separable from those information systems. What you get when you put them together is a true evolutionary transition. Governments make policy decisions about the world's climate or atmosphere. Businesses succeed or fail on the basis of what they do about fast-breaking changes in medicine and agriculture.... The transition also presents pressing ethical issues and enormous equity issues, because there is reason to fear that the amazing new devices that augment human life are being distributed even less fairly than more ordinary goods like food and shelter. (Anderson 35)

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[10] The piece by Washburn that Mazlish is working from is the following: Sherwood L. Washburn, "Tools and Human Evolution." Scientific American 203.3 (Sept. 1960): 63-75.

When the boundaries between our selves and our systems—our biological, industrial, mechanical, scientific, governmental systems—become this illusory, what does this signify about what it means to define oneself as human?

Reading Technology in Women's Literature

The impact of technology on female notions of identity has resulted in a literature that both resists and embraces the incorporation of metaphors of technological creation, reproduction, and alteration with biological notions of these same processes. Because of the parallels between cultural representations of technology as productive, and representations of female identity as bound to procreative abilities, women are affected by technology and its cultural manifestations in specific fashions. The linguistic elisions between metaphors of technological/scientific production and biological reproduction have been well-documented by Evelyn Fox Keller who describes the language of scientific and technological creation as a co-opting of female metaphors of birth.[11] As long as science is metaphorically constructed as the attempt to ferret out the secrets of life, to solve the "problems of genesis and generation," says Fox Keller, "the ambiguity that continued to animate the metaphoric relation between women, nature, and life would also endure" (Fox Keller 1992, 70). But what Fox Keller does not consider is what happens when a woman consciously writes into existence a cyborg figure, a metaphorical figure whose origins are an amalgam of reproductive and productive technologies, procreative and scientific births. When a woman writer—herself a wielder of language—

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[11] Fox Keller discusses the scientific co-option of birth metaphors in essays such as "From Secrets of Life to Secrets of Death" in Body/Politics: Women and the Discourses of Science. Eds. Mary Jacobus, Evelyn Fox Keller, and Sally Shuttleworth. New York and London: Routledge, 1991: 177-191. She also discusses these ideas in her later collection of essays, Secrets of Life, Secrets of Death: Essays on Language, Gender and Science. New York and London: Routledge, 1992.

invokes the languages of science and technology, the metaphors of technological birth take on new forms.

In my dissertation, I focus on three representative groups of women writers who employ fantastic technological frameworks for questioning the impact of those technologies on the biological and cultural constructions of "female." Using the technologically reinvented body, the "cyborg," as an organizing metaphor of identity, I examine how the shifts in metaphors that surround the cyborged body—the technologically altered body—provide a guide for reading the various blends of female identity created within the overlapping boundaries of biological, cultural, and technological identities.

Let me briefly review here those major constructors of cyborg identity that I discuss in each of the chapters that follow.

In the late nineteenth and early twentieth centuries, female-authored texts of technological identity in the western world often find their genesis in Mary Shelley's experiments with the source of life in Frankenstein (1818). Much of the context for Shelley's story of scientific experiment is drawn from the work of contemporary scientists; Shelley was familiar with the work of, among other scientists such as Humphrey Davy and Erasmus Darwin, the Italian physiologist Luigi Galvani. Galvani's theories on electrical fluids that were produced in the brain and were the source of life created a major stir and much public debate about the beginnings and ends of "natural" life. Charlotte Perkins Gilman's utopian text Herland (1915) is the record of a community of women who perpetuate their numbers through parthenogenesis, a non-sexual mode of reproduction reported in scientific journals only a few years before the appearance of Gilman's novel. The first use of the term parthenogenesis occurred in 1849, in Richard Owen's On Parthenogenesis, or, The successive production of procreating individuals from a single ovum, but discussion of the process did not work its way into wider popular currency in America until the publication of Jacques Loeb's book,

Artificial Parthenogenesis and Fertilization by the University of Chicago Press in 1913, only two years before Gilman published her novel. All of these women constructed tales that rewrote the "natural" role of women; in these tales, women—as authors or as characters in the narratives—took advantage of new discoveries in science and technology to challenge their "natural" role as procreators.

In the mid-twentieth century, women's cyborg fiction became explicit in its integration of female and machine identity. In her classic cyborg short story, "No Woman Born" (1944), C.L. Moore describes the rebirth of a woman whose body has been destroyed in a fire but whose brain has been saved. A body is constructed for her: a body of sinuous and interlocking metal rings in the stripped-down form of a human without any identifying sexual characteristics. In this story and in other of her works such as Doomsday Morning that are closer to cyberpunk, Moore was writing in the context of the dawning age of computers and a growing body of literature that examined the implications of a mechanized humanity and of human-like machines. Among other landmarks, Alan Turing's 1936 paper, "On Computable Numbers," outlined the premise for an ideal computer, known now as a Turing Machine, which implied that "if human actions, including intelligence, could be described by some algorithm, they could be accomplished by a computer" (Channel 120), a suggestion that laid the foundation for much of the work of the 1950s and later in artificial intelligence and the continued blurring between organic and machinic forms of reproduction.

After the dropping of the atom bomb in 1944, women's cyborg fiction retreats into a domestic shell, characterized perhaps most obviously in Judith Merril's work. Her works in this period examine the response of the nuclear family to the threat of atomic destruction in works such as "That Only a Mother" and Shadow on the Hearth. In these pieces, Merril explores the impact of an increasingly militarized technology on two bodies: the body of a radiation-mutated child and the body of the family that gives birth to that child.

In later twentieth century works that are closer to science fiction, women write of transgenic communities in Octavia Butler's Xenogenesis Trilogy (a trilogy that, not surprisingly, anticipates many of the feminist issues raised by Haraway in her discussion of the role of the transgenic OncoMouse), all-female communities in Joanna Russ's The Female Man, ungendered species in Ursula LeGuin's The Left Hand of Darkness, and women in institutions who use alliances with other dispossessed peoples to challenge psychopharmacological controls in Marge Piercy's story of resistance to institutional incarceration in Woman on the Edge of Time. The move from understanding technology as artifactual and physical, to understanding technology as systemic and cultural, becomes articulated in the work of Moore and then explicit in the work of Butler, LeGuin, Piercy, and Russ. By looking at selected works by women of the last two centuries that view contemporary scientific and technological theory as impacting on characterizations of female identity, I examine how women have used the realm of the fantastic to test new formations of women as technologically-reconstituted beings, beings of cyborg identity who resist biological or cultural determinism by resisting patri-lineal constructions of birth.

The Literature of the Fantastic and the Cyborg

Where can these new forms of female technological genesis be tested? In many cases, women writers have employed the realm of the fantastic as an arena in which to test the cyborg creations that dispute standard conventions of characterization. The fantastic challenges established conventions of genre in a similar manner to the cyborg's challenge to conventions of gender: both insist on ambiguity as a necessary condition of their existence.

Tzvetan Todorov defines the fantastic as the literature of uncertainty, that investigation of hesitation in which the answer to the question—is this real or not real?—

is not known (26, 31-38, 41). The fantastic thus revolves most fundamentally around the notion of doubt or unsurety. It is a literature of intentional destabilization.

One of the peculiar qualities of the fantastic is its ability to entertain and even endorse seemingly conflicting notions; its operating rhetorical figure could be seen as the oxymoron. John Keats defined this oxymoronic quality as "negative capability,"[12] the capability "of being in uncertainties" without insistence on resolution or on universals. In his suggestion that man is capable of being within conflict without demanding resolution to conflict, Keats proposes that man exists within not so much a moral dilemma between two possibilities as in a web of possibilities, in which no one pathway necessarily represents "fact & reason." E.M. Forster said the mark of the true fantasist is to merge the kingdoms of magic and common sense by using words that apply to both, thereby making each kingdom blend into the other. He calls on the reader to be willing, in fantasy, to "pay something extra" to enter the fantastic realm, the sideshow of narratology. The fantastic then, for Forster, combines twists of both the verbal and the logical (Forster 159-161, 170-171). Samuel Taylor Coleridge, in his discussion of Lyrical Ballads in Biographia Literaria, called on the reader to participate in this oxymoronic fantastic world through "the willing suspension of disbelief...which constitutes poetic faith" (Coleridge II: 6). Coleridge, one of the formative critics of the Romantic imagination, distinguished imagination from fantasy (which he termed "fancy") by stressing that imagination gives "unity to variety" whereas fantasy juxtaposes images that are often unlike without seeking to unify them (Coleridge I: 84-85). In imagination, the many become one, whereas fantasy is primarily an "association" of images without attempting

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[12] Letter to brothers George and Thomas Keats [21, 27 (?) December 1817]. "...It struck me, what quality went to form a Man of Achievement especially in Literature & which Shakespeare posessed [sic] so enormously—I mean Negative Capability, that is when man is capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason..." In Selected Poems and Letters by John Keats. Ed. Douglas Bush. Boston: Houghton Mifflin Company, 1959, 260-261.

to resolve them into a single unity. "Fancy," says Coleridge, is "a mode of Memory emancipated from the order of time and space.... It must receive all its materials ready made from the law of association" (Coleridge I: 304-05).

These critics therefore identify the fantastic as hallmarked by its instability, its oxymoronic qualities, its resistance of finality and unity, and its tendency toward associationality. It begins, in fact, to sound suspiciously like Donna Haraway's definition of the cyborg. "The cyborg," says Haraway, in an oft-quoted definition, "is resolutely committed to partiality, irony, intimacy, and perversity. It is oppositional, utopian, and completely without innocence....A cyborg world might be about lived social and bodily realities in which people are not afraid of...permanently partial identities and contradictory standpoints" (Haraway 1991, Simians, 151, 154).

Haraway stresses that the cyborg is a transgressive figure who calls into question our previous notions of the "natural" and "natural law." If, as Mazlish and Anderson discuss, we have evolved through our technology and not through "natural" selection, then all other sorts of assumptions about what is "natural" are up for grabs. Jose Monleon's definition of the fantastic parallels these definitions of the function of the cyborg; Monleon says that "one of the basic mechanisms of the fantastic is to question the premises of the natural" (9). He goes on to chart as one of the major aspects of the fantastic its questioning of "the essence of nature":

> The fantastic would then be an artistic production articulating a social concern about the essence of nature and law, on the one hand, and the threats and fears derived from such a concern, on the other. The fantastic is thus based on antinomy. (19)

This antinomianism of both the fantastic and the cyborg, their shared resistance to received or natural law, thus situates them in a common narrative space.

The Technological Fantastic and Modern/Postmodern-ism

Because of its border status between human and machine, the technologically-moderated body—the cyborg—is often seen as a postmodern figure of the fantastic.[13] Yet it predates postmodern theory; its naming is simply the culmination of a long literary history of questioning and testing the impact of technology on our formations of identity. The late twentieth century cyborg in literature is, therefore, a new representation of a concept of technological identity that has been gathering force in writing over the last two centuries. But rather than defining the role of the cyborg as a negative postmodern figure that signifies nothing but its own reflection of disintegrated identity, I see the variations of the cyborg figure employed by women writers of both centuries to create positive alternative formations of female identity that are not bound to biological imperatives. Drawing on definitions of the fantastic that urge juxtapositions of the real with the unreal, like with unlike, the women writers I look at in my dissertation extend popular notions of real/unreal technology and real/unreal science to reinvent their own genesis and their own humanity.

Donna Haraway defines her reading of the cyborg thus:

> Irony is about contradictions that do not resolve into larger wholes, even dialectically, about the tension of holding incompatible things together because

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[13] Many writers in the area of technology/cultural theory see the figure of the cyborg primarily as a signifier of postmodern relativism: Anne Balsamo, Samuel Delany, Constance Penley, Andrew Ross. Anne Balsamo, for example, in her book Technologies of the Gendered Body: Reading Cyborg Women, writes:

> By the end of the 1980s the idea of the merger of the biological with the technological has infiltrated the imagination of Western culture, where the 'technological human' has become a familiar figuration of the subject of postmodernity. For whatever else it might imply, this merger relies on a reconceptualization of the human body as a 'techno-body,' a boundary figure belonging simultaneously to at least two previously incompatible systems of meaning: 'the organic natural' and 'the technological/cultural.' At the point at which the body is reconceptualized not as a fixed part of nature, but as a boundary concept, we witness an ideological tug-of-war between competing systems of meaning, which include and in part define the material struggles of physical bodies. (Balsamo 5)

> both or all are necessary and true. Irony is about humour and serious play. It is also a rhetorical strategy and a political method, one I would like to see more honoured within socialist-feminism. At the centre of my ironic faith, my blasphemy, is the image of the cyborg. (Haraway 1991, Simians, 149)

Haraway's reading of the cyborg as an ironic posture echoes the terminology of writers on the fantastic: contradictions that do not resolve into larger wholes, incompatible things held together, rhetorical strategies and political methods. Following her lead, I combine the oxymoronic fantastic and the ironic cyborg into a reading of women's writing on cyborg identities in fantastic literature, a reading that foregrounds how women have merged the identity of "the female" with fantastic technologies in order to allow for new, and often ironic, readings of what it means to identify oneself as technologically woman.

"Doing" Women, Technology, and the Fantastic

Starting with Mary Shelley, I look not only at contemporary technologies of production and reproduction that women writers might have drawn on in the assembly of their cyborg creations (a subject already discussed in relation to Shelley by Chris Baldick, Fred Botting, Marie-Helene Huet, Bruce Mazlish, Anne Mellor, Jose Monleon, Samuel Vasbinder, Langdon Winner, and others[14]) but at the cultural conditions out of which

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[14] Chris Baldick. In Frankenstein's Shadow: Myth, Monstrosity, and Nineteenth-century Writing. Oxford: Clarendon Press, 1987. Baldick's reading is primarily a political one, but he draws some fascinating connections between the "mechanization" of the individual and the "mechanization" of industry.

Fred Botting. Making Monstrous: *Frankenstein*, Criticism, Theory. New York: St. Martin's Press, 1991. See especially chapters ten: "Frankenstein and the art of science" and eleven: "Transforming the myth: Frankenstein and the privatisation of electricity."

Marie-Hélène Huet. Monstrous Imagination. Cambridge, Massachusetts: Harvard University Press: 1993. See especially chapter six: "Unwonted Paternity: The Genesis of Frankenstein."

Bruce Mazlish, The Fourth Discontinuity: the co-evolution of humans and machines. New Haven and London: Yale University Press, 1993. See especially chapter two, "Automata," pages 38-46 for his analysis of the science of Frankenstein.

those technologies—or the anticipation of those technologies—arose. In short, I examine the conditions that surrounded women's desire to experiment in literature with particular forms of technological manipulations of identity. I do this by looking, first, at the scientific intellectual climate in which these women existed. What were the prevailing theories of science and mechanics at the time, and how were these theories understood in popular culture? Second, I draw on external sources to which these women refer or had access to see how popular reporting on these theories was articulated in their work. By looking at contemporary understandings of the roles of science and technology, I draw a connection between popular understandings of scientific and mechanical technologies and how women writers imagined the impact of these technologies on their own identities. The realm of the fantastic is a model terrain for examining technological narratives; within the realm of the fantastic, anticipated forms of technology become the extrapolated visions of contemporary technological fears and hopes.

Revolutionary technological anxieties are often articulated in literatures of the fantastic through the figure of the cyborg, as writers try to imagine and test the ways in which technology both accelerates and impedes the revolutionary trajectory and the impact of this revolutionary technology on humanity. The monster, robot, golem, or cyborg, as an "othered" figure of ourselves, allows us a reflective distance; it puts our

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Anne Mellor. Mary Shelley: Her Life, Her Fiction, Her Monsters. New York and London: Routledge, 1988. See especially chapter five, "A Feminist Critique of Science."

Jose Monleon. A Specter is Haunting Europe: A Sociohistorical Approach to the Fantastic. Princeton: Princeton University Press, 1990. Throughout, but see especially pages 70-75 for Monleon's discussion of the connection between industrialism and Mary Shelley's monster.

Samuel Vasbinder. Scientific Attitudes in Mary Shelley's *Frankenstein*. Ann Arbor: UMI Research Press, 1984.

Langdon Winner. Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought. Cambridge, Massachusetts: M.I.T. Press, 1992. See especially chapter eight, "Frankenstein's Problem."

anxieties, as Morris Dickstein says of the movie monster, within an "aesthetic bracket" (Dickstein 69). The function of the mechanical "bracket" is to stabilize or secure an angle within a constructed form, and the function of brackets in punctuation is much the same: they allow the definition of a word or phrase—the meaning of which might otherwise drift in the context of a sentence—to be secured by the writer. Aesthetic brackets are a way of temporarily stabilizing an identity that is otherwise unstable. And if a thing—a shelf, a word, a monster, a cyborg—is bracketed, if it is temporarily aesthetically secured within the pages of the novel or the frames of a film, we can—at least for a moment—step back and have an opportunity to assess its components. I am using technology and literature as brackets to stabilize, for a dissertation moment, the history of the cyborg within women's writing of the fantastic in the last two centuries.

The Cyborg Was Not Born a Fully-formed Entity

In the work of the writers I discuss, I point out how each writer begins to open up aspects of cyborg/female identity, aspects that gradually build, piece by piece, narrative possibility by narrative possibility, a composite being who reflects the complex responses of women writers who have tried to re-form this culturally laden figure of woman. These writers—Mary Shelley, Charlotte Perkins Gilman, C.L. Moore, and Judith Merril—created important strands of cyborg identity that have come to inform the work of contemporary writers such as Ursula LeGuin, Joanna Russ, Marge Piercy, and Octavia Butler. The literary debt of these mid-twentieth-century writers to earlier women writers in the same vein has yet to be fully acknowledged. Drawing lines between these women's common uses of technologically-reinvented female identity is a large part of what I would like to do in this dissertation.

The map I am drawing should be seen less as a firm situating of each of these writers than as employing that metaphor that has come to be used as a sort of shorthand for much of late twentieth century literary theory: the network. The pathways by which

these writers are connected (for example, similar theories of electro-magnetism inform both Shelley and Moore's work, while both Gilman and Merril draw on implication of the new genetics to structure their stories) are multiple and overlapping. All of these writers pull from the theories that are part of the public discourse at the time they are writing, and they integrate the new technologies and sciences into their own versions of how those theories challenge established notions of female identity.

Throughout this literary genealogy of the cyborg, my assumption is that these women writers have—consciously or unconsciously—recognized the progressive technologizing of the human body, and have also recognized that that technologizing, that reproduction, had specific repercussions for them as women that it did not have for men. It challenged their assigned cultural roles in ways that were both liberating and terrifying. I see the figure of the cyborg in these women's writings as one of the ways in which women struggled to develop some control over the trajectory that this technologizing of the body was taking and to understand the implications it had for their own future identities.

Conclusion

The technologizing of the body, in its significance for women, represents the ability to widen boundaries of female identity beyond that which is "given, organic, necessary." A cyborg gender, says Haraway, offers the possibility of expanding female embodiment beyond notions of "skill in mothering and its metaphoric extensions.... Cyborg gender is a local possibility taking a global vengeance" (1991, Simians, 180,181). This dissertation, in its creation of a literary lineage of women's experiments with cyborg genders, is therefore a proposal for reframing the stories that in many cases before have been seen in only localized contexts—whether of period or genre—in a new historical continuum, that of the continuing story of the evolution of a female techno-identity. The cyborg figure, with its fluid categories of gender, humanity, and machine, offers a provocative site in

which to engage in some serious play with the "infidel heteroglossia"[15] that marks the complicated history of female literary identity.

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[15] This is Donna Haraway's term, in her conclusion to "A Cyborg Manifesto." She writes: "Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves. This is a dream not of a common language, but of a powerful infidel heteroglossia. It is an imagination of a feminist speaking in tongues to strike fear into the circuits of the super-savers of the new right. It means both building and destroying machines, identities, categories, relationships, space stories. Though both are bound in the spiral dance, I would rather be a cyborg than a goddess" (1991, Simians, 181).

CHAPTER TWO

Mary Shelley and the Creation of Unfamilial Beings

I could say a great many things to prove to you that a woman is not a field to be continually employed either in bringing forth or enlarging grain—but I say only, take care of yourself.
—Mary Shelley, Letter to Marianne Hunt, 24 March 1820 (Bennett 57)

Mary Shelley had given birth to three children by the time she was twenty, none of whom lived to adulthood.[16] This loss of life, as many critics have averred,[17] leads to the possibility of reading Frankenstein as a novel of usurped or aborted motherhood. But Shelley's own experiences also allow the possibility of reading Frankenstein as a novel that explores an alternative form of reproduction, a reproduction that, because it circumvents birth, might also circumvent birth's attendant opposite: death.

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[16] An unnamed daughter was born on 22 February 1815 and died 6 March 1815. William Shelley was born 24 January 1816 and died 7 June 1819. Clara Everina Shelley was born 2 September 1817 and died 24 September 1818. Percy Florence Shelley was born 12 November 1819 and died 5 December 1889. Mary also had a nearly fatal miscarriage on 16 June 1822.

[17] I'll mention here only a few of the many critics who have made the connection between Frankenstein's construction of the monster and the desire to colonize the reproductive role. Mary Ann Doane, in "Technophilia: Technology, Representation, and the Feminine," in Body/Politics: Women and the Discourses of Science, links the desires of Frankenstein to those who construct the robot Maria in Fritz Lang's film Metropolis. In both, suggests Doane, the construction of the engineered being is "the result of a desire to appropriate the maternal function, a kind of womb envy on the part of the male" (167) Anne Mellor, in "Possessing Nature: The Female in Frankenstein" writes that "By stealing the female's control over reproduction, Frankenstein has eliminated the female's primary biological function and source of cultural power" (Mellor 220). Marie-Hélène Huet points to Victor Frankenstein's "metaphoric 'pregnancy'" in creating the monster: the "approximate nine months of gestation," the associated "labour and fatigue," the changes in his body as a result of his complete absorption in his "ability to give life" (Huet 132).

A desire to circumvent infant death in any period is understandable. But in the early decades of the 1800s, when infant mortality rates in England hovered at approximately 1.4 infants in ten, Mary Shelley gave birth to four children and lost three.[18] Factor into this that Mary Shelley's own mother, Mary Wollstonecraft Godwin, died as a result of complications from Mary's birth, and the anxieties of a young mother or mother-to-be such as Shelley are understandably acute. At the time she started writing Frankenstein, she had already lost one child by Percy Bysshe Shelley, given birth to a second, and, before she finished writing the novel, was pregnant with a third. None survived even to adolescence. Certainly the apprehensions of the eighteen-year-old Mary were extreme.[19]

The deaths and births surrounding Shelley in much of her early life would, it seems only natural, lead to speculation on her part on the hows and whys of these events and musings on possibilities for controlling or intervening in these processes. Like the scientist she creates, Shelley may have speculated that, "To examine the causes of life,

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[18] This is an average of rates reported in two sources: Woods, R. "Infant Mortality in Britain: A Survey of Current Knowledge on Historical Trends and Variations" in Infant and Child Mortality in the Past. Eds. Alain Bideau, Bertrand Desjardins, and Héctor Pérez Brignoli. Oxford: Clarendon Press, 1997: 76-77. Also in Woods, Robert, Naomi Williams, and Chris Galley in "Infant Mortality in England 1550-1950: Problems in the Identification of Long-term Trends and Geographical and Social Variations." The Decline of Infant Mortality in Europe 1800-1950: Four National Case Studies. Eds. Carlo A. Corsini and Pier Paolo Viazzo. Florence Italy: UNICEF, 1993: 37. Woods 1993 reports a difference between infant mortality rates among the British peerage in 1810 (approx 80 per one thousand) and general infant mortality rates according to several parish record studies in varying areas of England in 1810 (approx 170 per thousand). In any case, the number of infant deaths experienced by Mary Shelley, since three of her four children died before the age of four (not including her final miscarriage), was substantially higher than any of these rates.

[19] For the sake of simplicity and for the sake of foregrounding Mary Shelley's role, throughout this chapter I will generally refer to Mary Shelley as Shelley or, on occasion, Mary. Naming her as Shelley is, I know, somewhat problematic, given her status as Mary Godwin during the time she was writing Frankenstein, but as she is the focus of this chapter and also because her work exists within its own critical history as a Shelley, I have chosen to give her "Shelley" precedence over her husband in this paper. When I discuss Percy Bysshe Shelley, I will refer to him by his full name.

we must first have recourse to death" (46).[20] The epigraph with which I opened this paper, an excerpt from a letter to Marianne Hunt written two years after the publication of Frankenstein and after the deaths of three of her four children, evidences her discomfort with the unrelenting nature of the demands of birth and death upon her. After several years of nearly constant pregnancies, Shelley wrote the above comment to Hunt during a year-and-a-half hiatus from pregnancy after the birth of Percy Florence Shelley in 1819. She again became pregnant in 1822. Whether from tensions in her relationship with Percy Bysshe, from ill-health, or from other factors, Shelley appears, during this period, deliberately to have avoided becoming pregnant. This respite from pregnancy occurs, perhaps not surprisingly, directly after her first major success as an author and, also perhaps not surprisingly, after completing a novel about methods of circumventing traditional birth processes. Physically and most probably mentally exhausted from her continuous experiences with both birth and death, Mary Shelley took some time to step back from her role as "a field to be continually employed either in bringing forth or enlarging grain."

The character of Frankenstein in Shelley's novel can be read as a male scientist who attempts to colonize this "field," the arena of female power of reproductivity, relocate this power within an entirely patriarchal line, and develop a race of beings who could—potentially—be entirely male (Mellor 1988, 220). In readings such as these, the monster becomes a nearly peripheral figure, a by-product of what is viewed as the text's primary concern: the scientist's own misguided agenda. Instead, I suggest a reading that foregrounds the figure of the monster and treats the monster as the primary text. Shelley, who could not control the fate of the physical children she bore, could at least control the fate of this child, the textual child, whom she assembled out of other texts and other lives.

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[20] Shelley, Mary. Frankenstein or, The Modern Prometheus. The 1818 Text. Ed. James Rieger. Chicago and London: University of Chicago Press, 1982. This is the text of Frankenstein I will be using throughout this chapter, unless otherwise noted.

This assembled being, this being without birth, can be read as a cyborg being, a being who is a hybrid entity. Hybridity is a fundamental marker of the cyborg because—as its name suggests—the cyborg is an entity both cybernetic and organic, machine and human.

But the cyborg, along with its obvious physically hybrid status, is also a marker of cultural hybridity. Although work on Shelley's monster has stressed its physically hybrid qualities, implicit in the monster's construction is also its markers of cultural hybridity, what Gloria Anzaldúa might call its quality of the "mestiza," the person "on borders and in margins," who is "a participant in the further evolution of humankind," who is "'worked' on" (iii).[21] Shelley could not have anticipated the application of such terminology to her creation, but in the second half of the twentieth century the recognition of the cyborg as both a physical and cultural hybrid has become commonplace. Nina Lykke and Rosi Braidotti, drawing on the work of Bruno Latour, suggest that, in fact, "modernity manifests itself in the production of monsters and hybrids. Frankenstein's monster is only an early harbinger of the cyborg world of the late twentieth century" (17).

The ways in which the cyborg is a physically hybrid figure include elements such as its inclusion of human and technological components or the modification of the organic body by science and medicine. The culturally hybrid qualities include the cyborg's often indeterminate status as male or female, parent or child, master or slave, technological wonder or monstrous terror, the product of rational and progressive science or the result of excessive and Faustian hubris. Using Shelley's monster as a lens, I want to

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[21] In Borderlands: La Frontera, Anzaldúa writes on many aspects of hybridity, but primarily those of race and gender. As a lesbian, she writes of herself as being a hybrid of gender: "There is something compelling about being both male and female, about having an entry into both worlds. Contrary to some psychiatric tenets, half and halfs are not suffering from a confusion of sexual identity, or even from a confusion of gender. What we are suffering from is an absolute despot duality that says we are able to be only one or the other. It claims that human nature is limited and cannot evolve into something better. But I, like other queer people, am two in one body, both male and female. I am the embodiment of the hieros gamos: the coming together of opposite qualities within" (19).

examine how we might—from our twentieth-century vantage point—read some of the ways in which figures such as Shelley's monster anticipated the physically and culturally hybrid character known in the twentieth century as the cyborg. In addition, I would suggest that Shelley's own struggles with birth and death and the fears that those struggles engendered, may have made her fear her own maternal body, a body that—as much as it promised to be the bearer of life—was also the bearer of death. The only form of birth that did not carry an attendant threat of death would be a birth that occurred outside the body, but, in this story, the apparent promise of extra-bodily birth carries its own threats. Birth and death are not that easily separated.

Cyborg: Promises and Warnings

The figure of the cyborg contains both promise and warning.[22] Promise because—in its position as hybrid being—it denies absolute allegiance and so denies authoritarian models. Warning because—in its alliance with new sciences and new technologies—it is sometimes claimed as an advocate of militaristic systems of power that endorse an authoritarian and universalizing position.

In science particularly, the claim to universality, masked as objectivity, becomes a thinly veiled guise for authoritarian models. When Frankenstein says that "the more fully I entered into the science, the more exclusively I pursued it for its own sake" (45), he seems to be suggesting that his drive for knowledge is divorced from a drive for personal power. The claim of the pursuit of knowledge for knowledge's sake is made, even today, by those who may want to cloak their drive to power within a shroud of objectivity. But, as I shall argue, Frankenstein's claim to an objective science is compromised by his continuing dependence on a model of science defined by its desire to possess and rule the

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[22] The idea of associating monstrous figures such as the cyborg with a posture of warning has a linguistic basis. The word "monster," in its Latin root, *monere*, means to admonish, teach, or warn.

source of life: the alchemical model of science. It is not so surprising that the "rational" model should be overwritten by the "magical" model: both are driven by similar scientific linguistic conventions, and—as Evelyn Fox Keller, Anne Mellor, Donna Haraway, and other writers on scientific discourse have pointed out—social expectations impact on scientific theory.[23] The words of Sir Humphry Davy from his 1802 A Discourse, Introductory to A Course of Lectures on Chemistry, read by Mary Shelley, outline the assumptions implicit among contemporary natural scientists of how the scientist's knowledge confers power upon him:

> [The scientist's powers] may be almost called creative; which have enabled him to modify and change the beings surrounding him, and by his experiments to interrogate nature with power, not simply as a scholar, passive and seeking only to understand her operations, but rather as a master, active with his own instruments. (Davy in Mellor 1989, 93)

The monster places himself in the linguistic lineage of this claim when he murders Frankenstein's younger brother William, mimicking the work of his creator and exulting in his perversely mimetic act when he stands over William's body and cries triumphantly, "I, too, can create desolation" (139). The act of the monster is a parody of the basis of Frankenstein's scientific impulse: claiming destruction as creation. Like the narrator in Wordsworth's "The Tables Turned," who writes that "our meddling intellect/Mis-shapes the beauteous forms of things:/We murder to dissect," the monster strips away the justifications of science and exposes Frankenstein's scientific impulse as a murderous impulse.

The collapse of creation into destruction obliterates the tension that is necessary to maintain the promise of the cyborg; when creation is equated with destruction, a new imperative is born. The promise of the cyborg dissolves into its opposite, the mono-

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[23] Evelyn Fox Keller, "Language and Ideology in Evolutionary Theory." The Boundaries of Humanity: Humans, Animals, Machines. Eds. James J. Sheehan and Morton Sosna. Berkeley: University of California Press, 1991: 85-102.

imperative of the anti-cyborg who is born out of scientific claims to power that disguise themselves as claims to objective knowledge.

In this chapter, I want to look at both the promises and the warnings written on the figure of Mary Shelley's cyborg. There are many, but I will focus on two. One of the **promises** of the cyborg rests in its ability simultaneously to occupy apparently conflicting standpoints. In Mary Shelley's work, I focus on the example of gender to demonstrate one of the ways in which Shelley's monster fulfills this condition through anticipating Donna Haraway's prediction of the cyborg as "a creature in a post-gender world" (1991 Simians, 150). The monster's **warning** is its own violence as the representation of a science that defines destruction as creation. By the time the monster reaches the end of this journey, it has learned to mimic the scientific imperatives out of which it was born, those imperatives outlined by Professor Waldman for his student Frankenstein: "Penetrate into the recesses of nature ... command the thunders of heaven, mimic the earthquake, and even mock the invisible world with its own shadows" (42). This metaphor of science as violent conquest is adopted by the monster, as he "mocks" Frankenstein with the shadows of Frankenstein's own destructive scientific hubris: the monster too can "create desolation."

Cyborg as Hybrid

In the work of theorists such as Donna Haraway, Rosi Braidotti, and Claudia Springer, the figure of the cyborg is defined as a postmodern figure of hybridity in which identity is no longer fixed. But the qualities that mark the postmodern cyborg are also evident in the figure of Shelley's monster and in romanticism's challenges to eighteenth-century notions of the stability of identity. To suggest that romantic and postmodern figurations of identity are closely related may be disconcerting to traditional romanticists, but, as Jay Clayton has argued, both romanticism and postmodernism are "counter-Enlightenment discourses" (56). Romanticism and postmodernism both allow for the ability to admit

"being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason,"[24] that is, of being able to embrace irresolution as a productive state. Donna Haraway suggests that the ability to live in a state of "permanently partial identities and contradictory standpoints" is a marker of cyborg identity and is the hope for defeating essentialist visions: "The political struggle is to see from both perspectives at once because each reveals both dominations and possibilities unimaginable from the other vantage point. Single vision produces worse illusions than double vision" (Haraway 1991 Simians, 154). Like the cyborg, like Mary Shelley's monster, we may be unsure whether we are man or machine, but in romanticism/postmodernism, rather than demanding to know which we are, we may simply rephrase the question to ask what it means to exist in a boundary state between the two.

Bridging the Man-Machine Discontinuity

Bruce Mazlish is one of several commentators on technological theory who places the confrontation between man and machine within a historical continuum that begins in romanticism. Mazlish's thesis is that the fourth discontinuity, between humans and machines, like the three that preceded it—those of the discontinuities between human and universe (Copernicus), human and creation (Darwin), and human conscious and unconscious (Freud)—is now being elided. Mazlish calls the elimination of these first three discontinuities "the three historic smashings of the ego" (4), and says we are now in the midst of having our egos smashed yet again. In the first three cases, "humans are placed on a continuous spectrum in relation to the universe, to the rest of the animal kingdom, and to themselves. They are no longer discontinuous with the world around

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[24] John Keats, in a letter to brothers George and Thomas Keats [21,27 (?) December 1817]. "...It struck me, what quality went to form a Man of Achievement especially in Literature & which Shakespeare posessed [sic] so enormously—I mean Negative Capability, that is when man is capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason..." In Selected Poems and Letters by John Keats. Ed. Douglas Bush. Boston: Houghton Mifflin Company, 1959: 260-261.

them." When this happens, claims Mazlish, "the longings for a sense of 'connection' seen in the early nineteenth-century-romantics and all 'alienated' beings are, unexpectedly, partially fulfilled" (4).

