

# Genetic Engineering As Literary Praxis: A Study In Contemporary Literature

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GENETIC ENGINEERING AS LITERARY PRAXIS:  
A STUDY IN COMTEMPORARY LITERATURE

by

TAYLOR EVANS  
B.A. University of Florida, 2004

A thesis submitted in partial fulfillment of the requirements  
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## ABSTRACT

This thesis considers the understudied issue of genetic engineering as it has been deployed in the literature of the late 20<sup>th</sup> century. With reference to the concept of the enlightened gender hybridity of Cyborg theory and an eye to ecocritical implications, I read four texts: Joan Slonczewski's 1986 science fiction novel *A Door Into Ocean*, Octavia Butler's science fiction trilogy *Lilith's Brood* – originally released between 1987 and 1989 as *Xenogenesis* – Simon Mawer's 1997 literary novel *Mendel's Dwarf*, and the first two books in Margaret Atwood's speculative fiction *MaddAddam* series: 2003's *Oryx and Crake* and 2009's *The Year Of the Flood*. I argue that the inclusion of genetic engineering has changed as the technology moves from science fiction to science fact, moving from the fantastic to the mundane.

Throughout its recent literary history, genetic engineering has played a role in complicating questions of sexuality, paternity, and the division between nature and culture. It has also come to represent a nexus of potential cultural change, one which stands to fulfill the dramatic hybridity Haraway rhapsodized in her "Cyborg Manifesto" while also containing the potential to disrupt the ecocritical conversation by destroying what we used to understand as nature. Despite their four different takes on the issue, each of the texts I read offers a complex vision of utopian hopes and apocalyptic fears. They agree that, for better or for worse, genetic engineering is forever changing both our world and ourselves.

With deepest gratitude to the many people in my life who put up with me, and won't let me quit.

I'm looking at you, Mom, Dad, Sarah, and Maria.

Also for Frank: keeping me honest since 1991.

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## CHAPTER 1: INTRODUCTION

Their technology is pre-stone age . . . [or] Perhaps they are post-metal age.

– Joan Slonczewski, *A Door Into Ocean* (89)

Even in Snowman’s boyhood there were luminous green rabbits, though they weren’t this big and they hadn’t yet slipped their cages and bred with the wild population, and become a nuisance.

– Margaret Atwood, *Oryx and Crake* (86)

The landscapes of Margaret Atwood’s *MaddAddam* novels are inscribed with signs of scientific hubris and capitalistic decadence. Atwood’s near-future Earth is marked by environmental catastrophe, populated with grotesque hybrid animals, and overrun by a deadly hemorrhagic virus – the JUVE. The alien world of Joan Slonczewski’s novel *A Door Into Ocean*, in contrast, is inscribed with signs of scientific humility and pluralistic balance. Her story mostly takes place on an ocean-moon, one marked by environmental harmony, populated by an assiduously non-violent all-female society, and threatened by an occupying capitalistic military force. Atwood’s story has strong elements of dystopia; Slonczewski’s is clearly utopian. Published in 2003 and 2009, Atwood’s two *MaddAddam* novels – *Oryx and Crake* and *The Year Of The Flood* – are literary products from one of Canada’s most respected living authors. Published in 1986, Slonczewski’s *A Door Into Ocean* won the Joseph W. Campbell Memorial Award for Best Science Fiction Novel. These two texts are quite different, and yet they form the core of my thesis project because, for all their differences, they each make significant use of the

concept of genetic engineering. Atwood's world is littered with the byproducts of a genetic engineering industry run rampant and it is ultimately destroyed by the virulent JUVE, itself a genetically engineered catastrophe. Slonczewski's utopian society lives harmoniously in its water world where everything from the living raft tree habitations to reproduction is fully integrated into the practice of "lifeshaping" – what we would call genetic engineering.

I've chosen these two texts because they function as convenient bookends for this thesis. Genetic engineering has, in the space of thirty or so years, moved from the realm of cutting edge science (and main-stream science fiction) to a fact of life in our mundane world (and our self-consciously literary productions). In this time genetics has emerged as a formidable tool for everyone from biologists to criminal detectives. The cost of mapping one's genome is fast approaching a marketable price point (Markoff).<sup>1</sup> In this time genetic engineering has moved from the realm of pure science fiction into all sorts of novels. Slonczewski's novel is explicitly science fiction, set in a distant future of interplanetary travel and incredible genetic engineering, while Atwood describes her novels as "speculative fiction" ("Aliens" 513), distinct from science fiction in that she claims not to have created anything but rather worked with things that science has already created, or begun to create. Perhaps more importantly, while both novels may share an interest in the future lives of their scientifically effected characters, Slonczewski's novel is marketed as science fiction, while Atwood's novels can be found under the "Literature" section of your local bookstore.

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<sup>1</sup>This long-standing price point goal is believed to be around \$1,000, although the entrepreneurs working on this also note that the abundance of computing technology at most people's fingertips as another cause for hope that genetic sequencing will soon become a mundane reality for most Americans. More information available at NYtimes.com: <http://www.nytimes.com/2012/03/08/technology/cost-of-gene-sequencing-falls-raising-hopes-for-medical-advances.html>

The central argument of this thesis is that, as genetic engineering moves from the realm of speculation ever closer to reality, the idea of genetic engineering has become (and is still becoming) an ever more accessible metaphor for authors. In calling genetic engineering a “literary praxis” I am making use of the specific overtones of the word “praxis.” These are captured well in one of the *Oxford English Dictionary*’s definitions: “b. Conscious, willed action, esp. (in Marxist and neo-Marxist thought) that through which theory or philosophy is transformed into practical social activity; the synthesis of theory and practice seen as a basis for or condition of political and economic change. Also: an instance of this; the application of a theory or philosophy to a practical political, social, etc., activity or programme” (“praxis, n.”). It is the tension between theory and practical application which most draws me to this term.<sup>2</sup>

So I use the phrase literary praxis for a couple of reasons. First, for the verbal symmetry between genetic praxis and literary praxis. Although probably not what Marxist thinkers have in mind when using the term, genetic engineering operates more as a praxis than merely a practice or technology. It would be impossible without the theory of genetic inheritance which traces its origins to Gregor Mendel’s seminal 1866 study; it would also be impossible without understanding the physical form of those structures which enable Mendelian inheritance, which were discovered by James D. Watson and Francis Crick in 1953; it would be impossible without the computing technology which decodes and interprets the billions of genetic “letters”; it would be impossible without the sophisticated biological and medical knowledge which allows scientists (and others) to operate at the level of genetic information. So whenever any bit of

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<sup>2</sup> I should give honorable mention to Neal Stephenson, who uses the term regularly in his wonderful sf novels, and first got the word stuck in my head; I should also thank Dr. Campbell for turning me on to Neal Stephenson.

genetic engineering is performed, this process is not just the practice of genetic engineering, but an embodiment of all those layers of theory. Hence, I refer to genetic engineering as praxis.

Second, I use the term praxis to draw an analogy between literary uses of the concept of genetic engineering, and the use of genetic engineering itself. Specifically, I am looking at the way that the concept of genetic engineering shapes a text in certain, theoretically significant ways. Genetic engineering, as it is used in the texts I study in this thesis, operates as a mechanism for believably inscribing some theoretical idea into the world of the text. The literary form of genetic engineering functions as literary praxis for realizing the potentials imagined in Donna Haraway's "Cyborg Manifesto"; it is literary praxis which conflates nature and culture, self and Other,<sup>3</sup> and confuses our traditional notions of identity – which is to say, a posthuman praxis. Genetic engineering is deployed as a means of imaging a more perfect world, or as a means of dissecting our thoroughly imperfect one. It fits nicely into that "especially dense transfer point for relations of power" (Foucault 103) which Foucault recognized in the issue of sexuality. It defamiliarizes reproduction, deconstructs gender, and explodes the natural world.

Put another way, genetic engineering has become a tremendously useful metaphor, in the sense laid out by George Lakoff and Mark Johnson in *Metaphors We Live By*:

The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning, down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people. Our conceptual system thus plays a central role in defining our everyday realities. If we are largely metaphorical, then the way we

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<sup>3</sup> Throughout this thesis, I will capitalize "Other" to denote the Constitutive Other, which always opposes the Same. In this thesis, the Same will generally refer to the self, or one's own understanding of their identity.

think, what we experience, and what we do every day is very much a matter of metaphor. (3)

They go on to suggest that metaphors are systematic – “Because the metaphorical concept is systematic, the language we use to talk about that aspect of the concept is systematic” (7) – which implies that “the very systematicity that allows us to comprehend one aspect of a concept in terms of another (*e.g.*, comprehending an aspect of arguing in terms of battle) will necessarily hide other aspects of the concept” (10). The point of all this is that our way of being in the world (our praxis) is profoundly shaped by those Metaphors We Live By (or, in academic terms, our pet theories). If we acknowledge that the world as it was in 1986, or as it was in 2003, or as it is even today, is stacked against women, against the poor, against the environment, and if we wanted to change that somehow, a good place to look would be our metaphors: our (often unacknowledged) way of understanding the world and our place in it which shapes everything we do. And a good way to start effecting change is to find and disseminate new metaphors:

When people who are talking don't share the same culture, knowledge, values, and assumptions, mutual understanding can be especially difficult. Such understanding *is* possible through the negotiation of meaning. To negotiate meaning with someone, you have to become aware of and respect the differences in your backgrounds and when these differences are important. (Lakoff and Johnson, 231, emphasis original)

This negotiation of meaning offers the possibility of achieving not just an understanding between different groups (genders, species, politics, etc.), but also forming new kinds of understanding. Or as Lakoff and Johnson put it: “New metaphors are capable of creating new understandings

and, therefore, new realities” (235).<sup>4</sup> So I am suggesting, and will show in the following chapters, that genetic engineering functions as a new metaphorical system, one which has been evolving as the technology itself has evolved. Originally deployed as a sort of high-concept science fiction trope, genetic engineering has become almost mundane. But, regardless of its deployment, the literary use of genetic engineering seems to be constrained (or drawn) to a certain set of issues: gender, reproduction, nature, and the ethics of imposing free-will on previously uncontrolled, spontaneous systems.