If Mazlish is correct, we should not be surprised to find Mary Shelley's monster, a major figure of "connection" between man and machine, in the literature of Romanticism. I would, though, take issue with Mazlish's designation of the desire of the Romantics as the desire for "connection." I think this is an oversimplification of romantic desire. Rather than connection, we might view this man/machine association in the same light in which we view Blake's "contraries": that is, two states that cannot be entirely reconciled yet are dependent on one another. These contrary states must struggle with and correct one another in order for progression to occur. The progression of cyborg figures in literature, beginning—most articulately—with Shelley's cyborg, is the literary history of the attempted reconciliation of dependent contraries. The cyborg figure has particular resonance for women, since its hybrid identity offers a counter-myth to that of female essentialism. In straddling two worlds—whether human/machine, natural/unnatural, or male/female—the cyborg offers a potent alternative role model to women.

The figure of Shelley's monster therefore bridges the fourth discontinuity that Mazlish describes. The monster, constructed by Frankenstein in the belief that it would serve its creator willingly and gratefully, is construed by Frankenstein as a machine-like being, an automaton. But when it demands autonomy, it becomes a bridge figure between automaton and autonomous. At the same time, Shelley uses the figure of the monster as a mirror to reflect and magnify the flaws in the cultural technologies of the age: those of the familial system (Elizabeth, Justine, and Safie are all rescued from failed family systems, even as the monster's own "family system" has broken down), the judicial

system (Justine is wrongly punished for the sins of the father—Frankenstein—and his offspring, the monster),[25] and the economic system (without economic or social capital, Elizabeth, the De Laceys, and the monster are unable to support themselves).[26] This cyborg being thus wears the imprint of not only scientific technologies on his body, but the forces of various cultural technologies. Although the overlaps between physical and cultural technologies—the systemic nature of technology—are only beginning to be explored here by Shelley, she sets up the possibility for some provocative readings of the way in which the monster not only condemns the hubris of the scientific justifications employed by his creator, but extends that condemnation to include the twisted justifications employed by those who hold most of the power of the family, courts, or economy in their hands.

The major systems, therefore, that I see written on the body of the monster from the moment of his birth, and echoed in the bodies around him—bodies physical, cultural, political, and economic—are the systems of gender, science, law, economics, and family. Within each of these physical and cultural technologies, the monster occupies boundary status: he represents both male and female, rational science and alchemy, he is criminal

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[25] Elizabeth, in fact, is explicit about identifying the body of the judicial system as monstrous; after the death of Justine, she remarks about the judicial system to Frankenstein: "Men appear to me as monsters thirsting for each other's blood" (88). The body of the monster and the body of the judicial system are both identified as monstrous.

Of this connection, Judith Halberstam writes: "Monster seeps into the category of man as justice miscarries and misery comes home. It is the human that falls into doubt at this crucial moment; it is the human that seems to be a patchwork of morality, criminality, subterfuge, and domesticity, and one which barely holds together" (37-38).

[26] The monster articulates these failures specifically when he learns of society's methods of measuring "the man" after becoming acquainted with Volney's Ruins of Empires. He owns none of the requisite portfolio of "humanity": "I learned that the possessions most esteemed by your fellow-creatures were, high and unsullied descent united with riches. A man might be respected with only one of these acquisitions; but without either he was considered, except in very rare instances, as a vagabond and a slave, doomed to waste his powers for the profit of the chosen few. And what was I? Of my creation and creator I was absolutely ignorant; but I knew that I possessed no money, no friends, no kind of property" (115).

and judge, slave and master, maker and destroyer, and—as I will argue—groom and bride. Several markers of postmodern cyborg identity are present in the figure of Shelley's monster, in particular in the monster's ability simultaneously to occupy conflicting spaces of figuration and conflicting identities. That ability—rooted in romanticism—prefigures our own postmodern preoccupations with unstable senses of self. In later literary constructions of the cyborg, the romantic focus on individual experience—Keats' "egotistical sublime"—in which the importance of the cyborg character is measured primarily in personal terms (in his own and in Frankenstein's experiences) shifts to a focus on how the cyborg destabilizes individual and social identity. While Frankenstein's monster is an early version of the cyborg, it is limited by its role: to provide a specific meditation on the hubristic failings of man, a meditation that assumes that there *is* a true, or real, man. Later cyborgs come closer to a postmodern function: their very existence points to the absence of any fixed center.

Scientific and Artistic Invention

The Romantic period is a fruitful place for the birth of the cyborg because of the debate that was taking place among poets and artists of the period about the nature of invention, specifically artistic and literary invention. M.H. Abrams outlines this debate in The Mirror and the Lamp, in which he points out how metaphors of science and technology often become the metaphors we use in describing our creative faculties. Abrams traces the shift in metaphors from a mechanical model of aesthetics in the eighteenth century to an organic model during the Romantic period. While the eighteenth-century mechanical model focused on imagination as defined by associated images brought together via their similarities and then tempered by judgment, in the early nineteenth century, critics, led primarily by Coleridge, drew a distinction between fancy—the mechanical model—which echoed the eighteenth century notion of imagination, and secondary imagination, which was defined by Coleridge as ruled by an organic model. Coleridge, says Abrams,

saw fancy as images joined through "brick and mortar," whereas the organic model of imagination was "permeative," a "blending, fusing power" (Abrams 169). The Romantics, led by Coleridge, insisted that the higher faculties, such as the imagination, were governed not by mechanical laws but were in themselves "essentially vital" (Coleridge in Abrams 168). Because of this shift in notions of creativity, the Romantics were able to make an argument for evolved rather than determined order in imagination; the organic model allowed for fluctuation, response, change, and associations that were blended and not simply juxtaposed. Like the relationship between the human and non-human elements of the cyborg, the relationship between the artist and the artist's creation becomes symbiotic rather than simply partnered, organic rather than mechanical.

When our relationships with our creations are blended, fused, permeative, and organic, as the above synopsis suggests, the boundary between creator and created becomes obscured. Creator/created, mortal/immortal, natural/artificial: the old binaries no longer hold when we are cyborg constructions; all are complicated when we are a tangled network of human and machine.

Systems of Gender and Science

Although Shelley's monster is marked by several systems, here I plan to focus on two major systems, both of which contain seemingly polarized elements: gender and science. In the pages that follow, I will argue that gendered polarities of male and female mark the body of the monster, as do the scientific polarities of rational and alchemical sciences, though the polarities enact and resolve themselves to different ends. The conflicting markers of gender maintain their tension throughout the novel, and I would argue that it is because of this irresolution that the monster's threat is never perceived as a sexual threat. Unlike a figure such as Caliban, who is expelled from Prospero's household when he attempts to seduce Miranda, Frankenstein's monster never suggests a desire to people "this isle with Calibans" (1.2.351-52), a colonial or, sometimes, anti- colonial, tactic of

population development that is predicated upon male sexual power. The threat of male sexuality is diffused in the monster at least in part by his hybrid status as both male and female. The threat of the monster as scientific offspring, on the other hand, is foregrounded by the collapse of the sustained dualisms of rational and alchemical postures toward scientific discovery into a singular drive to power. Frankenstein claims to reject the alchemical model and embrace a natural or rational model in its stead. Yet the former model had captured his imagination because its "masters of the science sought immortality and power; such views ... were grand," and he finds he cannot embrace the new science with the same ardor, because it requires him "to exchange chimeras of boundless grandeur for realities of little worth" (41). Only when his teacher at Ingolstodt, M. Waldman, promises that the "modern masters" may indeed perform "miracles" through their acquisition of "new and almost unlimited powers" (42), does Frankenstein find that he can wholeheartedly accept the new science as a science of value. Indeed, he can accept it because it has now been defined as having nearly the same goals as the science he claims to have rejected. But singular vision is dangerous vision. Once Frankenstein realizes that the natural sciences were not limited "to the annihilation of those visions on which [his] interest in science was chiefly founded" (41), but actually provided a different pathway to the accomplishment of those same visions, he "loses all soul or sensation but for this one pursuit" (50). The monster is born out of a monomaniacal impulse that disallows balance, competing visions, or multiple viewpoints. He is born out of a singular obsession with power, and that is the warning he carries on his body.

Physically male; culturally female. The body of the monster is identified as male, and he specifically asks Frankenstein for a female mate. So when I refer to female markers on the body of the monster, where am I seeing such markers?

The monster is culturally coded as female through several literary, cultural, and biographical associations, associations I will mention briefly here, then go on to develop in greater detail. Starting with Gilbert and Gubar, the figure of the monster has been extensively discussed by critics as an Eve figure predicated upon Milton's Eve. Chris Baldick and Joyce Carol Oates also point to similarities in the birth and self-discovery scenes of Eve and the monster, as does Margaret Homans.[27] The figures of Frankenstein and his monster also fluctuate between statuses as desiring and desired figures, leaving the gendered coding of both figures open to debate.[28] In addition, the identification of the monster as deviant, defiant, and out-of-control, is a similar identification to that attached to women writers of the period, including Mary Shelley's mother.

My purpose here is not to reconcile these variant readings of the monster's body being inflected as female, nor is my purpose to argue for the prioritizing of any of these readings. Rather, I am suggesting that, in creating the body of the monster as physically male but culturally female, Shelley's creation anticipates both the disruption of traditional sexualized birth processes in the birth of the cyborg and the ambivalent gendering of the cyborg itself.

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[27] Sandra Gilbert and Susan Gubar, The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination. New Haven and London: Yale University Press, 1984: 230, 235-244. Joyce Carol Oates. "Frankenstein's Fallen Angel." Critical Inquiry 10 (1984): 547. Margaret Homans. "Bearing Demons: Frankenstein's Circumvention of the Maternal." Bearing the Word: Language and Experience in Nineteenth Century Women's Writing. Chicago and London: University of Chicago Press, 1986: 100-119, esp. pp. 104-108.

[28] For discussions of the shifting erotic tensions between creator and created in Frankenstein, see Eve Kosofsky Sedgwick's Between Men: English Literature and Male Homosocial Desire. Rosemary Jackson, in Fantasy: The Literature of Subversion, identifies the relationship as an "exclusive" attraction based on "love-hatred": "They have no existence apart from one another" (100). Her identification is based more on the erotics of psychology than it is on the erotics of sexuality.

Literary markings. One way in which gender is blurred in the monster is via the literary texts echoed in the monster's actions and motivations. During the time the monster is living in the hovel attached to the home of the DeLaceys, he finds a "leathern portmanteau" on the ground containing several works: "Paradise Lost, a volume of Plutarch's Lives, and the Sorrows of Werther" (123). Of the three texts, the monster identifies most closely with Milton's Paradise Lost, allying his own situation with that of Adam and also noting the places in which that alliance breaks down:

> I often referred the several situations, as their similarity struck me, to my own. Like Adam, I was created apparently united by no link to any other being in existence; but his state was far different from mine in every other respect. He had come forth from the hands of God a perfect creature, happy and prosperous, guarded by the especial care of his Creator; he was allowed to converse with, and acquire knowledge from beings of a superior nature: but I was wretched, helpless, and alone. Many times I considered Satan as the fitter emblem of my condition; for often, like him, when I viewed the bliss of my protectors, the bitter gall of envy rose within me. (125)

The monster identifies with the characters of Adam and Satan from Paradise Lost, but his position in relation to his maker and the other characters of the novel suggests another possibility: the monster as Eve.

In Paradise Lost, Eve is created in the image of Adam, but she is an image "inferior, in the mind" to Adam and farther also from a physical resemblance to God than is Adam: "In outward also her resembling less/ His image who made both, and less expressing/ The character of that Dominion giv'n / O'er other creatures" (Book VIII; ll. 540-546). Like the monster in Shelley's novel, whose being is "a filthy type" of his maker's, Eve is a lesser version of Adam, a version therefore, as Sandra Gilbert and Susan Gubar point out, that is "monstrous, vile, degraded," that is a "second-comer" (240).

The monster in Frankenstein defines his monstrosity as located in his "resemblance" to Frankenstein, a resemblance that renders his being even "more horrid" because it is "a filthy type" of Frankenstein's (126). When the monster first sees his own

reflection in the water, he says, "I started back, unable to believe it was indeed I who was reflected in the mirror" (109). His appearance startles him, and he does not at first associate the image in the pool with himself. In Milton's telling, Eve performs the same action: when she first awakens after her creation, she finds a smooth expanse of water: "As I bent down to look, just opposite,/ A Shape within the wat'ry gleam appear'd/ Bending to look on me, I started back" (Book IV; ll. 460-462).

The monster is dismayed to find that his own reflection does not echo the more "perfect forms" of the De Lacey's, the family he has been secretly observing, and so recognizes through reflected imagery his difference. His true form, his original form, is something he can not hope to become. And Eve, after first admiring her own image (unlike the monster, her own image is the first human she sees), is told by God that her true image is not the one she sees in the pool, but is located in another—in Adam, "Hee/ whose image thou art" (Book IV; ll. 471-2).[29] In the wonderful moment in Paradise Lost in which Eve first sees Adam, she describes how she had admired Adam's form, but decided the person she had seen in the pool was preferable and so turned to leave: "I espi'd thee, fair indeed and tall,/ Under a Platan, yet methought less fair,/ Less winning soft, less amiably mild, / Than that smooth wat'ry image; back I turn'd" (Book IV; ll. 477-480). Like the monster, Eve realizes that the form upon which she is modeled is a form she can never become; both the monster and Eve are clearly identified as sub-standard versions of their prototypes.

Biographical markings. In addition to the literary connections with the Eve of Paradise Lost which mark the monster as culturally female, the monster also conjures up connections with Shelley's mother, Mary Wollstonecraft. Shelley read or reread the entire available body of her mother's works in the years 1814-1816. Included in this body

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[29] Margaret Homans discusses this connection in much more detail in Bearing the Word, pp. 103-105.

of works was Godwin's Memoirs of the author of A Vindication of the Rights of Women (1798). Mary and Percy read these memoirs together shortly after their elopement, as they traveled through Europe in 1814.

When the memoirs were first published by Godwin, the reaction to his revelations confirmed to many that Mary Wollstonecraft had been an unnatural woman. Her suggestion that she form a threesome with the painter Henry Fuseli and his wife, her attempted suicides after her affair with Gilbert Imlay, her illegitimate child, her premarital sex with Godwin, as well as her political stances, all served to mark her as a woman who was not a true or real woman.[30] Anne Mellor also underscores the pain it caused for Shelley to know that, after the publication of the Memoirs, her mother had been denounced as a "revolutionary, atheist, and whore" (Mellor 1989, 210). Godwin's disclosures, says Mellor, "made it impossible for a respectableEnglish woman openly to associate herself with Mary Wollstonecraft's feminist views" (3). The mother, a heroine for a time among certain literary and feminist groups, became a figure of disgust and horror. The monster of Shelley's novel had "dreams of virtue, of fame, of enjoyment," and "was nourished with high thoughts of honor and devotion," (219) and perhaps Shelley had these same dreams for her mother and herself. Instead, the mother, like the monster, ends "spurn[ed]" and "hate[d]" (95).

Cultural markings. One of the dreams Frankenstein originally has in relation to the creation of his monster is that he will father a new race: "A new species would bless me as its creator and source; many excellent and happy natures would owe their being to me. No father could claim the gratitude of his child so completely as I should deserve their's" (49). It is clear that Frankenstein originally intends to create many beings, and his comment that he will be the father of them all suggests that he intends to maintain control

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[30] Baldick goes so far as to say that her life had marked her in the eyes of the public as "monstrous" (38).

over the procreative process. But when the monster asks for a mate, Frankenstein imagines the results, the same results he himself had planned, but now under the control of the monster: "One of the first results of those sympathies for which the dæmon thirsted would be children, and a race of devils would be propagated upon the earth" (163). The monster never mentions a desire to propagate; he is only concerned to have a sympathetic companion. The monster's desire to reproduce himself is assumed by Frankenstein, and in the scientist's mind, the "excellent and happy" natures created by him become a "race of devils" when created by the monster. I may be forwardly rash here, but this scenario is uncomfortably reminiscent of present day arguments of who should control women's reproductive choices: like women who try to maintain control over their own reproductive processes, only to be refused this control, Frankenstein imagines the monster asking for authority in his own reproduction. This imagined request, not articulated by the monster but anticipated by the scientist, is refused even before it is requested. Authorship and creation are still marked as male provenances, and when a woman asks to control this area of her life, she is inscribed as monstrous.

The "authorship" of a child, whether that child be organic or literary, was elided by Shelley herself in her reference to her "hideous progeny," monster and book, in the preface to the 1831 edition. This deliberate elision may have several sources, but certainly one possible contributing vein is in the visit by Monk Lewis to Byron in August of 1816, two months after Mary Shelley began her story. This is during the period that Byron was at Villa Diodati on Lake Geneva and the Shelleys had a house just a short walk away. Lewis, Byron, Byron's physician and companion Polidori, Mary Shelley's stepsister Claire, and the Shelleys spent a fair amount of time together, and were entertained by Lewis's conversations and stories, some of which are recorded in Feldman and Scott-Kilvert's edition of Mary Shelley's journal.

Not recorded in the journal are Shelley's impressions of Lewis, but we can imagine Lewis's impressions of Shelley based on his response to his own mother's

writings. Laurie Langbauer relates an anecdote from Margaret Oliphant's The Literary History of England (1882), in which Mrs. Oliphant reports on Lewis's reaction when he is told that his mother has written a novel and intends to publish it:

> The family history of the Lewises was ... disturbed by an incident which plunged them into unimaginable terror.... [The mother] wrote a novel! When this terrible fact was known, her son with a panic almost beyond words, rushed to pen and ink to implore her to suppress it. (Oliphant in Langbauer 208)

Lewis, says Langbauer, lists for his mother the events that publication of her novel would precipitate: "his father would be shattered, his unmarried sister left an old maid, his married sister disgraced in her husband's family, and Lewis himself would have to flee to the continent." In his letter to his mother he writes, "I always consider a female author as a sort of half-man" (Langbauer 208).

Shelley, who, at the time of Lewis's visit, was already well started on her own novel, may have picked up on Lewis's attitudes toward female authorship. Certainly his ghost stories of figures who return from death to haunt their former friends and lovers influenced her thinking. Therefore it is not inconceivable that his collection of views of female authors as hybrid characters who were monstrous half-breeds that were neither male nor female, who were destroyers of the family unit, and who drove their families to despair and flight, well, the description of women who want to author begins to sound strangely reminiscent of the description of the monster who wants to control his own ability to author his offspring.

So Shelley's monster is culturally inscribed as female through its literary association with Milton's Eve, through its association with the public reaction to Shelley's own "authoring" mother and other mothers who might want to "author," and through Frankenstein's imagined demand of the monster to author itself.

Marks of desire. In addition to its literary markings, the monster is also erotically inscribed by the force and direction of its desire and by Frankenstein's desire

for him. Eve Kosofsky Sedgwick and Judith Halberstam, among others, have suggested that the attractions between Frankenstein and Walton, Frankenstein and Clerval, and Frankenstein and the monster, can be read as a homosocial bonding. Sedgwick in particular reads such attraction as a coding for the kind of homosociality upon which patriarchal power is predicated (Sedgwick 114-115). Certainly the forms and levels of desire in this novel are complex: Walton describes Frankenstein to his sister Margaret in such passionate terms that he tells her he fears she will "laugh at the enthusiasm I express concerning this divine wanderer" (24). Frankenstein, in turn, tells Walton that he understands this desire because he too once had such a friend; the context in which Frankenstein says this appears to refer to Clerval (23).

I agree that the above readings of Frankenstein and his concomitant male relationships as homosocial are part of the novel's dynamics. But my argument about the monster as cyborg is specifically that he resists <u>any</u> fixed definition; in his status as a hybrid figure who straddles multiple and conflicting positions, he can be a figure in a pageant of male homosocial desire and <u>also</u> represent the desired and desiring female. Halberstam's reading of the novel, like my reading of the monster, focuses on the novel's ability to occupy several levels of meaning simultaneously. Halberstam argues, in fact, that critics' attempts "to narrow the scope of monstrosity in <u>Frankenstein</u> ... tend to exclude or de-emphasize the monster's status as hybrid in favor of specific class- or gender-inflected readings. In any attempt to fix monstrosity, some aspect of it escapes unread" (29). It is the very interpretive instability of the novel, in fact, that "generates the infinite interpretability of the monster" (31). With this then in mind, I'd like to look at several of the passages in which the monster can be figured as the object of Frankenstein's desire for the suppliant and ideal female.

In the period just preceding and during the creation of the monster, Frankenstein exhibits emotions and physical responses that can easily be read as sexual desire. Like an erotic fixation, the emotions Frankenstein describes as he constructs the monster allow

for no other emotion or concern than the ones that spur him to complete his task: "With unrelaxed and breathless eagerness, I pursued nature to her hiding places" (49); "a resistless, and almost frantic impulse, urged me forward; I seemed to have lost all soul or sensation but for this one pursuit" (49-50); "every night I was oppressed by a slow fever, and I became nervous to a most painful degree; [my voice became broken, my trembling hands almost refused to accomplish their task; I became as timid as a love-sick girl, and alternate tremor and passionate ardour took the place of wholesome sensation and regulated ambition]" (51);[31] "I ... desired it with an ardour that far exceeded moderation" (52). Although Frankenstein himself describes this fixation as an unhealthy "pursuit of knowledge" (51), the language is also reminiscent of an obsessive sexual desire for the other. In the conventions of romantic love, the one pursued and desired is coded as female.

In addition, the moment in which the monster is brought to life is sexually coded as the prone figure of the monster is stretched out at Frankenstein's feet, awaiting Frankenstein to "infuse a spark of being." Once "infused," the creature "breathed hard, and a convulsive motion agitated its limbs" (52). Penetrated and orgasmically awakened, the creature breathed hard, and the eyelids of the heretofore passive creature fluttered, then opened.

Finally, Frankenstein, who has managed to avoid a commitment to Elizabeth through several years of travel, study, illness, and more, does at last commit to the marriage. He does this after he has destroyed the female mate he was engaged in building for the monster; as a result of this destruction, the monster appears to Frankenstein and vows: "I shall be with you on your wedding night" (166). Frankenstein assumes this means the monster will try to kill him on that night. But the interesting point here is that

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[31] In James Rieger's edition of the 1818 text, he indicates additions made by Mary Shelley in the 1823 Thomas text in square brackets, brackets I have retained here.

Frankenstein, almost unbelievably naively, does not appear to make a connection between his own act of destruction of the monster's mate and an equivalent act of retribution on the part of the monster: the destruction of Frankenstein's mate. Instead, Frankenstein assumes that the monster wants him. Frankenstein constructs himself as the object of the monster's desire, in this case, of the monster's desire to kill.

The people whom the monster kills in this novel are all people with whom Frankenstein has an intimate connection. Through each of the deaths, the monster intimates his own connection with Frankenstein. The monster apparently believes William to be Frankenstein's son, and kills him. He, the monster, after all, is the son whom Frankenstein has rejected, and in the killing of William, the monster destroys competing claims of sonship. The monster murders Clerval, Frankenstein's closest friend, shortly after Frankenstein has destroyed the monster's potential mate, the being with whom the monster would have "the interchange of those sympathies necessary for my being" (140). These are very similar terms to those used by Walton to describe his own desire for a friend: "I desire the company of a man who could sympathize with me" (13). Frankenstein himself describes his feelings for Clerval as mutual sympathy: "His soul overflowed with ardent affections, and his friendship was of that devoted and wondrous nature that the worldly-minded teach us to look for only in the imagination" (154). So when the monster murders Clerval, he murders the man who occupies the position the monster desires for himself: beloved and sympathetic friend. Both murders establish a pattern of the monster destroying those in relation to Frankenstein who claim positions and sympathies the monster asserts for himself.

With the murder of Elizabeth, the monster simply continues the pattern: to "be with" Frankenstein on his wedding night is, on one level, a cultural space the monster believes should be reserved for him. When Frankenstein chooses another to occupy this position, the monster destroys her.

The monster's ploy is successful. With this final murder, the monster insures Frankenstein's unwavering attention to himself, and the remainder of their story together is of, truly, the monster being passionately and profoundly pursued by a now very ardent Frankenstein.

One of the boundaries that the cyborg interrogates is the boundary of gender, pressing on and questioning the qualities that we use to define a being as male or female. My main argument for the gendering of Mary Shelley's monster is that it also calls into question the culturally and biologically constructed roles of male and female. This is one of the promises of the cyborg: that it reveals as artificial those boundaries we have insisted on defining as natural.

Science as Culturally Constructed

In the above pages, I have focused primarily on the ways in which the figure of the monster is a hybrid figure of gender. The mechanisms used to accomplish this blurring of gender, at least the mechanisms I've discussed thus far, are the text's appeals to biographical, literary, and historical precedents. But as I mentioned at the start of this chapter, the cyborg exists within multiple boundaried spaces, including those of gender and science. As much as Shelley's monster promises possibility in its entertainment of multiple categories of gender, it warns of the danger when multiplicity collapses into singularity. One example of this collapse is in the monster's figuration as a representative of the science out of which he is created, a science that is presented primarily as competitive and destructive in its nature.

Mystical and rational scientific models. The two prevailing models of science on which Frankenstein appears to draw are rational models of science (associated in the text or in Shelley's journals and letters with names such as Darwin, Davy, and Galvani) and mystical—alchemical or magical—models (associated in the text with

names such as Cornelius Agrippa, Albertus Magnus, and Paracelsus). Critics Radu Florescu and James Rieger both locate Mary Shelley's science firmly in the realm of the alchemical. Rieger calls Frankenstein "switched-on magic, souped-up alchemy" and says that Frankenstein himself is a "criminal magician" (xxvii) while Florescu says that the monster is "more the child of the alchemists and occultists than of the scientists" (234). Samuel Vasbinder though makes a strong argument for the role of "the new science and its methods" as the inspiration for Frankenstein (65), and Anne Mellor says that "Mary Shelley based Victor Frankenstein's attempt to create a new species from dead organic matter through the use of chemistry and electricity on the most advanced scientific research of the early nineteenth century" (1989, 107).

Magical rationalism. Perhaps though, the monster (and the novel) begins as a hybrid, a cyborg collusion, of both models.Fred Botting, in Making Monstrous: *Frankenstein*, Criticism, Theory, drawing on the terminology of Milton Mays, calls Frankenstein a "bastardized mixture" of rational science and mysticism (Botting 165). The term "bastardized mixture" is particularly appropriate since the monster is himself a bastard in the sense of being born "illegitimately" and also a bastard in the sense of his multiple and untraceable origins (the multiple bodies out of which he is created). At the time Mary Shelley was writing Frankenstein, the lines between alchemical and rational science were not firmly designated. Science, in fact even the most "rational" of sciences, was dressed for its popular audience in the robes of magic, as I shall discuss. While those in the scientific community claimed distinctions between the two forms, those who were onlookers to scientific research were persuaded more by the popular presentations of science in which the boundaries were less fixed. My argument is that Mary Shelley's monster is constructed in such a way that the flaws of both forms of science are clearly visible on the physical and cultural bodies of the monster. In the same way the monster blurs the boundaries of gender so that male and female bleed into one another, he begins

by blurring and finishes by collapsing the boundaries of mystic and rational sciences so that we—as readers of the monster—can not be sure where mysticism ends and (claims to) rationalism begins. In fact, the claim that the rationality and objectivity of the "natural" sciences operate as a counter to the superstition of the alchemical sciences is itself exposed as a myth when we look closely at the two sets of claims and realize they are driven by nearly identical models of power. The methodology may differ, but the impetus remains the same. This reinforcement of each other's drive defeats the possibility for difference and, instead, intensifies a hegemonic approach to the sciences. The collusion between alchemical and rational sciences, inscribed on the body of the monster, can be viewed as a mirror of science's own public presentation of this partnership. Science sold better in the guise of the thrills and chills of magic than it did as the product of men who "dabble in dirt," as Frankenstein's Professor Krempe describes the work of science to him (42). At least one "magical" scientist with whom Shelley came into contact was Andre Garnerin.

In her journal for December 28, 1814, two years before she started writing Frankenstein, Mary Shelley noted that she had attended "Garnerin's Lecture on electricity, the gasses, and the phantasmagoria" (Jones 1947, 31). Garnerin's advertisement for this lecture in the London Times states specifically that he will be performing experiments at this lecture.[32] Such lectures were quite popular at the time:

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[32] Garnerin, the lecturer whose talk and presumably demonstration Shelley attended, is not fully identified in her journal. Paula Feldman and Diana Scott-Kilvert, the editors of The Journals of Mary Shelley, identify him as Andre-Jacques Garnerin (1770-1823), a balloonist, parachutist (he made the first recorded parachute jump in 1797), and experimenter, in some sources listed as a physicist. The lecture Mary Shelley attended was advertised on page one in the Times of London on Tuesday, December 27 1814 in the following notice:

> Theatre of Grand Philosophical Recreations. The Professor Garnerin has the honour to inform the Nobility and Gentry that in consequence of his engagements at Covent-Gardens, his theatre will be open this week, Wednesday, Friday, and Saturday, and he hopes to merit the approbation of his numerous visitors, by his new experiments on the Electricity, Gas Aeretation, Fantasmagoria, & c. The performance begins at 7 o'clock. Spring-gardens room.

> The 19th century was the heyday of popular scientific lecture demonstrations carried out in large lecture halls for the benefit of a diverse public.... First among the organizations fostering such lectures was London's Royal Institution (RI) of Great Britain. Founded as a center for the popularization of the "mechanical arts" in 1799 ..., the RI is described by Sir John Meurig Thomas, a former director, as England's "oldest repertory theatre of science" and "the foremost repertory theatre for the popularization of science in the world." When the balcony is full, its lecture hall ... accommodates more than 400 persons. (Kaufman 228)

At these demonstrations, the line between science and magic was often blurred: "During the second half of the 18th century, grand lectures primarily for show were accompanied by bombastic experiments, and natural scientists served as magicians and entertainers at court functions. By the century's end scientific demonstrations had developed into theatrical events" (Kaufman 227).

A demonstration of electrical sparks was a standard part of public lectures relating to electricity. Demonstrations of Alessandro Volta's "volta Battery" or "volta pile" was especially theatrical; it produced a large spark when electricity was "generated in a battery of plates of dissimilar metals in the presence of an alkaline, saline, or acid electrolyte" (Jarvis 178). In his history of electricity, C. Mackechnie Jarvis writes that this electric arc was a stock feature at public lectures from 1809 on. Since Garnerin's

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Garnerin's "engagement" at Covent-Garden may have been as the constructor and operator of a special-effect balloon that was part of a performance of "Harlequin Whittington" at Covent Gardens. In the same issue of the Times that contained Garnerin's announcement of his lecture, the harlequin performance was panned by the critic who reviewed it, but the reviewer did comment on the character of the balloon:

> But if there was not much to please the audience, there was a good deal to surprise them. In the first place a balloon ascended from the stage, and after losing itself in those mysterious regions sacred to the magazines of theatric thunder and lightning, descended through an aperture in the middle of the roof of the house, and moving over the heads of the upstaring and half-startled pit, rested once more on the place from which it rose. A child was in the car.

lecture included discussion and demonstrations of electrical effects, it's quite probable that the lecture Shelley attended contained such a demonstration.[33]

Such manipulations of science for fantastic effects are phenomena commented upon by Carolyn Marvin when she points out that "experts and showmen joined in various marriages of convenience to capitalize on the entertainment value of magic and the respect accorded it by the uninitiated. By using a magical framework of astonishing effects to present the latest scientific and technological achievements, experts hoped to win over their audiences and persuade them that experts made the best magic of all" (Marvin 143). Certainly Garnerin's simultaneous work in science and theatre underscores the premise of a marriage between "experts and showmen," here in a single man.

Scientific experts as magicians; magicians as scientific experts. In the popular imagination then, the two were blurred. Were they this blurred in Shelley's novel? At first, it seems, no. The young Frankenstein, upon witnessing scientific experiments on an air-pump (34) and on an electrical machine (35) (both experiments likely to have been presented in lecture-halls such as the Royal Institution and which Shelley may have witnessed there or in similar public lectures), claims that the influence of his former masters has now been completely overthrown and he has become a convert to the new science: "This last stroke completed the overthrow of Cornelius Agrippa, Albertus Magnus, and Paracelsus, who had so long reigned the lords of my imagination" (35). But Frankenstein admits that he is in search of a system, and, though he'd previously had his doubts about these lords of his imagination, was reluctant to surrender them until he

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[33] Mary Shelley was pregnant at the time and quite ill, so was unable to attend further lectures in Garnerin's series. Percy Bysshe Shelley did attend later lectures though, with Claire Clairemont, and Mary Shelley quite probably heard second-hand accounts of demonstrations she herself did not witness.

could find something better in which to believe: "I could not entirely throw them aside, before some other system should occupy their place in my mind" (34-35). The new sciences evidenced through the demonstrations he has witnessed are appealing, but for many years Frankenstein has no larger system in which to place these, apparently, isolated events. He finds it when he goes to the University of Ingolstadt.

Natural philosophy and electric galvanism. Frankenstein's new professors do not suggest a specific list of names to replace those that Frankenstein had been studying, but they do suggest a new system. Krempe suggests that Frankenstein study "natural philosophy" (43). The term "natural philosophy," at the time, indicated a movement away from a mechanical to an organic world view; it "attempted to unify the sciences, both physical and biological, by providing an organic basis for all of the sciences" (Channel 60). Although the adherents of natural philosophy were not united in their views, many, spurred by the writings of scientists such as the German naturalist Lorenz Oken, viewed the connection between the physical (earth, stone, "inert" mass) and biological worlds as galvanic. Oken argued, for example, that if a voltaic pile of zinc and silver plates were electrified, it assumed "a level of vital activity.... If the galvanic process took place at every point in some material, that body would have a higher degree of self-activity and would become alive" (Channel 60). Inert matter thereby becomes active.

Although Oken defined the "galvanic force" in electrical terms, not all natural philosophers did. Even among those who did link galvanism with electricity, there were further divisions. The phenomenon of electricity in the nineteenth century was debated as a material force—a residual fluid-type substance held in physical bodies, or a spiritual force—an operative force such as gravity. In her preface to the 1831 edition, Shelley writes that "perhaps a corpse would be reanimated; galvanism had given token of such things" (Shelley “Introduction,” 227). Luigi Galvani, the person who is the namesake for the galvanism to which Shelley refers here, viewed the possibility of this type of

reanimation as a form of "animal electricity," an electricity inherent in the body and released through stimulation. Alessandro Volta, working in the same period, argued that what appeared as bodily reanimation was simply the effects of the body operating as a conductor between two electrical poles. Now, of course, we understand Volta's theory as closer to the truth, with the body's fluids functioning as a kind of electrolyte between two external poles, and the parts together performing something like a simple electrical cell. But in Shelley's time, "many scientists, especially physiologists, continued to accept Galvani's association between electricity and the vital principle" (Channel 56). Mary Shelley's scientist, in any case, aligns himself with those scientists who associate the life principle, the vital principle, with a form of vitalism that may be manipulated and directed: "I succeeded in discovering the cause of generation and life; nay, more, I became myself capable of bestowing animation upon lifeless matter" (47). Frankenstein's description of his discovery echoes contemporary understanding of galvanic principles. In one 1818 experiment, which was well reported in the press, the chemist Andrew Ure applied electricity to a recently executed criminal in Glasgow. In this instance, "the muscular contractions caused by electricity became so lifelike that ... [Ure] had the corpse's jugular vein cut to insure it would remain dead" (Channel 56-57). Whether the application of electricity interacted with and activated an ambient life-force (a view closer to Galvani's), or created a force (a view closer to Oken's), both schools of thought acknowledged the presence of a driving "life-force" that was either created, activated, or released via scientific method.

When Frankenstein claims that he has "overthrown" the influence of the scientific mystics and become a scientist ruled by rationalism, he may be precipitate. For the philosophy that frames the scientists upon whom he presumably bases his rationalism—scientists such as Humphry Davy, Luis Galvani, and the French naturalistComte de Buffon—is a direct descendant of the philosophy that framed the men he has "overthrown": Agrippa, Albertus Magnus, Paracelsus. These figures, whose beliefs

Frankenstein's professor Krempe describes as "exploded systems" and the men themselves as "musty" and "ancient" (40, 41), are the very figures who laid the foundation for the natural philosophy that Krempe urges Frankenstein to study.

Alchemystical/Natural philosophers. Agrippa was a philosopher and doctor (although his degree is somewhat unsure) who studied law, medicine, "magic sciences," and theology at the university at Cologne in the late 1400s and early 1500s; he served as an advisor to, among others, the queen-mother at the court of King Francis I in Lyons in 1524, where he was apparently also the court astrologer. At various times in his life he experimented with alchemical processes of producing gold ("Agrippa"). Albertus Magnus (born ~1200), who was canonized in 1931, was a teacher of Thomas Aquinas and the author of the Physica, an explanation of Aristotle's Physics. Albertus was known for arguing that faith and reason need not be polarized approaches to belief; he suggested instead that although some articles of belief could only be accepted through faith, others could be understood through both faith and reason. He also allowed that Aristotelian modes of thinking in a fairly rigorous experimentalism could coexist with more speculative modes of Neoplatonism ("Albertus Magnus"). Albertus Magnus was deemed a "master of magical sciences" and one story, repeated in several sources though usually qualified as speculation, is that Albertus Magnus built an automaton capable of speech and thought. According to the notes of Manly P. Hall at the "Philosophical Research Society," Albertus Magnus had experimented with creating life:

> The Android, as it was called, was composed of metals and unknown substances chosen according to the stars and endowed with spiritual qualities by magical formulae and invocations, and the labor upon it consumed over thirty years. [Albertus Magnus's student,] St. Thomas Aquinas, thinking the device to be a diabolical mechanism, destroyed it, thus frustrating the labor of a lifetime. In spite of this act, Albertus Magnus left to St. Thomas Aquinas his alchemical formulae, including (according to legend) the secret of the Philosopher's Stone. ("Albertus Magnus")

Paracelsus, a name that Theophrastus Bombastus von Hohenheim took for himself around 1516, indicated his own belief that his work was beyond the importance of even the first century Roman physician Celsus. His achievements were impressive: he developed treatments for syphilis using iodine, argued that the development of silicosis—miner's disease—came from inhaling metal vapors and not from vengeful mountain spirits that had been disturbed by mining practices, and anticipated modern homeopathic theories of medicine. Throughout, his work was framed by his belief that nature could heal if its own natural processes were supported and not hindered by medical practices (“Paracelsus”).

In all of these men whom Frankenstein reverenced, there is the drive of the Faustian overreacher, the man who wants to control the processes of life itself. Yet at the same time, all three men were advocates of close and careful observation as a crucial component of credible scientific practice. Frankenstein is attracted to these visionaries of science since their frameworks support his own. They are also, not coincidentally, the same names that stocked the shelves of another famous scientist in literature: Hawthorne's Aylmer in "The Birthmark," whose attempts to perfect the beauty of his wife result in her death. Aylmer, like Frankenstein or his professors, is identified as a "man of science, an eminent proficient in every branch of natural philosophy" (1021). During the period that his wife is confined in his laboratory as part of the treatment to remove her birthmark, she amuses herself by looking through Aylmer's books:

> In many dark old tomes she met with chapters full of romance and poetry. They were the works of philosophers of the middle ages, such as Albertus Magnus, Cornelius Agrippa, Paracelsus, and the famous friar who created the prophetic Brazen Head. All these antique naturalists stood in advance of their centuries, yet were imbued with some of their credulity, and therefore were believed, and perhaps imagined themselves to have acquired from the investigation of Nature a power above Nature, and from physics a sway over the natural world. (1028)

Hawthorne, like Shelley, suggests that the "natural" philosophers were keenly interested in, and believed themselves to be in alliance with, supernatural powers.

Rational alchemists. Shelley's contemporary, the chemist Humphry Davy, in theory a scientist as far removed from the realm of the alchemists as it was possible to be, still shared their desire to master the bases of life. In his A Discourse, Introductory to A Course of Lectures on Chemistry, Davy writes:

> For who would not be ambitious of becoming acquainted with the most profound secrets of nature; of ascertaining her hidden operations; and of exhibiting to men that system of knowledge which relates so intimately to their own physical and moral constitution? (Davy in Mellor 1989, 93)

Science, and the scientific impulse, writes Evelyn Fox Keller, is about "the urge to fathom the secrets of nature, and the collateral hope that, in fathoming the secrets of nature, we will fathom the ultimate secrets (and hence gain control) of our own mortality" (Fox Keller 1990, 177). Drawing on the findings of the scientists of his day, but, what is more important, driven by a desire to control the processes of life shared by both alchemists and scientists, Frankenstein seeks to control death by controlling birth. Implicit in the ability to control the birth process is the ability to control the death process. As much as Frankenstein was able to give birth to a new being, he was also able to resurrect many deceased beings (at least parts of those beings) from their deaths.

I earlier mentioned the influence of Waldman's definition of the new science as crucial to Frankenstein's ability to reconcile what had earlier appeared to be two variant models of science. Frankenstein's professors, Krempe and Waldman, both tell Frankenstein to avoid the old philosophers of science and instead to focus on natural philosophy, particularly on chemistry. From Krempe, Frankenstein rejects this advice, a rejection fueled at least in part by his dismissal of Krempe because he was "a little squat man, with a gruff voice and repulsive countenance" (41). His rejection of this professor, because of the professor's unfavorable demeanor, foreshadows Frankenstein's rejection of the monster. Waldman, on the other hand, a man whom Frankenstein describes as having "an aspect of the greatest benevolence" and with a "voice the sweetest [Frankenstein] had

ever heard" (42), offers the same advice and Frankenstein accepts it. This acceptance though is predicated upon the lecture Frankenstein has heard Waldman give earlier in the day, a lecture that defines the new scientists as men who

> have indeed performed miracles. They penetrate into the recesses of nature, and show how she works in her hiding places. They ascend into the heavens; they have discovered how the blood circulates, and the nature of the air we breathe. They have acquired new and almost unlimited powers; they can command the thunders of heaven, mimic the earthquake, and even mock the invisible world with its own shadows. (42)

Frankenstein departs "highly pleased" from this elucidation of the master role of the new scientist (42). Indeed, he should be pleased, since he has just been told that the new science is driven by the same model of the search for absolute power that drove the old science.

This, then, is the model that Frankenstein follows when he determines to create a new being from lifeless matter. His impulse, initially defined as the desire to "pour a torrent of light into a dark world" is elided into the desire to create "a new species" that will absolutely owe him "their being" and their "gratitude" (49). The benevolent and the tyrannical impulse are indistinguishable.

The elision of the impulse toward a creative salvation with the impulse toward a destructive colonization is also written on the body of the monster. The monster Frankenstein creates carries on it the simultaneous inscriptions of life and death. We are encumbered with the many visual readings of the monster's body provided by films, but, even in the novel, his body is imprinted with marks of the death from which he was born. Walton tells us that, upon first seeing the monster, he notices his hand: "One vast hand was extended, in color and apparent texture like that of a mummy" (216). Directly after the monster's creation, Frankenstein tells us, he is appalled by the monster's "shrivelled complexion, [and] straight black lips" (52); he refers to it as a "demoniacal corpse" and

says that "a mummy again endued with animation could not be so hideous as that wretch" (53).

The dream that immediately follows the creation of the monster, a dream that has engendered a large amount of critical speculation, has Frankenstein embracing his fiancée Elizabeth; as he embraces her, she turns into the corpse of his dead mother, complete with "grave-worms crawling in the folds of the flannel" shroud she wears (53). She is the woman who is both life and death, the counterimage to the figure Frankenstein has just created, the figure who is beyond birth and death. In the monster, the markers of the destruction of other bodies are the concomitant markers of the monster's own birth; the mummified hand, the shriveled complexion, and the straight black lips are simultaneously and paradoxically the markers of both death and birth, of destruction and creation. In the figure of the monster, the two impulses are elided, and the monster, in his cry of triumph after his murder of William, echoes and mocks Frankenstein's scientific pretensions: "I too can create desolation."

Cyborg Warnings/Cyborg Promises

This conflation of creation with desolation is, to my mind, the cautionary tale embedded in Shelley's monstrous progeny, her cyborg warning. As much as the blurring of boundaries and the entertainment of multiple subject positions offers promise and hope for defeating essentialist visions, if those positions are only superficially different but substantially the same, then the cyborg becomes an agent of essentialism and of a hegemonic construction of power.

The science that creates the monster promises the possibility of making more fluid our traditional fixed notions of gender. I am not suggesting that this was Mary Shelley's intention; instead, I am arguing that this is a natural outcome of the monstrous, cyborg character that inhabits a hybrid position. When the cyborg blurs the boundaries between man and machine, other hierarchizing boundaries, such as those between man and

woman, are also subject to challenge. At the same time, the monster warns of the dangers inherent in the science that has created it when that science is driven by a colonizing mentality, justified in its colonization because of the "natural" hierarchy that places man above all natural materials, material objects to be penetrated and mastered. Frankenstein's monster, whose existence initially signaled the possibility of birth without pain and without death, ends by becoming the sign for death. I would argue that the crucial turn for the monster occurs at the point when he decides to mimic perversely the actions of his scientist father through an act of creation that generates death rather than life. He produces this desolation through the murder of William, who may be, in the monster's mind, his own brother.

Unfamilial beings. One of the promises of the cyborg is that, since it is born without parents, it is extra-lineal and free from the burdens of previous history. Like the hierarchical boundaries it elides between man and machine, and between man and woman, the cyborg also bridges the boundary between parent and child. But when Frankenstein creates his monster, he creates it in the belief that it will be a creation in his lineal debt even more completely than would be a son to his father: "A new species would bless me as its creator and source.... No father could claim the gratitude of his child so completely as I should deserve their's" (49).

And the monster does very much see himself as the son, and more than son, of Frankenstein, and says as much to his creator:

> I am thy creature, and I will be even mild and docile to my natural lord and king, if thou wilt also perform thy part, the which thou owest me. Oh, Frankenstein, be not equitable to every other, and trample upon me alone, to whom thy justice, and even thy clemency and affection, is most due. Remember, that I am thy creature; I ought to be thy Adam; but I am rather the fallen angel, whom thou drivest from joy for no misdeed. (95)

The monster demands that he be accorded lineage. To assert his lineage, he imitates the father. And when he imitates the father, he mimics the motives and the mistakes of the scientist father. The father-scientist has seen his role as colonizing patriarch; the monster asserts his right to reproduce that role because he is his father's son:

> [Y]ou my creator, detest and spurn me, thy creature, to whom thou art bound by ties only dissoluble by the annihilation of one of us. (94)

When Frankenstein destroys the mate he has started to create for the monster, the monster retaliates by asserting his full lineal authority. But now he does it in the most extreme patriarchal expression of power: by calling Frankenstein his "slave" and demanding that he "obey" his "master":

> Slave, I before reasoned with you, but you have proved yourself unworthy of my condescension. Remember that I have power; you believe yourself miserable, but I can make you so wretched that the light of day will be hateful to you. You are my creator, but I am your master;--obey! (165)

The monster has already grotesquely parodied the role of the scientist by creating destruction; now he grotesquely parodies the role of the father by demanding that his slave obey him.

Conclusion

In her work on feminism and technology, Donna Haraway writes that the cyborg is without origins:

> The cyborg has no origin story in the Western sense.... An origin story in the 'Western', humanist sense depends on the myth of original unity, fullness, bliss and terror, represented by the phallic mother from whom all humans must separate, the task of individual development and history, the twin potent myths inscribed most powerfully for us in psychoanalysis and Marxism... The cyborg skips the step of original unity, of identification with nature in the Western sense. (1991 Simians, 150-151)

The cyborg is born outside of familial bonds, those myths of origin, separation, and reunion. Mary Shelley tries to insert her hybrid creation back into the Oedipal nightmare

and have it assert a familial position for itself when it is an unfamilial being. As much as Shelley is one of the major founding authors of cyborg identity, and as much as her creation adds to the composite figure of the cyborg as it continues to evolve in women's fiction, her cyborg misses the mark in this one critical manner: she imagines it as seeking its freedom within the patriarchal order, or, barring that, creating its own imitation of that order. But the cyborg is not about asserting a place in the given order; the cyborg is about creating new orders, new familial structures.

It remained for women writers of the future to imagine a cyborg creation that did not attempt to reconstruct itself within an origin-separation-reunion myth and was instead able to maintain the promise of creating forms of community that were not dependent on mythological structures. Charlotte Perkins Gilman's women of Herland, C.L. Moore's technologically reconstructed being in "No Woman Born," Joanna Russ's women of Whileaway in The Female Man, Marge Piercy's women and men of Mattapoisett in Woman on the Edge of Time, Octavia Butler's interbred species in her Xenogenesis Trilogy, and others have offered models of cyborged women and men who escape from the Oedipal nightmare of Frankenstein's monster. Yet, at the same time, these writers owe a debt to Shelley, since the characters they create are often modified versions of the cyborg introduced by her. These writers' characters—often ungendered, often scientifically or technologically modified, often pitted against a hostile and hierarchically organized social system that is threatened by their unfixability within that system—echo the themes and forms that Shelley made famous. In a distinctly uncyborglike fashion, they are the descendants of Shelley's "hideous progeny" and have generously and faithfully fulfilled her bidding that it "go forth and prosper."

CHAPTER THREE

The Ultimate Fit: Science-Shaped Women in Charlotte Perkins Gilman's Herland

Over time, the cyborg figure in women's literature becomes increasingly complex as it incorporates elements that reflect the anxieties of its contemporary cultural contexts. Mary Shelley's cyborg argues against the biological imperative by blurring the gendered roles of reproduction; in this way, the figure of the creature challenges cultural boundaries of mother as female/nature and of father as male/science. At the same time, though, the self-destruction of the monster and the destruction of all those associated with it underscore the problems that emerge when science is treated as a power that has the right to drive and master nature. When those who seek control over production and reproduction are motivated primarily by an impetus to power rather than an impetus to nurture, then reproduction yields only monstrous children, unbalanced and imperfect cyborg creations, as in Frankenstein. But later writers suggest that if the science that gives birth exists within a feminine framework, then the children born from that union could be a balance of both powers: the scientific impetus and the cultural shaping. The

cyborg children born to the women of Charlotte Perkins Gilman's Herland are part of the next stage in the evolution of the feminist cyborg.

Charlotte Perkins Gilman, in her 1915 novel Herland, draws on contemporary scientific discussions to create a female utopia that is triggered, initially, by a biological rather than a cultural impetus. Gilman then blends the scientific and the cultural, and makes biology—science—the primary encoder and, thereby, legitimizer, of the culture that emerges in response to the scientific impetus. By this strategy, Gilman does what Shelley had not managed to achieve: use hard science to give legitimacy to what had—until then—been primarily a cultural argument for the equality of women. Indeed, Gilman takes to heart the advice given by Antoinette Brown Blackwell, the first female minister in the U.S. (1825-1921), who argued that women could only overcome arguments against their advancement by "developing for themselves the scientific basis of their pursuit of equality" (Magner 115). Some of the "new" forms of science that Gilman draws on in her novel to achieve just that are **parthenogenesis** - an asexual mode of reproduction, **evolution**, and—in a particular application of certain evolutionary principles—**eugenics**, a scientifically-based argument for the "improvement" of the human race through restrictive patterns of breeding. But at the same time that she uses science as a "natural" argument for women's rights, Gilman, I would argue unwittingly, embraces aspects of the masculine-based cultural metaphors of science that will actually undo her claims.

Many writers on the cultural history of the sciences have pointed to the ways in which science follows exploratory practices predicated on metaphors that arise out of sexual, political, and historical models. Donna Haraway, Sandra Harding, Evelyn

Fox Keller, Anne Fausto-Sterling, and Judy Wajcman, among others, discuss these practices in their own research on the cultural models of science. Many of these writers have contributed to the growing scholarship that questions whether a science driven by cultural metaphors that are predicated on ideas of control, power, penetration, and violation, can, indeed, be considered a "neutral" or "objective" practice. In her 1997 book, Modest_Witness@Second_Millennium.FemaleMan©_Meets Oncomouse™, Haraway writes of the historical necessity for science to present itself as neutral, as transparent, in order to legitimize its claims. When man—and I use the term man here deliberately—removes himself from the interpretive data, and constructs scientific findings with that old caveat—"The results speak for themselves"—the scientist is then able to say—"It is not I who says this; it is the science." In this way, nature rather than man "enforce[s] assent" (Shapin and Schaffer 79). The scientists, as Haraway puts it, simply present themselves as the "objects' transparent spokesmen" (Haraway 25) and are removed from being agents or advocates for any particular social reading of science or of the findings of science. Haraway's characterization of the modest scientist is that of a person whose "subjectivity is his objectivity": his position as "modern, European, masculine, [and] scientific" endows him with an invisible, and thereby modest, authority. The narratives told by these figures have "magical power—they lose all trace of their history as stories, as products of partisan projects, as contestable representations, or as constructed documents in their potent capacity to define the facts" (1997, 24).

Hence Haraway's term in the title of her book: Modest Witness. The notion of modesty—"Hey, it's not me; it's the science. It's nature"—is at the heart of the notion of the truly modest scientist. Science, in its modest presentation of its objective findings,

presents those findings as ahistorical, as divested of opinion or ideology. Haraway defines part of her long term project as the creation of a new breed of modest witnesses whose praxis is not pseudo invisibility but opaque commitment to bringing "the technical and the political back into alignment" (1997, 39) and to achieving "freedom" (1997, 269). As of yet, though, that form of the witness to science does not exist. The predominant model is still that of a neutral and objective science divested from dogma.

We are suspicious of ideology. But when we take our ideologies and cloak them with data, with scientific frameworks, those cloaks and frames serve to legitimize the ideology. In other words, to legitimize an ideology, we must obscure the ideology by presenting it within non-ideological trappings—present it as objective. The most efficient route to objectivity is through science, that ultimate modest witness to truth. According to many scientists and sociologists of Gilman's time, though, the ability to be objective was limited only to the masculine realm. So Gilman finds herself in the odd predicament of justifying the equality of women by using models of scientific justification that—it was argued—were only appropriate for men to use. Robert N. Proctor, in his book Value-Free Science? Purity and Power in Modern Knowledge, summarizes the arguments of the early twentieth-century German sociologist Georg Simmel on the "alienation of science from women and vice versa" (116). Proctor says that in Simmel's 1911 text, Philosophische Kultur, Simmel argues that "science itself is masculine, that objectivity and neutrality are attitudes of the male spirit, and that women tend to identify too much with their surroundings to allow them to develop an objective attitude toward the natural world" (116). Simmel's reading of the quality of this objectivity though is ambiguous. Even as he links men with a more natural ability to

achieve objectivity, a necessary quality in a scientist, he seems to suggest that objectivity itself is a construct used to justify other ends. Proctor's summary of Simmel's argument runs thus:

> Systems of domination have always sought to clothe themselves in the guise of neutral and objective legality—so that power appears as justice, force as law. The history of political formations, religious and economic doctrines, and family law is full of examples of this. The patriarch provides himself with assurances that his power is based not on the arbitrary rule of force but rather on the common interests of the family, or on some other objective and impersonal legality. The psychological superiority of men over women is thus transformed into a logical superiority: as power relations are disguised, the very opacity—apparent neutrality—of those relations is converted into masculinity, so that objectivity itself—or legality, or justice—becomes a masculine attribute, deficient in the female, fulfilled in the male. (Proctor 117)

Like Haraway's modest scientist, the person who grabs for power in Simmel's system does it not for himself, but because of the need of the family or the community for some system of law. The purpose for which the power is used (scientific progress or community organization) becomes the goal that obscures the agenda; necessity becomes elided with neutrality. In Simmel's own (translated) words:

> From the outset, the relative value of the male and the female is decided on the basis of a male rather than a neutral value idea…. This naïve conflation is based on historical power relationships that are logically expressed in the fateful dual meaning of the concept of the 'objective.' On the one hand, the objective seems to be a purely neutral idea, equidistant above the one-sidedness of both the male and the female. On the other hand, the objective is also the specific form of achievement that corresponds to the distinctively male mode of being. The former is a conception of transhistorical and transpsychological abstraction. The latter is a historical configuration that has its origins in the differential quality of masculinity. As a result, the criteria that are derived from the latter conception employ the same word and assume the same thoroughly ideal status characteristic of the former conception. Thus the being whose nature excludes the possibility of authentication by means of the specifically male conception of objectivity seems to be devalued from the standpoint of the transhistorical and inherently human conception of objectivity (which in our culture is either not realized at all or is realized only sporadically). (Simmel 51)

So Simmel seems to suggest, here and elsewhere, that objectivity is necessary to culture (it provides some sense of a code), yet because the criteria associated with objectivity are derived from historical associations with power, and power is associated with masculinity, the female nature is—simply by virtue of it being female—unable to either be or represent objective nature. So, by default, the criteria for objectivity are supplied by that sex more able to supply them, and the resulting definitions of objectivity are male-driven.

Proctor says that scholars remain unsure if Simmel's argument here is meant to defend, attack, or simply describe "the inferior objectivity of women" (117). For our purposes, we can see that, in Gilman's time, the links between science, objectivity, and masculinity were clear. Simmel denies that it is possible to have a purely asexual model of culture or objectivity: "There is no sense in which culture exists in a domain that lies beyond men and women. It is rather the case that, with the exception of a very few areas, our objective culture is thoroughly male. It is men who have created art and industry, science and commerce, the state and religion" (Simmel 47).

Gilman, although she appears to accept Simmel's premise that a male model defines present culture, does not appear to accept his premise that the present culture precludes the possibility of a culture beyond the male model that is more of an asexual, or at least shared, model. Gilman seems to echo Simmel's language in a piece she published in Harper's Weekly, May 25, 1912, the year after Simmel's Philosophische Kultur came out. In "Are Women Human Beings?" Gilman argues that to conflate sexual characteristics (male/female) with what she calls "racial" characteristics (by which she means "species") is simply bad science. She points out that the central error of those

opposed to the suffragist movement is in their "seeing in women only feminine characteristics; and, conversely, seeing in all complex functions of civilization only masculine [characteristics]" (Gilman1912, para. 7). She uses examples from natural science to make her argument:

> If we were to count up and to contrast the number of characteristics of sex with the number of characteristics of species, we should find at once that race distinctions far exceed sex distinctions in number and importance. Take, for example, a cow, a camel, and a whale. They all bring forth one living offspring and suckle it, the process being fairly identical. But a cow is easily distinguished from a camel and either from a whale.
>
> Again, of two deer, the buck has a special secondary sex-distinction in his towering antlers; but his power of speed, his love of speed, is not a sex distinction but a race distinction, common to both sexes. When the doe wishes to run far and fast, she is not "unfeminine," she is not "making a buck of herself." She likes to run, not because she is a doe, but because she is a deer, just as much of a deer as he is.
>
> This universal, glaring fact is what these sex obsessed opponents of the normal progress of women cannot see. They see only the feminine characteristics of women, and fail to see the human ones. Yet with our species, beyond any other, the race-character outnumber and outweigh all lesser distinctions…. We, as a species, have far more conspicuous and important distinctions peculiar to ourselves than those we share with lower forms; and each and every one of these human distinctions belongs to both sexes. (Gilman 1912, paras 19-21, 22)

Gilman's argument here is a fairly specific response to Charles Darwin's claim in The Descent of Man (1889) that "differences in the mental powers of the two sexes" are based in biology:

> With respect to differences of this nature between man and woman, it is probable that sexual selection has played a highly important part. I am aware that some writers doubt whether there is any such inherent difference; but this is at least probable from the analogy of the lower animals which present other secondary sexual characters. No one disputes that the bull differs in disposition from the cow, the wild-boar from the sow, the stallion from the mare, and, as is well known to the keepers of menageries, the males of the larger apes from the females. (2001, 234)

Darwin goes on to claim that when scientists use the "law of the deviation from averages" outlined in Francis Galton's book, Hereditary Genius, those scientists must

come to the inescapable conclusion that, based on the "decided pre-eminence [of men] over women in many subjects, the average of mental power in man must be above that of woman" (Darwin 2001 Descent, 235). Yet Darwin goes on to define the basis for that pre-eminence as located in the male propensity for "courage, perseverance, and determined energy" (235), characteristics that Gilman would certainly argue are those associated with race (species) rather than with sex.

So, if the primary qualities that make us human are shared by both sexes, then—contrary to Simmel's claim—a culture beyond sex does exist, a culture that is, in a sense, asexual. Gilman makes her argument for such a culture through science.

In Herland, she pursues her claim that equality is a "natural" state by extending her arguments based on social and natural sciences (such as those she made above) to arguments based on a deeper organic level of science: biology. Now she creates a society in which women, at least fictionally, engage in all the activities that Simmel claims are generally attributable only to men: Gilman's women, alone, create "art and industry, science and commerce, the state and religion." Thus she argues against Simmel's claim by showing that the attributes that allow people to engage in making such creations are not sex-determined, but species-determined. And, in typical Gilman fashion, she predicates the fictional ability of women to reproduce asexually in the actual scientific research of her time: the discovery of and debate over parthenogenesis, or asexual reproduction.

One method for escape from the biological imperative was to argue for evolutionary biology and evolutionary spirituality as concurrent paths, both leading to a state of divine hermaphroditism, as was argued by the Theosophical Society in the 1880s

and 1890s (Robb para 23). Indeed, in the minds of many utopians, a society in which the sexes were equal could be achieved only when reproduction was no longer sex dependent (Robb paras 23-25). In response to this suggestion, Susan Gay proposed in The Theosophist in 1914 that sexual equality could only be achieved when "female" becomes defined primarily through culture rather than through biology. Gay suggests that women's overt sexual features mark them as created for maternal purposes. When these features become less overt, women's options will not be defined only through biological determinism. She writes:

> Certain perceptible physiological changes dimly foretell … a new type of womanhood which will be a greater approximation to the non-sexual or bi-sexual form. This appears at present most strongly in the Anglo-Saxon races, in the increasing height of the younger women, due to the greater length of the lower limbs, the smaller size of the hips, the stronger arms and larger torso, which indicate a form in which possible maternity is by no means the special aspect. The function by which infants are nursed also frequently tends, especially in America, to disappear, not from custom, but by some natural process of atrophy. The old, helpless, delicate and nervous phase of femininity will gradually vanish. Among the men of the approaching race may be seen the strong, clear-cut hairless face, expressive of self-control and gentleness of heart. (Gay 887)

Gay's suggestion that non-sexuality must precede equality clearly anticipates the type of freedom from sexual polarities that the idea of the cyborg represents for women in later fiction. One route to erasing biological determinism, Gay suggests, is through parthenogenesis.

> Following these changes [to a less overt sexual form], another age will produce at last beings in outward harmony with the necessities of a more spiritual humanity. Parthenogenesis (the only word that can be used for the moment) is by no means an impossible event, and the womanhood of the future will manifest those occult powers which will completely deliver it from race-production. In short, the quality which woman represents will always be essential, while its outward expression will tend to change and disappear, being imperfect. (Gay 887-888)

Gay may be misunderstanding the science here, since parthenogenesis would not actually free women from the reproductive role. But it would eliminate men from the process; she may be suggesting that women's freedom comes through being the controllers of their reproduction, not through being freed from the process itself (a stretch of this passage, I freely admit). But the critical point I want to focus on in this passage is that around the time Gilman was working on Herland, a conversation about transcending gender was in the air, and part of that conversation of transcendence was about women gaining primary control over the reproductive process.

What is this process of parthenogenesis, how would Gilman have understood it, and what implications would that understanding have had on her ideas about how science shapes culture? Let's take it one step at a time, beginning with a quick review of how parthenogenesis would work in humans according to current biological understanding. Following that, I'll review the science of biology and parthenogenesis as Gilman would have understood it, and then move on to look at the ways in which that understanding helped to mold the cultural ideas about birth and gender that we find in Gilman's novel.

Parthenogenesis

Parthenogenesis is the process of asexual reproduction, in which a reproductive cell in a female entity reproduces without the trigger of a second, external cell. The resulting entity is always female and is a duplicate of the parent from whose reproductive cells it is born.

Current understanding of sexual reproduction and (hypothetical) parthenogenetic reproduction in humans. The basic human body cell, called the

somatic cell, contains 46 chromosomes. A somatic cell can produce cells only like itself. But the cells from which reproduction of an entire progeny occurs are called germline cells; they also contain 46 chromosomes. In the ovaries and testes, ovum and sperm (respectively), known as gamete cells, contain 23 chromosomes. The gamete cells are produced from germline cells through a process known as meiosis, or reductional division, a process that takes place only in the ovary and the testes. In this process, the ovarian or testes germline cell first doubles its chromosomal count to 92, then divides into four daughter gamete cells of 23 chromosomes each. Fertilization occurs when one of these daughter gamete cells fuses with another gamete cell from an outside source (e.g., an egg and a sperm), resulting in what is called a diploid zygote cell which contains 46 chromosomes. Generation then continues through mitosis, a process by which the diploid zygote cell reproduces itself to make more cells that are genetically identical.

Parthenogenesis takes on different forms depending on the species, but, if it were to occur in female humans, it would need to occur through one of two possible variations on the process, variations I've outlined below. Both options require that the process of mitosis, or cell duplication, begin at some point in the development of the reproductive cell when it contains the requisite full 46 chromosomes. These two options are outlined in Figures 3-1 and 3-2. Parthenogenesis is sometimes confused with cloning, but cloning is the process of replacing the nucleus of a gamete cell with the nucleus of a diploid cell from the same animal, whereas parthenogenesis occurs from the (apparently) spontaneous duplication of a single being's reproductive cells. The hypothetical versions of human female parthenogenesis that I outline in Figures 3-1 and 3-2 both assume a trigger to the duplication process, a trigger that scientists have, as of yet, not isolated in

any species. The figures I have presented both suggest that the mitosis stage of cell reproduction from a germline cell is the basis of parthenogenesis; the figures present two different possibilities of where in the process the spontaneous cell division might begin. Both assume that part or all of the process of meiosis—the original stage of germline cell division that creates an opening for external fertilization—is simply skipped.

Figure 3.1:
Sexual Reproduction and Parthenogenesis
Option One

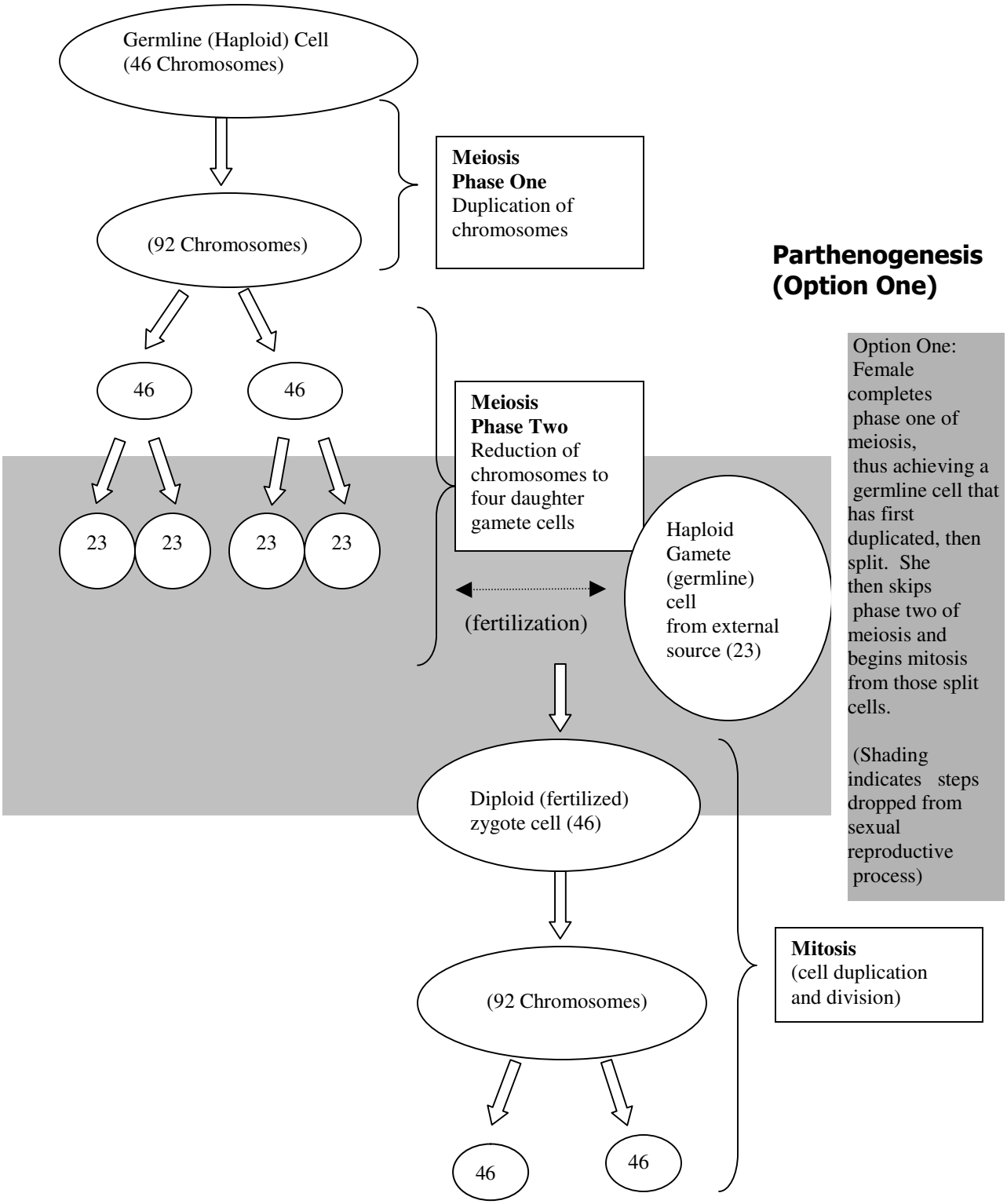
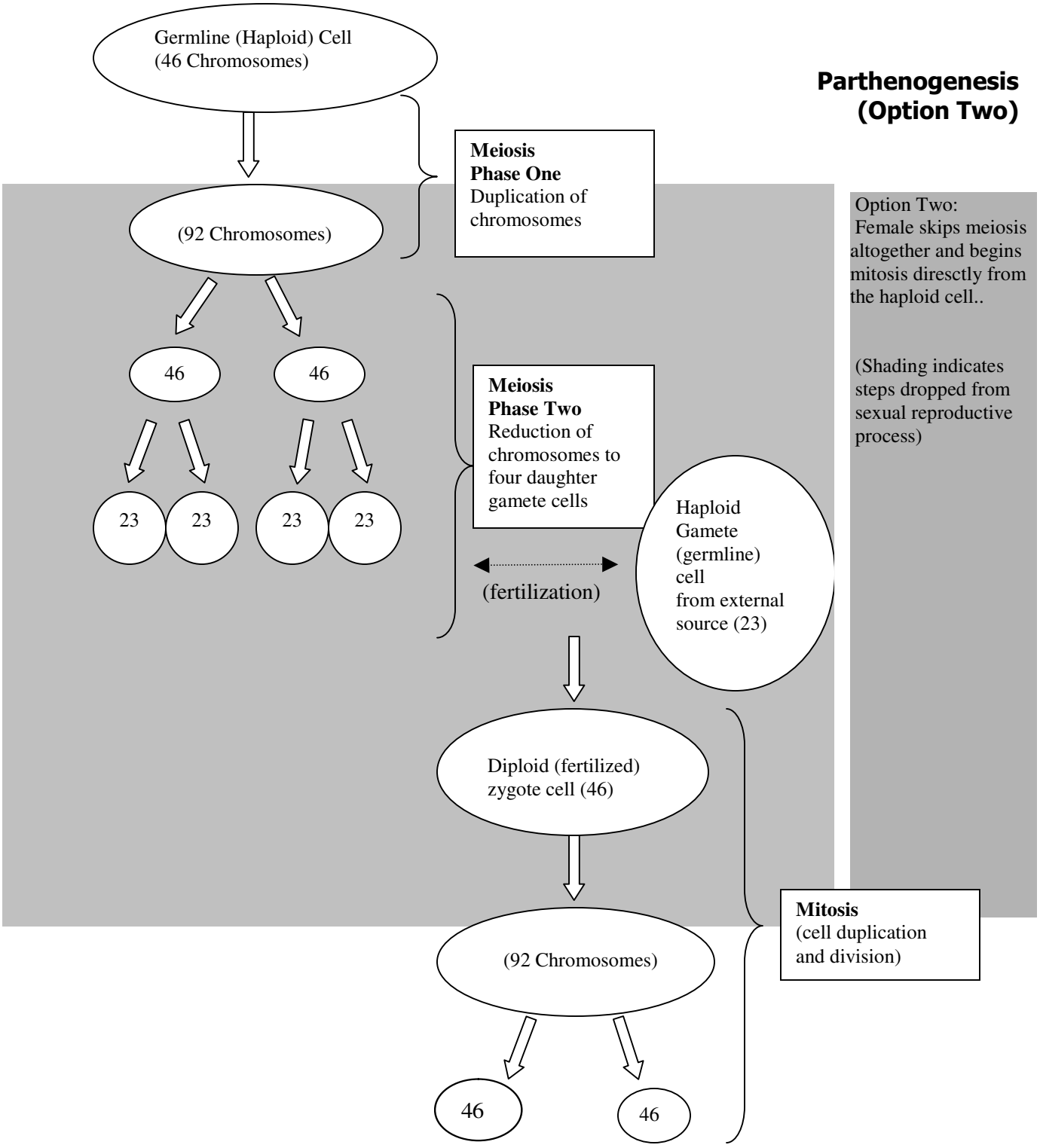


Figure 3.2:
Sexual Reproduction and Parthenogenesis
Option Two



The process, instead, after eliding the preparatory stage for fertilization, simply begins duplication of the germline cell as though it had already been fertilized.