Hence my choice of bookends: Slonczewski, who depicts genetic engineering as an undeniably positive force oriented against the forces of a much more destructive (and familiar) world, Valedon; and Atwood, for whom genetic engineering is an unrelentingly negative force, not oriented against the (masculine) world of mineral science and commerce, but rather aligned with them in an accelerating rush towards apocalypse. In *A Door Into Ocean*, genetic engineering is central to the existence of the utopian world Slonczewski develops. In Atwood’s novels, genetically modified organisms (GMOs) litter the landscape, and a particularly virulent genetically engineered virus precipitates the collapse of society and leads to the death of nearly everyone. That is, in Atwood’s novel, genetic engineering is a catastrophic technology, with a destructive potential on a level with nuclear weapons.

These novels dramatize the range of reactions that genetic engineering elicits. It is notable that these are the earliest and most recent novels in this study – *A Door Into Ocean* came out in 1986 and Atwood’s *Oryx and Crake* and *The Year of the Flood* were released in 2003 and

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<sup>4</sup> At a recent conference, I was asked about this concept in another context, and I explained it with the help of a TV character from the show *Community*. Jeff suggests that Britta doesn’t know what an analogy is, to which she replies, “Wait, I know what it is! It’s a like a thought... with another thought’s hat on!” Metaphors, in this pop cultural case, would be the hat. Change the hat, and you change thought.

2009, respectively. The other two works I study in this thesis – the collection *Lilith's Brood* by Octavia Butler and the 1997 novel *Mendel's Dwarf* by Simon Mawer – fall chronologically somewhat in between *A Door Into Ocean* and Atwood's novels.

*Lilith's Brood* was originally released as three separate novels – *Dawn* (1987), *Adulthood Rites* (1988), and *Imago* (1989) – which were collected as the *Xenogenesis* trilogy. In Butler's story, the apocalyptic-level event is caused by nuclear weapons, and salvation comes at the hands of genetically promiscuous aliens. This salvation has, however, its own apocalyptic overtones as the aliens restrict human reproduction, and modify all children born of the recused humans. This effectively means humans will give birth to a new species, thus entailing the extinction of humanity in its current form. Simon Mawer's novel is told on a somewhat more constrained scale. Dr Benedict Lambert, an achondroplastic dwarf, a modern-day geneticist, and an indirect descendant of the founder of genetics Gregor Mendel, serves as the protagonist and narrative voice. He strives to identify the genes responsible for his condition. His success allows him to choose whether his offspring will share his dwarfism, potentially rendering achondroplasia a thing of the past. While on the face this may seem to be an entirely positive outcome, in Mawer's treatment it is considerably more ambivalent. The ability to choose one's offspring based on genetic characteristics aligns quite closely with the monstrous, racist eugenics movement of the late 19<sup>th</sup>-early 20<sup>th</sup> century era. It also forces the reader to face the reality of Lambert's condition: he inhabits a non-normative body, which modern political correctness would deem acceptable, but he also now inhabits a body that, he suggests, no one would want to pass on.

A central issue in all of these novels is the way we define ourselves. Genetics allows for the establishment of objective criteria for what is human and what is not. However, genetics has

also revealed just how little fundamental difference there is between humans and other animals. It highlights just how little difference there is between different “races” of humans, how little difference there is between a normative, healthy adult and a “deformed” achondroplastic dwarf. And with genetic engineering, it is allowing for human control of biological organisms of a far greater scale than ever before. The traditional boundaries between humans and animals, natural and synthetic, male and female, all are collapsing in the wake of genetic engineering.

This boundary collapse is very closely related to the posthuman discourse. Myra Seaman offers a good description of the origins of posthumanism, and thus the origins of humanism itself: “The human long presumed by traditional Enlightenment and post-Enlightenment humanism is a subject (generally assumed male) who is at the center of his world (that is, *the* world); is defined by his supreme, utterly rational intelligence; does not depend (unlike his predecessor) upon a divine authority to make his way through the world but instead manipulates it in accord with his own wishes; and is a historically independent agent whose thought and action produce history” (247). This construction of the self as human (or the human as Self) lies at the heart of our contemporary way of understanding the world; the human functions as a category against which Other categories (like “animal” or “nature” or “primitive”) can be formed. Of course such a subject never truly existed; it was merely the theoretical product of Enlightenment, but it was a useful construct: in many ways this idea was central to the development of both democracy and science. By establishing the sovereignty of individuals rather than just monarchs, it was possible to imagine a system where every person had a say in the system. As Myra Seaman notes, this system was of course flawed in that it granted full “person-hood” only to men, and even then only men of a certain class, culture, and race. But it

nevertheless paved the way for a broadening of our understanding of the rights of liberty and has led to the emancipation of peasants from their monarchs, races from their oppressors, and women from men, at least in a legal sense.

The development of the human liberal subject also paved the way for (or perhaps, emerged from) a regime of objective scientific rationality. This new way of knowing was equally rooted both in a supposedly objective stance – memorably described as self-effacement by George Levine in *Dying to Know* – and in a rationality that finds its highest form in math. Dr. Lambert notes this in a quip in *Mendel's Dwarf*, (apocryphally) quoting the eminent physicist Ernest Rutherford: “Science is physics; or it is stamp collecting” (222). The first kind of science is mostly built on a rigorous rationality, which is to say, math. Mendel’s great contribution to biology, the reason his study of descent in peas and flowers eventually gave birth to the new field of genomics, is that he applied math to his observations, noting the discrete ratios which apparently governed heredity. The second kind of science rests on an assumption that there are clear and meaningful distinctions between different objects of scientific interest. “Stamp collecting” is only meaningful if the specimens are distinguishable.

A similar transition has been occurring with respect to how we construct our own identities. In the classic liberal human mode (the mode of enlightenment thinkers like John Locke and Thomas Hobbes) one’s identity is defined by some series of fixed features, like class, race, and gender. This model begins to break down in the twentieth century leading to the concept of a “posthuman.” N. Katherine Hayles discusses this in her book *How We Became Posthuman*. This book explores the rise of cybernetics – as a technological construct as well as an ideological one – and the related collapse of the liberal human subject. As Hayles shows in

her history of the scientific debates which led to the development of cybernetics and information theory, posthumanism is born from a fusion of the two perspectives, a fusion which may ultimately lead to the collapse of “stamp collecting” science altogether. *How We Became Posthuman* describes the historic Macy Conferences on cybernetics and the debate which surrounded the eventual disembodiment of information. The Second World War saw the birth of information as a science and technology. After the war, information become defined as disembodied and abstract, a definition codified by the Macy Conferences. Hayles studies these conferences for evidence of the birth of information theory, and locates in that moment the destabilization of the liberal humanist self. She tracks the changes in how scientists and researchers theorized information and the implications for the modern understanding of the human subject. She characterizes this shift as one from a (Lacanian) presence/absence dichotomy to a new pattern/randomness distinction; from a privileging of possession to a privileging of access: “The effect of these transformations is to create highly heterogeneous and fissured space in which discursive formations based on pattern and randomness jostle and compete with formations based on presence and absence” (Hayles 28). By tracing the history of the scientific debates leading to cybernetics, Hayles also traces the recent history of anxiety over the loss of an easily definable subject.

In other words, Hayles looks at the way that information theory posits a form of consciousness (or humanness) which is already disembodied – already posthuman. This theory has become instantiated via the widespread adoption of computer technology. Briefly, as we spread our awareness out over vast physical distances via informational networks – through the internet, mediated by computers and constantly connected smart phones, often in the form of

Facebook socialization – we run up against the difficulty of defining the boundaries of the human subject. This difficulty is already inherent in the concept of cybernetics, and as this concept becomes ever closer to reality, this difficulty seeps into facets of life normally insulated from philosophical debates. As a way of explaining our new, conflicted posthuman condition, Hayles describes the rise of cybernetics theory, noting: “The result of this breathtaking enterprise was nothing less than a new way of looking at human beings. Henceforth, humans were to be seen primarily as information-processing entities who are *essentially* similar to intelligent machines” (7, emphasis original). The emphasis on “essentially” is especially appropriate. In her engagement with the post-modern theories underwriting posthumanism, Hayles emphasizes early and often the way that such cybernetic posthumanism is in fact just another form of essentialism.

As she goes on to note: “the cybernetic machine was designed so that it did not threaten the autonomous, self-regulating subject of liberal humanism. . . . On the contrary, it was to extend that self into the realm of the machine” (Hayles 86). But this idealistic conception of man merged with machine—or rather, interpolated by information—overlooks the important question of context. Can one still be the subject of liberal humanism when disembodied? The conflict between these two conceptions of information is the core theoretical issue in Hayles’s history of information. As she persuasively argues, the disembodiment of information was neither necessary nor inevitable. Rather, a decision was made to decontextualize information, to theorize information as both abstract and unchanged by its immediate environment. This move was not unopposed, but it was the result of the Macy conferences, and it became the baseline for understanding information. In later years this move was questioned as roboticists (in particular) began to grapple with the difficulty of realizing abstract concepts in physical forms – of

developing a cybernetic praxis. By stripping information of its context, the Macy conference set information free and paved the way for the jargon-y world of cloud computing and internet databases, but it also created, and obscured, the problem of context: the importance of body or embodiment.