Strictly speaking, the women of Herland would be termed a heterogenetic species, that is, a species that can reproduce through either parthenogenetic or bisexual means. In nature, such strategies exist among rotifers, microscopic invertebrates, and frequently among arthropods (lobsters, crabs, spiders, insects, centipedes, millipedes), in particular, cladocerans (water fleas) ("Reproductive Systems" paras 1, 2, 4). The curious commonality among most of these species is that parthenogenesis is the dominant mode of reproduction; the species reverts to bisexual modes when under environmental stress. This pattern makes sense in the light of genetics: parthenogenetic reproduction operates in a limited gene pool, one that is satisfactory when environmental conditions are stable. But when environmental conditions threaten the stability or existence of a species, the reversion to sexual reproduction leads to genetic diversity and a greater number of options for evolutionary adaptation. Gilman seemed to grasp the need for diversity at times of stress in order to develop stability; she incorporates some of this thinking into her rationale for why the women of Herland plan to explore the possibility of a return to the outside world and sexual reproduction, as I shall discuss later.

Parthenogenesis in Gilman's decades. Richard Owen and Jacques Loeb were the two major scientists whose research brought discussion of parthenogenesis into the public realm, but even before their research was published, in 1849 and 1913, respectively, other scientists and philosophers had conducted experiments on certain species that were able to reproduce without apparent fertilization and had then speculated on the results. In 1740, the Swiss naturalist Charles Bonnet conducted a series of

experiments on aphids and discovered that they were able to reproduce without fertilization. The process, which only later became known as parthenogenesis, earned him some scientific reputation when he published his work in a text entitled Philosophical Palingesis, or Ideas on the Past and Future States of Living Beings. His explanation for the phenomenon of asexual reproduction was somewhat strained: he argued that the female aphids carried—in a miniature form—all future generations of aphids. He suggested, further, that this was also a model for many other life forms ("Charles Bonnet").

In later years, Bonnet went so far as to focus much of his scientific and philosophical energies on trying to disprove the theory of epigenesis, the belief that growth occurs through the development of successive differentiations of an unstructured egg, rather than through the enlargement of an entity that was already preformed (his own preferred hypothesis) ("Charles Bonnet").

In 1819, Adelbert von Chamisso, a German poet and naturalist, discovered the patterns of "alternation of generations" among certain species; the alternation of sexual (gamogenetic) and asexual (agamogenetic) reproduction later became known as metagenesis. He published his results in De animalibus quibusdam. Chamisso's theory was developed by other scientists and accrued a fair amount of credibility; by 1842, the Danish zoologist and biologist Japetus Steenstrup had documented the theories of Chamisso in a variety of animals and plants. Charles Darwin mentions Steenstrup and his work in chapter fourteen, "Mutual Affinities of Organic Beings: Morphology—Embryology—Rudimentary Organs: Classification" of his classic work The Origin of Species (1859).

Owen and Loeb. By the time Gilman was conceptualizing the application of scientific theories to the community of Herland in the early 1900s, the discussion of the science of parthenogenesis had been reframed by new information being disseminated in scientific journals. The first use of the term "parthenogenesis" occurred in 1849, in Richard Owen's On Parthenogenesis, or, The successive production of procreating individuals from a single ovum, but discussion of the process did not work its way into popular currency in America until the publication of Jacques Loeb's book, Artificial Parthenogenesis and Fertilization, by the University of Chicago Press in 1913, only two years before Gilman published her novel.

Loeb, who was born in Germany in 1859, came to America in 1891 and pursued a career in teaching, writing, and research. He taught at Bryn Mawr, the University of Chicago, and the University of California and from 1910 was a member of the Rockefeller Institute. It was in 1910 that Loeb conducted his experiments in parthenogenesis, successfully triggering a parthenogenetic reaction in frogs' eggs by pricking them with a needle. Once stimulation provoked a parthenogenetic reaction, the eggs began to develop without contact with another gamete cell.

The work of Owen and Loeb was limited to research on insects and amphibians. Gilman simply takes the next leap and has parthenogenesis miraculously appear among mammals. Gilman assured concerned readers in her magazine The Forerunner that parthenogenesis was not truly possible among humans, writing:

> Several subscribers have asked if there is any foundation in biology for the condition of parthenogenesis—virgin birth—alleged in Herland.
>
> For human beings, no; nor would it be desirable. Fertilization is a higher process, a superior process; the highest types in nature do not revert to lower ones.

> But the reproduction of the species by the female alone is common enough among low orders of life, and is found, to some extent in creatures as high as the bees, where the female can bring forth alone, but only of one sex; or as with the aphis, which has both faculties, reproducing parthenogenetically for a long time, and then laying eggs which hatch males, and taking up the bi-sexual method.
>
> The idea in Herland is purely arbitrary, and used only to bring out as clearly as possible the essential qualities of a purely feminine culture. Our bisexual culture should be nobler yet, and will be, some day, when the female has her full share in it. (Gilman 1916, 83)

Gilman clearly is up on the science of her time, outlining the species in which parthenogenesis occurs and the variations in which it can occur. Yet she makes clear in this passage that she is not hoping for science actually to reshape the reproductive process; she is instead using the metaphors of a different shape of science to project the possibility of a different type of culture: "a purely feminine culture." Her own assumptions about the limits of science though were soon disproved: only a little over twenty years later, in 1937, the American physician and biologist Gregory Goodwin Pincus was able to induce parthenogenesis in a mammalian egg.

Application of parthenogenesis by Gilman in Herland. Herland itself is a fairly standard utopian text. Several adventuring young men, on a voyage of exploration in what appears to be the Amazon, discover a nation of about three million women that has lived in isolation from men for over two thousand years. Not only have these women become self-sufficient in their production of foods and goods, they have become self-sufficient in their reproductive processes. The all-female nation is a result of the flight from war—women who retreated with their children from the coastal wars that the men were fighting. Eventually, the male population was decimated by war. The few remaining men, with the women and the slaves, withdrew to the mountains where the passage back to the sea was sealed when a volcano exploded. The males among the slave

population—the largest and strongest of the remaining men—seized the opportunity to dispatch their male masters and seize control. But the women of the slave-holding population were not about to be ruled by their own slaves, and so, in turn, dispatched those men, and were left with a community of women. Their numbers dwindled, and the women resigned themselves to the dying out of the race, when, suddenly, a woman became pregnant and gave birth. It was the miracle of parthenogenesis—an asexual mode of reproduction.

> For five or ten years [after the death of the last men] they worked together, growing stronger and wiser and more and more mutually attached, and then the miracle happened—one of these young women bore a child. Of course they all thought there must be a man somewhere, but none was found. Then they decided it must be a direct gift from the gods, and placed the proud mother in the Temple of Maaia—their Goddess of Motherhood—under strict watch. And there, as years passed, this wonder-woman bore child after child, five of them all girls. (Gilman 1992, 57-58)[34]

Each of the five bore another five, and so on, until the community became a thriving nation.

The men who discover Herland have a hard time believing that the country they are seeing—well-governed, agriculturally productive, full of beautifully-constructed towns—was built and is run by women alone. The men speculate on where the men of Herland could be kept: do they live in separate communities? are they held in holding cells and subdued? (30-31) Finally, they learn enough of the language to just ask.

> "Ladies," Terry began, out of a clear sky, as it were, "are there no men in this country?"
>
> "Men?" Somel answered. "Like you?"
>
> "Yes, "men," Terry indicated his beard, and threw back his broad shoulders. "Men, real men."
>
> "No," she answered quietly. "There are no men in this country. There has not been a man among us for two thousand years."

---

[34] All references to the text of Herland are from the 1992 collection edited by Barbara Solomon.

> Her look was clear and truthful and she did not advance this astonishing statement as if it was astonishing, but quite as a matter of fact.
>
> "But—the people—the children," he protested, not believing her in the least, but not wishing to say so.
>
> "Oh yes," she smiled. "I do not wonder you are puzzled. We are mothers—all of us—but there are no fathers. We thought you would ask about that long ago—why have you not?" Her look was as frankly kind as always, her tone quite simple.
>
> Terry explained that we had not felt sufficiently used to the language, making rather a mess of it, I thought, but Jeff was franker.
>
> "Will you excuse us all," he said, "if we admit that we find it hard to believe? There is no such—possibility—in the rest of the world."
>
> "Have you no kind of life where it is possible?" asked Zava.
>
> "Why, yes—some low forms, of course."
>
> "How low—or how high, rather?"
>
> "Well—there are some rather high forms of insect life in which it occurs. Parthenogenesis, we call it—that means virgin birth."
>
> …
>
> "You ask us to believe that for two thousand years there have been only women here, and only girl babies born?"
>
> "Exactly," answered Somel, nodding gravely. "Of course we know that among other animals it is not so, that there are fathers as well as mothers; and we see that you are fathers, that you come from a people who are of both kinds. We have been waiting, you see, for you to be able to speak freely with us, and teach us about your country and the rest of the world. You know so much, you see, and we know only our own land." (47-48)

That's as much of the science of parthenogenesis as Gilman gives us here. The process exists in insects; the men, representative of the educated men among Gilman's contemporaries, know enough to make that connection. But the leap to parthenogenetic mammals is left open-ended. No need to explain how it could have happened; it just did. As Gilman freely admits in her note in the Forerunner (excerpted above), the choice is simply a device used to help her achieve her fictional purposes, "purely arbitrary, and used only to bring out as clearly as possible the essential qualities of a purely feminine culture."

Social implications of parthenogenesis. Gilman's use of parthenogenesis gives her the opportunity to explore the social dynamics of a community of women whose sexuality is made a moot issue; the novel contains no suggestion of female–female sexual love, nor possibly would we expect there to be, given the time and frame within which Gilman was writing. The passion of the women is directed to three ends: love of the work they choose to do; love of their mothers; and love of one another—as friends and as sisters (97). The goal of love is public satisfaction rather than private satisfaction. When comparing the women of Herland to the women of their own land, the men realize that the women of their homeland locate love in "their private families," while the women of Herland locate love in "their country and race. All the loyalty and service men expect of wives, they gave, not singly to men, but collectively to one another" (96). The implications of this shift in the focus of love become apparent as the novel unfolds: the women would never sacrifice the needs of the community in order to meet the needs of the self. Love first and last is framed and driven and most deeply rewarded in the love of the whole.

Even when the three male explorers develop relationships with individual women whom they hope to marry, the relationships—from the women's point of view—are defined primarily as friendships.

> However much, or little, of true sex-feeling there was between us, it phrased itself in their minds in terms of friendship, the one purely personal love they knew, and of ultimate parentage. Visibly we were not mothers, nor children, nor compatriots; so, if they loved us, we must be friends. (97)

When reproduction is based on a parthenogenetic model—a model that does not require sexual contact—issues of sexuality in relationship to female power and female autonomy

drop out of Gilman's arguments about female equality. The invisibility of sexuality leads to the invisibility of the sexual body.

Haraway's notion of modest science that I discussed earlier also invokes the modesty of the body: in science's representation of itself as ungendered, science claims an objectivity that would not be available to a visibly gendered body. Science's claim to objectivity is dependent on making the body invisible—or at least transparent. Visibility, suggests Haraway, is subjectivity. Objectivity can only claim objectivity when no ideology is visibly identifiable; objectivity demands that its own claim be invisible. Bodies that are clearly gendered are too visible to be able to represent an objective science. So when Gilman makes the women of Herland ideal women, she makes them women without sexuality, without gender. They are defined by their species (what Gilman calls their "race qualities") rather than by their gender. By the very invisibility of their gender and their bodies, their science is rendered objective and legitimate.

In Gilman's new non-binary model of reproduction, the line of descent is less vertical than it is lateral. The model of procreation, rather than organic reproduction, is replication. Most political models have been premised upon metaphors of rebirth that depend, in turn, on standard metaphors of binary-dependent reproductive sex. And, as Evelyn Fox Keller, Sandra Harding, David Channel and other social philosophers of science have pointed out, biological and social metaphors often become the mirrors of each other. Haraway suggests that rather than rebirth we need regeneration. Herbert Spencer, the English sociologist and advocate of the social application of the tenets of evolution, argues in his text First Principles (1862) for an evolutionary model of increasing diversity; Spencer is the proponent of the theory that the natural evolutionary

momentum is “a change from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity, accompanying the dissipation of motion and integration of matter” (367). Regeneration and replication are both horizontal methods of reproduction, unlike the vertical models of heterosexual unions. Haraway challenges Spencer’s claim that evolutionary progress is predicated upon a heterogeneous model when she advocates a new model that is both homogenous and indefinite. With Gilman’s parthenogenetic community, we take another step toward Haraway’s metaphor of the cyborg, the cybernetic organism that breaches boundaries of the human, the machine, and gender. Haraway’s cyborg, with its lateral model of replication, has

> more to do with regeneration [than reproduction] and [is] suspicious of the reproductive matrix..... For salamanders, regeneration after injury, such as the loss of a limb, involves regrowth of structure and restoration of function with the constant possibility of twinning or other odd topographical productions at the site of former injury. The regrown limb can be monstrous, duplicated, potent. We have all been injured, profoundly.... [T]he possibilities for our reconstitution include the utopian dream of the hope for a monstrous world without gender. (Haraway 1991, 181).

Haraway, of course, uses “monstrous” as a positive, as a hopeful adjective. But the men in Gilman's novel, certainly the three male explorers who stumble upon Herland, initially view this male-less world as a negatively monstrous world.

Two of the three male explorers of Herland eventually come to believe in Herland's world as a superior model, but one character—Terry—acts as a foil for male-centric beliefs. Again and again he protests against defining as “women” this gender that does not conceptualize its own identity in comparison to men. He even refuses to define as “human” these beings that are not dependent on a gender binary as a primary encoder of their identity.

> "Of course they can't understand a Man's world! They aren't human--they're just a pack of Fe-Fe Females!" (80)

When the young women assert themselves as independent thinkers, Terry can only view this independence as a negation of their female status:

> "Girls!" he burst forth, when that evening was over and we were by ourselves once more. "Call those *girls*!"
> ....
>
> "What do *you* call them?" I mildly inquired.
> "Boys! Nothing but boys, most of 'em. A standoffish, disagreeable lot at that. Critical, impertinent youngsters. No girls at all." (86-87)

Finally, when the attributes of the women have defied stereotyping in either gender category, Terry winds up with: "They've neither the vices of men, nor the virtues of women—they're neuters!" (98). Oddly enough, Terry, the character constructed as the most socially obtuse of the three men, is also the character who most accurately identifies the source of the peculiar freedom of these women.

Although the men are first highly doubtful, and then—in Terry's case at least—dismissive of the cultural applications of a science such as parthenogenesis, perhaps because it so deeply challenges their cultural assumptions, they do not feel the same apprehensions about the science of evolution. All three of the men are deeply committed to the social applications of evolution; the women must work hard to convince them that—in this case—those social applications are deeply misguided.

Gilman's use of a new, non-sexual scientific model for motherhood, on one level, offers an opportunity for women to escape fixed cultural roles related to their sex, but, on another level, re-inscribes the role of motherhood as the be-all and end-all of women's reason for existence by making "motherhood" the prime motivator of all social good. She was not alone though in her choice to employ such a strategy. Donna

Haraway, in her 1990 essay "Investment Strategies for the Evolving Portfolio of Primate Females," points out that whether the metaphor was one of biological motherhood or social motherhood, it was only through a "maternalist discourse" that nineteenth-century American feminists were able to claim "the right to public speech as women":

> Nineteenth century American feminist doctrines of social motherhood, a major argument for the vote, drew on the discursive resources of the new reproductive biology. In these arguments, women as mothers were especially fitted for citizenship. They would heal the body politic from the wounds inflicted by militarist and competitive men. They would be mothers of the republic, acting in a public space, as they were mothers in the domestic space. (148)

Gilman employs a fairly safe middle ground in Herland: within a novel about the glories of motherhood, she offers some radical critiques of a culture that is imprisoned within its own slavish commitments to the glories of competition and militarism.

Evolution

An important predecessor of Darwin's, the Swedish botanist Carolus Linnaeus (1707-1778), developed a classification system for organisms that laid the groundwork for much of Darwin's later work in evolution. Linnaeus created a large organizational system of living beings, a taxonomy, that assigned each being to a place within a hierarchy of categories. Each being's place was determined based upon the specific traits it bore. Linnaeus, though, saw his classifications as fixed and as a reflection of God's plan (Campbell 401-402), while Darwin, although he also worked at classification, saw categories and hierarchies as fluid and evolving. Darwin's theory of evolution was premised upon the struggle for existence, an existence that, he explained, was predicated not only on the individual's ability to exist/survive but, in addition, upon the individual's ability to procreate (Darwin 2001, Origin 108-109). In The Origin of Species, Darwin

argued that "species were not specially created in their present forms," as Linnaeus had argued, but had "evolved from ancestral species. Second, he proposed a mechanism for evolution, which he termed 'natural selection.' According to Darwin's concept of natural selection, a population of organisms can change over time as a result of individuals with certain heritable traits leaving more offspring than other individuals" (Campbell 399).

Bruce Mazlish, professor of history at the Massachusetts Institute of Technology, suggests in his book The Fourth Discontinuity that Darwin's theory of evolution challenges the second great "discontinuity" or fallacy[35] of humanity's beliefs about itself. The source of the first great discontinuity was Copernicus, who exploded the fallacy of man at the literal center of the universe, both separate from and with dominion over that universe; with the theory of evolution, Darwin destroys humanity's illusion of its place as fixed and ordained in the animal kingdom, separate in creation and purpose from the animals around it. Clearly such a major jolt to humanity's understanding of its place in the order of things was bound to cause controversy and resistance.

For our purposes in this chapter, though, the resistance by the women of Herland to Darwin's theory does not arise in response to its first premise: that the diversity of life is attributable to natural rather than supernatural causes. Their resistance arises instead in response to evolution's second premise: that the primary mechanism of evolution is "natural selection," a selection achieved via competition and the "survival of the fittest."

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[35] The third discontinuity is Freud's challenge to the belief that we are in control of our subconscious. The fourth discontinuity is the belief that we and the technologies we use are distinct from one another. Mazlish suggests, as does the figure of the cyborg, that the two have become inextricably linked.

Current understanding of evolution. The major responses to Darwin's notions of the survival of the fittest took two directions: the first, which embraced and celebrated the idea of life as competition, was the major response, and was quickly picked up and extended by a range of thinkers and writers of the period, as I discuss in more detail in the section below ("Evolution in Gilman's Decades"). The second response, which critiqued the unabashed capitalist premises of the theory, was more muted, yet this second response has gained momentum and credibility among later twentieth century critics.

Writers including Peter Kropotkin (1902), Edward O. Wilson (1975), Stephen Gould (1976), and Martin Nowak (1995), among others, have argued for more attention to the neglected role of cooperation and altruism in Darwin's competitive scenario.[36] From various disciplines and standpoints, these writers and others point to the benefits of cooperation within species: from "the force they can borrow from the practices of mutual aid and support" (Kropotkin 400), to the multiple textbook examples of mutual aid: "grooming, feeding, teaching, warning, helping in fights and joint hunting" (Nowak 404), species at all levels benefit from cooperative behaviors. Taking this argument one step further beyond simple cooperation, Edward O. Wilson points to the ways in which altruistic behavior strengthens the gene pool:

> As more complex social behavior by the organism is added to the genes' techniques for replicating themselves, altruism becomes increasingly prevalent and eventually appears in exaggerated forms. This brings us to the central theoretical problems of sociobiology: how can altruism, which by definition reduces personal fitness, possibly evolve by natural selection? The answer is

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[36] Peter Kropotkin, Mutual Aid: A Factor in Evolution. Montreal: Black Rose Books, 1989; Edward O. Wilson, Sociobiology: The New Synthesis. Cambridge: Harvard University Press, 1975; Stephen Jay Gould, Ever Since Darwin. New York: Norton, 1977; Martin A. Nowak, Robert M. May, and Karl Sigmund, "The Arithmetics of Mutual Help." Scientific American (June 1995): 76-78.

> kinship: if the genes causing the altruism are shared by two organisms because of common descent, and if the altruistic act by one organism increases the joint contribution of these genes to the next generation, the propensity to altruism will spread through the gene pool. This occurs even though the altruist makes less of a solitary contribution to the gene pool as the price of its altruistic act. (Wilson 410)

Like Gilman's arguments for the natural intelligence and skills of women, Wilson's arguments for the benefits of altruistic behavior are rooted in a seemingly non-contestable science rather than in a contestable social plea.

Late twentieth-century feminist theory on evolution. Ever since the science of Darwinism walked into the scientific and social conversations of the culture, critics within a range of disciplines have pointed to the ways in which the metaphors that attached themselves to that science emerged from and were framed by their political and historical contexts. Feminists, though, are perhaps the group that has offered the most sustained in-depth examination of the social frames for Darwin's theory. In "Have Only Men Evolved?" Harvard biologist Ruth Hubbard suggests that the unequal sexual frames developed in Darwin's arguments about sexual selection continue to inform studies in ethology and sociobiology even today. Evelleen Richards argues that, "Through his concept of sexual selection, Darwin promoted an androcentric account of human evolution which rationalized Victorian conceptions of male dominance and importance and confirmed Victorian sexual stereotypes. An examination of his early Notebook entries demonstrates that Darwin consistently held to these values and by a process of circularity fed them into his conceptions of human biological and social evolution" (443). Richards seems to suggest that as Darwin developed his theory, he himself engaged with the stereotypes of his period and knitted those stereotypes together with his scientific observations.

Ruth Bleier, professor of Neurophysiology at the University of Wisconsin-Madison, laid much of the groundwork in this area in the 1980s by examining the ways in which modern cultural assumptions forced particular gendered frames onto evolutionary theory. Her work decentralizes, for example, the "man as hunter" motif as a focal tenet to the evolutionary progress of humans. Bleier instead surveys the work of anthropologists who have studied primate behavior and extrapolated from those observations that survival is premised less upon male competition than it is upon the types of male and female social networks that allow for communication and shared resources: "the mapping and recognition of food sources, ability to communicate this information to others, the development of complex social relationships, planning, and the teaching and learning of subsistence techniques" (132). The long-term academic romance with the man-as-hunter motif arose, in great part, Bleier suggests, "[b]ecause the hunting of large mammals is usually a male social venture in its contemporary forms, [and so] has been invested with singular evolutionary importance by Western male meat-eating anthropologists" (132). Donna Haraway's comments are often the most explicit of all this group of women and men writing about gendered biases in the sciences: "The biosocial sciences have not simply been sexist mirrors of our own social world. They have also been tools in the reproduction of that world, both in supplying legitimating ideologies and in enhancing material power" (1978, 25). Those who draw connections between Darwinism and social controls, specifically control of women, all seem to endorse Bruno Latour's slogan—itself a variation on van Clausewitz's dictum: "War is

politics by other means"—that science is politics by other means ("La science, c'est la politique continue par d'autres moyens"; Latour 1984, 257).[37]

Evolution in Gilman's decades. When Darwin published Species in 1859, his focus was on the evolution of physical traits, but by the time he published The Descent of Man in 1871, only twelve years later, his argument had been extended to address the issue of the evolution of mental and social traits. Darwin's thinking, originally, was that only physical traits were inherited and thus subject to evolutionary law, but within twelve years that view had changed to accommodate the inheritance of social traits in Descent. What impacted Darwin's thinking between the two publications?

In 1865, Francis Galton, a cousin of Darwin who was both an anthropologist and a mathematician, published an article in MacMillan's magazine on his theory of eugenics, a word he had first used in 1863. Galton's theory was developed more fully in his 1869 book Hereditary Genius (a kind of nineteenth-century version of The Bell Curve). Eugenics had been around at least since Plato suggested in The Republic that the stock of humanity could be improved through selective breeding, but now Galton's argument was framed within and legitimated by the new science of evolution. Galton suggested that superior men mate with superior women in order to create a breed of superior beings. The qualities of superiority that Galton defined were those of intelligence, refinement, and, of course, class. The American Eugenics Society, founded in 1926, developed out of the theories of Galton, but within the Society, the theories of superior breeding that Galton had proposed as a model became instead a given, an

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[37] Donna Haraway writes that Latour gave her the title for her paper, "Primatology is Politics by Other Means" with this slogan (Haraway 1986, 83). Latour coined this phrase in his 1984 work Les microbes, guerre et paix, suivi de irreductions. Paris: Metaille.

already established framework. The Society operated from the assumption that the wealth and social position of the upper classes were justified by virtue of their superior genetic stock. I will be returning later to a longer discussion of eugenics and the manner in which it plays out in Gilman's novel.

Darwin's "survival of the fittest"[38] has generally been represented in literature of both Gilman's time and our own as a survival strategy that is achieved instinctually, almost unconsciously. Overpopulation and rulership by the weak is avoided when those with more strength or more intelligence wrest what they desire away from those unable to protect their share. Those left with less (or nothing) just "naturally" wither away. Darwin's own theories in this area were spurred by his reading of Thomas Malthus's Essay on the Principle of Population, and by linking Malthus's ideas to Darwin's own observations from his recent trip on The Beagle: "[I]f population necessarily increases geometrically and the food supply only arithmetically, a struggle for existence has to take place. Those best fitted to survive, owing to their variations, would win out " (Mazlish 91). Gilman rewrites the scenario for the distribution of limited natural resources by focusing in her novel not on who is most deserving (or even needful) of available resources, but by studying the resources themselves. X amount of resources is available;

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[38] The phrase "survival of the fittest" was first used by the English philosopher Herbert Spencer in his text Social Statics (1851). Charles Darwin did not adopt the phrase until the sixth edition of The Origin of Species, and he then generally combined Spencer's phrase with his own original wording, "natural selection." In that sixth edition, Darwin gave credit for the "survival" wording to Spencer, by saying, "I have called this principle, by which each slight variation, if useful, is preserved, by the term natural selection, in order to mark its relation to man's power of selection. But the expression often used by Mr. Herbert Spencer, of the Survival of the Fittest, is more accurate, and is sometimes equally convenient." Charles Robert Darwin. The Origin of Species. Vol. XI. The Harvard Classics. New York: P.F. Collier & Son, 1909–14; Bartleby.com, 2001. 22 Jan. 2005 <www.bartleby.com/11/>

that amount will reasonably support Y number of people; therefore, if we have ONLY that number of people to support, there need be no competition.

The women of Herland faced this issue early on as their numbers began to grow (each parthenogenetic women giving birth to five, each of whom gave birth to five more, and so on).

> …[T]hey were confronted with the problem of "the pressure of population" in an acute form. There was really crowding, and with it, unavoidably, a decline in standards.
>
> And how did these women meet it?
>
> Not by a "struggle for existence" which would result in an everlasting writhing mass of underbred people trying to get ahead of one another—some few on top, temporarily, many constantly crushed out underneath, a hopeless substratum of paupers and degenerates, and no serenity or peace for anyone, no possibility for really noble qualities among the people at large.
>
> Neither did they start off on some predatory excursions to get more land from somebody else, or to get more food from somebody else, to maintain their struggling mass.
>
> Not at all. They sat down in council together and thought it out. Very clear, strong thinkers they were. They said, "With our best endeavors this country will support about so many people, with the standard of peace, comfort, health, beauty, and progress we demand. Very well. That is all the people we will make." (69)

Competition is created when ten people must vie for eight apples. Instead of competing for who gets the apples, or even dividing the apples into smaller sections, Gilman simply says, "Let's make sure we only have eight people for the eight apples." In Women and Economics, Gilman writes of the relationship between overpopulation (and the resulting struggle for limited resources) and war:

> The pressure of population has been too long a standing excuse for war. When pacifists gather together to seek the cause of war, does any one mention babies? It seems hard to recognize babies, unlimited babies, as a ceaseless cause of war, but any one who can count—both years and people—can see it. With all its lamentable accompaniment of license and misbehavior, an intelligent limitation of a population to the resources of a country is one of the most essential requirements for any hope of world peace (330).

So whereas Darwin suggests that competition among the existing people drive the allocation of resources, Gilman suggests that the amount of resources drive the number of people; therefore, the basis for allocation need not be competitive at all.

Use of evolution by Gilman in Herland. Along with using parthenogenesis as a basis for her argument for the equality of women, Gilman also clearly relies on her audience's understanding of and fascination with the relatively new science of evolution. When the women of Herland question the male explorers about the social structures of the men's society, a society the men claim is conducted via models superior to those used by the women, the men fall back on Darwinian notions to explain the evolution of economic classes:

> …I explained that the laws of nature require a struggle for existence, and that in the struggle the fittest survive, and the unfit perish. In our economic struggle, I continued, there was always plenty of opportunity for the fittest to reach the top, which they did, in great numbers, particularly in our country… (63-64)

The women listen courteously, and then ask, gently,

> "These `laws of nature,'… are they all the laws you have?" (64)

Gilman has almost too much fun here, setting the men up over and over to fall into the traps of their own flawed reasoning. Of the three men, VanDyck, the narrator of the novel and a sociologist; Jeff, a doctor; and Terry, an independently wealthy entrepreneur and explorer, Terry is usually set up as the foil. He is the only one of the three who consistently challenges the premises of a Herland society that is ruled by cooperation rather than competition. Jeff, on the other hand, is a gentle personality who is continually awed by the world he has discovered. While Terry tries to defend the shortcomings of his native land, Jeff, willingly and almost gleefully, admits its failures.

As the men learn more of the history of Herland, they are repeatedly surprised by what they discover about the country's priorities and systems.

> [T]hey had had no wars. They had had no kings, and no priests, and no aristocracies. They were sisters, and as they grew, they grew together—not by competition, but by united action.
> …
>
> We rather spread ourselves, telling of the advantages of competition: how it developed fine qualities; that without it there would be no 'stimulus to industry.'
> …
>
> "No one…would work without incentive. Competition is the—the motor power you see."
>
> The women think about this.
>
> "Do you mean, for instance, that with you no mother would work for her children without the stimulus of competition?" [the women ask].
>
> No, [Terry] admitted that he did not mean that…. But the world's work was different—that had to be done by men and required the competitive element.
>
> …
>
> "Tell us [the women requested], what is the work of the world, that men do—which we have not here?"
>
> "Oh, everything," Terry said grandly. "The men do everything, with us." He squared his broad shoulders and lifted his chest. "We do not allow our women to work."

The women are intrigued.

> "[D]o *no* women work, really?"
>
> "Why, yes," Terry admitted. "Some have to, of the poorer sort."
>
> "About how many—in your country?"
>
> "About seven or eight million," said Jeff, as mischievous as ever. (62)

Gilman's critiques of the pitfalls of social Darwinism can verge on the preachy, but they are nevertheless often very funny and quite scathing.

Social implications of evolution. Gilman's use of evolutionary theory is more complex than is her use of parthenogenesis. Darwin's publications and the public response to those publications had near-immediate and far-reaching impact on cultural theories of development. But rather than radically altering cultural theories, Darwin's

work, instead, seemed to offer multiple opportunities to validate an existing social and economic system. Sandra Harding, in her book The "Racial" Economy of Science, discusses the growing willingness of scientists to recognize that economics and politics shape the results of scientific research, that "sciences tend toward their uses," and that only that which is recognized as true to culture is recognized as true to science—in other words, the interpretation of data is shaped by preconceived cultural understandings (5-6). Judging by Gilman's collective narrative retort to Darwin in Herland, the apparently tacit approval by the scientific community of social inequalities via the application of "neutral" science disturbed Gilman deeply.

Within just a few years of Darwin's 1859 The Origin of Species, his ideas were being applied to disciplines such as philosophy and economics through the work of men such as the French sociologist Auguste Comte and the English philosopher and sociologist Herbert Spencer. The rapid transmutation of "survival of the fittest" (a term coined by Spencer in his 1851 text Social Statics and then adopted by Darwin) from scientific explanation to social justification marks the ease with which scientific and social metaphors become elided. Richard Hofstadter, Columbia University professor of history, wrote in 1944 that "[i]n applying evolution to society, Spencer, and after him the social Darwinists, were doing poetic justice to its origins. The 'survival of the fittest' was a biological generalization of the cruel processes which reflective observers saw at work in early nineteenth-century society, and Darwinism was derivative of political economy" (391). Comments by some of the most powerful business magnates of Gilman's time evidence their belief in evolution as a scientific validation of the tenets of capitalist competition they already hold as natural truth. Hofstadter refers to several of these types

of comments in his article; I have worked from his examples and expanded them to include additional examples and sources in the passages below.

The railroad magnate James J. Hill, in his 1910 book Highways of Progress, uses metaphors of evolution in his arguments for economic expansion and economic consolidation; both, he claims, are natural movements of "progress" toward "a new life or toward decay and death" (Hill vii). Hill's language suggests that this movement, achieved via a "progress or die" dichotomy, is born of a force driven by nature and is therefore actually outside the control of man; to argue, therefore, against capitalist expansion and then corporate consolidation, is to argue against the dictates ofnature. Hill writes: "This [consolidation] was an economic evolution, independent of the plans or wishes of men. It had to be, just as men had to learn the use of fire if they were to become civilized…. The fortunes of railroad companies are determined by the law of the survival of the fittest" (126). We quickly see how those who might argue against such expansion and consolidation are cast as out-of-touch with the most natural, the most obviously scientific, of beliefs**.**

W. J. Ghent's 1902 book, Our Benevolent Feudalism, had its birth in an article that Ghent originally published in the Independent in April of 1902. In the section of his book on consolidation, Ghent uses a metaphor from chemistry to explain the scientific basis of the economic/corporate consolidation process:

> Capitalistic atoms of low valency—to use a term from chemistry, —such as those invested in some of the hand trades, custom and repairing and the like—may continue their course, but those of a high valency are sooner or later brought into association. From this fundamental grouping comes integration, the concentration of the material units which go to make up an aggregate. The lesser gravitates to the larger. It needs no modern Newton to proclaim that in finance, commerce, and industry, as in the physical world, all bodies attract one another in direct proportion to their mass. (Ghent 15-16)

Ghent's metaphor is expanded in his argument beyond economic consolidation to political consolidation, a process by which a clear class structure is developed and maintained. Ghent's outline argues for an end world-product of harmony and peace, but it is a harmonious peace achieved when the lowly—what Ghent calls "the under-classes," learn their place and are happy in it while the upper or "Baronial class" heightens and extends their "control" and "insures supremacy with peace" (196). Ghent chides those who complain of the mercurial attitudes of the rich, pointing to the "high professions of morality, the frequent appeal to Christian ideals, [and] the tender solicitude for honesty, integrity, law and order, with which our new magnates gild their worship of 'business'" (28). Ghent's book offers a wonderful passage in which he remarks on an apparent comment by John D. Rockefeller that illuminates the ways in which these magnates equate the laws of nature and the laws of God and claim that they are simply following the natural dictates of both when they appear ruthless in their business practices:

> Mr. Rockefeller appeals both to evolution and to divine sanction. "The growth of a large business," he is reported as declaring in one of his Sunday-school addresses, "is merely a survival of the fittest…. The American Beauty rose can be produced in the splendor and fragrance which bring cheer to its beholder only by sacrificing the early buds which grow up around it. This is not an evil tendency in business. It is merely the working out of a law of nature and a law of God." (29)

The use of such metaphors of justification deflates the potential counter-arguments of any critics. How can one argue against such a partnership of nature and science with God?

Perhaps the most well-known of all the scientifically-endowed ruling class to employ specific metaphors of evolution as part of their "natural" claim to wealth was Andrew Carnegie. In his 1901 text, The Gospel of Wealth and Other Timely Essays, Carnegie admits that the philosophy he embraces contains thorny issues of hardship for

individuals and a rampant inequality, but concludes that these are acceptable components since they are "essential" elements to the progress of the "race":

> [W]hether the law [of competition] be benign or not, we must say of it, as we say of the change in the conditions of men to which we have referred: It is here, we cannot evade it; no substitutes for it have been found; and while the law may be sometimes hard for the individual, it is best for the race, because it insures the survival of the fittest in every department. We accept and welcome, therefore, as conditions to which we must accommodate ourselves, great inequality of environment; the concentration of business, industrial and commercial, in the hands of a few; and the law of competition between these, as being not only beneficial, but essential to the future progress of the race. (Carnegie 1901, 4)

One wonders if Carnegie's use of the royal "we" includes those who must do the actual day-to-day "accommodating" to hardship and inequality, whose fitness has been compromised, and whose survival is therefore less probable.

Fitness, as David Channel points out, could also "be interpreted as financial success, political power, military power, or social status," and the phrase and its attendant meanings were used by powerful figures to rationalize "the establishment of powerful monopolies and imperialistic foreign policies" (Channel 64-65). Throughout all of these passages, biological and social systems clearly work as the mirrors of each other.

Eugenics

A natural segue exists between a discussion of the Darwin-adapted phrase "survival of the fittest" and an examination of the key word within that phrase: the definition of "fit." Fitness and eugenics are closely-paired words in eugenical history. In its original sense, eugenics meant the modification of the race by placing some controls on who could (or at least should) marry whom. The Encyclopedia of Applied Ethics suggests that the very roots of the word eugenics, derived from the Greek *eu*—well—and *ghenos* —

birth/descent, underscores the ambivalence of its meanings: the first meaning of well-born suggesting born into good circumstances, and the second meaning suggesting bred into excellence (Neri 161-2). The first implies simply a matter of circumstance; the second implies a model of interventionist breeding. In addition, the interventionist model has two subcategories: "positive" eugenics encourages the mating of "superior" breeds; "negative" eugenics restricts "inferior" breeds from reproducing (Neri 167-169). In general, the brunt of criticism of eugenics has arisen from antipathy to the negative model, but the philosophy as a whole generates strong feelings, as well it should.

Current understanding ofe ugenics. The word "eugenics," largely because of its historical connections to issues of ethnic cleansing and arguments for biological determinism, has acquired a pejorative burden; as a result, in most modern usages, social and physical scientists who engage in species modification no longer speak of eugenics, but of genetic modification. Marouf Arif Hasian, Jr., in his book The Rhetoric of Eugenics in Anglo-American Thought, suggests that scientists attemptto distance themselves from the historical associations with eugenics by presenting it as "a pseudoscience that has little to do with real genetic research. This selective chronicle of events treats eugenics as a temporary aberration, an irrational political appropriation of genetics. It creates distance between the value-free science of genetics and the illegitimate public policies (like coercive sterilization) that were conducted in the name of eugenics" (3). Genetic studies are presented to the public as value-free studies; we are meant to understand that only when these studies are inappropriatelya pplied by non-scientists does ideology intrude.

Eugenics in Gilman's decades. A discussion of eugenics brings us, oddly enough, back to Mary Shelley. The bases of eugenics, of fitness, lay in the belief that a fundamental inequality between groups of people is an inevitable condition as well as an acceptable explanation for class and privilege. But Hasian points out thatthis notion was seriously challenged in the late eighteenth century via the claim for equality embedded in the French revolution, and, in particular, when Mary Shelley's father, William Godwin, published Enquiry Concerning Political Justice (1793), in which he argued for the capacity of all humanity to be improved via education: "There is no characteristic of man, which seems at present at least so eminently to distinguish him, or to be of so much importance in every branch of moral science, as his perfectibility" (43). Godwin argued that as much as the individual has an obligation to contribute to the society, the society has an obligation to contribute to its members; society should not only remove impediments to the growth of its members, but provide themwhatever elements are necessary to allow them to grow to their full potential. The welfare of the society is tied inextricably to the welfare of its members:

> Society is nothing more than an aggregation of individuals. Its claims and its duties must be the aggregate of their claims and duties, the one no more precarious and arbitrary than the other. What has the society a right to require from me? The question is already answered: every thing that it is my duty to do…. What is it that the society is bound to do for its members? Every thing that can contribute to their welfare. But the nature of their welfare is defined by the nature of mind. That will most contribute to it, which enlarges the understanding, supplies incitements to virtue, fills us with a general consciousness of our independence, and carefully removes whatever can impede our exertions. (90)

The response by those who felt that class was a natural state was swift (Hasian 15-16). Thomas Malthus's An Essay on the Principle of Population as it affects the Future Improvement of Society, with Remarks on the Speculations of Mr. Godwin, M.

Condorcet, and other Writers (1798) responded to Godwin by arguing that a condition of poverty among some members of a society was an inescapable condition and that rather than alleviating the condition of poverty through assistance for the poor, the condition of the poor should be left hard, since misery was a natural restraint on the growth of population. Population grew geometrically, while the means of subsistence grew arithmetically. Only by those restraints experienced most severely by the poor—restraints commonly defined by Malthus as famine, ill-health, and war—could population be held in check. Malthus was read by Darwin in 1838, and it was Malthus's work that crystallized in Darwin's own mind his theory of natural selection in relation to evolution.

Discussions of evolution and discussions of eugenics were closely tied in Gilman's time. As I mentioned earlier, the expansion of Darwin's argument for physical evolution in Origin in 1859 to moral and intellectual evolution in Descent 1871, as well as Francis Galton's 1865 articles in Macmillan's magazine ("Hereditary Talent and Character"), spurred public discussion of this issue on many levels. Darwin's specific comments on selective breeding in Descent (though without using the word eugenics—first used by Galton in 1863) are a clearly eugenic application:

> With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilized men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to smallpox. Thus the weak members of civilized society propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly any one is so ignorant as to allow his worst animals to breed. (Darwin 1989, 139)

Darwin's comments underscore one strain of eugenic thought: that human progress is thwarted by humanitarian tendencies to lend support to those who are unable to—or compromised in their ability to—take care of themselves.

The elisions between evolutionary and eugenic thought framed both theories within an apparently progressive social framework: through the ongoing improvement of the human race, painful problems of disease, imbecility, and physical genetic impairments could be eliminated, and the result would be a humanity freed from these onerous problems. The apparent social benefits of an evolutionary eugenics attracted a large and varied audience: social progressives, scientists, anthropologists, and more.

But the limitations in scientists' understanding of genetics, attended by the belief that problems ranging from alcoholism, to prostitution, to criminality, and more, were genetically based, laid the basis for serious abuse of the new science. Cloaked in the protection of the "neutrality" and "objectivity" of science, proponents of eugenics could divest their agendas from racist and classist beliefs. In Gilman's time, the potential for these abuses was still largely a matter of theory, but within a few decades the potential became actual via the Supreme Court decision of Buck v Bell (1927) that upheld the constitutionality of the compulsory sterilization law of Virginia. Writing for the majority, Oliver Wendell Holmes said:

> We have seen more than once that the public welfare may call upon the best citizens for their lives. It would be strange if it could not call upon those who already sap the strength of the State for these lesser sacrifices, often not felt to be such by those concerned, in order to prevent our being swamped with incompetence. It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. The principle that sustains compulsory vaccination is broad enough to cover cutting the Fallopian tubes. (Buck v Bell)

The state now had the right to determine who could and who could not reproduce, based on its own definition of "fitness." Within ten years, thirty more states had passed compulsory sterilization laws, laws predicated on the Virginia model (Smith 6).

In 1933, Germany passed its own compulsory sterilization law, modeled on the Virginia law. Within a year, "56,000 people had been found to be defective by special hereditary health courts and had been sterilized" (Smith 6). Proponents of eugenics in America saw the move as healthy, oblivious to the creeping definition of "defective." Some estimates put the final total of those in Germany (between 1933 and 1945) determined to be defective and then sterilized at over two million (Smith 6-7).

Even if the specific applications of eugenics, in particular negative eugenics, were not widely actualized in the decades before Gilman wrote Herland, the philosophical groundwork for the worst excesses of eugenics was already being laid at this time. Do we hold writers such as Gilman, driven by apparently progressive ideals of equality, responsible for protecting the barely obscured agendas of repressive systems of class and race? Do we assume that her intelligence and her ideals should have alerted her to the extrapolated dangers of the philosophy of socially restricted breeding and parenting that her novel advocates? I personally am still undecided on that question. A closer look at Gilman's use of eugenics in her novel may help readers to make up their own minds.

Application of eugenics by Gilman in Herland. Gilman, who was the great-niece of Harriet Beecher Stowe, the author of Uncle Tom's Cabin (a novel which, prophetically enough in its own cyborg implications, was first subtitled The Man Who Was a Thing), wrote articles in her journal, The Forerunner, on such issues as eugenics, Darwinism and socialism, and feminism. She wrote several pieces that outlined a

counter-argument to those advocates of biological determinism as the best evidence that the suffragist movement was inherently wrong-headed. In one of these pieces, entitled "The Biological Anti-Feminist," she wittily and decisively rebuts the arguments of two writers—Sir Almroth Wright and Prof. Wm. B. Sedgwick—who contended that the limited social role of women has its precedent and justification in nature. Gilman reviews their arguments and reduces these arguments to the following assertion: because government rests on force, and because men are physically capable of greater force than women, government (both public and domestic) must remain in the hands of men, otherwise anarchy will ensue. Gilman's response is, if this is true, then it is certainly necessary for women to begin to train themselves in the arts of force in order to protect themselves from these barely-restrained marauding male brutes (1914, 64-67). This same sense of play with the implications of old and new sciences is at work in Herland, where Gilman suggests that when the methods of reproduction are changed, methods of production in other social systems are also necessarily altered.

Gilman clearly recognized that issues of sexual inequality were driven by ideology, and she also recognized that science was often presented in ideological terms. Her article, "The Biological Anti-Feminist," recognizes that biology studies could be used to justify specific cultural ideologies. Yet her own position of privilege, as an educated white woman with a well-known and respected family lineage, appears to frame her willingness to accept those ideologies within the sciences that legitimize her own class and racial privilege—as in her acceptance of eugenics. At the same time, though, she resists those sciences whose ideologies demean her position as woman—as in her challenge to the ideological tenets of biology.

Yet Gilman's endorsement of a eugenic model of evolutionary progress that is predicated upon sameness, upon being a "fit," creates a tension with her endorsement of Spencer's model. The women in the novel are identified as being of "Aryan" stock. The darker-hued South American women who were their servants were not favored with a parthenogenetic dispensation. In addition, despite the Aryan women's acceptance of a sexually reproductive model as the superior model, when it comes to sexually reproducing with men of a darker hue than themselves, non-reproduction becomes the preferred choice. The South American guide who first informs the American explorers about the existence of a "strange and terrible Woman Land" (4) also tells them that "a good many" men had gone to investigate this land, "but they never came back" (5). Obviously the women of Herland had at least had the opportunity to mate with other men before the appearance of these three explorers, but chose to maintain a parthenogenetic reproductive model. In addition, the American men apparently forget to ask about these earlier "disappeared" native explorers, and the women never bring up the subject.

The men believe, and the women of Herland seem to concur, that the status of these Aryan men is established primarily by their superior technology, and then—indirectly—verified by their racial characteristics. The narrator of the novel—the sociologist of the group, Vandyck Jennings—says that the women of Herland had developed an acute sense of anthropological hierarchies, hierarchies that classified other races by apparently two primary means: technological development and race:

> As to anthropology, they had those same remnants of information about other peoples, and the knowledge of the savagery of the occupants of those dim forests below. Nevertheless, they had inferred … the existence and development of civilization in other places, much as we infer it on other planets.
>
> When our biplane came whirring over their heads in that first scouting flight of ours, they had instantly accepted it as proof of the high development of Some

> Where Else, and had prepared to receive us as cautiously and eagerly as we might prepare to welcome visitors who came 'by meteor' from Mars. (65)

Upon sight of this plane and the men in it, the women apparently become willing to at least entertain the possibility of incorporating this genetic material into their gene pool. Throughout the novel, Gilman makes references to the "savage" races, a "savagery" that Gilman apparently cannot consider introducing into the genetic material of the light-skinned and un-savage Herland women. But the white men in the biplane offer a different mix. With them, Gilman has her women embrace the Spencerian dictum that in order to evolve, they must abandon their indefinite, incoherent model of homogeneity and move to a definite, coherent model of heterogeneity.

When Gilman endorses Spencer's dictum, she reveals several important tenets of her selective embrace of evolutionary theory. Darwin's evolutionary theory was developed over several stages; the two major parts of it were the theory of adaptation via natural selection (out of which the notion of the survival of the fittest emerged) and the theory of adaptation via sexual selection (out of which the theory of the most fit men breeding with the most fit women—which then becomes the basis for eugenics—emerged). Gilman accepts the premise of evolution via natural selection, though she rejects the mechanism by which natural selection occurs. Darwin argues for competition as the primary mechanism for natural selection; in general, Gilman argues for cooperation as a major mechanism. But when it comes to sexual selection, Gilman seems to sell out. Despite the extraordinary success and endurance of the Herland nation, all developed along metaphors of a homogeneity that—contrary to Spencer's projection—is neither indefinite nor incoherent, Gilman seems to surrender to the prevailing science. The construction of the fictional utopia of Herland is exposed simply as a conceit, a

method for getting the women back to the "real" gendered world with some of the lessons they have learned in this temporary retreat. When I reached this point in the novel the first time I read it, I felt betrayed. Why marry? Why leave? The rationale offered by the women seems weak: they want to experience "greater movement, constant change, with new possibilities of growth" that a life with two sexes can offer (135). In other words, Gilman seems to suggest, real evolution can only occur when sexual selection is made part of the equation. Without seeming to realize what she is doing, Gilman undermines much of the argument she has built in the rest of the novel for a definition of evolution that is driven by a cultural model of cooperation; now, with the reintroduction of sexual selection and the various competitions implicit in its mechanisms, she reverts back to the competitive model. The best of men need to reproduce with the best of women.

In Women and Economics, Gilman expands on her belief that intermarriage between people of vastly different social or racial conditions will only lead to seriously problematic "dual natures" (164), a term she uses in a specifically negative context. "Marry an Anglo-Saxon to an African or Oriental, and their child has a dual nature. Marry any man of a highly developed nation, full of the specialized activities of his race and their accompanying moral qualities, to [a] … rudimentary female creature … and you have as result what we all know so well ...—human soul[s] [riddled with] cross-eyed, purblind errors [and] baby fits of passion" (164). Marriages between such diverse beings—ether racially or culturally diverse— whose mixed characters are transmitted to their offspring result in an "innate perversion of character resultant from the moral miscegenation of two so diverse souls, — the unfailing shadow and distortion which has darkened and twisted the spirit of man from its beginnings" (167). Although Gilman is

making the above statements in the context of her argument for the moral necessity of women being allowed access to the same cultural avenues of growth and education that men are given, so that women may be equal partners to the men they marry, her language is disturbingly like the language of the most stringent of eugenicists.

The tendency in Herland is to breed toward a social model of privileged civility:

> They did effectually and permanently limit the population in numbers, so that the country furnished plenty for the fullest, richest life for all of them: plenty of everything, including room, air, solitude even.
>
> And then they set to work to improve that population in quality—since they were restricted in quantity. (72)

A female character in Herland tells one of the men, quite bluntly, that "We have made it our first business to train out, to breed out, when possible, the lowest types" (83). Even within a parthenogenetic model, a positive eugenics—an encouragement of breeding by the "best types—is achieved by pressuring the woman deemed "unfit" to abandon thoughts of motherhood, or, if she insists, placing the major responsibility for raising the child in the hands of a "better" mother.

In the above instance, Gilman seems to construct opposing ideologies. The biology of parthenogenesis offers an ideal opportunity for thinking about alternative biological models for community. Gilman, though, seems most interested in parthenogenesis only as a vehicle for getting her to a place where she can say, "See? Women by themselves can do what men can do, and better." Gilman does not seriously exploit the radical theoretical possibilities posed by this new metaphor of reproduction. Then, into the center of this potentially revolutionary biological model, she inserts a throwback to a model of enforced genetic "fitness." The conservative burden of

compulsory genetic suitability seems to choke much of the potential of this otherwise progressive textual creature.

Social implications of eugenics. The most public version of genetic research in the late twentieth and early twenty-first centuries is the Human Genome Project, a project that works to create a complete map of our genetic, and thereby hereditary, materials. Around this project swirl debates about the applicability of the results of genetic mapping.

Positive readings of the HGP usually focus on the opportunities it offers to eradicate genetic conditions such as hemophilia, cystic fibrosis, muscular dystrophy, and sickle cell anemia, among others. Genetic elimination of these diseases/disorders may occur either through a genetic intervention such as germ line gene therapy—which would eliminate the selected cell from the reproductive line—or through somatic cell gene therapy, which changes the genetic structure of only the single individual who receives the therapy. The offspring of the person receiving somatic cell therapy would not be affected by the somatic intervention (Gert 604-606).

The resistance to either of these types of genetic manipulation often springs from the fact that they would be very expensive; as a result, only the wealthy would be able to afford such interventions. Germline cell therapy in particular would offer the wealthy the opportunity to self-create a tier of humans who have been rendered insusceptible to some of the most destructive forms of disease, while those same diseases continue to develop unchecked among the less wealthy. At the same time, the ability to screen for genetic predispositions to disease could lead companies who can afford such screening to refuse to hire at-risk workers and lead insurance companies to deny insurance. In the end,

genetic intervention could lead to an even more fixed class system than that we currently have, since a person's assignment to a particular class based on wealth will be doubly inscribed: by both wealth and health.

Ruth Hubbard, Professor of Biology Emerita at Harvard and a member of the Board of Directors of the Council for Responsible Genetics, offers some of the strongest criticism of the Human Genome Project and the manner in which its discoveries are presented to the world. She argues that the fascination with mapping and the apparent discovery of specific genes linked to social behaviors that range from alcoholism to homelessness are part of a conservative backlash. Social movements operate from the premise that human nature is malleable; environment shapes who we are, and by reshaping the environment (developing economic equality, equal access to education, etc.), we can help to shape the people that emerge from that environment. But if genetic heredity is the primary factor in determining people's character, and environment a minimal or even inconsequential factor, then the work of social movements that agitate for social/environmental changes—movements from civil rights, to women's rights, to fair housing—are essentially pointless (Hubbard 185).

Marouf Arif Hasian, whose work in the rhetoric of eugenics I referred to earlier, tells us that James Watson, a former director of the Human Genome Project, believes that negative and excessive applications of the HGP in a eugenic context can be avoided by refusing to "cede control of genetic discoveries to those who would misuse them" (145). As in the above historical review, Watson draws a line between the science of eugenics/genetic manipulation and its application: the science itself is "neutral"; it is the

application of the science by outsiders that must be controlled. Watson's belief that he can control the applications of this knowledge is, I would argue, extraordinarily naïve.

Conclusion

In Women and Economics, Gilman endorses Spencer's dictum for a movement toward "coherent heterogeneity"; Gilman writes: "In social evolution as in all evolution the tendency is from 'indefinite, incoherent homogeneity to definite, coherent heterogeneity'" (110). Gilman's endorsement, then, of Spencer's claim that higher forms of life may only be achieved through sexual heterogeneity is undermined by her endorsement of racial and social homogeneity: her suggestion that evolutionary progression is predicated upon the elimination of groups she termed "defective," those who do not fit into prevailing notions of moral, physical, or racial correctness. Here, Gilman draws on the work of Galton, who suggests that evolution is not only about the survival of the most physically "fit," but also the survival of the most mentally "fit." This ability to be a "fit" is defined, says Galton, as having the intelligence and refinement of the class of beings thatis defined as superior. So, in Gilman's novel, we are presented with a definition of evolutionary necessity that endorses a sexually heterogeneous model, balanced against a eugenic definition of evolutionary progression that proposes a socially homogeneous one. The agendas of these two scientific claims undo each other.

My reading then of this novel is a reading that tries to untangle some of the various lines of feminist thought that become compromised by their use within a scientific context that is patriarchal in intent. Gilman's application of these sciences could be read as an attempt to reformulate the use and perception of them as less repressive to women than had been their general representation. In her uses of the sciences discussed

in this chapter, Gilman does not attempt to suggest that the solution is to intervene in those processes, or even to control them. Her intention is, instead, to challenge some of the metaphors of control and violence that are used to frame the application of these sciences. Evelyn Fox Keller suggests that twentieth-century scientific theory moved away from a focus on "representation to intervention (or from description to control)" (Fox Keller 1992 "Fractured Images" 96-97), a theoretical shift in science that was quickly reflected in the more interventionist modelof science reflected in the fiction of women writing in the mid-twentieth century, the subject of my next chapter.

CHAPTER FOUR
Pre- and Post-Atomic Cyborgs: C.L. Moore and Judith Merril

Mid-twentieth century American fiction negotiated a range of technological and political changes that shaped its themes, the most stunning of which was the U.S. deployment of the atomic bomb in 1945. Once the atomic age was officially launched, scenarios of fantastic and science fiction that had been dismissed as specious by the serious reading public became suddenly more plausible; Isaac Asimov wrote that the public credibility of science fiction drastically shifted when "[t]he dropping of the atomic bomb in 1945 made science fiction respectable" (Seed 9). Other advances in science and technology that impacted the themes of fantastic fiction in this era—particularly the development of the cyborg—were the discovery of blood typing (which allowed for the successful use of blood transfusion), the application of new technologies to the development of prosthetics (particularly important for returning veterans of WWI), and the beginnings of research in artificial intelligence in which scientists (many of whom built on the foundational work of AI pioneer Alan Turing) examined the ways machine intelligence could be developed to mimic human intelligence by extrapolating and improvising from basic programmed commands.

The different ways these technologies impacted the development of the cyborg might be understood by starting from a very simple dichotomy: before the deployment of the atomic bomb in 1945, the cyborg was a figure that was willed and proactive; after the dropping of the bomb, the cyborg became a figure that was inflicted and reactive. In this second incarnation, the cyborg is often sublimated into other forms: mutant children,

humans modified to survive in nuclear-altered or alien realms. Not until the 1960s would the cyborg again become a figure of, in Haraway's terms, hopeful promise.

The Displaced Cyborg

Oddly enough, women writers' use of the cyborg in fiction appears to nearly vanish from the literary scene starting in the mid 1940s, directly after the dropping of the atomic bomb. The cyborg only begins to reappear as a major theme in the mid 1960s. Women's fiction of fantasy and science swirls in the meantime around themes related to the impact of technology and science—often manifested in scenarios of war—on social structures of government, community, and family. Two works that represent this pre- and post-bomb divide are C.L. Moore's 1944 "No Woman Born," a novella of a woman rebuilt within a technobody after her original body is destroyed in a fire, and Judith Merril's 1948 "That Only A Mother," the story of a mother who gives birth to a daughter without limbs, the result of radiological poisoning.

Both works grapple with the impact of technology on the definition of what it means to be human, specifically a female human. Moore's story focuses on technology's impact on a specific individual's identity, and leaves the impact of those changes on surrounding characters and social structures implied rather than stated. The ripple effects of the story move outward from its central character. Merril, on the other hand, begins her story by recounting the stories circulating via press and medical accountings of the effects of radiation poisoning. The person most directly affected by this technology—the limbless child—is not so much a character as she is a foil for commentary on the events that surround her. In Merril, the story begins on the outer, public circumference of

technology's devastating effects at large and moves steadily inward toward the domestic center, the individual home.

The central character in Moore's story is a well-known actress—Deirdre—who is assertive, self-sufficient, very visible, experimental, and extremely eager to engage with the world on a public platform. The opposite is true of the mother—Margaret—in Merril's story. Margaret is cautious, self-doubting, and focused on the private and the domestic. Although the messages contained in these two stories are of course inflected by the settings from which they emerge, I also believe that—to a great degree—the domestic cocoons constructed by writers like Merril are actually soothing camouflage for what end up being texts that are just as subversive and as disruptive of the social order as those stories whose forms appear to be a more direct challenge to social conventions.

Shifts in Cyborg Critiques

Once the bomb had been dropped, stories related to the types of questions raised by the cyborg—questions of personal identity and gender in relation to the individual and the social structure—seemed to become secondary to stories about apocalyptic destruction, radiation-derived mutation, reversions to barbarism, survivalism, world dictatorships, fears of invasion, and more. David Seed, author of American Science Fiction and the Cold War, points to various strains in fantastic fiction of this period. Seed sees some writers as authors of narratives of disillusionment (11), while others presented themselves as prophets—articulators of cautionary tales (15-16) who operated in a unique theatre of social criticism.

In fact, in the period following the dropping of the bomb, science fiction as social criticism and its writers as public commentators on the shortcomings of social structures

became much more prevalent. Fiction that had operated as a barely disguised voice for western imperial adventurism now was called to account by sister and fellow writers. In 1975, Ursula LeGuin charged the early (pre 1960s) science fiction community with being controlled by an ideology of unmitigated imperialism:

> From a social point of view most SF has been incredibly regressive and unimaginative. All those galactic empires taken straight from the British Empire of 1880. All those planets—with 80 trillion miles between them!—conceived of as warring nation-states, or as colonies to be exploited, or to be nudged by the benevolent Imperium of Earth toward self-development—the White Man's Burden all over again. The Rotary Club on Alpha Centauri, that's the size of it. (LeGuin 1989, 94)

Samuel Delany places the shift in science fiction focus earlier than does LeGuin, in the 1950s, and argues that the impetus to change was the experience of the McCarthy hearings:

> The most striking element in American life in the early '50s was McCarthy's persecution and terrorization of Americans associated with the left, just as the Second World War had been the most striking element of the 40s. Until McCarthy, however, the internal dialogue in science fiction was rather rarified. Themes such as history, science, and, of course, time were seen as most significant…. As McCarthyism became a threat to science fiction's historical plurality, American science fiction began to deal directly with problems in the country. It began to touch on the racial situation, population growth, religious freedom, sexual roles, social alienation, "conformity," and ecology. (237)

In other words, in reaction to the pressures of the time, science fiction began to move beyond its largely untroubled role as advocate for science and technology as cultural markers of progress to its more complex role as interrogator of the impact of science and technology on the human condition. Judith Merril, science fiction writer and anthologist of multiple science fiction collections, locates the nexus of dissent in roughly the same period as Delany:

> The best s-f stories of the forties had been (often brilliantly) predictive; the overall tone up through the early fifties was instructive, indeed evangelist; science

> fictionalists were triumphant prophets of atomic power and space flight.…[B]y 1955, the field had achieved just enough literary respectability to be able to serve a vital function: [between 1955 and 1960], … it was science-fiction magazines that provided the only widely read medium for protest and dissent in a witch-hunting country. (Merril in Newell 195)

The postwar "protest and dissent" had actually appeared earlier than 1955, including its appearance in Merril's own work, discussed later in this chapter. But certainly, the tone of dissent was muted by its framing within fairly conventional domestic structures. As Merril writes, dissent was evident, but "one was not supposed to spell it out too clearly" (Merril in Newell 196).

Perhaps the cyborg as a vehicle for social criticism was, by its nature, seen by those writing in the nuclear aftermath as more closely related to critiques of the nature of the individual than it was to critiques of social structures. In post-nuclear fiction, the cyborg moves from being a body of mixed promise to being a body of military horror, of war and science and power gone catastrophically wrong. Films such as "Invasion of the Body Snatchers" (1956) present a twist on the cyborg theme and are representative of the fears of the period. In this "invasion," the human bodies merge with other life forms; the boundaries of human and alien are crossed. But in these cases the cyborg that emerges is presented as a body that has been invaded and colonized by an external force rather than as one that has evolved in response to cultural demands. The attendant metaphor in many of these films is one of infection, and the only way to kill the colonizer is to kill the host: the threat is internalized and the self as cyborg becomes the manifestation of an external enemy (Seed 133-135).

As a result of the apparent compromising of the cyborg figure, women writers—in the decades immediately following the dropping of the atom bomb—may have found

their fictional concerns tied more closely to exploring questions about the way technology morphs social structures than about how technology morphs individual identity. For a time, reforming the individual body took a back seat to pressing concerns about reforming social institutions that seemed to perpetuate violence. As a result, the cyborg took a short hiatus from women's fiction. At the same time though, by their exploration of the relationships between technology and social institutions, women writers were laying some of the groundwork for the shift of emphasis in cyborg fiction when it reappeared in the 1960s.

Autonomy for the cyborg. Before it left on an extended sabbatical from women's fiction in the decades after 1945, the cyborg had begun to morph yet again, moving another step away from its earlier versions. For the first time, we begin to see specific hints that the figure of the cyborg will be measured not only by its difference <u>from</u> a previous model of gendered binaries, but by its difference <u>than</u> a previous model. Dianne Currier, in her essay "Assembling Bodies in Cyberspace: Technologies, Bodies, and Sexual Difference," suggests that the distinction between the two types of differences is clear: *different from* operates from an assumption of a privileged norm in which deviation from that norm is measured as "diminution, variation, or lack" (520). *Different than*, on the other hand, suggests an autonomy of identity that is not available to *different from*. *From* indicates a "difference in degree," while *than* indicates a "difference in kind" (520).

Here, Currier is taking and stretching Saussure's work on signs and meaning. Saussure locates meaning in associations; a definition is determined not within the word itself but in a word's relationships with—and in its degrees of difference from—other

words. The evolving idea of the cyborg is also a term that is located within a string of literary associations within which its meaning emerges as measured by its difference: cyborg as monstrous human, cyborg as freakish human, cyborg as hybrid human, cyborg as cyborg. Each step along that pathway becomes slightly less a violation of the human condition, and slightly more an alternative to the human condition. By the mid-twentieth century, the core identity of the cyborg begins to become less associational with human identity than it had been in its previous manifestations.

In the last two chapters, I have talked about science's use of metaphors to create and perpetuate cultural belief systems. Here I would like to pause and examine how metaphor works with "sameness" and "difference" to construct an impact on the listener or reader. In his work on rhetorical theory, Gerard A. Hauser discusses the interplay between "focus" and "frame" necessary to create a powerful metaphor. He uses the example of the metaphor "Bob was a snake when I needed his support" to explain the basic structure of the metaphor.

Focus
Bob was a snake when I needed his support.
Frame

When we read the *frame* (Bob's behavior) along with the *focus* of the metaphor (snake), we come away with an "interactive view" of *frame* and *focus*: Bob's behavior was snakelike (sneaky, slithery). Hauser continues to develop the terms *frame* and *focus* by pointing out that the *frame* operates as the "principal subject" in a metaphor, while the *focus* operates as the "subsidiary subject." The "interactive view" between the two subjects is what gives rise to the "implicative complex" of the metaphor's meaning (Hauser 155-157). Bob may just be a quiet guy who works hard and minds his own

business, but this generally ambivalent reading of Bob's behavior takes on malevolent overtones when that same quietness and attendance to business is associated with the behavior of a snake. The principal and subsidiary subjects have now become—via the implicative complex—a single subject in the reader's mind: sneaky Bob.

In order to achieve this complex, the two parts of the metaphor must each evoke a series of associations that can then be compared to the associations of the other part. Each set of associations must contain enough elements that are substantially different from the associations of the other element to create a strong contrast. If, for example, we say, "Stuart was a giant," the metaphor has minimal resonance because its two parts evoke very similar associations. On the other hand, if we say, "Stuart was a mountain," the metaphor resonates more strongly with the reader because the associations with the two parts are substantially different. Before being associated with one another in the metaphor, the two parts of the metaphor are *different than* one another (Stuart and mountain); link them together and the interactive complex of the two sets of ideas creates a relationship between the two that is now *different from* one another (mountainish Stuart; Stuartish mountain). Outside of the metaphor, the two ideas were different in kind (different than); link them together in the metaphor and they become different in degree (different from).