An analogous development occurred with the rise of genetics. Once nature is reduced to a string of DNA, the essential characteristic of a given animal becomes its genetic code rather than any particular embodied feature. This code is in base 4 rather than base 2 – that is, there are 4 possible nitrogenous bases (G, C, T and A), while only 2 possible binary numbers (0 and 1) – but the principle holds: what is essential about a particular organism is no longer any particular manifested trait, but the code underlying all such traits. This leads to a peculiar sort of boundary destruction, since it allows for all organisms to be placed in objective, testable categories—thus ratifying and apparently objectively settling the boundaries. These manifold categories are, however, based on a common genetic denominator, thus obscuring if not erasing what were once considered essential differences, those differences which once gave rise to such categories in the first place. Norbert Wiener, “the father of cybernetics,” confronted a number of troubling questions as the cybernetic program progressed, such as “[w]here should the cybernetic dissolution of boundaries stop? At what point does the anxiety provoked by dissolution overcome the ecstasy?” (Hayles 85). These same questions can be adapted to the discussion of genetic engineering, and function as guiding questions for the authors of my four texts: What is lost by genetic engineering? What do we give up when we live in an environment entirely of our own creation? Are the gains worth the loss? Do we have a choice?

The reason cybernetics and genetics provoke so much anxiety is that they expose the weakness of our old system without offering a good replacement. Where a clear distinction between humans and animals was once obvious, it has recently become obscure. Indeed, Mendelian inheritance disproved the Darwinian orthodoxy that inheritance was gradual and continuous by showing traits to be discreetly, mathematically, and probabilistically determined; the apparent universality of the very DNA which drives the genetic drift had made the supposedly hard and fast (discrete) distinctions between human and non-human seem like so much orthodoxy. Thus the animal kingdom (the word itself encodes an assumption of hierarchy) is less an orderly tree than a continuous system.

This continuousness plays well into a postmodern sort of boundary collapse. The old (modern-era) divisions between race (white v. non-white), gender (man v. woman), and even life itself (human v. animal) must needs be rewritten. This collapse of old systems – dichotomous, heterosexist, racist, and patriarchal as they tend to be – can be seen as a positive development, as offering the potential to construct a new world free from old problems. In her famous *Cyborg Manifesto*, Donna Haraway teaches us that “[c]yborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves” (154). At stake in her famous manifesto is the future of women in a system defined so long by gender dichotomy. In this sense the cyborg and its inherent hybridity collapses old dualisms, and from the rubble of that old order a new one can rise. Rather than a world shackled to a codified and unjust system of identity, “a cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints” (154). This, Haraway suggests, is how we escape a past

dominated by gender dichotomy. But the cyborg Haraway describes is “a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction” (149). Her theory applies to genetics about as well as Hayles’s posthumanism, which is to say, well so long as we include a few caveats.

Genetics, and more specifically genetic engineering, can be read through a cyborg or posthuman lens because it gives rise to similar hopes and anxieties. But it fits neither model perfectly because genetic engineering is fundamentally biological and embodied. Both theories deal with the hybridity that emerges when people and their machines are conflated. Genetic engineering raises many of the same questions as the cybernetic machine or the artificial intelligence, only more so. One can intuitively distinguish Man (in the humanist sense) from Machine, even if a rigorous distinction is difficult—*i.e.*, I can easily say that my glasses are separate from me, they are not-me, even though they modify something I would not consider separate from me, my vision. But if I wear my glasses whenever I am awake (and thus whenever I’m making use of my vision), then the alteration provided by the glasses becomes as much a part of my vision as my eyes; does my casual distinction between glasses and self really hold? The issue gets more complex as we branch out into ever smaller machines, such as the nanomachines in Neal Stephenson’s *The Diamond Age*, or as devices function as surrogates for missing but normative pieces of anatomy, such as prosthetic limbs, or as we experience ever more of our social life in digitally mediated environments, such as Massively Multiplayer Online Role Playing Games and Facebook. But in all these cases there is an essential difference: these devices are mineral in origin. Haraway’s cyborg is a hybrid of “machine and organism,” but what if the machine is an organism? Similarly, the posthumanism that Hayles speaks out against

envisions the human mind as essentially computational, essentially informational, and hence, fundamentally disembodied. Hayles argues for a return to considerations of embodiment and context. But what about when the information is itself inherently embodied—when it is fundamentally meaningless without the messy context of biological life? A DNA sequence can be stored on a computer, but is nothing more than a string of numbers unless embedded into an organism—it provides a map which RNA can express in the form of proteins, and it is the summation of these proteins over time that leads to a biological organism.

In *A Door Into Ocean*, Slonczewski offers an ecofeminist utopia on Shora, where genetic engineering has led to a literal sort of conflation between women and nature that the term “ecofeminism” suggests. It is a world where the inhabitants, known as Sharers, are perpetually at peace (even when there is major disagreement), a world populated entirely by women, and a people in harmony with their environment. The conflict emerges from these people’s contact with another human society, one structured hierarchically and rooted in mineral science. Atwood’s novels present a different vision of the future, one considerably less optimistic. Hybridity, at the core of Haraway’s manifesto and central to the cybernetic collapse of an easily definable human subject, is rendered grotesque. For Atwood, hybridization has led to a collapse of nature, and her world embodies anxieties similar to the ones identified by Hayles. In *Lilith’s Brood*, Octavia Butler describes an alien species, the Oankali, who compulsively hybridize with foreign species. Over the course of the work’s three sections, humanity and Oankali meet, join, mate, and eventually coalesce into a new, superior, hybrid species—even if humanity ultimately has little say in the matter, leading Jessie Stickgold-Sarah to call the work a pessimistic utopia. Mawer’s *Mendel’s Dwarf* offers yet another take on genetic engineering, this one set on

contemporary Earth. The knowledge of genetics is a mixed blessing for Dr. Lambert, since as an achondroplastic dwarf he has been marked by a random genetic trait that modern genetics has allowed him to understand. With that information, he develops the ability to identify, at the embryonic stage, which of his potential offspring have achondroplasia and which do not. From there he engages in a bit of rudimentary genetic engineering by selecting which fertilized embryos will be used in an *in vitro* procedure. The line between making a merciful decision and the cruel eugenics of the recent past is dreadfully thin, a fact which Dr. Lambert sees all too clearly. The irony is, of course, that such knowledge does nothing to change his physically and socially diminished stature; nor, ultimately, does it play much of a role in the novel's closing tragedy.

In all four works, the shifting of simple boundaries between human and nature is central. Whether this shift results in a utopian society, an ambivalent future, a cruel present, or a dystopian apocalypse, it is all uncharted territory. In all cases, the shift is not one of the liberal human subject *per se*, but of the boundaries we use to define our identities. Like the boundaries between man and woman, white and non-white, civilized and savage, genetic engineering renders the boundary between nature and humanity unstable –more importantly, it destabilizes the boundary between what is “natural” and what is “cultural,” the final, most fundamental space against which our old constructions of self were defined. Nature, in this sense, has ceased to be easily definable, and as a result has become a contested space for defining the future.

The possibilities of genetic engineering range from creating a bold new world to desecrating the old cruel world; from solving all our problems to simply re-inscribing problems of old onto a new, apocalyptic landscape. Haraway notes: “It is certainly true that postmodernist

strategies, like my cyborg myth, subvert myriad organic wholes (for example, the poem, the primitive culture, the biological organism). In short, the certainty of what counts as nature – a source of insight and promise of innocence – is undermined, probably fatally” (152-53). This tends to be a central source of tension in these novels. Will the collapse of human and nature bring humans closer to a natural innocence – as Slonczewski suggests – or will it fatally corrupt nature – as Atwood attests?

The trend across time for these stories is one from optimism to dread. In part, this reflects the anxieties born from the mainstreaming of genetic engineering. When Slonczewski was writing, genetics was a well-established branch of knowledge, but it was still largely “stamp collecting” sort of science, that is, mostly concerned with gathering knowledge, but with little ability to manipulate the world with this knowledge. Atwood, in contrast, deals with anxieties profoundly rooted in contemporary developments. Crake, the eponymous villain of the series, works on his genetically engineered post-humans (the “Crakers”) in a way that is largely an extension of what contemporary bio-medical technology already enables.

For instance, while *in vitro* fertilization requires a womb (and hence, a woman), this technology diminishes the “femininity” of giving birth: “Currently scientific achievements allow women to become mothers through in-vitro fertilization, to control when and where motherhood occurs, to know the sex of their child in advance; in other words, it is possible to give birth to a new life without involving emotions, empathy, and sociability” (Botta 251). A lack of emotion, empathy, and sociability is not an essential component of such mediated reproduction, merely a potential. But it is a powerful potential. In essence, it allows for maternity (and paternity) to be profoundly rewritten. Whether this is interpreted as a move for the better (as in *A Door Into*

*Ocean*) or worse (as in *Oryx and Crake*), or some murky ethical ground in-between (as in *Lilith's Brood* and *Mendel's Dwarf*) depends largely on the story being told.