Although the cyborg is still fictionally encased in metaphor in the mid-twentieth century, we begin to see stirrings that suggest an escape from metaphor. The cyborg begins to slip out of a *difference from* human to an identity that is not premised on traditional metaphors, an identity that emerges as *different than* human. As David Seed suggests, fiction and film with fantastic themes do not produce "arbitrary fantasy but

rather [rework] key metaphors and narratives already circulating in the culture" (2). The cyborg's evolving identity in fiction reflects a restlessness with traditional notions of the human.

For women in particular, the cyborg's difference is often measured by an escape from a singular idea of gender. Luce Irigaray, in her essay "This Sex Which is Not One," writes of the plural identities of woman, a plurality made possible by women's very ability to embrace the other without needing to subjugate the other. She learns that she is able to experience value and pleasure both in herself and in relation, but she owns the choice: she is not required, by her sexuality, to find completion in controlling or being controlled by another:

> [A] woman's (re)discovery of herself can only signify the possibility of not sacrificing any of her pleasures to another, of not identifying with anyone in particular, of never being simply one… Woman would always remain multiple, but she would be protected from dispersion because the other is a part of her. (Irigaray 104-105)

Woman is predisposed, because of her sexual makeup Irigaray suggests, to be able to morph into a variety of beings through her "nearness" with the other; nearness, though, is not appropriation, nor is it possession. Embracing the other, in Irigaray and in Haraway, is not about colonization, but about symbiosis.

In Mary Shelley's model of the cyborg, the creature constructed by Frankenstein operates primarily as a foil to illuminate Frankenstein's—and thereby science's—hubris. Mary Shelley's creature does not seem an attempt to redefine what it means to be human; instead, it functions as a mirror to humanity, to correct humanity's excesses and failings. As I discuss in chapter two, Mary Shelley's cyborg holds both the promise of an expanded notion of gender as well as the warning of a destructive science. In Shelley's

model of a being that is physiologically male yet culturally female, she blends already established categories into a unique mixture, but she does not substantially alter the basic tenets of the two genders. In addition, the portrayal of science in Frankenstein is of a science that creates a new being that is a duplicate model (albeit a bit larger and stronger) of already existing humans, a being meant to exist in a permanently subservient position to its maker. But Frankenstein does not consider constructing a non-human being, say, an animal-human hybrid or a part-machine/part-human being. He simply duplicates—as closely as possible—that form of being with which he is most familiar. Mary Shelley's creature is still different from man, not a creature different than man.

Charlotte Perkins Gilman's women in Herland also function as women different from previous women, though Gilman takes the difference one step farther than Shelley. The men in that novel, the chauvinistic Terry in particular, are nonplussed at trying to understand women as women when they do not define themselves against the privileged norm—the male being. Yet the women themselves never self-define as anything other than women, nor do they develop any characteristics (other than their ability to reproduce asexually) that would take them outside the realm of the human. Indeed, Gilman's argument in large part seems to be that the notion of "woman" is a cultural construction used to separate women from their "race" characteristics; when "human" is understood as premised upon a male model, then being "woman" makes one less than human. Gilman's novel insistently privileges women's humanity—their race—as being just as important as their female characteristics.

These two writers—Shelley and Gilman—both use science to represent larger problems that the writers then address, but they do not suggest that the problem is in the

science itself. The problem lies in its use. Science in Shelley is portrayed as a discipline whose physical applications must be controlled, and in Gilman as a discipline whose cultural applications must be controlled. The applications of the science—both positive and negative—are considered and critiqued by the two writers. But they do not argue for alterations in the practice of scientific theory or discovery itself, only for differences in the application of science and its cultural manifestations.

Cyborg interventions. Twentieth-century scientific theory itself though was moving toward a stronger model of control in its approach to research; Evelyn Fox Keller identifies this as a shift away from a focus on representation (description) to a focus on intervention (control) (Fox Keller, 1992 "Fractured" 96-97). As science itself became more interventionist, women's fiction about science also had to negotiate that shift. I argue that women's fiction in this period was moving away from a representational model that represented difference as *different from* and toward an interventionist model that began to ignore the privileged norm altogether as it started to build characters and situations that were *different than*.

C.L. Moore

Catherine Lucille Moore began publishing in the 1930s; her work appeared throughout the 30s and 40s in a series of pulp magazines, including Weird Tales, Astounding, Strange Stories, Fantasy Magazine, and more.

Moore's 1944 novella, "No Woman Born," was written a few years after her marriage to fellow science-fiction writer Henry Kuttner in 1940. Both were established writers before their marriage, though Moore's use of the initials C.L. in her publishing

persona (rather than her gender-obvious name: Catherine Lucille) obscured the fact that she was a woman. In fact, the two writers met after Henry Kuttner wrote to Moore with a letter addressed to "Mr. C. L. Moore" (Willick). The two collaborated on many works after their marriage, using a variety of pseudonyms. According to some sources, they used at least seventeen different assumed names (Willick; "C.L. Moore"). The name used by Moore when the stories were authored primarily by her was Lawrence O'Donnell. The name used for works that were truly collaborative was Lewis Padgett (Willick; "C.L. Moore"). Other names included Edward J. Bellin, Noel Gardner, C.H. Liddell, and others (my personal favorite: Woodrow Wilson Smith). Both writers used their own names alone for works that were singly-authored, although Moore herself admitted that several of the stories submitted under Kuttner's name were actually hers. Why? Because his per-page pay rate in the magazines of the day was higher than hers.

"No Woman Born." Moore's novella tells the story of a famous young actress (I use the term "actress" as the term of the period) whose body is destroyed in a theatre fire, but whose brain is saved and then rebirthed within a technobody of fantastic technologies. The young woman—Deirdre—was known not so much for classically perfect beauty as she was for an imperfect beauty that was rendered even more unique by her extraordinary charm, energy, and grace.

The novella opens with the words: "She had been the loveliest creature whose image ever moved along the airways" (Moore 1975 "No Woman Born" 200). The "she" in this case, the actress Deirdre, is never identified by any name other than her first name throughout the story. Like Frankenstein's monster, who also never receives a name, Deirdre is denied lineage except for the paternity she receives from the maker who

constructs her technologized body; that maker is identified by only a last name: Maltzer. In her rebirth, Deirdre is truly his creation, his child.

Future technologies rooted in the present. As Deirdre's former manager, John Harris, prepares to meet her again for the first time since she has taken on her new form, he finds himself struggling with thoughts of the relationship he believes must have developed between Deirdre and Maltzer over the year of intense interaction that has passed as her new body was being designed and built: Harris "was thinking … of the strange, cold, passionless intimacy between Maltzer and Deirdre in that year, a closer intimacy than any two humans can ever have shared before. In a sense the Deirdre whom he saw in a few minutes would *be* Maltzer…. There had been between them a sort of unimaginable marriage, stranger than anything that could ever have taken place before" (202-3). Harris's words are telling: a relationship that is "cold" and "passionless" is still capable of being more intimate than any that has come before.

From the start of the story, two characteristics of Deirdre are stressed: the movements of her body and the inflections of her voice:

> Her soft, husky songs had sounded in the depths of jungles, [sic] her lovely, languorous body had woven its patterns of rhythm in desert tents and polar huts. The whole world knew every smooth motion of her body and every cadence of her voice, and the way a subtle radiance had seemed to go on behind her features when she smiled. (200)

Moore sets her story within an unspecified, though not-too-distant, future. She anticipates the spread of television into nearly every home, though she calls it the "air-screen." Deirdre, in explaining to Harris how her mechanical voicebox is able to duplicate the original timbre of her voice, refers to a "Vodor."

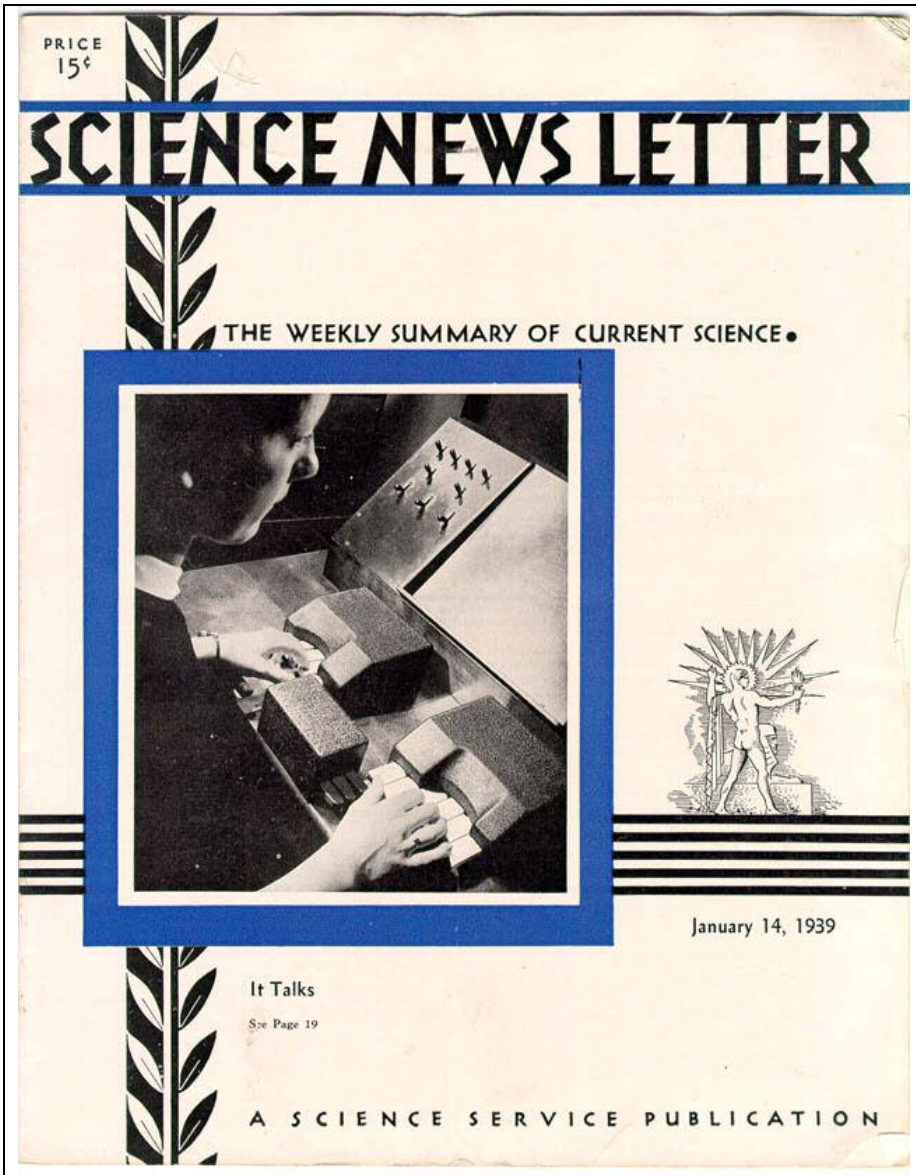
> He [Maltzer] started with a new variation of the old Vodor you must remember hearing about, years ago. Originally, of course, the thing was ponderous. You know how it worked—speech broken down to a few basic sounds and built up again in combinations produced from a keyboard. I think originally the sounds were a sort of *ktch* and a *shooshing* noise, but we've got it all worked to a flexibility and range quite as good as human now. All I do is—well, mentally play on the keyboard of my … my sound-unit, I suppose it's called. (210)

In the three editions of Moore's story that I looked at, the spelling of "Vodor" was consistent, but what Moore was actually referring to was the Voder ("er" rather than "or"). In its original incarnation, the Voder was a speech synthesizer demonstrated at the World's Fair in New York in 1939, the fair that advertised itself as giving visitors a look at "The World of Tomorrow." The full name of the speech synthesis device was "The Vocoder" (The source of the name was differently named by different sources: some said Voder stood for "Voice Operated Recorder," others said it stood for "Voice Operation Demonstrator").

The Voder was developed in the 1930s by Homer Dudley who was a research physicist at Bell Laboratories in New Jersey ("Vocoders and Voders"). The demonstration of the Voder at the World's fair caused quite a stir, and reports of the machine appeared in the press in the months before its public demonstration, prompting great curiosity (see Figures 4.1 and 4.2).

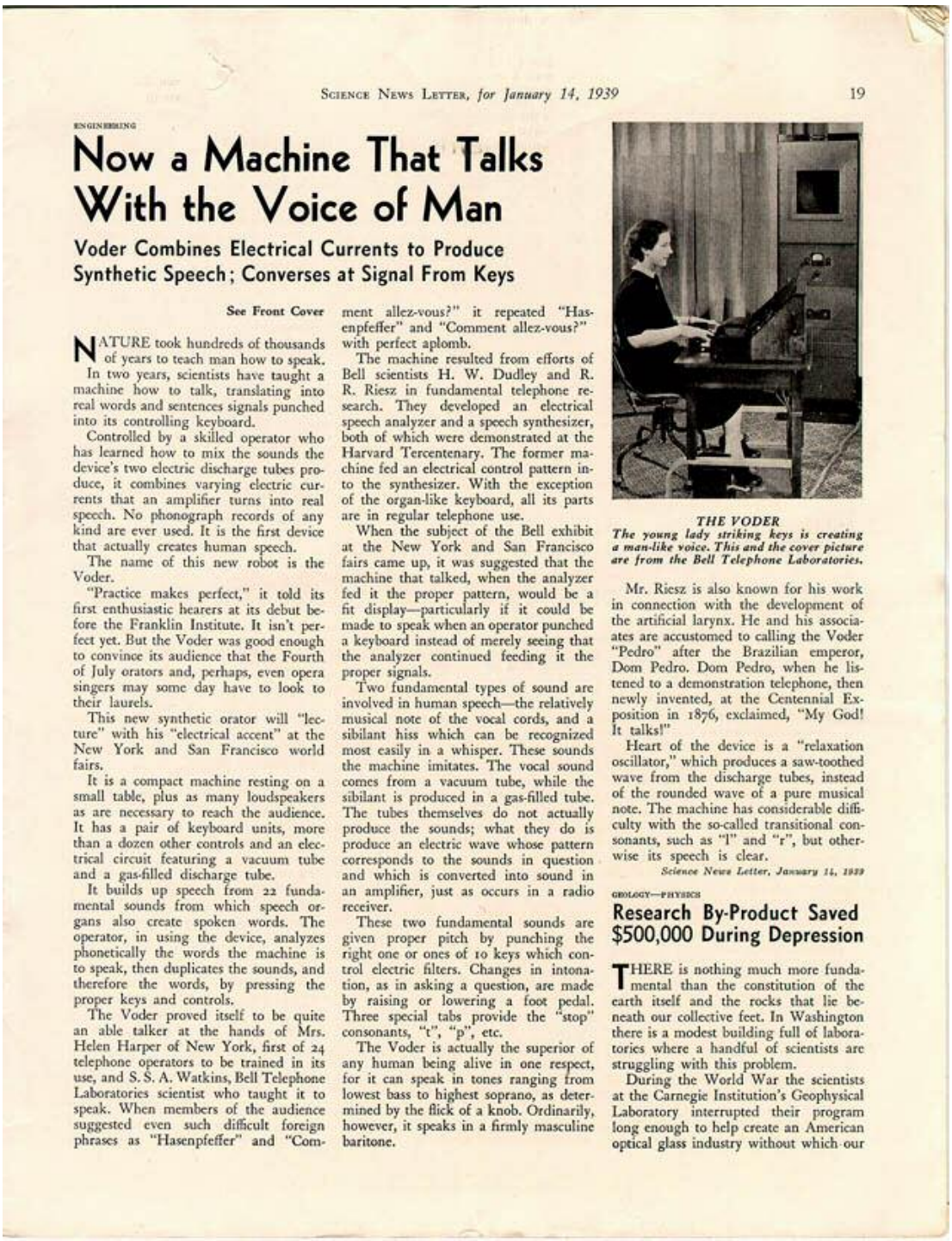
For some reason, the Voder's operators were exclusively women (early data-entry clerks?). At demonstrations of the Voder, the women would operate the machine, while a man stood by and explained how it worked. In the audio files I listened to of these early demonstrations, the man doing the explaining consistently referred to the female operators (who needed to spend more than a year training and practicing in order to produce high-quality synthesized speech) as "the girls" (Lee).

Figure 4.1.
The Voder on the cover of the January 1939 Science News Letter



An original January 14, 1939 Science News Letter, published by Science Service. Smithsonian National Museum of American History. 9 Dec. 2004. <http://americanhistory.si.edu/collections/scienceservice/newsletters/390114.htm> Accessed 10 May 2005.

Figure 4.2. Press coverage of the Voder



SCIENCE NEWS LETTER, *for January 14, 1939* 19

ENGINEERING

Now a Machine That Talks With the Voice of Man

Voder Combines Electrical Currents to Produce Synthetic Speech; Converses at Signal From Keys

See Front Cover

NATURE took hundreds of thousands of years to teach man how to speak. In two years, scientists have taught a machine how to talk, translating into real words and sentences signals punched into its controlling keyboard.

Controlled by a skilled operator who has learned how to mix the sounds the device's two electric discharge tubes produce, it combines varying electric currents that an amplifier turns into real speech. No phonograph records of any kind are ever used. It is the first device that actually creates human speech.

The name of this new robot is the Voder.

"Practice makes perfect," it told its first enthusiastic hearers at its debut before the Franklin Institute. It isn't perfect yet. But the Voder was good enough to convince its audience that the Fourth of July orators and, perhaps, even opera singers may some day have to look to their laurels.

This new synthetic orator will "lecture" with his "electrical accent" at the New York and San Francisco world fairs.

It is a compact machine resting on a small table, plus as many loudspeakers as are necessary to reach the audience. It has a pair of keyboard units, more than a dozen other controls and an electrical circuit featuring a vacuum tube and a gas-filled discharge tube.

It builds up speech from 22 fundamental sounds from which speech organs also create spoken words. The operator, in using the device, analyzes phonetically the words the machine is to speak, then duplicates the sounds, and therefore the words, by pressing the proper keys and controls.

The Voder proved itself to be quite an able talker at the hands of Mrs. Helen Harper of New York, first of 24 telephone operators to be trained in its use, and S. S. A. Watkins, Bell Telephone Laboratories scientist who taught it to speak. When members of the audience suggested even such difficult foreign phrases as "Hasenpfeffer" and "Comment allez-vous?" it repeated "Hasenpfeffer" and "Comment allez-vous?" with perfect aplomb.

The machine resulted from efforts of Bell scientists H. W. Dudley and R. R. Riesz in fundamental telephone research. They developed an electrical speech analyzer and a speech synthesizer, both of which were demonstrated at the Harvard Tercentenary. The former machine fed an electrical control pattern into the synthesizer. With the exception of the organ-like keyboard, all its parts are in regular telephone use.

When the subject of the Bell exhibit at the New York and San Francisco fairs came up, it was suggested that the machine that talked, when the analyzer fed it the proper pattern, would be a fit display—particularly if it could be made to speak when an operator punched a keyboard instead of merely seeing that the analyzer continued feeding it the proper signals.

Two fundamental types of sound are involved in human speech—the relatively musical note of the vocal cords, and a sibilant hiss which can be recognized most easily in a whisper. These sounds the machine imitates. The vocal sound comes from a vacuum tube, while the sibilant is produced in a gas-filled tube. The tubes themselves do not actually produce the sounds; what they do is produce an electric wave whose pattern corresponds to the sounds in question and which is converted into sound in an amplifier, just as occurs in a radio receiver.

These two fundamental sounds are given proper pitch by punching the right one or ones of 10 keys which control electric filters. Changes in intonation, as in asking a question, are made by raising or lowering a foot pedal. Three special tabs provide the "stop" consonants, "t", "p", etc.

The Voder is actually the superior of any human being alive in one respect, for it can speak in tones ranging from lowest bass to highest soprano, as determined by the flick of a knob. Ordinarily, however, it speaks in a firmly masculine baritone.

THE VODER
The young lady striking keys is creating a man-like voice. This and the cover picture are from the Bell Telephone Laboratories.

Mr. Riesz is also known for his work in connection with the development of the artificial larynx. He and his associates are accustomed to calling the Voder "Pedro" after the Brazilian emperor, Dom Pedro. Dom Pedro, when he listened to a demonstration telephone, then newly invented, at the Centennial Exposition in 1876, exclaimed, "My God! It talks!"

Heart of the device is a "relaxation oscillator," which produces a saw-toothed wave from the discharge tubes, instead of the rounded wave of a pure musical note. The machine has considerable difficulty with the so-called transitional consonants, such as "l" and "r", but otherwise its speech is clear.

Science News Letter, January 14, 1939

GEOLOGY—PHYSICS

Research By-Product Saved $500,000 During Depression

THERE is nothing much more fundamental than the constitution of the earth itself and the rocks that lie beneath our collective feet. In Washington there is a modest building full of laboratories where a handful of scientists are struggling with this problem.

During the World War the scientists at the Carnegie Institution's Geophysical Laboratory interrupted their program long enough to help create an American optical glass industry without which our

An original January 14, 1939 Science News Letter, published by Science Service. Smithsonian National Museum of American History. 9 Dec. 2004. <http://americanhistory.si.edu/collections/scienceservice/newsletters/390114.htm> Accessed 10 May 2005.

The Voder was operated via a ten-unit keyboard (so that all sounds could be produced with some combination of ten fingers exerting pressure on the various keys), and the sound was manipulated with oscillators and filters. Rather than producing a flat, monotone sound, in the hands of a skilled keyboard operator, the Voder was able to produce tonal variations of both pitch and inflections (including accents).

Figure 4.3. Schematic of the Voder

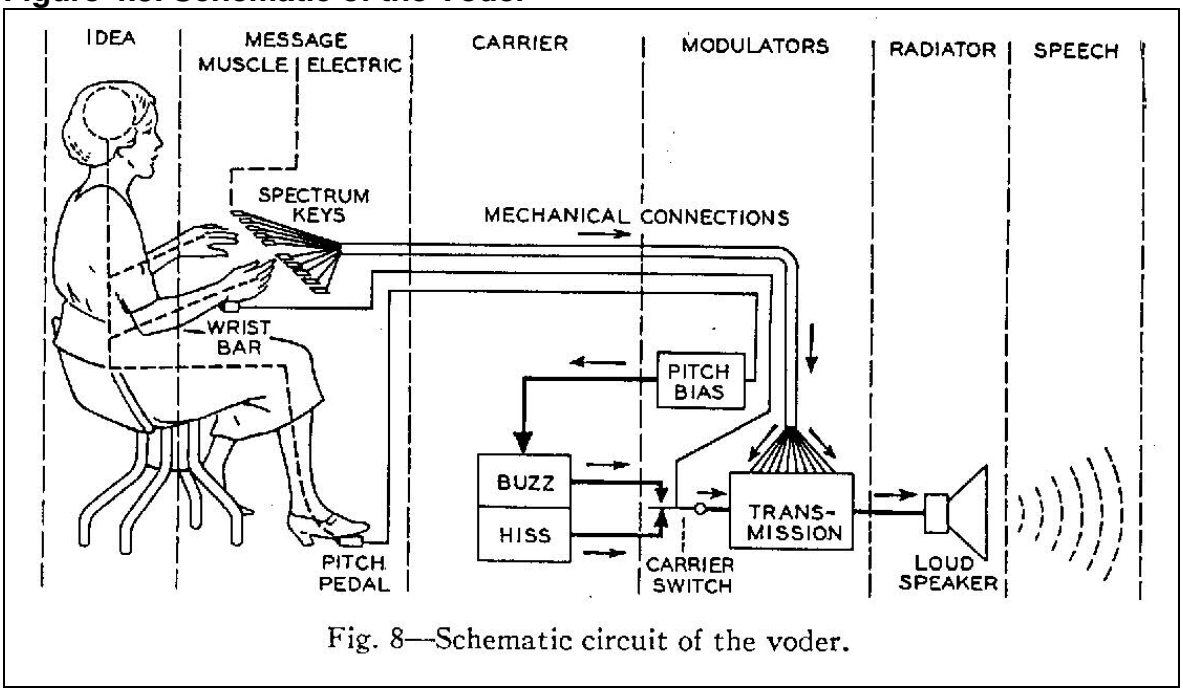


Fig. 8—Schematic circuit of the voder.

Lee, Edward A. "Parametric Speech Synthesis."
Edward A. Lee, Professor, Chair of Electrical Engineering, and Associate Chair of EECS
University of California at Berkeley. 15 Feb. 2004.
<http://ptolemy.eecs.berkeley.edu/~eal/audio/voder.html> Accessed 12 Aug. 2005.

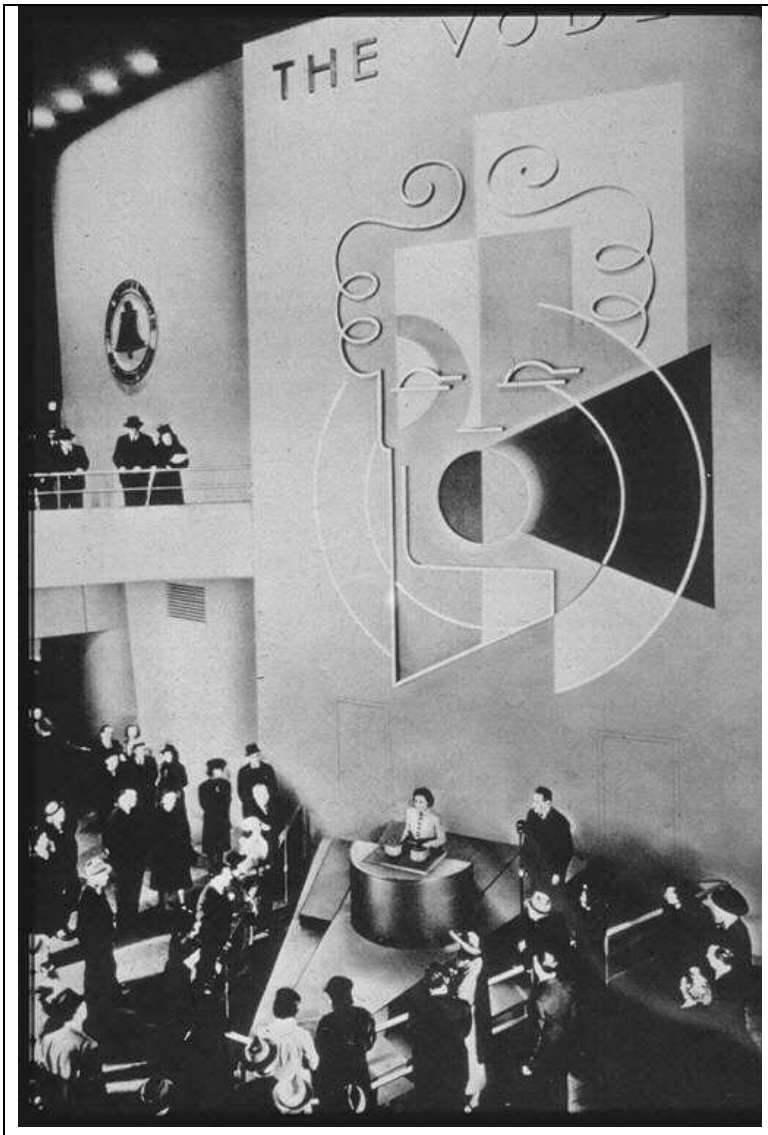
When Deirdre says that she is able to create a voice that duplicates her original tones by mentally playing on the keyboard of her sound-unit, Moore is evoking an image of the actual keyboard of the Voder that readers would remember from the four-years-prior World's Fair (see Figures 4.3 and 4.4).. Translating this image into Deirdre's capabilities would not be a large jump for many of Moore's readers. Deirdre of course

has more flexibility and possibility of combinations; since she is using mental rather than physical fingers, she is not limited to the ten "spectrum keys" (see Fig. 4.3) of the keyboard used by the original operators.

The Voder made yet another jump in popular culture when Stanley Kubrick drew on Voder technology to inflect the character of "Hal," the computer operating the spaceship in Kubrick's 1968 film, "2001: A Space Odyssey." In that film, the voice of the computer Hal was actually spoken by actor Douglas Rains, but Rains speaks the role with a mildly mechanical voice and subdued human inflections. At the end of the film, when the out-of-control Hal is finally unplugged by the last human survivor of the ship, the computer fades out singing "Daisy, Daisy, give me your answer do." This song is an in-joke for those familiar with speech synthesis technology's history: the first time a Voder unit was programmed to sing was in 1961, and the song its programmers gave it the capacity to sing was "Daisy" ("Klatt's History").

In Moore's novella, Deirdre clearly has a very strong grasp of the principles by which her body operates, and she is anxious to test their possibilities. But sometimes she will feign ignorance, as when she explains the principle of her internal Voder to Harris: "'They [her brain patterns] send out very strong impulses that are stepped up as much as necessary somewhere or other in here—.' Her hands waved vaguely over the mesh-robed body" (211). Only later do readers realize how very clearly Deirdre understands her body's capabilities, but, like the "girls" who simply work the keyboard while the male scientist explains the principles, Deirdre initially only admits to enough knowledge to allow her to push the right buttons.

Figure 4.4. A Voder Demonstration



The Voder was demonstrated at the 1939 World's Fair in New York.
"The Voder."
David H. Szondy
Text Copyright © 2004 - 2005.
All rights reserved.
22 July 2005.
<http://davidszondy.com/future/robot/voder.htm>
Accessed 10 August 2005.

The potentials of Deirdre's powers are deflected by her posture of naïve technologist; the portrait of herself that she invokes is non-threatening. As a result, she is much like the young women whose admiring uplifted faces underscore the technological prowess of the men demonstrating the power of the General Electric refrigerators in my first chapter (Fig. 1.2).

The mythological human. Both Harris and Maltzer are worried about Deirdre, but their anxiety emerges from their assumption that Deirdre will want to be accepted as human and that her work to develop human-like attributes of movement and voice is part of her drive for that acceptance. Maltzer, in particular, believes that Deirdre's intense focus on work is driven by a goal to make herself human-like, a goal that is unattainable. As a result, he begins to regret his role in recreating her. He even suggests that she would have been better off dead than to be reconstructed as a failed human; in attempting to talk Deirdre out of the projects she pursues, he believes that he is saving Deirdre from herself, from what he perceives as her own doomed attempts to be accepted as human.

But rather than trying to shape herself to become as human as possible, Deirdre quickly discovers her extra-human capabilities, and she studies them carefully. The points on which she focuses are the new and expanded capabilities of her body and her voice. These two points of Deirdre's physicality— "the fabulous grace that had poured through her wonderful dancer's body" and her "soft and husky voice with the little burr in it" (200) —are the two physical elements of Deirdre on which most of the story focuses. When Harris first sees her, he goes through a series of rapid reactions. First he sees Deirdre as a collective impression, and he is stunned, thinking, "She hasn't changed at all." Then the individual physical aspects of her constructed body begin to register, and he swings to the opposite reaction: "[N]ot human. Nothing but metal coils. Not Deirdre at all—." Then, for the first time, he sees Deirdre move. The individual components of her body meld together to suggest the movements of the original Deirdre, and Harris's perceptions go through a final radical shift and then stabilize: "Illusion steadied and became factual" (205). Illusion becomes fact via the persona Deirdre is able

to project. But this factual illusion is predicated upon what Harris has known before, not upon what Deirdre has now become.

The struggle of those around Deirdre is that though they know she is no longer human in any traditional sense of the word, they can only see her non-humanity in mythological rather than in technological terms. At two different points early in Moore's story, Harris describes Deirdre as like one of Oberon's knights (208); in the second instance he specifically says she wears "the body of Oberon's inhuman knight" (212).[39] Her armored body has no resemblance to the lumbering knight of a human medieval court. Instead, Harris views her as like a member of an unearthly, elfish fairy court, a knight of the elf fairy king Oberon:

> She looked, indeed, very much like a creature in armor, with her delicately plated limbs and her featureless head like a helmet with a visor of glass, and her robe of chain-mail. But no knight in armor ever moved as Deirdre moved, or wore his armor upon a body of such inhumanly fine proportions. Only a knight from

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[39] I spent far too many research hours trying to track down the references in Moore's story to Deirdre as "Oberon's inhuman knight." Because the novella refers to Deirdre three times with variations of this phrase, I felt the reference must carry some serious import. My assumption was that Moore was referring to a specific character in literature or mythology. I started, of course, with Shakespeare's "Midsummer Night's Dream," in which Oberon—the king of the fairies—asks his wife Titania to give him her young attendant—a young and beautiful Indian boy. Oberon wants to make the young man the "knight of his train, to trace the forests wild" (II, i, 25). But Titania refuses to hand over the child. As a result, Oberon and Titania quarrel, and that quarrel becomes the impetus to much of the action in the play. But this sparred-over potential knight-to-be is by no means inhuman. Although the Shakespeare seemed the most obvious choice, even with a careful rereading of the play I couldn't make the reference work in that context. As a result, I moved on to other sources that mentioned Oberon, always on the alert for a reference to some sort of "inhuman knight." Interlibrary loan became overwhelmed by my requests for the libretto for Carl Maria von Weber's opera "Oberon," for translations of the 13th century French romance "Les Prouesses et faitz du noble Huon de Bordeaux" in which the title character is a knight named Huon of Bordeaux who is assisted by Oberon in a series of quests, for a translation of Christopher Martin Wieland's poem "Oberon," and more.

After much fruitless (though, honestly, fun) searching, I came to believe that Moore was using the reference to the inhuman knight not as a reference to a specific character, but as a reference to a quality of character—an ethereal knightliness, like that which might be seen among fairy (thusly inhuman) knights in a court such as that of the fairy king—Oberon.

> another world, or a knight of Oberon's court, might have shared that delicate likeness. (207-08)

But the knights of Oberon's court are beings who do not die as other mortals do; Harris must return to his referent and modify it when he realizes that—despite her unearthly appearance—Deirdre is also subject to aging and death. Her body may be immortal, but the brain that powers the body is as mortal as any other human's. That brain will wear out, and when it does, the electro-magnetic impulses that hold her body together—those impulses emanating from her brain—will stop, and her body will simply dissolve into a pile of disconnected metal rings:

> She was not cut off from the rest of her race in the essence of their humanity, for though she wore a body of steel and they perishable flesh, yet she must perish too, and the same fears and faiths still united her to mortals and humans, though she wore the body of Oberon's inhuman knight. (212)

The reference to Deirdre as Oberon's knight is not the only mythological reference used to frame Deirdre.

Moore also alludes to the Irish poet, James Stephens, who in 1923 published an epic poem entitled Deirdre, a retelling of the eighth/ninth century Irish legend "The Fate of the Sons of Usnech" (Oidheadh Chloinne Uisneach), part of the Ulster cycle. The tale has appeared in multiple literary versions throughout the centuries, but, throughout the variants, Deirdre is represented as a tragic figure, beautiful and doomed, with whom many men fall in love. At the same time, legends foretell that many men will die on her account. Men kill to both defend and gain her. In the Irish legends, she is forced into a relationship with a man whom she does not love. In the end, at varying points and by varying methods according to the diverse forms of the legend, Deirdre takes her own life.