In *Oryx and Crake*, the power of genetic engineering and biological/reproductive technology has eliminated the need for biological parentage altogether, but most especially the need for a mother. In Butler's *Lilith's Brood*, the issue is reversed: rather than collapsing the power (and responsibility) of reproduction down to one man (with, of course, the help of a vast scientific apparatus), Butler's characters only reproduce in pods of five –a pair of humans, a pair of Oankali, and one third-gendered *ooloi*. This parental proliferation, and many human's resistance to it, highlights the arbitrariness of our modern reproductive coalitions while nonetheless acknowledging how central such “natural” groupings are to our sense of our humanity. In Slonczewski's novel, reproduction occurs between women only, but it is portrayed as an almost purer form of what we have now. In Mawer's novel, *in vitro* is explicitly used, and its moral dimension is directly interrogated, as Dr. Lambert makes use of his status as scientist to substitute his own semen for another man's (subverting paternity), then segregate the fertilized eggs into normative and achondroplastic-gene carriers, and finally select which to give to the mother (subverting the “natural” random selection). In all cases, there is a breakdown of gender roles as predicted in Haraway's “postmodernist strategies,” embodied by the various characters' abilities to create children without the use of sexual dichotomy. Whether the collapse of sexual reproduction leads to a balanced utopia or completes the marginalization of women depends on who's writing, and when.

If the issue of genesis in these novels represents a collapse of the distinction between man and woman in reproductive terms, it also embodies a collapse between human and nature. The

Crakers are created through genetic manipulation of human embryos with additive “enhancements” such as the ability to live off nothing but free-growing vegetation and enhanced resistance to disease and intense sunlight. The children produced by the *ooloi* are hybrids of human and Oankali, incorporating advantageous traits from both. The Sharers reproduce via heavily mediated “fusion of ova, a process requiring lifeshaper assistance and the consent of the Gathering” (Slonczewski 89). Only in *Mendel’s Dwarf* does reproduction follow along natural lines, but even there the element of selection challenges the natural models of reproduction.

But as our knowledge and skill increases, we are increasingly mediating the biosystems of our environments. These novels raise the question: What is nature in an environment entirely (or at least, potentially) of our own making? The novels provide two contrasting approaches to this question, approaches which can be categorized in line with distinctions outlined by Jayne Glover: instrumentalism and intentionalism. The scientific enterprise documented in *Mendel’s Dwarf*, conducted by Crake in *Oryx and Crake* and by the Valans in *A Door Into Ocean*, all follow along the lines of instrumentalism, which arises from a “selfhood conceived as that of the individual who stands apart from an alien other and denies his own relation to and dependency on this other” (Plumwood 142, quoted in Glover 51). This cold science contrasts with the intentionalist approach of the God’s Gardeners in Atwood’s *The Year of the Flood* and the Sharers in *A Door Into Ocean*, an approach which “allows an ethical response encompassing respect for, and mutuality with, others” (Glover 51). Genetic praxis does offer some complications to this division, however. The division between self and Other is never completely erased in Slonczewski’s novel, for instance – the uber-enlightened Sharers still debate about the humanity of the antagonistic Valans, a debate with potentially destructive results. Rather, what is

embraced in the intentionalist approaches is a renegotiated self/Other understanding, built from an enlightening genetic knowledge. Neither is the division ever completely clean – even the uber-instrumentalist, Crake, ultimately implicates himself in his science, apparently choosing death over living in the world of his own creation. The instrumentalist approach simply reflects a different negotiation of the changed self/Other divide.

Put another way, we can think of “instrumentalist” approaches as signifying a science which is valuable for its predictive models. This prediction is the first step in being able to manipulate “nature” or, more broadly, the Other in any human v. Other system (such as human v. nature). In short, science is an instrument to be used to achieve some ends. Because there is a presumed separation between the agents and what they manipulate, such manipulations can be engaged in without much concern for the inherent ethics of such a change. Butler turns this around ironically by casting her salvific Oankali as initially instrumentalist towards humans. Although her aliens are ultimately unable to cause physical pain without experiencing the pain themselves, they lack an understanding of the human psyche, while at the same time they intuitively understand humans as fatally hierarchal. They are compelled to “fix” humanity, and in their quest to do so often violate what we would recognize as the free will of these humans. Even at the end of the final piece of *Lilith's Brood*, recalcitrant humans are brought into the fold mostly because the pheromones of the human-born human/Oankali hybrid *ooloi* seduce any natural humans who smell it.

Intentionalism, by contrast, approaches science as more of a descriptive force, one which recognizes the self as implicitly contained in the Other. Science is not, in this construction, a tool for manipulation so much as a way of expanding knowledge. While the Sharers in Slonczewski's

novel have the ability to manipulate the genome of any biological creature they encounter, they do not use this ability lightly. Instead, they live symbiotic lives within biological constructs which function as houses, transports, food sources, propulsion, et cetera. Octavia Butler's Oankali likewise have a fundamentally intentionalist relationship with their technology, which is also fundamentally biological. However, their compulsion to "fix" humans, to cure them of their reliance on mineral technology and their destructive hierarchies, is stronger than any objections the humans can muster.

Danette DiMarco, speaking of Atwood, draws a useful connection between instrumentalism and cybernetic-like deconstruction: "*Oryx and Crake*, with its focus on *homo faber* and instrumentalism grounded in personal profit, has repeatedly revealed the oppressive and degenerative nature of man-made barricades, divisions, separations, and enclosures" (192). Instrumentalists like Crake use science as a tool to manipulate nature for personal (often profitable) ends. As Glover notes: "Crake, like the other scientists, has worked so long with an instrumentalist approach towards nature that he is able to convince himself that animals created in a laboratory are the same as those naturally occurring in nature and that there are no ethical questions surrounding the creation of new species" (53). Of course both of these interpretations are limited, somewhat, in their lack of historical perspective. From the time the first organisms evolved barriers to separate them from a hostile environment there has been an essential boundary between self and Other. The distinction between created and naturally occurring animals is not as clear as Glover suggests. The art of breeding has a long and storied history. Farmers regularly cull crops and artificially manipulate the course of a plant-strain's evolution. By becoming the force of selection, humans have been genetically modifying animals for

centuries. From the dawn of human history, we have been selectively breeding animals (dogs seem to have been the very first) for our own gain, heedless of the ethical consequences of bending nature to our will. The difference between that and genetic engineering is one of speed and control. When seen at the level of DNA coding there is no essential difference between natural and artificial animals. The distinction has already collapsed. What remains is how we (as a species, as members of a discourse community) choose to use this science. Genetic engineering in the real world merely accelerates this process, takes it to another level. But, practically speaking, it represents no new development, simply a new way of seeing old developments.

It is important to note that both instrumentalists and intentionalists face the same sort of boundary confusion when their science enters the realms of genetic engineering. For intentionalists, it represents a sort of Haraway-esque hybridity, a fundamental conflation of the self with nature. For instrumentalists, it represents a Hayles-eian sort of abstraction, where the ethical boundaries of science become obscured. That is, when the subject of science is fundamentally similar to the objects of our study (and manipulation) then we (humanity, nature, etc.) become valid spaces for unfettered scientific exploration.

Although it is tempting to say such genetic manipulation clearly represents an unnatural act, these texts as a whole call this into question. Take, for instance, the luminous green rabbits spoken of in the first epigraph. Atwood obliquely refers to biopunk artist Eduardo Kac's transgenic project, Alba, completed in 2000.<sup>5</sup> By splicing the genes for phosphorescence from a jellyfish into a rabbit, Kac and a team of scientists intentionally created what was perhaps the

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<sup>5</sup>Announcement documented at <http://www.ekac.org/gfpbunny.html>.

world's first true chimera. Although envisioned as an artistic project, the birth of Alba raises serious questions about the boundaries between human and nature, between science and nature, and between what is natural and what is unnatural. In Atwood's world, the glowing green rabbits, for instance, have escaped their cages and interbred with native populations. The progeny of such bunny unions are clearly not in the realm of human control, but neither are they separate from a history of human intervention. Also, while a rabbit and a jellyfish may not be able to naturally reproduce, the genetic information in Kac's glowing bunny was entirely drawn from nature; science just stitched it together. Atwood even notes this: "As Crake used to say: *Think of an adaptation, any adaptation, and some animal somewhere will have thought of it first*" (*Oryx* 164, italics in original). These events, both real-life genetic engineering and Atwood's fictional take on it, call into question the boundary between nature and science.

In a sense, there are no "natural" spaces in the worlds of any of these stories, no spaces which are untouched by human/sentient activity. In *A Door Into Ocean*, the settlements on Shora are alive, but their form and function is determined in large part by their symbiotic relationship with the Sharers. In *Lilith's Brood*, the Earth's biosphere is essentially annihilated by nuclear winter; it is selectively reconstructed by the Oankali, and even then much of the action takes place in the Oankali's biological spaceship and earthbound colonies. In *Oryx and Crake*, there are allusions to elements like the sea level (suggesting a recent and rapid rise) and the intensity of the sun (suggesting a loss of protective ozone) which suggest environmental catastrophe predating Crake's apocalyptic genetically engineered virus (c.f. *Oryx* 37, 63). Even Mawer's world in *Mendel's Dwarf* is marked by humanity, as much of the action takes place in cities and labs. As Wolter suggests:

[W]e no longer depend on nature's force, but have become the force. By burning fossil energy, the global climate had been changed forever and with it the relationship between the planet and its inhabitants. From the global change in our climate and the fact that in future the strength of tornadoes, hurricanes, and the heat in summer are not acts of nature but the result of man's actions, it has to be inferred that the primal relationship between the nature of our planet and its inhabitants has been destroyed. (264)

Wolter draws direct, causal links between climate events (like tsunamis, tornado/hurricane strength, and summer heat) and the use of fossil fuels; that is, she suggests these events can no longer be considered natural because they have been so markedly shaped by human activity. Of course the matter is a little more complex: "global warming"<sup>6</sup> reflects a rise in average global—not local—temperature. What this means for more localized systems (*e.g.*, summer temperature in Florida, number and strength of hurricanes, etc.) is far from clear. Chaos theory grew out of climatology for a reason (Gleik). We have little data to predict the climate in a warmer world—for better or for worse.

It is worth noting that climate change is a fact of Earth's history, even at current rates (the last ice age came on fast, for example). So while the proximate cause of climate change is humanity's use of fossil fuels, and can thus be considered unnatural, the reaction of both local and global climates still follows the same physical laws as before, and can thus be seen as natural. Indeed, one of the great anxieties about climate change is that it will alter the world in such a way that humanity can no longer exert any sort of control—even the soft control

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<sup>6</sup> As formulated by UN Intergovernmental Panel on Climate Change. Report can be accessed via the IPCC website: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm)

represented by prediction. Similarly, genetically engineered chimeras represent a case of human intervention without a guarantee of human control. We can engineer a rabbit to glow in the dark, but we cannot guarantee the rabbit will stay in its cage, cannot guarantee that it will live and die when and as we see fit. There is a limit to human control. In other words, humans lack the capacity to fully control nature, even by unnatural means.<sup>7</sup>

In the case of genetic engineering, issues of control seem to be central to the definition of nature. Given this issue, what, in the end, constitutes a natural space? Henri Lefebvre offers a useful definition. In *The Production of Space*, Lefebvre describes the way nature has long been defined (he would say produced) by culture as the space where culture is not. That is, “to say ‘natural’ is to say spontaneous” (70). Lefebvre’s definition still indicates a primacy of humanity in defining nature: the “spontaneous”<sup>8</sup> aspect suggests the distinction is positioned less against the human subject as against human agency. In this sense, Lefebvre’s definition of “natural” sidesteps the issue of human subjectivity in defining what is natural—we can be embodied or not; his concern is intent. This definition works well for describing nature in these novels; or rather, it helps center the issue of the unnatural in the novels. The luminescent rabbit, both in reality and in *Oryx and Crake*, is unnatural because it was created—could only be created—by conscious intervention. That definition is uncontested. The definitional difficulty appears when considering everything that comes after the creation of the rabbit.

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<sup>7</sup>As Dr. Patrick Murphy pointed out in the defense for this thesis, glowing rabbits would never thrive in nature – no rabbit population would select *for* visibility. This speaks to another aspect of the question of “natural” vs. “cultural”: such an alteration is doubly artificial since human intervention is required not simply for the creation, but also the continued existence of glowing rabbits. They could only exist in a human world on human terms.

<sup>8</sup>The operative definition of “spontaneous” for Lefebvre can be found in the *Oxford English Dictionary*: “Occurring without apparent external cause; having a self-contained cause or origin.” Other, more circular definitions include “Arising or proceeding entirely from natural impulse, without any external stimulus or constraint” and “Acting voluntarily and from natural prompting.” The Natural is that which is spontaneous (which arises from the natural, which...).

After Kac and his team successfully inserted the phosphorescence-inducing genes, Alba gestated, developed, and generally existed as any un-modified rabbit would. The luminous rabbits in Atwood's novels go one better by successfully mixing with local populations and entering the natural (spontaneous/uncontrolled) ecosystem. If unnatural is non-spontaneous, or that which happens because of human intervention, chimeras (in reality or in these novels) are unnatural only so long as intent is involved. If human (or alien) involvement ends at genesis, the chimera would, by Lefebvre's definition, become natural. Thus the previously separate states of 'natural' and 'unnatural' shift over time. The case of genetic engineering, again, does not necessarily point to any vastly new development in a world of domesticated animals, irrigation, terraced hillsides where rice is grown in vast quantities; rather, it indicates a new level of control and an accelerated pace of change. The old boundaries were no more solid before genetics than they are now, but whereas before their shifting occurred over decades and centuries, now they can occur over years, months, or even days.

Boundaries work best when they are fixed and immutable. The ability of humans to alter nature in a permanent way makes nature, in some sense, liminal. Clear demarcations between 'natural' and 'unnatural' break down when formerly unnatural objects take on natural characteristics. This is suggested by Bouson – "Crake's words reflect the 'postmodern' scientific mindset that openly flouts the 'laws' of nature posited by modern science and works to collapse boundaries among species" (145) – and Wolter: "Whereas nature was hitherto a force larger than and independent of humankind, this is now no longer the case. As we now influence and change natural phenomena, our concept of self, of theology and philosophy will change fundamentally" (264). Traditional boundaries between different species, and between human and nature, were at

least partly contingent on an obvious and apparently innate distinction. This distinction has collapsed. The implication at the heart of my thesis is that genetic engineering is not so much one science/technology effecting a radical alteration of the world (although the potential is there), but rather that it is underwriting a potentially massive shift in the way we see ourselves. Ultimately this shift renders the self monstrous, or perhaps even alien. It is not clear which fate is worse: the truly alien is entirely unknowable, and in many ways less frightening than that more familiar monster. Is it worse to live as monstrous but recognizably human, or to become unknowably alien? The second, while less frightening in a literary sense, is also represents a sort of suicide.

This tension is embodied in the texts I analyze in this thesis. Each author balances utopian elements against some apocalyptic overtones. Or, to put it another way, each of the texts plays with the inherent ambiguity of the word “utopia,” both in the sense of term, both the ou-topia (meaning no + place) and eu-topia (meaning good + place). Genetic engineering comes with many possibilities for beneficial use, but it also comes at the potential cost of those things which make us recognizably human. Or, as Lefebvre claims, nature is “being murdered by anti-nature – by abstraction, by signs and images, by discourse, as also by labour and its products” (71). In extending human control into previously natural areas, we destroy what once defined those areas as natural – and by extension, what defined us. The dissolution of clear boundaries between the embodied human and the information-entity of the mind is tied by Hayles to the rise of cybernetics theory. By positing the fundamental element of identity (or functionality) as information, cybernetics quietly uproots centuries of embodiment as the center of humanism. By applying this sense of information-over-matter to biology, genetic engineering (and related fields) does the same thing for nature. Atwood seems to be taking a more scientific (and less

Marxist) approach to reach Lefebvre's conclusion: nature is no longer allowed to be spontaneous, its old mysteries have been demystified, and it is now part of the same body of knowledge that defines human spaces (*i.e.*, science).

Pandora's Box has been opened, as Atwood suggests: "We've always been good at letting cats out of bags and genies out of bottles, we just haven't been very good at putting them back in again" ("Aliens"). Even if humans and computers never merge, cybernetics' way of conceptualizing human identity has exposed the old boundaries as permeable and weak. Even if Alba's descendants never escape into the wild and populate our forests with glowing rabbits, her very existence exposes the boundary between humans and nature as illusory, at best. The question now is how we choose to react to this change. Will we follow in the models suggested by Haraway, Slonczewski, and (to an extent) Butler, and embrace the potential for positive restructuring? Or will we fail, and follow the paths feared by Hayles, Mawer, and Atwood?

Literature is useful for these sorts of questions because it is not bound to the (occasionally unfortunate) finality of real life, but instead functions as a space for multiplicity, exploration, and deep thought. In the following chapters, this thesis will explore each of the novels discussed here in far greater depth, with an eye towards divining what our relationship to sex, gender, nature, the environment, science, and even ourselves will be in the brave new world of genetic genius. What people will be in't? Will they look like us? Will we even want to know them? Of course we cannot truly know until we get there—the future is not yet written. But perhaps these four works can offer us a glimpse. One thing is certain: we are now living in a post-natural world.

## CHAPTER 2: A *DOOR INTO OCEAN*: MENACING THE ECOFEMINIST UTOPIA

*A Door Into Ocean*, by the biologist-cum-novelist Joan Slonczewski, un-ironically portrays an ecofeminist utopia. Published in 1986, Slonczewski's second novel takes place primarily on a utopian moon called Shora. This moon is completely covered with water, and populated entirely by females who live in harmony with their oceanic environment and whose society has lasted for untold generations. In keeping with the tradition of utopia, these women, known as "Sharers," live in a world where there is no war, physical pain is conquered upon maturity, and the only forms of conflict are elaborate forms of passive exclusion, codified in the practice of "Unspeakings." The structural basis for the entire utopian society is a form of linguistic reciprocity which permeates all aspects of Sharer society – one cannot speak in the native Sharer language without implicitly acknowledging both the self and the Other (the subject and the object) as being inextricably tied together. This utopian vision is in line with Haraway's *Cyborg Manifesto*, as it offers a possible way out of a world-system built on binary oppositions. In her own guide to the novel, Slonczewski suggests the plot is constructed around a series of binary oppositions, and the "Sharer language plays a crucial role in deconstructing all the polarities above" ("Guide"). Slonczewski cleverly delivers a vision of a society without violence and exploitation, yet beneath this utopian interpretation there lies a deeply integrated deployment of genetic engineering. This concept forms a necessary precondition for the rest of the story, and functions in an explicitly positive, but implicitly negative way: positively, it allows for a purely female society to reproduce, and is the key to the otherwise passive Sharers' great strength; but, negatively, it seems to have come at the cost of eliminating men from the society. That

Slonczewski builds her utopia on top of an advanced form of genetic engineering says much for her optimistic appraisal of genetic engineering in general.