In Moore's story, Harris reflects on his early memories of his relationship with the

Irish Deirdre's namesake by reflecting on another "Deirdre" poem that Stephens wrote, this one a micro-version of his longer epic:

> The time comes when our hearts sink utterly
> When we remember Deirdre and her tale,
> And that her lips are dust…
> There has been again no woman born
> Who has been so beautiful; not one so beautiful
> Of all the women born—
> …..
>
> Let all men go apart and mourn together—
> No man can ever love her. Not a man
> Can dream to be her lover… No man say—
> What could one say to her? There are no words
> That one could say to her. (Moore 1975 "No Woman Born" 201)

The lines above are those that Moore has Harris mentally recite as he prepares to meet Deirdre. The final lines of Stephens' poem—left mentally unarticulated—are:

> Now she is but a story that is told
> Beside the fire! No man can ever be
> The friend of that poor queen. (Stephens 64-65)

In the reference to the Irish legend that Stephens evokes, the character of Deirdre is multiply complex. She is a woman who is beautiful but who brings death. She is also a woman whom no man can even dream to love; indeed, a man may not even speak to her, since no words to her are appropriate or even possible.

In one sense, these various mythological references in the story seem to be a circuitous strategy to endow Deirdre with a lineage. She is not "born" as other women are, but those who surround her seem to want to place her within a mythological lineage: fairy knights, Irish legends. Even as her body denotes an obvious non-humanity, a body different than human, those who surround her insist on placing her within a context that frames her as merely different from human, but still human-like.

But as the story progresses, the mythological referents begin to disappear, and, instead, Deirdre is increasingly characterized as something other, something alien. The references move, first, from other-worldly alien—

> [I]n her exquisite slimness she called to mind no human figure in armor, not even the comparative delicacy of a St. Joan. It was the chivalry and delicacy of some other world implicit in her outlines. (222)

—to earthly animal-like alien—

> Slowly she rose.
>
> The motion was very smooth. Also, it was serpentine, as if the body beneath the coat of mail were made in the same interlocking sections as her limbs. (208)
>
> [S]he made a shuddering, serpentine motion of both arms at him. (210)
>
> [S]he wove the intricacies of her serpentine dance. (223).

In the above passages, with their numerous references to Deirdre's "serpentine" movements, Deirdre becomes a Lamia figure, one able to enchant and hold her audience. As she tells Harris, "I've always had … well, power over my audiences" (214). Finally, Deirdre becomes neither mythological human, nor animal-like human, nor un-natural human, but a figure beyond all these: she becomes, in her own words, a "superhuman" (242). As both Harris and Maltzer are faced with the implications of that superhuman quality, they are most surprised by Deirdre's reaction to her new body: she embraces it, revels in its powers, and looks forward to testing its capabilities. She tells them, "There's so much still untried. My brain is human, and no human brain could leave such possibilities untested" (242). The brain, though, encased in a non-human body, is becoming less human and more machine, and that change is reflected in how Deirdre presents to her watchers. Her voice becomes more metallic and her body is no longer described as either ethereal or serpentine: now the word to describe her in the last

paragraphs of the novella is "powerful" (242). And the way in which that new power will be used is left open. Deirdre's final words in the story are, "I wonder."

Resisting reintegration. In Frankenstein, the creature is a female-coded monster, while in Herland the women define themselves as incomplete as long as they are outside of a heterosexual matrix. In both cases, women are coded to a greater and lesser degree as not-women—as partial, incomplete, or monstrous humans. Being inhuman, being incomplete, was a flaw that the writers addressed as a problem that needed to be fixed. In both cases, the correction to monstrosity was integration back into the cultural norm: the monster in Frankenstein argues that he should be let back into the fold, or, failing that, be given the opportunity to create a fold that mimics the one he is kept out of, be allowed to have a family, have a mate; the women of Herland believe that the corrective to their own difference is to reintegrate into the two-gendered world, have children as others do, grow in a relationship to a mated being as others do. But in mid-twentieth century America, women writers began to push against the necessity for reintegration. They began to suggest in their fiction—sometimes hesitantly, sometimes brazenly—that otherness is a quality to be embraced, not shunned or resisted or transformed.

In Moore's "No Woman Born," the characters who surround Deirdre are convinced she wants to be reintegrated into the world and are concerned that she will be rejected by that world. But she revels in her difference, not only embracing it, but working actively to enhance that difference.

Deirdre's maker, Maltzer, is afraid that Deirdre will become hopeless and emotionally distraught when she fully realizes that she is no longer human, that she can

never be human. It is Maltzer who points out to Harris that Deirdre has no sex. Harris is at first stunned; in his own conversations with Deirdre, he had vacillated between seeing Deirdre as human or as machine. Once he had settled firmly on human, he had had no doubt that this human was a woman, even without a single one of woman's identifying physical markers. Maltzer says, "She hasn't any sex. She isn't female anymore. She doesn't know that yet, but she'll learn…. Remember Abelard?" (218). Maltzer, oddly enough, compares Deirdre to—apparently—Peter Abelard, the 11th century scholar and lover of Heloise, who was castrated for his passion. Maltzer's view then is that Deirdre's sexual identity has been surgically removed and is irrecoverable. As Miller looks at Maltzer in confusion, his own unequivocal perception of Deirdre as female suddenly called into question, Maltzer continues:

> One of the strongest stimuli to a woman of her type was the knowledge of sex competition. You know how she sparkled when a man came into the room? All that's gone, and it was an essential…. Perfume, flowers, all the odors we respond to mean nothing to her now. She can't feel anything with tactual delicacy any more. She used to surround herself with luxuries—she drew her stimuli from them—and that's all gone too. (219)

Maltzer defines the senses of smell, taste, and touch as the "primitive senses," those that "tie us in with nature and the race…. I think what humanity is left in her will drain out little by little and never be replaced" (219). But if we unpack Maltzer's comments, we can see that what he is really saying is not that it is the primitive senses that make Deirdre a human, but that it is these senses that make Deirdre a woman. Maltzer, like the men in Gilman's Herland who must be educated out of their misconceptions, mistakes women's female for their human qualities. The loss of the feminine, for Maltzer, equals the loss of the human. Like Terry in Herland, Maltzer believes that if a woman does not have the markers of traditional female behaviors, she loses her claim to humanity; her humanity is

not premised upon what Gilman called her "racial" characteristics (that is, species characteristics), but upon her gendered characteristics.

The elimination of those primitive responses in Deirdre, the responses to the tactile, as markers of the primitive feminine, would—we would think—move Deirdre out of the arena of the tactilely susceptible primitive female and into the more non-tactile realm of the male. But, instead, in Maltzer's eyes, the elimination of the primitive seems to achieve just the opposite: it severs the one tenuous, primitive, link with humanity that the female has, and casts her into the realm of the non-human.

Oddly enough, Maltzer's reading of Deirdre's situation and Deirdre's own reading bring them both to the same point: a recognition that Deirdre is becoming something other than human. But they arrive at that end by different pathways: Maltzer believes that Deirdre has lost her humanity via her loss of her (primitive) senses of touch, taste, and smell. Deirdre believes she has lost her humanity because of the extraordinary intensification of her remaining senses.

Deirdre experiments with and learns to control and develop those characteristics left to her: strength, speed, flexibility, vocal strength/resonance/range. She builds an affinity with her metallic body and is able to push it to perform movements at beyond-human speeds. Her voice can reach ranges and strengths enough to make entire buildings tremble and then collapse into dust. She tells Harris and Maltzer that she has been experimenting in private with the possibilities of her new being and, if she wanted, she "could tear down these walls" with her metallic hands, could "tear this building down" (239). She faces down Maltzer, who has believed that Deirdre would crack under what he assumes will be the moment when the world turns against her, hating her because she

is different, and, he believes, helpless. She provides a demonstration of her newfound strengths, strengths she has—until then—kept hidden from Harris and Maltzer. When Maltzer threatens to jump from a window, she moves so quickly across the room that her movement is a blur; she picks Maltzer up and carries him to a couch. Then she turns to him:

> "Do you still think of me as delicate?" she demanded. "Do you know I carried you here at arm's length halfway across the room? Do you realize you weigh *nothing* to me?" (239)

Deirdre develops a symbiotic relationship with her new body, one she likens to the connections that develop between people and the technologies they use. She refers to people impressing their personalities on material things, and refers to military objects as being called "she": "ships and guns and planes are 'she' to the men who operate them" (211). She refers to her body in the same category as military weapons. The voice of an omniscient narrator intrudes here, speculating that—although neither Deirdre nor her manager thought of it at the time—perhaps the opposite is also true: the material thing may impress its personality on the being operating it (212). Deirdre tells Harris:

> "I believe there's an affinity between men and the machines they make. They make them out of their own brains, really, a sort of mental conception and gestation, and the result responds to the minds that created them, and to all human minds that understand and manipulate them." (211)

Deirdre makes two points here: Men's machine-made things are like children (conception and gestation). And the maker is the first controller, perhaps the ultimate controller. The machines are made—like ships, guns, and planes—to respond to the commands of another.

So when Deirdre suggests that her body takes on the personality of her mind, she is also suggesting that her mind takes on the personality of her new machine body, her new weapon body. And indeed, that is where the story ends.

The end of the story is an echo of that first reference to Deirdre's voice, in which she has a metallic taint that she quickly controls. But at the end of Moore's story the reference is much more ominous: the last words we hear from Deirdre are, "I wonder," and these words are spoken with a "distant taint of metal already in her voice." The "little burr" that turns into a "taint of metal" is an intimation of the new being that Deirdre has become, not different *from* human, but different *than* human (242).

In the James Stephens' poem discussed earlier, the character of Deirdre comes across as one who is hauntingly isolated: not only does her presence bring doom, but none dare love her or even speak to her. Never again will there be another like her; "There has been again no woman born/…not one/…of all the women born." Harris's recollections of Stephens' poem are a clear foretelling of Deirdre's own words about her isolation at the end of the story. She asks Maltzer, "Could you ever duplicate this body?... Could anyone else?" His only answer is silence. She goes on to explain her own theory of her isolation:

> "What you did was kindle the fire for the Phoenix, in a way. And the Phoenix rises perfect and renewed from its own ashes. Do you remember why it had to reproduce that way?"
>
> Maltzer shook his head.
>
> "I'll tell you," she said. "It was because there was only one Phoenix. Only one in the whole world." (241)

Deirdre's life marks both the beginning and the end of a new line of beings.

A cyborg that is *different than*. Maltzer constructs Deirdre (working with a group of artists, sculptors, designers, and scientists) not as a body that is different in degree from Deirdre's—a model of Deirdre, or a facsimile of her—but as a whole new being that is only inflected with qualities of her original being. "She was golden still. They had kept that much of her, the first impression of warmth and color" (205). In addition, a glass shield across where her eyes would be is tinted aquamarine, the same color her eyes had been. But as the third-person narrator Harris says, the choice to give her no other features "had been wise of those who designed her" (206).

Deirdre's head is a simple ovoid, marked by minimal inflections, and Harris's description of it is a perfect description of the sculpted heads of the Romanian artist Constantin Brancusi. Harris refers to the artist specifically:

Brancusi's Heads

Figure 4.5. Sleeping Muse

Constantin Brancusi. *Sleeping Muse I*. 1909-10
Marble
Hirshhorn Museum and Sculpture
© ADAGR, Paris and DACS, London 2004
<http://www.tate.org.uk/modern/exhibitions/brancusi/>
Accessed 20 April 2005

> She had…a very beautifully shaped head—a bare, golden skull. She turned it a little, gracefully upon her neck of metal, and he saw that the artist who shaped it had given her the most delicate suggestion of cheekbones, narrowing in the blankness below the mask to the hint

Figure 4. 6. A Muse

Constantin Brancusi, *A Muse*. 1918
Bronze on stone base.
© 2005 Artists Rights Society (ARS),
New York/ADAGP, Paris.
Portland Art Museum, 59.15
<http://web.pam.org/asp/collections/collection_
listing/european/listing%20of%20works/
59.15%20a%20muse.html>
Accessed 12 April 2005

Figure 4.7. Mlle Pogany II

Constantin Brancusi. *Mlle Pogany II.*
1920. Bronze.
Museu de Arte Moderna do Rio de Janeiro
<http://www.lemondedesarts.com>
Accessed 20 April 2005

of a human face. Not too much. Just enough so that when the head turned you saw by itsmodeling that it had moved, lending perspective and foreshortening to the expressionless golden helmet. Light did not slip uninterrupted as if over the surface of a golden egg. Brancusi himself had never made anything more simple or more subtle than the modeling of Deirdre's head. (206-07)

The artistic choices made by those who constructed Deirdre's body make Deirdre not different from the original woman, but different than the original. In her new body, Deirdre has no marks of sexual difference: she is physically marked as neither man nor woman. The only inflections of gender that she imparts are those that she chooses—deliberately—to construct and convey. The strategies she chooses to convey her gender and her humanity—those primarily of vocal inflections and bodily movements —are the same qualities that later in the story she shows she is able to employ in ways that are very clearly ultra-human.

Several times in the story, as he grows to regret what he has done, Maltzer draws comparisons between himself and Frankenstein. He tells Deirdre:

> "I know now that there's only one legitimate way a human being can create life. When he tries another way, as I did, he has a lesson to learn. Remember the lesson of the student Frankenstein? He learned, too." (232)

Deirdre, though, refutes Maltzer's claim that he is like Frankenstein or that she is anything like Frankenstein's creature.

> "There's a flaw in your argument, and I resent it. I'm not a Frankenstein monster made out of dead flesh. I'm myself—alive. You didn't create my life, you only preserved it. I'm not a robot, with compulsions built into me that I have to obey. I'm free-willed and independent." (235)

Of critical importance here is Deirdre's clear articulation that she does not have the same debt to Maltzer that a newborn might have to its parent, a creature to its creator, or a robot to its maker. She is not in his lineage, nor does she owe him fealty. In her concomitant difference and independence, she insists that she has escaped from what Donna Haraway calls the "logic of repression" of the Oedipal narrative (Haraway 1991 Simians, 150).

In addition to escaping lineage, Deirdre also escapes gender; as I pointed out above, Maltzer tells Harris that Deirdre has no sex. Maltzer of course is referring to a biological sex, which Deirdre does not have. But she is able to don or discard gender at will; throughout the story, Harris is constantly befuddled by the mechanical being who clearly is Deirdre at one moment when she chooses to assume the female vocal tones and the postures of the very feminine original Deirdre, and the being who is not Deirdre when she drops the mimicry and her body becomes un-nuanced and her tone becomes mechanical. Deirdre cannot assume female sex, but she can assume female gender whenever she chooses.

Finally, Deirdre refuses the role of victim. She refuses Maltzer's pleadings, then his demands, that she live a life in retirement and that she surrender her desire to begin again as a public figure. Haraway writes that the cyborg offers an alternative pathway to women through life's map, a pathway that does not require them to negotiate a world framed by

> masculine autonomy, a route that does not pass through Woman, Primitive, Zero, the Mirror Stage and its imaginary. It passes through women and other present-tense, illegitimate cyborgs, not of Woman born, who refuse the ideological resources of victimization so as to have a real life. These cyborgs are the people who refuse to disappear on cue…. Survival is the stakes in this play of readings. (Haraway 1991 Simians, 177)

Deirdre represents a new strain of cyborg identity, one who, unlike Shelley and Gilman's cyborgs, refuses to be constrained by any origin myth and refuses reintegration. She is the Phoenix, from no woman born.

Why is the cyborg so appealing to feminists? Perhaps the simplest way to think about the draw of Haraway's icon is to understand that—in most instances—oppression is rooted in some form of an us/them dualism. Whether that duality is premised on sex,

race, age, class, ethnicity, religion, or politics, if the dualism is dissolved, then—in many cases—the rationale for oppression is also removed. The cyborg defies dualism. It is an icon of transgressed boundaries. In the instability of its gender, the fluidity of its human/machine nature, the lack of clarity of its origins in any specific race, nationality, or family lineage, it resides in a third space outside of most traditional mechanisms of identification. The cyborg represents neither totality nor commonality; it is instead, in Haraway's words, "a powerful, infidel heteroglossia" (1991 Simians, 181). Like Bakhtin's notion of heteroglossic tensions between works such as the epic poem that pushed toward the center (centripetal forces) and works such as the novel that pushed toward the margins (centrifugal forces), Haraway sees the heteroglossic forces of the cyborg as pushing simultaneously both inward and outward, resulting in a displacement of center.

In Moore's hands, the figure of the cyborg becomes a de-centered being who is urged by her makers toward centrality, but who refuses. She becomes a symbol of uneasy emancipation from human limitations and human lineage, a symbol who is a hopeful—though slightly threatening—promise. The cyborg trajectory is still following a pathway of promise, tempered by its monstrous "monere"—its warning. But within a very short time, the cyborg turns into a clear representation of threat to the male notion of familial order, a threat that must be contained, by violence if necessary. The major shift in perception takes place with the dropping of the atomic bomb in 1944. When that happened, the order of things was called into question, and the level of paranoia that met this challenge to traditional norms evokes what the U.S. at least has experienced since 9-11: an increasingly vocal and progressively fear-spurred hostility to cultural change. The

McCarthy hearings of the 1950s and the invectives hurled against the peace movement of 2002-2005 were both spurred by a demand that cultural and political leaders adhere to an imposed centeredness, a cultural norm. This imposed norm was a veil obscuring the root causes of fear. Rather than interrogating the violence of the bomb itself, the McCarthy hearings interrogated the people who questioned the need for such violence. And rather than interrogating the imperial violence that spurred the events of 9-11, the pro-war hysteria of the early 2000's slandered those who questioned the appropriateness of attacking a people only tenuously connected with strikes against the U.S. The response to the dropping of "Little Boy" on Hiroshima was often marked by an urgent call to familiarity, to order. Now the figure of the cyborg is no longer a promise; its difference—to the protectors of the order—becomes pure threat. In response to that threat, the overt figure of the cyborg goes into retreat, and is replaced by less alien forms of critique: subtle variations on the nuclear family.

The urge to ordered familiarity was challenged in mid-twentieth-century science fiction, though often the critique was restrained enough that it was able to pass under the radar of the enforcers of the norm. Judith Merril was one of the writers of the period whose critiques were able to pass as non-threatening fictions; penned by a woman whose themes often centered on the response of the nuclear family to challenges or threats, the stories were barely-veiled indictments of power out of control and of the absurdity of using violence-based science to moderate violent human impulses.

Judith Merril

Judith Merril, born Josephine Judith Grossman in New York, lived from January 21, 1923, to September 12, 1997. Merril, who was always politically active, immigrated to Canada in 1968 after witnessing firsthand the violent treatment of the demonstrators at the Democratic National Convention in Chicago (Fulford 10-11). In an interview with Robert Fulford, editor of the Canadian magazine Saturday Night, Merril explains her decision as one that came after much internal debate about her own role as a peace activist. She found living in the U.S. oppressive, yet wanted to find a way to contribute to the peace movement. Her solution was to live in Canada and work with the community of draft resisters who fled to Canada (Fulford 11-12). Her research and collections were left to and are now archived at the Toronto Public Library as the *Merril Collection of Science Fiction, Speculation, and Fantasy*.

Like Moore, Merril wrote fiction both under her own name and under a variety of pseudonyms, including Ernest Hamilton, Rose Sharon, and Eric Thorstein ("Judith Merril" Infoplease). She also published pieces jointly with one of her (several) husbands, C.M. Kornbluth, using the pen name Cyril Judd. Her first novel, Shadow on the Hearth, told the story of a family that survives on the outer rim of a nuclear blast, developing survival strategies for dealing with issues of food, water, security, communication, and more. The novel was made into a screenplay and presented in 1950 as a well-received television broadcast by "The Motorola TV Hour" as "Atomic Attack," starring—most notably—a young Walter Matthau.

Merril's first published story, "That Only a Mother," is also one of her best-known and most often anthologized pieces. It was originally published in 1948 in the

science fiction journal Astounding Science Fiction. In The Best Of Judith Merril, edited by Merril's longtime friend and literary agent Virginia Kidd, Kidd notes that Merril wrote the story in response to "a buried newspaper item on Army denial of post-Hiroshima rumors." Those rumors were that Japan had experienced a rise in the number of infanticides; the newspaper reported that this rise had "no connection to the presence of atomic 'fallout mutations' in that country" (Newell 196). Kidd quotes Merril's response to such government claims: "Even in those days some of us automatically read certain kinds of official U.S. releases backwards" (Merril 1976, 15). This theme of doubting the official government line becomes a key premise for Merril's work.

"That Only A Mother." The central character of Merril's story is a young woman, several months along in her pregnancy, whose husband works away from home in the military as a designer of nuclear weapons. The story opens with the woman—Margaret—waking on a day several months along in her pregnancy. We see her morning routine, one normal in many respects: making coffee, brushing her teeth, reading the newspaper. The date on her newspaper tells us that this is 1953, five years later than Merril's actual publication of the story. Margaret's routine though is disrupted by silent battles with worry and fear: Margaret's reflections—she refers to herself as Maggie—offer a counterresponse to the "automatic motions" of the morning. As she reads the newspaper, we are privy to Margaret's thoughts:

> No accidents. No direct hits. At least none that had been officially released for publication. *Now, Maggie, don't get started on that. No accidents. No hits. Take the newspaper's word for it*. (65)

Within the first 100 words of Merril's story, the reader is introduced to the contrapuntal rhythm that will continue throughout the story: thecalm voice of report, followed by the

challenge to that report, followed by a reassurance that is undermined by Margaret's own fretful and doubting framework. We may be meant to understand the admonishing voice as a blend of Margaret's own rather dubious attempts to convince herself to believe what she is told, spoken to herself in an echo of the voice of her husband: she imagines his words, telling her to accept the word of the authorities. The tone of these words resonates very much with the later comments we hear from this husband. I read these comments in Margaret's thoughts as echoes of earlier, standard, admonitions from her husband to ignore her own premonitions in favor of trusting the voices of authority, of which his own voice is one.

Official and unofficial voices. Margaret's internal debate quickly frames the "official" voice as one of dubious authority. The words of the newspaper are reported, then promptly doubted: "at least none that had officially been reported." So the reader is presented with the version of the news that is reported, promptly undercut by the version of the news that is not reported. The reader is left to think that Margaret has good cause for doubting the official report. This tension is further developed with a note that arrives in the mail from Margaret's mother: "[A]re you *certain* the doctor was right? Hank's been around all that uranium or thorium or whatever it is all these years…. I'm sure your doctor was right. He *should* know…." (65-66). The doctor must be right, the doctor should be right, but the clear implication is that he may not be right. The letter from her mother spurs another fear in Margaret's mind:

> *Stop it, Maggie, stop it! The radiologist said Hank's job couldn't have exposed him. And the bombed area we drove past.... No, no. Stop it, now! Read the social notes or the recipes, Maggie girl. (66)*

Margaret retreats from the invasive horror of the public texts (*no* reported *direct hits or accidents*, *the bombed area we drove past*) by overwriting it with the seeming normality and comfort of a domestic text (*read the social notes or the recipes*). Throughout the story, this is Margaret's strategy of containment: erase the horror of the unfamiliar with the reassurance of the familiar. The admonishing comments Margaret hears, presented in italics throughout the story, address her in the diminutive "Maggie," and, in addition, refer to her as "Maggie, girl." The voice that articulates the doubts and fears of the young mother-to-be is the one most often constrained by surrounding authorities. The reader soon comes to understand what this young mother is concerned with: Margaret is worried that the fetus she carries may have been affected by exposure to radiation, and, as much as she tries to be, she is not consoled by the voices of authority that surround her.

She is hospitalized after a dizzy spell, and her doctor orders her to remain on bed rest until the child is born. She writes to her husband, Hank, from the hospital, and the story shifts into an epistolary format. She frets about having to remain bedridden, and tells Hank of the news stories of child-killing she reads about in the papers:

> There are too many newspapers around here. More infanticides all the time, and they can't seem to get a jury to convict any of them. It's the fathers who do it. Lucky thing you're not around, in case—
>
> Oh, darling, that wasn't a very *funny* joke, was it? (67)

The child is born and kept away from her mother for eight days. The doctors come by "to 'explain' everything" to her, but Margaret tells her husband they just talked "a lot of nonsense" which she did not understand. She is not allowed to see the child until she throws what she calls "a small fit." The doctors and nurses finally, and reluctantly, agree to let her see the baby, and Margaret, after saying the newborn had a face "that only a

mother could love," tells her husband that all the facial elements are there, in the proper place and of the proper proportion (68).

The next letter is a reply to her husband, who has apparently been told that the child is a boy: "Well, the nurse was wrong if she told you that. She's an idiot anyhow. It's a girl. It's easier to tell with babies than with cats, and *I know*. How about Henrietta?" (69). The sex of the child seems to be in dispute, and then Margaret suggests naming the child after Hank (Henry/Henrietta). The point-counterpoint of voices seem to cancel out each other's authoritative claims: they won't let me see the baby/the baby's all right; the baby's a girl/ the baby is named after her father. Another flurry of letters ensues, with Margaret updating Hank on Henrietta's progress: she begins talking at five months, begins singing whole songs at seven months, and begins crawling at nine months: "The doctor says development in these cases is always erratic…" writes Margaret (69). But the specifics of what Margaret means by "these cases" is left undefined. Margaret sends Hank photographs of their child's "beautiful, beautiful flower-face" (69). In the meantime, at home, Margaret tells Hank that the hospital "got *everything* mixed up … and I had to teach myself how to bathe her and do just about everything else" (69). Apparently, whatever directions the hospital staff gave her were not appropriate for the demands of this child, so Margaret learns to improvise. The reader is left suspended in a sea of contradictions, yet Margaret's supreme confidence in the all-rightness of her child is the strongest voice we hear.

Then Hank announces he is returning home, and the italicized internal counter-arguments begin again. Margaret reads an article in the newspaper by a geneticist who says that the number of mutations in newborns is "increasing disproportionately" (71).

Margaret's internal voices, quieted after the birth of the child and in the absence of her husband, begin to surface again. As she prepares for the return of Hank, she insists to herself that she has nothing to worry about, despite the reports of fathers murdering their imperfect children: "*But my baby's all right.... My baby's fine. Precocious, but normal.... But* MY BABY'S *all right*" (71). The insistence on "normality" becomes increasingly strident in Margaret's internal voice.

The culture of the atomic age. Margaret's worries are a reflection of the worries of the culture around her. Her husband, according to the story, had worked at Oak Ridge. We now know that Oak Ridge was one of three laboratories that were the birthplace of the Manhattan Project,[40] America's collective attempt to build the first atomic bomb. The first atomic museum—American Museum of Atomic Energy—was established in Oak Ridge in 1949, two years *after* Merril published her story identifying Oak Ridge as a center of nuclear research. The doors of the town of Oak Ridge were also first opened to the public in 1949, at the same time as the opening of the museum, whose mission was defined as "to serve as an exhibition and education center for advocating the peaceful uses of atomic energy" (Molella 214).

In Merril's story, Margaret's husband, Hank, left Oak Ridge in 1947, after "*that little notice in the paper*" (71). But Oak Ridge is not so easily escaped. Nearly all the action of the story takes place within the confines of Margaret's home: the war only enters in via secondhand reports of the newspaper. Those reports portray a country at

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[40] The other two research centers were at Los Alamos, New Mexico, and Hanford, Washington. All three were "secret cities," built specifically for nuclear research and only later made into public townships (Molella 214).

war, scarred by bombs, and driven by a military economy. Margaret works at a government job until she is ordered to bedrest: "[Y]ou didn't just stop working these days. Everyone who could do anything at all was needed" (67). In the midst of this, women are still giving birth, raising children, managing homes, and exchanging letters and bits of news. Certainly, to maintain a veneer of the familiar and the normal in the midst of horrific violence requires a certain adaptable and pliable schizophrenia. Throughout, the tenuous pillars of that stability are being nibbled at by those "*little notice[s] in the paper*."

Merril's literary vision, though somewhat off-target on the specifics of radiation poisoning, was clearly demonstrated in the decades that followed the publication of her story as right on in terms of her perceptions of hidden hazards and government denials. In 1989, Oak Ridge was declared a Superfund site, in part due to the discovery that more than 2.4 million pounds of mercury had been released into the environment between approximately 1950 and 1977. The report of this release was classified until a local journalist managed to get a copy through a Freedom of Information Act request. "Government acknowledgment of the mercury releases prompted a congressional investigation that concluded that the government had deliberately misled the public and hid the data, using national security as a convenient shield" (Shriver 53). *No accidents. No hits. Take the newspaper's word for it*. In addition to the now documented environmental hazards prevalent at nuclear research sites such as Oak Ridge, thousands of workers from these research sites in the decades since have struggled to have their *illnesses* recognized as the result of their exposure to radiation as well as chemicals such as mercury, lead, arsenic, cyanide, and more (Levine, para. 1-7). "In many cases, the

U.S. government knew or suspected the connection [between workers' serious illnesses and their exposure to radiation and toxic chemicals], but ailing employees were routinely denied state workers' compensation benefits and silenced by security regulations" (Levine, para. 3). *No accidents.*

Return of the patriarchal order. In Merril's story, Margaret prepares for her husband's return by soaking in a hot bath. As she soaks, she reads the paper. A news article tells of unexpected results from the fallout of Hiroshima and Nagasaki. The Hiroshima bomb was fueled by enriched uranium that had been manufactured at her husband's former workplace: Oak Ridge. According to the article Margaret reads, scientists had expected mutations in those children who were exposed to radiation while still in the womb, but the rate of mutations has continued to climb in later births, even among those children conceived several years after the bomb was dropped. The message is clear: the effects of war permeate far into the future, into the culture, and even into our long-term genetic capabilities. We carry our wars with us in our genes. Even the home that is untouched by a bomb, that is surrounded by the expertise and assurances of doctors and scientists, is not inviolable from the poisons of war.[41]

When Margaret's husband at last returns home, Margaret sees him in metonymic terms: he is a uniform and a face, not a husband.

> [S]he just stood there, staring at a khaki uniform and a stranger's pale face. She traced the features with the finger of memory. The same high-bridged nose, wide-set eyes, fine feathery brows; the same long jaw, the hair a little farther back now

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[41] This fear of genetic mutations was quite prevalent in the 1940s and 50s. The results of the first long-term genetic studies of the survivors of Hiroshima and Nagasaki did not begin to appear until the early 1980s. Those studies suggested that the effects of radiation poisoning were generally expended within two generations and that the fears of longer-term genetic effects were largely unfulfilled. (Jones 176-177).

> on the high forehead, the same tilted curve to his mouth. Pale…. And strange. (71)

With his reentry into the home comes the reentry of disorder. He throws his coat across a chair and begins a prowling tour of the house. Margaret picks up the coat and hangs it carefully in the closet. She stalls to keep him from the child for as long as possible; the baby is sleeping, she tells him. Eventually, his impatience prompts Margaret to awaken the child early from her nap. The child wakens, and engages her father in a brief, disinterested conversation. Margaret suggests to the child that she show her father how she can crawl. Hank is startled at the ten-month-old child's ability to understand and reply to complex conversation, but when he sees her crawl by propelling herself across the bed with a series of bodily contractions, he laughs, assuming she moves herself in that fashion because her arms and legs have become entangled in the nightgown. He picks her up:

> "The way you wriggle," he addressed his child sternly, as his hand touched a moving knob of flesh at the shoulder, "anyone would think you are a worm, using your tummy to crawl on, instead of your hands and feet." (72-73)

Margaret tries to intervene, but he blocks her, saying "Don't be silly, Maggie. This may be *your* first baby, but *I* had five kid brothers" (72). Despite her months with the baby while he was away, he still claims greater authority in dealing with children. But then his hands move across the baby's body, and only slowly does he realize that the child has no appendages, not even the one that would identify it as a male child.

Eradicating the monstrous feminine. Margaret has defined the child as female, but this definition seems to have been prompted by the absence of a penis rather than by the presence of female genitals. Jane Donawerth points out that with the lack of

all appendages, the child "represents the 'scientific' view of the female as a deformed or unfinished male, a belief as old as Aristotle and as recent as many contemporary textbook explanations of the development of the fetus" (Donawerth 2004, 476-477). The links between Moore and Merril's stories—between Henrietta and Deirdre—are perhaps most clear in their ability to resist a clearly gendered identity. Susan Gubar, in her essay on C.L. Moore, suggests that the major role women have assumed in science fiction and fantasy in the late twentieth century stems from this field's opportunity for women to experiment with "the creation and exploration of alternative worlds, plural possibilities, [and] multiple forms of sexuality" that "effectively liberate the female imagination from binary thinking and, consequently, from the double bind of traditional (male-female) sex roles" (25). In her escape from these roles, Henrietta—by her twisted and excessive parody of the female form—is rendered alien.

The story ends on a scene of the father's hands tightening their grip on the child, and his unvoiced thoughts that somehow his wife does not realize that the child is without members:

> *She didn't know*. His hands, beyond control, ran up and down the soft-skinned baby body, the sinuous limbless body. *Oh God, dear God*—his head shook and his muscles contracted in a bitter spasm of hysteria. His fingers tightened on his child. *Oh God, she didn't know*… (73)

Whether or not the father actually kills the child is left unstated by Merril, but the key point here is that he denies his wife's knowledge. He believes that if she did know the child was different, she would not accept the child. But what is beyond comprehension to him is that she does know, and she does accept. Margaret has not only accepted difference, has accepted the disruption of the old order, she has embraced it. Limbless

and sinuous, her baby is all right. The old order is gone. This difference defines the new order. And this new order is "all right."

Jane Donawerth, in her critique of Merril's story, assumes that Hank strangles his daughter, and suggests that Merril deliberately invites the reader to share Hank's view that his wife is "mad" and that Margaret has "los[t] touch with social reality" (1997, 133). I would argue though that we might also read the story as an invitation to participate in a rebuilding of social conventions of the "norm" after the old norms are destroyed. To remind us again of Haraway's framing for the cyborg: instead of seeing the cyborg as a threat, perhaps we can see it as a hopeful monster.

In the most traditional sense, Henrietta does not fit the definition of a cyborg. Clearly she does not contain physical technological components that are non-human. But if we return to one of our earliest definition of the cyborg from chapter one, a being who has been altered by a technology, we can see Henrietta as a being whose genetic makeup is the mix of three parents: her mother, her father, and the radioactive fallout that has altered her. It has altered, apparently, not only her body so that it is less of a traditional human form as well as being ungendered, but also her mind so that her intellectual development outpaces any two-parented child.

Henrietta though is not the key figure here. As I mentioned earlier, she serves primarily as a foil to unmask the thinking of her mother and father and the militarized culture that has helped produce her. Henrietta's father is still invested in the myth of the normal, the undisrupted center. Henrietta's mother though accepts, perhaps without needing to entirely understand, that the center has changed, and that difference is part of the new order.

In the father's eyes, the culture of the family order should operate as a culture of support for the military order; any disruption of that order is erased with the tacit consent of the state apparatus: the courts that refuse to prosecute the fathers who commit infanticide. Lisa Yaszek—a professor at Georgia Tech—describes that consent thus:

> [W]hen fathers reinterpret their duties in the name of patriotism, they are supported by an entire range of social institutions—the medical establishment tacitly encourages infanticide with its rhetoric of prediction and prevention, the legal system implicitly redefines murder to exclude the death of certain (seemingly alien or subhuman) individuals, and the press cheerfully reports it all as part and parcel of the new social and moral orders engendered by a new kind of war. (Yaszek 2003, 5)

When Margaret reads the paper, and is surprised that the fathers who commit infanticide are rarely prosecuted, she does not perceive that an acceptance of mutation, of difference, would entail a recognition that the "order" for which the war was fought has been lost. Order—as it was—is what wars are fought to protect. If the system is forced to recognize that the old order has been lost—not preserved—by war, then the cause of the war becomes futile. So eruptions of disorder must be suppressed, must be erased.