I agree with Sheryl Vint's appraisal that "this novel establishes Slonczewski's concern with how the ways we conceive of identity constrains and enables various sorts of politics" ("Theorizing the Global"), although I think it is important not to understate the role of the biological vs. mechanical dichotomy which undergirds the utopian society. Slonczewski does lay out the potential destructive power of advanced life-sciences, and she does make clear that this destructive potential is kept in check by the social structure more than anything inherent in the technology.<sup>9</sup> But her utopia is nonetheless premised on a rejection of mechanical/inorganic science, and this is tied to the Sharers' apparent historical rejection of men, even keeping in mind what Peter Fitting notes, that "[t]he novel makes a clear distinction between values and plumbing" (41). Although Slonczewski goes out of her way not to implicate all men everywhere in the negative elements of society – the occupying forces have plenty of women in their forces, and a man does become fully integrated in the Sharer society, to name just two examples – the anti-utopian elements are all implicitly or explicitly masculine: the occupying general is a man, the power which threatens the utopia is called the Patriarch, and (most importantly) the benevolent, ideal society is one made up entirely of women. This ideal society is inseparable from the life-sciences which serve as the technical foundation of their community: "the emphasis on female values has led to imaginary communities which pay special attention to the 'life' sciences like medicine and biology, which are opposed to men's skill with war technology" (Fitting 41).

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<sup>9</sup> Edward Higgins explores this dynamic in depth in a chapter called "Quaker Ethos as Science Praxis in Joan L. Slonczewski's *A Door Into Ocean*."

So it is fitting that Slonczewski sets her novel a few decades after the capitalistic, militaristic, masculine society which rules the planet Valedon has found its way onto Shora. Trade has formed and the most valuable commodities at the beginning of the novel are rocks and gems, which Valans – the people from Valedon – trade for Sharer textiles and medicines, two commodities with tremendous value back on Valedon. While the Valan traders bring mineral wealth and resources with them to the moon of Shora which are valuable commodities for the Sharers, they also bring other less desirable objects: specifically, precious gems and rocks. Many of the Sharers are profoundly disturbed by the minerals because they lack any sort of life; since the moon is entirely covered with water, the Sharers never see minerals, and only interact with living organisms. But some small minority of Sharers become obsessed with the stones, to the extent that they isolate themselves from the rest of their society in a condition they call “stone sickness.” One particularly central Sharer, called Merwen, travels to Valedon to better understand the Valans. She decides to bring back a young Valan peasant man named Spinel who willingly goes off on what he sees as an adventure to the exotic ocean-moon of Shora. Once there, he learns the Sharer language, becomes fully enculturated, and ends up falling in love with a Sharer woman.

The principle conflict in the story revolves around the Sharer attempts to end the stone trade. This issue is front and center when an envoy called the Malachite – a representative from the centralized Patriarchal power-center – appears for his once-a-decade visit.<sup>10</sup> He represents a power which is a remnant of a previous civilization of humans, known to the characters in this

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<sup>10</sup> The Malachite is a robot, and so is fundamentally sexless, but the Valan characters nevertheless explicitly think of the Patriarch and thus its envoy the Malachite as male: “‘The Patriarch is a worldmother, like Shora. He will build understanding.’ Of course Sharers would hear ‘She,’ but Berenice could not think of the Patriarch as anything but male. ‘His messenger is a malefreak who knows Valans and shares care of them’” (93).

story as “Primes.” These humans had tremendous scientific prowess and originally populated the galaxy. Details are murky, but it is suggested that they set up the Patriarch before largely disappearing, probably as a result of the robot/computer Patriarch’s attempt to control all human civilizations. The Malachite is a robot – a fact which horrifies the Sharers, because they associate all minerals (and thus all mineral-derived technologies) with a sort of permanent death. The Malachite has the military power to command by fiat – he resolves a Valan dispute by leveling the city of what he judges to be the offending faction – and after visiting the Sharers for a short time, orders a resolution to the trade dispute apparently in the Sharers’ favor. He also, however, orders the Valans to occupy Shora and discover what they can about the Sharers’ genetic engineering. It is soon revealed that the Sharers are a lost community descended from Primes without the interferences of the Patriarch, and thus possessors of technology which exceeds even the Patriarch’s.

This occupation proceeds as many foreign occupations do: with misunderstandings, needless suffering, and death. The Sharers practice their non-violent resistance, much to the consternation of the military. Throughout the story, a debate rages within the Sharer society as to whether the Valans, “death-hastenings” that they are, qualify as humans (and are thus to be treated as Sharers treat each other—that is, without force) or not (opening the door to radical, genetically engineered solutions, like a deadly virus). Merwen’s agenda in bringing Spinel to her world is to see if Valans (particularly the Valan men, whom the all-female Sharers call “male-freaks”) can become the ethical beings which Sharers recognize as fellow humans. The resolution sees the Valan military occupation defeated by a non-violent resistance which successfully exposed the senselessness of the occupation. The Sharers ultimately accept the Valans as humans, although

they view most Valans more as children than as equals. This positive resolution offers the strongest evidence that Slonczewski is working within the utopian genre.

It also suggests that, for Slonczewski, the answer to “what is lost by genetic engineering?” is almost entirely positive: violence (towards people, towards nature), poverty, pain, pollution, and exploitation. Also lost, perhaps not so incidentally, are men. Genetic engineering allows for Slonczewski to imagine a world where men have had no influence for thousands of generations, and as a result the world is much fairer, equitable, and non-violent. Her society functions almost as a feminist reimagining of Francis Bacon’s *New Atlantis* utopia. Perhaps the original natural philosopher—prototype for the modern scientist—Sir Francis Bacon is one of the first theorizers and proponents of empiricism and the scientific method. His utopia, *New Atlantis*, lays out an idealized society centered on the “Solomon House,” a place which (with respect to study of the natural world) closely resembles the modern research university. For the inhabitants of his utopian city “Bensalem,” the college is the very eye of this kingdom. The purpose of the college is to conduct research in a clearly recognizable precursor to the scientific method. Bacon sums up the purpose of the college: “The end of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible” (35). The similarity between Bacon’s utopia and the modern research university is, perhaps, no surprise, since Bacon largely originated the ethic of empiricism and in doing so founded modern research. It is notable that, while the society in *New Atlantis* is more than simply a large college, the utopian elements are largely tied to descriptions of the college. Bacon’s research method, whatever its real-world application, is a well ordered system, and his ideal college is ordered accordingly. So his utopia is a society where an

educational institute much like today's modern university sits at the (literal and figurative) center of society. The purpose of this institute is to pursue greater knowledge to improve the lives of its own citizens.

As utopias go, Bacon's is probably one of the most successful ever imagined, as it describes much of our current higher education academy structure – although it must be said that our world is far from utopian. But, for all our society's problems (and Slonczewski is dealing with many of them), we do nevertheless live an average of twice as long as people did when Bacon was writing, and we do have much more leisure more broadly available than was possible in his time. Slonczewski puts a biologist's spin on the whole thing: at the figurative center of her world is the practice (or, perhaps more accurately, the praxis) of genetic engineering, called "lifeshaping." This technology enables the entire society to function: it is explicitly needed for reproduction, implicitly responsible for the remarkable biological habitations and superior aquatic mobility of the Sharers. This utopia is not necessarily recognized as such in the beginning, perhaps because it is so feminine-centric: "Male (and some female) travelers typically suffer from the dis-ease wrought by matriarchal utopias" (Murphy 268). Indeed, the lack of any central power, the lack of violent resistance, the lack of a trading culture all serve to confuse the foreign Valans. As much as anything, Slonczewski's story is about the dissemination of the utopia to a broader culture.<sup>11</sup>

It is worth noting that the Sharers have, throughout the whole story, the theoretical capability to use their genetic engineering prowess to wipe out the colonizing occupiers. When

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<sup>11</sup> Although I will focus on the genetic engineering component of Slonczewski's story, I will note that genetic engineering is far from the central concern of *A Door Into Ocean* – that would be the non-violent, Quaker-esque, reciprocal culture which drives the Sharer culture. Rather, genetic engineering functions as an important element of the premise, and since Slonczewski is first and foremost an accomplished microbiologist, I feel a focus on the implications of genetic engineering in her novel is entirely appropriate.

the Malachite assures the Valan occupiers that “There is no threat to you, at present” (207) we realize that it is not speaking about the Sharer’s technological capability so much as their cultural willingness to militarize their technology. The utopian strains, then, are more a function of the style of society as they are a function of the technology itself. This style – the reciprocal, balanced approach of the Sharers – is emphasized by the Sharer’s language, their studious non-violence, and their close relationship with their immediate environment; specifically, with the living “raft-trees” which the Sharers nurture and manipulate.

Thus the feminist/utopian strain to Slonczewski’s story is also bound up in an ecocritical conversation. The Sharers live a low-impact, environmentally sensitive life – a lifestyle which is thrown into sharp relief by the aggressive actions of the Valans. For instance, the Sharers ride out the seasonal catastrophe of “seaswallowers” – a biannual event where massive sea-creatures migrate from one pole of the moon to the other, eating everything in their path. The Valans, in contrast, dump chemicals into the water to help ward the leviathans off. At the most extreme moment of Valan intervention, Valan General Realgar dumps so many chemicals into the waters around the Sharer “raft-trees” that the seaswallowers skip the Sharer inhabitations entirely. Although General Realgar intended this as something of a humanitarian demonstration of Valan powers, for the Sharers the gesture is anathema, because the seaswallowers play an important role in culling the other sea-life. Months after the missed “cleansing” Sharer raft-trees are nearly overrun with the abundance of other life: the balance on Shora is thrown off by the Valans’ arrogant chemical intervention.

Although the Sharers have the capability to control much of their environment, they have evolved a relationship with genetic engineering which is in balance with the uncontrolled

ecosystem of Shora. In part this may be related to the fact that, as Susan Stratton suggests, “Slonczewski is biologist as well as feminist, and her utopian world emphasizes the intricacy of the ecology of which her women are part. . . . Slonczewski seems to derive both feminist and ecological aspects of her novel from a more general interest in ethical relationships based in peaceful coexistence with others and resistance to dominance behaviors” (“Intersubjectivity”). Sheryl Vint concurs, suggesting, “Their ecofeminist technology is based on ways of working with the natural capacities of other species and a sense of themselves as part of a larger web of life. They do not use pesticides or herbicides but instead nurture the ecosystem to balance population and food supply” (“Animal Studies” 447). She connects this to “[t]he Sharer way of life [which] is entirely rooted in their refusal of the self/Other boundary; they literally cannot conceive of the possibility of doing harm to another without also harming self, a political and philosophical stance that emerges from how they have chosen to organize their communal relationship with other species on the planet” (“Theorizing the Global”). Laural Bollinger makes similar observations with regards to the microbial life in *A Door Into Ocean*, which is as integrated into the Sharer lifestyle as their massive raft-tree habitations: “Slonczewski constructs the Sharers as wholly committed to eco-sustainability, both at the macro and micro level . . . The novel contrasts the Sharer’s eco-sustainable choices with the less environmentally-sensitive Valans, who use machines and chemicals where Sharers use indigenous cephalopods and microbes. The degree to which characters accept the purpling effect of the breathmicrobes—and thus reject contagion models of understanding infection—comes also to signify the characters’ acceptance of Sharer ways” (384-85). None of these studies, however, makes note of the

curiously perfect fit between Sharers and their environment in the light of the Sharers known bioengineering prowess.

Certainly the Sharers' willingness to make use of the local life suggests a complex symbiosis which exceeds simple stewardship. The balance is, however, suspiciously resilient. As Slonczewski notes on her Guide, the various fauna on Shora is edible by the Valans and, for that matter, by the Sharers themselves, since both are human:

An aspect of evolution not discussed in *A Door into Ocean* is that of biochemical compatibility between Earth creatures and those of an alien biosphere. In *A Door into Ocean*, Spinel from Valedon can immediately eat and enjoy the plants and animals of Shora, many of which largely resemble Earth organisms. Apparently they all contain DNA and the same twenty amino acids that make up our proteins, the building blocks of terrestrial life. This can only be explained if the Sharers have systematically replaced most, if not all, of the pre-existing ecosystem of Shora with Earth-evolved organisms--in other words, in their own way they must have terraformed Shora, just as Valedon was terraformed. ("Guide")

The possibility that the flora and fauna of Shora have been engineered into a sustainable balance is never discussed in the novel, and it is missing from the exegetical works as well.<sup>12</sup> The implications of terraforming complicate any ecocritical reading. Maintaining an environment of one's own design has much more in common with city buildings and modern housing than with real-world green movements or natural stewardship. Certainly the Sharers are more in tune with

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<sup>12</sup> To be clear, this chapter focuses specifically on Slonczewski's novel *A Door Into Ocean* and related exegetical works – that is, the one novel and related critical explanations and interpretations of Slonczewski's *oeuvre*. She has other novels set in the same universe which deal with similar issues in different ways, but they are beyond the scope of this chapter and thesis.

their environment than the Valans are (with the environment on either Shora or Valedon); but if they or their ancestors created the environment in the first place – either from scratch, bringing the life with them to an otherwise dead moon, or through manipulation of the already-present life form – then the parallel between Sharer stewardship and a similar relationship on our world would be tenuous at best.

We do not know whether the species on Shora are all introduced or if they were modified to be compatible with the human needs. The potential for genetic praxis to enable simulacra of natural environments which are nevertheless products of conscious ingenuity (*i.e.*, environments which appear unmediated but are in fact heavily mediated) seems to be an implicit consequence of genetic engineering, at least in literary treatments. Octavia Butler’s alien geneticists travel on living ships—more complex versions of the raft-trees. They seed the Earth with habitations which will, eventually, consume all the natural resources of the Earth and launch themselves into space, explicitly linking the creation of wholly mediated biological spaces (created and controlled via genetic engineering) with the complete destruction of Earth. Atwood has overtones of this destructive link as well in the corporate Compounds which house the geneticists. These Compounds simulate the safe environments which have all but disappeared from her world in the face of climate change, forging the same metaphorical link between living space, genetics, and environmental destruction. For Slonczewski, this issue is not broached in *A Door Into Ocean*.<sup>13</sup> Rather, it is a condition of her utopia, and whatever the ethics of its creation,

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<sup>13</sup> This is dealt with more in the sequels, and discussed at length by Christa Grewe-Volpp in an article entitled “Lifeshaping a New Planet” which explores what happens in the sequel *The Children Star*. In Ms. Grewe-Volpp’s discussion, she notes that in Slonczewski’s later books the Sharers and Valans spread out to planets which need to be colonized and terraformed, a process which becomes especially tricky when these planets have hostile (to human) biospheres and xeno-organisms. But if Slonczewski looks into this issue in her later books, she still does little to explore the ethics of the Sharer’s origins in *A Door Into Ocean*.

it does seem to suggest an idyllic lifestyle with its own dangers (*i.e.*, excitement, relief of boredom, life) but in a way that is eminently conducive to a more enlightened way of being.

There are internal conflicts, of course, even in Slonczewski's best of all possible worlds. On Shora, individuals and even whole communities can become alienated when Unspeaking drags on for too long; the biannual catastrophes in the form of seaswallowers pose an existential threat to the living rafts which are the Sharers' homes; and the occasional psychopath does appear. These negative aspects of the utopia appear in the story mostly through Merwen, the central Sharer in the story. For instance, she is best known as a skilled "wordshaper" because she ended a decades-long Unspeaking between two large communities. Near the middle of the story, she helps the survivors of a raft-tree that is consumed by a seaswallower. And she is haunted by what she considers to be her greatest failure: her inability to help a fellow Sharer (whom I suspect is meant to be a psychopath) who had murdered someone. Instead of talking the psychopath back into the community, Merwen almost gets herself killed. But these occasional tragedies serve mostly to affirm the fundamental humanity of the Sharers – though they are not without their struggles, they have better ways of dealing with them. Unspeaking is preferable to violence and "death hastening," since it leaves open the possibility of reconciliation; you can't reconcile with a corpse. The seaswallowers are an integral piece of the ocean's lifecycle, keeping the populations of other creatures and plants in check, and generally keeping the Sharers' on their toes. Even the psychopaths have a place in the society, although that place is one of exclusion.

In a sense, the reason the Sharer society is so utopian is that they embody the cyborg ideal. The figure at the heart of Haraway's famous *Cyborg Manifesto* is "a hybrid of machine

and organism” – hence the term cyborg, which is a portmanteau of “cybernetic” and “organism.” Thus, the Cyborg is explicitly marked by its relationship with machinery. This is why I say the Sharers embody the cyborg ideal only “in a sense”; for the first half of *A Door into Ocean*, at least, they are largely identified against Valan norms – norms of dress and nudity, cultural hierarchy, propensity to solve problems violently, and (importantly) what the Valans would consider “technology.” These norms are reinforced as norms for the reader by their familiarity: our society hides its nudity, we live in a world of hierarchies, violence exists all around us, and our machinery is, like the Valans’, based on sophisticated manipulation of mineral-based objects. Heightening this relationship even further is the fact that the largely familiar world of Valedon is contrasted against the profoundly unfamiliar world of Shora. So when the Valans condemn Sharer society as “pre-stone age,” the reader is likely to agree. This lack of recognizable technology, and thus a class of objects we’d recognize as “machine,” would seem to render the Sharers unlikely candidates for embodying a Cyborg ideal. But this is merely an artifact of the different modes of technology (and the science which drives it) with which Haraway and Slonczewski work – one in the energy-and-particle-physics-derived world of computers, the other in a biology-derived world of genetic engineering.

Slonczewski was first published in 1986, the year after Donna Haraway originally published her famous *Cyborg Manifesto*. Because Slonczewski struggled, at first, to find a publisher – “An early version of *Ocean* was rejected by two publishers, one of whom derided it as a ‘fairy tale’” (“Guide”) – and because she had to write the novel before it was sent off to publishers, of course, it is unlikely that *A Door Into Ocean* was directly influenced by Haraway or Cyborg theory. However, *A Door Into Ocean* nevertheless engages with many of the same

issues that Haraway identifies as “troubling dualisms”: “self/Other, mind/body, culture/nature, male/female, civilized/primitive, reality/appearance, whole/part, agent/resource, maker/ made, active/passive, right/wrong, truth/illusion, total/partial, God/man” (165). Self and Others are linguistically tied together – the Sharer language has no verbs for possession or even, really, identity; their verbs can only connote “sharing,” thus “obey” can only be interpreted as “share will” (249). Mind and body are transcended through the “white state” trance which allows Sharers to escape pain and experience their life atemporally. Culture and nature are united through the practice of “lifeshaping” or what we would call genetic engineering. The distinction between male and female is rendered irrelevant by the all female society. Civilized and primitive are united in the apparently primitive but actually civilized Sharers (and confounded by the apparently civilized but comparatively primitive Valans). Reality and appearance are challenged by the apparent simplicity of Shora, although this particular dualism is one of the few which is not explicitly challenged. Whole and part are conflated in the biosphere of Shora, which the Sharers view as a unified system of which they are merely a piece. Agent and resource are united in the biological resources the Sharers cultivate. Maker and made are united in genetic engineering as well; the Sharers are all produced by genetic engineering, and some of them grow up to become those genetic engineers called “lifeshapers” (*cf.* 33, 89). The active/passive binary is exploded by the active passivity of the white trance, by Unspeaking, and by their tremendously effective passive resistance.