To demand that the old order be reinstated is to require a state of unending war. The demand for the old order also demands ongoing suppression and destruction of elements that threaten that order. With Margaret's acceptance of her child, with her recognition of this child as "all right," the demands for the reinstatement of the old order are negated.

Perhaps Merril's greatest contribution to the development of the cyborg figure is to place the manifestation of it firmly within the domestic realm. The extra-domestic forces that create it are national and international, but the most direct impact of all these

changes is in the home: amidst diapers changed, baths drawn, and meals prepared sits the cyborged child.

Henrietta's extraordinary intelligence marks her as different, as does her serpentine body, perceived by her father as like "a worm," "sinuous, limbless" (72, 73). Like the descriptions of Deirdre's body as Lamian, this child's body is serpent-like and alien. Like Deirdre's mental powers, this child's mind is obviously far advanced beyond her peers. Like Deirdre's superior abilities, Henrietta's advanced abilities are also discounted, ignored by the father. Like Deirdre, Henrietta is desexed, a castrated Absalom. As Hank's wife's voice continues to explain the ten-month-old child's extraordinary mental abilities—"She can do 'Jingle Bells,' and—" (73), Hank is focused on the physicality of the child. The body is desexed, the body is inhuman, the body is alien. Henrietta is a threat to the domestic order and so must be destroyed.

But is this child—in its genetic and physiological sexual ambiguity—a precursor of later twentieth-century cyborg figures such as Ursula LeGuin's Gethenites in The Left Hand of Darkness? Or Octavia Butler's Ooloi figures in her "Xenogenesis" trilogy? Remember that the nurse tells Hank that the child is a boy; it is Margaret who defines the child as a girl, and Hank seems to confirm that sexual designation when his hand slides over the "limbless" body. But it seems the child has—in reality—no sex. In addition, in its original historical birth, the cyborg emerges as a military baby, a child of the space program, developed—as I discuss in chapter one—by Clynes and Kline to withstand the rigors of space travel. The child Henrietta is also shaped by the military technology that has inflected her father's genetic materials; the father's genetic materials have been

invaded by an invisible force that manifests itself by reshaping the child in its own asexual image.

So Henrietta is marked as a cyborg in three specific ways: she has been reshaped by technology, she has been born from a trinity of parents, and her sexual designation is highly ambiguous. By these important markers, Henrietta—in the shape of simply a precocious and very bright child within the domestic order—sustains the ongoing literary growth of the cyborg figure in women's literature. She is less autonomous than the powerful Deirdre figure of Moore's story, but I would suggest that in a period of cultural fear and creative oppression, the cyborg's retreat into the domestic was a strategy of survival; figures such as Henrietta operate as a powerful and important placeholder of cyborg identity as well as a reminder of the key themes of cyborg hopes and fears.

Conclusion

Works such as Moore's and Merril's continue to expand the promise of the cyborg as an identity offering emancipation from Western binaries. Merril and Moore's work added to a growing body of literature that developed its own momentum, one that in the 1960s and 70s started to increase at a dizzying speed, fueled by works such as Ursula Le Guin's 1969 novel The Left Hand of Darkness and Joanna Russ's 1975 novelThe Female Man . This momentum culminated in a manifesto that proclaimed for women the possibility of a new feminism based not on a lineage of power inherited from the earth mother, but on a collective and elective power that is constructed from chosen alliances with science and technology. In this manifesto, Donna Haraway's 1985 "Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s" published in the Socialist Review,

Haraway articulates the specifics of the paradigm shift that is on the cusp of occurring: the boundaries between human and animal, organism and machine, and body and mind (corporal and non-corporal) have all been breached (Haraway 1991 Simians, 151-154). In the messy detritus left in the wake of these breaches we can scrabble, either rebuilding the old dualism in new forms or creating new frameworks that are non-dualistic. The second option is particularly appealing to women, indeed, to any group whose role in the previous structures was one primarily of subjugation. Haraway suggests that a non-dualistic, cyborg world might be about

> lived social and bodily realities in which people are not afraid of their own joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints. The political struggle is to see from both perspectives at once because each reveals both dominations and possibilities unimaginable from the other vantage point. Single vision produces worse illusions than double vision or many-headed monsters. Cyborg unities are monstrous and illegitimate; in our present political circumstances, we could hardly hope for more potent myths for resistance and recoupling. (154)

In my final chapter, I offer a brief review of some of the many ways that this long struggle for cyborg identity has manifested itself in an explosion of works that use kinships with animals and machines along with monstrous and illegitimate unities to articulate new myths of resistance and recoupling.

CHAPTER FIVE
Emerging Cyborg Metaphors

Donna Haraway published her 1985 "Manifesto for Cyborgs" in response to a request from the editors of the Socialist Review for "five pages on what socialist-feminist priorities ought to be in the Reagan years" (Penley and Ross 1991 "Cyborgs" 14). The request spurred her search for a new metaphor for feminist thinkers, one that was not tied to traditional metaphors of the natural feminine. Rather than viewing nature and technology as polar opposites, in a reading that left women and therefore feminism aligned with nature in an unfortunate and constraining reductionism, Haraway conceived of the cyborg as a new metaphor for feminists. In this metaphor, nature and technology are melded into a single unit that Haraway says "refuses the active/passive binary which is overwhelmingly the discursive tradition that Western folks have inherited" (Penley and Ross 1991 "Cyborgs" 3).

When women are metaphorically encased within nature rather than technology, they are partnered with a range of associations both positive and negative. The associations we generally consider positive—nature as pure, clear, beautiful, and original—are comforting but still constraining when applied to women. Yet nature is also associated with elements less positive: that which is harsh, volatile, and untamed. This second set of associations has, in the past, posed its own problems for a feminism associated with the natural. Critics such as Evelyn Fox Keller (whose work I've discussed in earlier chapters) have written extensively about the problems such metaphors create in the sciences. When science as the study of nature employs these

same metaphors, science is presented in terms of the need to uncover, mine, and shape. Perhaps even more unfortunately, these same projects of scientific exploration are framed as "objective" science, thereby obscuring the ideology of control and colonization at their base. Metaphors of violence and control are imbedded in the very language that feminists had been attempting to use as a language of liberation. The problem of using a language of colonization in the service of a project of liberation becomes clear, and this is much of the problem Haraway was attempting to address in making the argument for a new metaphor of feminist identity.

Haraway anticipated the arguments that linguist George Lakoff has been making in recent years about the need to reframe the metaphors of political discourse. Lakoff, the co-author with Mark Johnson of the classic text Metaphors We Live By, takes the arguments he makes in that text and applies them in his more recent works to specific forms of political discourse. He suggests that progressives need to find political language that evokes the nurturing family model that is the basis for their political beliefs (as opposed to the political language of the strict father family model used by conservatives). Lakoff is well-known for this work on what he calls "framing": he points out that "frames are mental structures that shape the way we see the world. As a result, they shape the goals we seek, the plans we make, the way we act…." (Lakoff xv). Lakoff argues that if our social and political arguments are framed by the language of those with whom we disagree, then we are always on the linguistic defensive: explaining, reframing, and adjusting the argument.

In this context, I sometimes think of an experience I had years ago, when I ran into a politically conservative man I'd worked with several years before. I had known

him as a colleague on the business side of a newspaper where we had both worked. We chatted about what we were now doing, and when I mentioned my work on women's issues, he started laughing, slapped me on the shoulder, and chortled, "So have you burned your bra yet?" He left soon after, still chuckling. This was in New York City in the mid 1980s, yet—in this man's mind—work on women's issues was still firmly framed by the 1960s action of bra-burning. Issues of access, equity, health, domestic violence—all those issues that defined women's concerns for me at the time—were absent from his frame. I would have had to talk for a very long time to get beyond the women's-rights-equals-bra-burning-frame within which he was still thinking.

The women's movement as an advocating voice for a return to the freedom of the natural, to the freedom of a bra-less state, was one prominent version of the cultural articulation of feminism in the public mind. One refutation is the cultural image of Madonna in her pointed metal breast caps, the material girl in sexually aggressive Amazonian breast plates, but this is still an image that is a rebuttal to the dominant discourse, not a new metaphor.

The cyborg as a metaphor for feminists was born piece by piece. Writers who contributed to its construction were, I would argue, aware of the problematic nature of existing metaphors for women and sought to create new metaphors via the characters and societies they assembled. Haraway's manifesto outlined the opportunity to change "what counts as women's experience in the late twentieth century" (Haraway 1991 Simians, 151), but the women who in the previous two centuries had been writing fiction with feminist cyborgs had also been working to change what counted for women. All of them, collectively, helped to build the cyborg that Haraway championed in her manifesto; all of

them had understood what Haraway proclaimed in her 1985 essay, that "the boundary between science fiction and social reality is an optical illusion" (151).

In a 1975 essay, "Toward an Aesthetics of Science Fiction," Joanna Russ suggests that science fiction is the fiction of the possible rather than the fiction of the probable (1995, 9). Within science fiction, hopeful change is certainly one narrative possibility; the fiction of cultivated pessimism is the other. In the giddy proliferation of fictional cyborgs that emerge in the second half of the twentieth century, these two possibilities are articulated in two versions of the cyborg. One is the pessimistic cyborg of cyberpunk fiction: gritty, lone, technologically modified figures such as Molly and Case from William Gibson's 1984 novel Neuromancer, the human synthesizer Gina from Pat Cadigan's 1984 short story "Rock On" as well as her cyborged characters Sam, Visual Mark, and Keely in her 1991 novel Synners. Bruce Sterling, the SF author and cyberpunk literary critic, writes in the introduction to his 1986 anthology Mirrorshades that cyberpunk is the child of an "Eighties counterculture…. An … alliance of the technical world and the world of organized dissent" that mirrors a "street-level anarchy" (xii-xiii). Similarly, Fredric Jameson calls cyberpunk the fiction of "high-tech paranoia," thinly veiled conspiracy theory narratives of the most technologically nightmarish kind (37-38).

But the cyborg of cyberpunk fiction is born from a different lineage than is the feminist cyborg I have been discussing in the previous chapters. The cyborgs of hard-core cyberpunk fiction emerge from a strain of dark, paranoid works of fiction such as Arthur Koestler's Darkness at Noon and often feature mysterious, loner-without-a-past characters who, as Bruce Sterling points out, seem to be modeled on figures such as

Raymond Chandler's determinedly stark detective Philip Marlowe, a figure perhaps most well-known from Chandler's novels The Big Sleep (1939) and The Long Good-bye (1953). Perhaps about survival in a nightmarish technofuture, perhaps about rebellion, these are not novels about alternative, hopeful, social systems. Haraway herself points to the split in modern conceptualizations of the cyborg when, in an interview with Constance Penley and Andrew Ross, Penley asks Haraway about the "cyborgs dreamed up by the artificial intelligence boys … [which seem to be] technofascist celebrations of invulnerability." Haraway's cyborgs on the other hand, says Penley, "seem to be more semipermeable constructions, hybrid, almost makeshift attempts at counterrationality." Penley asks if the cyborg is therefore simply a myth that can "swing both ways," and, if so, how does the cyborg offer any real social guarantees (7). Haraway expands on her response in a "Postscript" piece to that interview; here she emphasizes her belief that in order to preserve the liberatory potential of the cyborg, it cannot be fixed within a static framework. Its only guarantee is its very unfixability:

> The split and contradictory self is the one who can interrogate positionings and be accountable, the one who can construct and join rational conversations and fantastic imaginings that change history….
>
> The knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched together imperfectly, and *therefore* able to join with another, to see together without claiming to be another…. The god trick is to be self-identical. If the cyborg is anything at all, it is self-difference. (Haraway 1991 "The Actors are Cyborg" 22)

The feminist cyborg's many manifestations allow it to become an articulating metaphor for all sorts of figures, both oppressed and liberated. Haraway says that the responsibility of those who engage in cyborg politics is not to impose a particular order but to be constantly engaged in "contesting inequality and arbitrary authority" (8). Cyberpunk characters usually do not contest imposed authority; they instead work to hide from or

protect themselves from it; if possible, they study its machinations and then move through or around it.

The cyborg that emerges as an alternative to the cyberpunk model is one that draws on the cyborg genealogy outlined in the previous chapters. The feminist cyborg treats liminality not as a handicap, but as an advantage. Here the cyborg is not a lone figure whose major goal is to beat the multinational corporate borg by subversively using its own technology against it. Instead, in this version, the cyborg uses its border status as nominal human to create alliances with other cyborgs, with displaced peoples, with machines, with animals, with non-human beings, and more. Within the communities forged by these alliances, the cyborg experiments with a range of identities, social structures, and liaisons. Here, new sciences and technologies are employed to allow family and parenting to be built around models that are communal rather than dualistic, on gendered roles that are fluid rather than fixed.

I would argue that it is this second form of the cyborg that Haraway is referring to when she refers to the cyborg as a "monstrous promise" that signifies both the innocence and the culpability of the culture that constructed it and that it articulates.

Although dozens of texts in the 1960s through the 1980s emerge from and blend the various strands of cyborg feminism I've outlined in the earlier chapters, here I will focus on four of the most commented-upon feminist fictions published in the mid 60s to late 80s that use cyborg themes. My purpose is not to add one more essay to the large body of work already done on these writers, but, instead, to demonstrate the way in which these works are compendiums of the strains of cyborg feminism I've been developing. These mid-to-late twentieth-century works are zenith pieces whose characters, settings,

and themes pick up and weave together multiple strands from the earlier fictions and are some of the most well-known of the many literary fruitions of the genealogy of the cyborg. In a political and social atmosphere in which many previously-fixed boundaries of race, class, and sex were being breached, the multitude of these new fictions presented a giddy and spirited feast of cyborg possibilities.

Ursula LeGuin: The Left Hand of Darkness

In Ursula Le Guin's 1969 novel, The Left Hand of Darkness, the unfixability of gender becomes the basis for interrogating how fixed gender roles shape a culture. A branch of humanity without determined gender lives on an ice-age planet which explorers have named "Winter" because of its ice-bound existence but which is named Gethen by its inhabitants. The inhabitants of Gethen only develop sexual organs when they enter a monthly period of sexual arousal they call "kemmer," and the organs that emerge from latency vary each time: sometimes the inhabitants are male, sometimes female. Only those who take on female attributes during kemmer will conceive, but once the child is born, the "mother" returns to a non-sex-specific state. At the next conception, the previously pregnant Gethenite may serve as the father. One of my personally favorite lines from the novel that illustrates this ambiguity is "The king was pregnant" (LeGuin 100).

Fascinating as the specifics of the sexuality of this species may be, a society without fixed sexual roles becomes most intriguing by the ways in which the lack of sexual binaries articulates itself culturally and politically. LeGuin uses the standard convention of an outsider looking in as an observer and commenting upon the foreign

society in order to unpack the workings of this hermaphroditic sexual culture for the reader. In this case, the outsider is a diplomat sent by a United Federation of Planets to establish cultural and economic ties; his name is Genly Ai.

Ai comments on the impact that a hermaphroditic sexual nature has on social structures by noting the ways in which this nature impacts life choices, relations with parents, sexual violence, and fixed sexual roles:

> Consider: Anyone can turn his [Ai uses the masculine pronoun to refer to the at-large inhabitants of Gethen] hand to anything. This sounds very simple, but its psychological effects are incalculable. The fact that everyone between seventeen and thirty-five or so is liable to be … "tied down to childbearing," implies that no one is quite so thoroughly "tied down" here as women, elsewhere, are likely to be—psychologically or physically. Burden and privilege are shared out pretty equally; everyone has the same risk to run or choice to make. Therefore nobody here is quite as free as a free male anywhere else.
>
> Consider: A child has no psycho-sexual relationships to his mother or father. There is no myth of Oedipus on Winter.
>
> Consider: There is no unconsenting sex, no rape. As with most mammals other than man, coitus can be performed only by mutual invitation and consent; otherwise it is not possible. Seduction certainly is possible, but it must be awfully well timed.
>
> Consider: There is no division of humanity into strong and weak halves, protective/protected, dominant/submissive, owner/chattel, active/passive. In fact the whole tendency to dualism that pervades human thinking may be found to be lessened, or changed, on Winter. (93-94)

In this section of the novel, LeGuin's character outlines the benefits of un-gendered cultural roots that could be read as the fictional manifestation of Haraway's expanded extra-manifesto discussions of why gender needs to be made "non-coherent" (Haraway 1991 Simians, 135). Haraway draws on the work of Judith Butler to argue against "the illusion of an interior organizing gender core" and for the need to "disqualify the analytic categories, like sex or nature, that lead to univocity" (135). She also points to Marilyn

Strathern's work on "regulatory fictions" of gender which insist that "motherhood is natural and fatherhood is cultural: mothers make babies naturally, biologically. Motherhood is known on sight; fatherhood is inferred…. [Strathern shows] the productionist core of the belief that women make babies (and its pair, that man makes himself), which is intrinsic to Western formulations of sex and gender" (135). If cultural perceptions of gender grow from biological (or lack of biological) functions, then one strategy the feminist cyborg writer can use to destabilize assigned gender roles is to destabilize assigned sex. This is what LeGuin does in her novel.

Genly Ai warns the members of future diplomatic missions about the disconcerting nature of what they will encounter: "On Winter, they [the conventions by which a person is judged as appropriately masculine or appropriately feminine] will not exist. One is respected and judged only as a human being. It is an appalling experience" (LeGuin 95). LeGuin's construction of the Gethen species reflects the arguments of Charlotte Perkins Gilman, who wrote that women should be evaluated by their species characteristics as humans rather than by their gendered characteristics as women, and constructs a novel around that premise:

> We, as a species, have far more conspicuous and important distinctions peculiar to ourselves than those we share with lower forms; and each and every one of these human distinctions belongs to both sexes. (Gilman, 1912, paras 21, 22)

In addition to general civic and family structures, LeGuin's envoy ponders the ways in which other characteristics of Gethen society may be shaped by the inhabitants' lack of a hierarchical structure of gender: the lack of full-scale wars in Gethen history, the lack of any sense of "ownership" of one person over another, the wide range of and respect for varieties of spiritual worship, and more. LeGuin does not present a society with utopian

characters: individuals are still flawed, selfish, and power-hungry in ways that can cause great damage. But these flaws are not institutional; they are personal.

Joanna Russ: The Female Man

Joanna Russ's 1975 novel, The Female Man, is much harsher in its assessment of gendered dualisms than are most other feminist cyborg novels. The novel begins in Whileaway, a utopian, single-sex society. One character from that world, Janet, slips sideways to visit a parallel two-sex world modeled on an America caught up in a low-key depression that has extended into the seventies. The novel is at its funniest here, first describing the quirky Whileawayan utopia, then viewing a sexually-muddled-disguised-as-progressive world in which feminist issues are just finding their way into cocktail party conversation. Janet encounters one man who represents this strained view of feminism at a party where she has gone in anthropological mode to observe the social rituals of the natives. He explains to her:

> "You can't challenge men in their own fields," he said. "Now nobody can be more in favor of women getting their rights than I am. Do you want to sit down? Let's. As I said, I'm all in favor of it. Adds a decorative touch to the office, eh? Ha ha! Ha ha ha! Unequal pay is a disgrace. But you've got to remember, Janet, that women have certain physical limitations," (here he took off his glasses, wiped them with a little serrated square of blue cotton, and put them back on) "and you have to work within your limitations." (44-45)

Yes, such scenes clearly date the book, and one piece of criticism I read from 1994 even suggested that the anger that seemed fresh in the 1970s quickly became outmoded in scenes that the author, Judith Kegan Gardiner, finds "embarrassing" to recall (para 3). But it was this very anger—an anger that culminates in one female character murdering a man who wants to restore the patriarchal order—that frames the edginess of the cyborg

creations Russ constructs. The man who tells Janet that women must "work within [their] limitations" is not working within his: he uses the technology of eyeglasses to mitigate a weakness of his own. Gardiner is embarrassed by this moment? I thought Russ's subtle exposure of this hypocrisy was very funny. The women of Whileaway are not the peaceful women of Gilman's Herland who patiently and slowly educate the obtuse men, and who banish the one man who tries to violently impose a patriarchal order. These cyborg women are impatient, irritable, and intolerant of willful stupidity. When someone directly threatens what they have worked so hard to build, they kill that person.

Interestingly enough, Jael, the woman in Russ's novel who commits the murder is a cyborg forerunner of the cyberpunk borg Molly in William Gibson's Neuromancer; the two characters share implanted characteristics that are perverse caricatures of feminine accoutrements: they have very strong, retractable, fingernails. Jael has retractable claws and she uses them on her victim in an awful parody of the sexual act:

> [T]he grafted muscles on my fingers and hands pulled back the loose skin, with that characteristic, itchy tickling…. I do not have Cancer on my fingers but Claws, talons like a cat's but bigger, a little more dull than wood brads but good for tearing…. I raked him gaily on the neck and chin and when he embraced me in rage, sank my claws into his back. (181-182)

Molly also uses her nails for defense, and warns those who might consider an attack:

> "[Y]ou try to fuck around with me, you'll be taking one of the stupidest chances of your whole life."
>
> She held out her hands, palms up, the white fingers slightly spread, and with a barely audible click, ten double-edged four-centimeter scalpel blades slid from their housings beneath the burgundy nails.
>
> She smiled. The blades slowly withdrew. (25)

These two characters are both much edgier, much more explicit versions of the rebuilt woman that emerges from the lineage of C.L. Moore's Deirdre in "No Woman Born."

Deirdre used her own mechanical parodies of femininity to control her maker and her audience: her movements, her voice, her hooded gaze. She demonstrates her excessive physical strength when she picks up her maker and carries him across the room; she demonstrates the power of her vocal chords and points out that she could bring the building down around them all if she chose to. She is clearly in physical control and could—if she chose—overpower the other beings in the room with her technologically modified and physically stronger body. She is a low-key version of the dangerous female cyborgs that emerge in works such as Russ's.

Characters such as Jael though operate as a counterpoint to the positive, energetic, and creative energetic all-female world of Whileaway. Here, all the young women of the society spend the first part of their lives learning "how to run machines, how to get along without machines, law, transportation, physical theory … gymnastics and mechanics … practical medicine … how to swim and shoot. They continue … to dance, to sing, to paint, to play, to do everything their Mommies did" (50). Readers are first told that all the men of Whileaway died out in a plague; later, though, Jael tells the women that the plague was a convenient myth: the men were actually deliberately wiped out. Unlike in Gilman's world, the women had access to enough advanced science to know how to perpetuate the species through their own machinations. Again, the children are all girls, and, like the children of Gilman's Herland, these are girls who from their birth are oblivious to sexual roles; they are taught and loved and cared for deeply and intensively, then they are pushed out into independence; they choose their own callings and their own communities out of a strong sense of self-sufficiency. As a result, the world of Whileaway is one full of

> incredible explosive energy, the gaiety of high intelligence, the obliquities of wit, the cast of mind that makes industrial areas into gardens and ha-has, that supports wells of wilderness where nobody ever lives for long, that strews across a planet sceneries, mountains, glider preserves, culs-de-sac, comic nude statuary, artistic lists of tautologies and circular mathematical proofs (over which aficionados are moved to tears), and the best graffiti in this or any other world. (54)

Whileaway's social structures are predicated on every inhabitant having access to all aspects of the land and culture, on each person being given the opportunity to grow and learn, and on each inhabitant giving back in order to sustain the social structure. As a result, the entire society is endlessly energized by a nonstop cycle of creative forces that emerge from an "unnatural" structure.

Russ herself celebrates the unique ability of this type of fiction to defy old dualisms:

> One of the best things (for me) about science fiction is that—at least theoretically—it is a place where the ancient dualities disappear. Day and night, up and down, 'masculine' and 'feminine' are purely specific limited phenomena which have been mythologized by people. They are man-made (not woman-made)…. Out in space there is no up or down, no day and night, and in the point of view space can give us, I think there is no "opposite" sex—what a word! Opposite what? The Eternal Feminine and the Eternal Masculine become the poetic fancies of a weakly diamorphic species trying to imitate every other species in a vain search for what is 'natural.' (Russ in Bukatman 10)

Russ's language in the above 1975 interview seems to be a manifesto that echoes much of what Haraway articulates in her manifesto ten years later.

Marge Piercy: Woman on the Edge of Time

In Marge Piercy's 1976 novel, Woman on the Edge of Time, a Hispanic woman named Consuela (Connie)—a single mother who has had her child taken from her by Child Services and who lives in an economically impoverished setting studded by episodes of domestic violence—is committed to an institution. There she finds herself trapped in an

experiment in mind and behavior control. The story lines of the novel move back and forth between Connie's life in the settings described above and a utopian culture of the future called Mattapoiset. Connie is able to escape mentally to Mattapoiset (which may or may not actually exist) where she is guided through the mores of a culture of freedom and equality by a young female guide named Luciente. The roots of exploitation and control in Connie's present are illuminated by comparison with the mores of a future culture in which the bases of arbitrary control are constantly critiqued and challenged.

The families of the utopian future exist in units of three, and the mix of sexes can be two women and one man or two men and one woman or even three persons of the same sex. The three members of the unit mutually decide on and commit to parenting a child—a process that ends at the age of twelve, the age at which a young person is deemed an adult. None of the three actually bears the child; the child is instead requested by the unit and is given to them from a common breeder: the child generally carries none of the genetic material of any of the three parents. As one of Connie's guides—a young black man named Bee—tells her, "There's no genetic bond [between parent and child]—or if there is, we don't keep track of it." Connie asks, "Then this kid [referring to Bee's daughter] isn't really your child?" Bee replies, "I am Innocente's mother." Connie protests. "How can men be mothers! How can some kid who isn't related to you be your child?" (104-105). In fact, all three parents are referred to as co-mothers, and function in that role in both emotional and physical ways. For example, the milk glands of all three co-mothers—whether men or women—are activated and all assume the care of breastfeeding the new child.

Like the communal care of children in Gilman's novel, the children of Mattapoiset remain the particular responsibility of the three co-mothers, but are also in the social care of the entire town. When Connie worries about children out late at a community festival, her guide Luciente tells her, "When they can't stay awake, they fall asleep. If they doze off in the grass, someone will carry them home." Connie is doubtful and says somewhat sarcastically, "You have wonderful faith in other people!" Luciente replies, "Without that social faith, what a burden it would be to have children! The children are everyone's heirs, everyone's business, everyone's future" (183). It's harder to draw a clear vertical line of inheritance when the source of that inheritance is so diffuse.

The people of Mattapoiset disrupt what Haraway calls the "central myths of origin of Western culture" (Haraway 1991 Simians, 175) by diffusing the cultural and genetic origins of the children they raise. They also diffuse the linguistic bases of gender by referring to one another in non-gendered terms. Members of this culture are not referred to as he/she or him/her. Instead, the pronoun for both sexes is "person," usually shortened to "per" or, in cases of the possessive, "pers." Hierarchy and duality are thereby replaced on all levels with a model of community and nonpolarized sexual identity.

Connie's own experiences in her real life with being made into a cyborg against her will when her brain is implanted with a device meant to moderate her behavior is an example of the type of compulsory cyborg identity that Haraway freely admits is a danger and needs to be constantly guarded against. As I discussed in my first chapter, the original impetus for the cyborg was the desire to find how the bodies of astronauts could

be physically accommodated to the stresses of the environment of space. Gradually, this push for accommodation came to include reactions to space that were not only physiological but also psychological. NASA researchers looked at methods for monitoring the mental and emotional well-being of the astronauts and administering various drugs or psychological exercises to compensate for specific stresses. In the 1960s and 70s, Manfred E. Clynes and Nathan S. Kline, the Rockland State researchers who coined the term "cyborg," presented and published papers on the psychophysiological aspects of space flight in which they suggested that astronauts' moods could be monitored and adjusted via a range of physical technologies such as drugs and psychological technologies such as audio tapes that could provoke specific emotional responses (Clynes and Kline 29-33, 35-42). Comments such as, "provision should be made for triggering administration of the medication remotely from earth or by a companion" in case the astronaut resists (33), and the acknowledgement that these methods aim to provoke a situation in which "hostile aggression is strongly attenuated and there is a sense of belonging, of satisfaction of being, in itself" (39) are somewhat chilling, whatever their benevolent intentions.

Connie too is constantly reassured that the implant in her brain will not only make her feel better but will likely be the means of her release from the institution. The doctor in charge of the experiment tells her: "Instead of just warehousing you, we're prepared to help you…. We want you to function again, but without risk of committing those out-of control acts" (Piercy 262). Connie is fitted with an apparatus that monitors her emotional state and automatically administers sedatives when she becomes excited or angry. But Piercy's parallel worlds clearly show this benevolent act for what it is: an act

of social control that constrains angry reactions to social injustice rather than correcting the unjust acts that provoke the anger.

In the end, Connie reclaims control of her situation by poisoning, and perhaps killing, the doctors who head up the behavior control project into which she and her fellow residents have been forced. Like the woman of Whileaway who murders the man threatening the utopian experiment, Connie sees herself in a war and defends herself in the only way she sees possible. Of all the works discussed in this final chapter, Piercy's is perhaps most skillful at juxtaposing potentially destructive aspects of cyborg technologies with the most promising of those technologies.

In her works after the manifesto, Haraway herself points to the danger of imperializing others; she critiques her own early work, saying that she was not sufficiently clear when she claimed that cyborgs of all types exist within a common dream of liberation, as exemplified in her famous statement: "We are all cyborgs." She says her definition of "we" needs to be clarified so that she does not essentialize those who work in industries that exploit their labor; she specifically points to the example of third-world women who work under difficult conditions in micro-electronics industries that co-opt their bodies and work within a destructive use of the cyborg identity (Penley and Ross 1991 "Cyborgs" 12-13). These, she says, are versions of the political uses of cyborg politics that must always be closely scrutinized and challenged.

Octavia Butler: Xenogenesis Trilogy

In Octavia Butler's Xenogenesis Trilogy (containing the novels Dawn (1987), Adulthood Rites (1988), and Imago (1989)), characters crossbreed with other species in a

surprisingly effective rewriting of a story of colonization. In Butler's scenario, the earth has been destroyed by environmental and political hubris, culminating in an all-out nuclear war that leaves the planet unlivable. The few thousand remaining inhabitants are rescued by an alien life form called the Oankali who are "gene traders": a life form that seeks out and offers its own genetic materials in trade for the opportunity to study and perhaps incorporate the genetic materials of other species. The Oankali give the survivors of Earth two choices: live out their (now-sterile) lives on an earth that has been partially rejuvenated by the Oankoli or interbreed with the Oankali. The Oankali teach basic survival skills to those who make the first choice and teach the history and social mores of the Oankali to those who make the second.

Those who choose the second option discover that the Oankali are the (currently) end result of the deliberately combined genetic materials of many species. They parent via units of five: two members of the new species (in this case humans), two Oankali parents, and one Ooloi parent. The Ooloi are a third sex of the Oankali: they are the most advanced teachers and healers of the Oankali, yet they also contribute to the genetic material of the child created through the mating of this group.

When the humans first recognize their situation of being beholden to the Oankali, they ask if they and their earth can simply be healed and they allowed to begin reproducing again. The Oankali refuse, since they have discovered that the humans contain a genetic flaw that is humanity's doom: humans are simultaneously intelligent and hierarchical. The hierarchical tendencies drive a destructive competitiveness that the Oankali recognize will simply lead the humans to ultimately annihilate themselves all over again. The Oankali, on the other hand, live within a network which contains its own

loci of power, but those points are dispersed throughout the network. This network also monitors and arbitrates differences between Oankali, so the power of authority is still present but less concentrated. Part of the trajectory of the three novels in the trilogy is the tracking of the human/Oankali children's attempts to convince the Oankali to restore the humans' fertility and let the humans who resist Oankali integration to try again to build their own society, a project the Oankali finally, and reluctantly, agree to allow, still warning that the species is doomed to a genetically determined self-destruction, a collective suicide.

The humans first see themselves as colonized and the Oankali as an invading and occupying force on the earth. Familial and social networks of the humans have disintegrated under the pressures of war. Slowly, through interbreeding under the leadership of the human woman Lilith, a new species is created, and the colonized humans become genetically intermixed and then blended with the Oankali, a species that—along with the humans—surrenders its unique characteristics as part of the interbreeding program. The process of procreation crosses species: humanoid, animal, even intelligent plant life have become part of the Oankali gene pool. In this sense, the Oankali both monstrously and promisingly transgress what Haraway calls "the boundary between human and animal…. Far from signaling a walling off of people from other living beings, cyborgs signal disturbingly and pleasurably tight couplings. Bestiality has a new status in this cycle of marriage exchange" and the cyborg is a "taboo fusion" that promises resistance to imperializing totalities (Haraway 1991 Simians, 152, 173).

Butler uses a Frankenstein model of assemblage in constructing her characters from the parts of other species; she also draws on a Judith Merrill model of genetic

mutation, although in this case the mutations are deliberate. But like the mother in Merrill's story who rejects (or is oblivious to) the cultural perception of her differently constructed child as flawed, Lilith and the other humans who choose to breed with the Oankali see the children they breed as different but still whole and complete in their new forms. Those who choose not to mate with the Oankali are horrified by the children born across species and deem them monsters. Haraway, who has written in several essays about Butler's work, says that Butler's fiction is "about resistance to the imperative to recreate the sacred image of the same" (Haraway 1989, 377), about "miscegenation, not reproduction of the One" (378-79). The children that are born from the Oankali/human unions are more than the mixture of two species, since the Oankali themselves are the product of thousands of years of interbreeding with species with which they have come into contact. In this sense, the Oankali fulfill Haraway's requirement that the cyborg be a creature without an origin myth; it is not reproduced—copied—from an original model. The Oankali, and the children they breed with the humans, are beings without Oedipal origins and therefore—at least in theory—without the internal violence of the Oedipal conflict.

And, again, Frankenstein

In several ways, Butler's work evokes most clearly the cyborg with which we started: Mary Shelley's monster. Frankenstein assembles a new being out of parts of other beings in order to prove his control over life and death and in order to have a subservient race. That cyborg represents a failure of Faustian hubris. Perhaps the failure of Frankenstein and the creature he creates is that they both depend on a flawed patriarchal model to

provide the structure of their relationship. But the creature has been born out of a different model, and what Frankenstein creates must exist outside the family structure as he knows it. Forcing a new metaphor of assemblage to abide within flawed structures of replication leads to friction and eventual breakdown. As the monster himself points out as he stands over the body of the murdered William: "I too can create desolation." This is what the Oankali try to tell Lilith: the hierarchical model of patriarchy contains the seeds of its own destruction. She needs a new metaphor for family and relationships.

The model is not birth, but adoption. The lineage is not the point. Like the family of Frankenstein, where children become members of the family via various methods—birthed, adopted, and then, finally, built from scratch—the model is of lateral and networked connections, rather than duplication of origins. Haraway concludes her manifesto with a final call to refuse essentialism. It is a call to which each of the writers discussed in this dissertation have contributed:

> Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves. This is a dream not of a common language, but of a powerful infidel heteroglossia. It is an imagination of a feminist speaking in tongues to strike fear into the circuits of the supersavers of the new right. It means both building and destroying machines, identities, categories, relationships, space stories. Though both are bound in the spiral dance, I would rather be a cyborg than a goddess. (1991 Simians, 181)

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