So while I do not mean to suggest that the Sharers are ideal Cyborgs in the exact sense developed by Haraway, they do embody a possible solution to the issues that Haraway raised; and, more importantly, the form of Slonczewski’s solution is very similar to Haraway’s. She

even sets up a similar list of binaries which are addressed through the course of the novel: “In literary terms, *A Door into Ocean* sets up a series of interlinked polarities or binary oppositions, all of which relate to traditional notions of female/male. Each of these oppositions is deconstructed or resolved through the course of the story.” (Slonczewski, “Guide”). My specific interest in this correlation between Haraway’s cyborg theory and Slonczewski’s novel is the way that they seem to have independently developed the same general solution to the most pressing issues of 1980s feminism; the major difference being that Haraway sees (inorganic) computers as the likely technological vector of disruption, while the micro-biologist Slonczewski posits genetic manipulation as the likely vector.

For the world of *A Door Into Ocean* genetic engineering functions as a sort of uber-technology, comparable to computer technology in a host of other sf novels. The Sharers appear primitive to the Valans – Spinel is somewhat horrified, for instance, by the lack of clothing, the exoticness of the food, and off-putting organic quality of the living quarters. Valan traders avoid the biannual seaswallower attacks with chemical deterrents, while the Sharers appear to passively suffer from these regular disasters. Decisions are made by general acclimation, and Sharers seem largely incapable of truly grasping the rules of trade. Relatively valueless stones are coveted by certain members of Shora, and are considered repulsive to the rest. But, in fact, these “primitive” aspects are merely artifacts of a much more sophisticated technology. The only minerals on Shora are at the heavy center of the moon – the center to which all dead things sink, somewhat explaining the Sharers’ association of minerals with death.

The association is, however, quite a bit deeper: all people on Shora live in a society where everything is, in principle at least, biological: the walls of habitations are growths of algae

and fungi, the “boats” are living organisms, the food is all collected from the surrounding water, the medical care is all handled with genetic manipulation. So the entire world, for a Sharer, is alive with dynamic potential. Minerals are largely static, even though present in organic material, and their technical potential is unlocked only through a very different sort of manipulation. For the genetic engineering savants on Shora, minerals and other synthetic technologies are completely alien. The obsession of some Sharers with stones comes from the same source as the more common Sharer sense of repulsion: the presence of something which is simply not alive completely contradicts their understanding of the universe.

At first, the Sharers technology is not recognized for what it is. Valan scientists and traders think that the Sharers use living matter because that is what is available – that is, they view the lack of mineral-based technology as evidence of a lack of sophistication. This mistaken assumption resonates pretty clearly with the history of earthly colonization, as unfamiliar traditions are misunderstood, or imperfectly understood, and the fundamental human complexity is assumed to be missing. This assumption is challenged by the Malachite, the mineral based (and thus, to the Sharers, monstrous) representative of the colonial power, who recognizes the genetic engineering as a forbidden technology from a time long past.

Slonczewski’s deployment of genetic engineering is rather complicated by these dual assessments. On the one hand, the clearly superior society – nonviolent, equitable, well-fed, etc. – is just as clearly associated with genetic engineering. This science/body of knowledge allows their idealistic society to exist in the first place, and ultimately helps to ensure its victory in the battle against the oppression of the machines. And, in this association, the genetic engineering is placed in a separate category from other, mineral based technologies. The minerals that the

Valans mine, manipulate, and trade, are clearly associated with destructive, divisive, oppressive, capitalistic and militaristic forces. Conversely, genetic engineering is recognized as a technology in its own right, as sophisticated (and potentially dangerous) as the mineral-based technologies of the distant Empire, and clearly superior to what the material society on Valan can do. It is elevated to a place on par with the most advanced Empire technology (embodied in the Malachite and his tremendously powerful spaceship), and oriented in opposition to this technology (and the society it enables/determines). Ultimately, the geneticists win the day, first in *A Door Into Ocean*, with the withdrawal of the Valan forces, and later when their passive, genetically enlightened way succeeds even more conclusively, by enabling the new federation of the Free-Fold in the sequel *Daughter of Elysium*. So genetic engineering is both a lifestyle that transcends technology, and a technology that transcends lifestyle.

By describing a society which is fundamentally mediated by a form of technology – even a form that bears many similarities to unmediated nature – Joan Slonczewski creates what we could call a race of posthumans. These characters are not integrated with a computer based technology, but they do in some sense exceed the boundary of the liberal human subject. One way Slonczewski helps to break down the traditional boundaries of the human subject is through her choice to make the entire Sharer society biologically female. In their own eyes, there is no gendered marker for the body – one of the key characteristics of a human subject is thus rendered moot. Gender in *A Door Into Ocean* is at once central to the story’s utopian vision and almost sublimated beneath the text. The “femaleness” of the Sharers is only apparent to foreigners like Spinel and the Valans (and, we must note, the readers as well). In part this mono-sex culture functions as a sort of ultimate realization of a contemporary progressive humanism, which has

moved from defining rights individualistically but only to men, and putatively wealthy white ones at that, to a broader definition which enfranchises other races and eventually other genders as well. The feminist movement which preceded Slonczewski's book did much to ensure that "women" as a category were included among those who are "endowed by their Creator with certain unalienable Rights." By envisioning a society constructed entirely of women, Slonczewski offers a vision of a world where the feminist project has fully succeeded.

But, of course, there are some complex political ramifications to Slonczewski's decision to essentially exclude men from her vision of utopia. Such a move goes beyond a mere vision of gender equality by fully reversing the issue of gendered humanism altogether. That is to say, the original humanistic vision of which implicitly excluded women has been transformed into a fantastical feminist vision which implicitly excludes men. That Slonczewski couches this move in a veil of inevitability – how could the Sharers even know to include men when there are no men? – is especially interesting. It suggests a pessimistic approach to the feminist cause, that the only way to fully enfranchise women is to fully exclude men. This radical position can be read two ways: a feminist-minded reader may cheer at the thought of such an achievement, while a male reader may feel left out or even excluded. To one who is both, the experience is rather conflicted. The Sharer society, the community of noble savages, only came about because men were not part of the equation. To the extent that the Sharers represent a utopian vision of a possible future, it offers a difficult answer, at best.

It is important, however, to note the historical context in which Slonczewski was writing. It is a familiar axiom in science fiction circles that science fiction is never about the future, it is always about the present. Thus, the society Slonczewski develops in *A Door Into Ocean* need not

be understood simply as aspirational, as an ideal towards which we should strive. It was written during the Reagan administration and a general resurgence of American conservatism, also a time when the so called second-wave feminist movement was fracturing. Against this backdrop, the feminist vision Slonczewski offers is relieved of some of the fraught symbolism inherent in an all-female society. So while a man reading *A Door into Ocean* may feel somewhat excluded, the gender exclusivity of the Sharers is merely a premise. The reintroduction of a gender dichotomy, via Spinel and the Valans, ultimately does little to reinstate the gender dichotomy for the Sharers. Men, like Spinel, are called “male-freaks” but the epithet refers more to their status as an outsider with a notably different appearance than any essential bias about sex or gender. So while the gender dichotomy is clearly in play, and equating femininity with utopian non-violence certainly carried political implications, for the characters within the novel such issues are not particularly salient.

Rather, the Sharers can be said to represent, in the historical sense, a fully realized feminist ideal which is then menaced by the intrusion of a more familiar, dichotomous, violent, gendered society. I say menaced because the threat is both deliberate and surmountable. The Valans do not represent an existential threat to the Sharers, because the Sharers have the means (if not the will) to wipe out the entire Valan civilization. But the Valan presence on Shora is disruptive nonetheless, and it does result in significant causalities for the Sharers. From a historical perspective, we can say that the issue which Slonczewski grapples with most directly is one of an existential threat to the feminist movement – from within and from without.

Ultimately the greatest threat to the Sharers comes less from the Valan occupiers (or the Valan torture, weapons, aggression, etc.) but rather from the potentially violent strains within

Sharer culture itself. There are factions which call for the eradication of Valans. Such a move would represent an abandonment of the characteristics which makes Shora utopian in the first place. This is an especially vivid threat since the calls for violence are hardly unprovoked, and indeed, the Malachite apparently attempts to incite just such an event. So, to draw the argument beyond the plot: the truest danger comes from the fracturing of the female movement, from the possible abandonment of their ideals in the face of (a masculine) aggression. If the Sharers constructed a virus to eliminate or, at least, coerce the Valans off their planet and out of their lives, they would cease to be Sharers; to do so would be to “share death” on a massive scale, and such a move is figured tantamount to suicide. But what options have the Valans left?

The parallel discussion within the feminist community would not, of course, broach the issue of genocide (gyno-cide?); that extreme option is mostly a function of the story-logic (how else could the peaceful Sharers forcibly remove the militarily superior Valans?). But this extreme nevertheless suggests the sorts of “solutions” which were possible options for feminist-minded individuals. The terminology used by the Sharers suggest a fairly direct parallel: while speaking of what we would recognize as biological warfare, the Sharers use the term “closing the door” in their debate over how to handle the Valans. The image of a closing door does suggest the drastic solution of cutting men out from the picture entirely, an extreme implementation of Adrienne Rich’s lesbian continuum.<sup>14</sup> There is a tradition in feminist sf of imagining worlds without any men; this tradition may soften the unmarked decision to write men out of the original utopia.

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<sup>14</sup> I hasten to add: Slonczewski specifically claims that her characters which suggest men are somehow lesser are soon shown to be wrong, and Spinel’s story (his inclusion, his relationship with Lystra, his embrace of Sharer culture where even the female Valan Nisi falls short) bears this contention out. Slonczewski has not written a story about how awful men are, nor does she argue that men are the problem and need to be eliminated. None of this changes the premise, though, and her deployment of genetic engineering situates the story in a world which implies the willful exclusion of males, thus suggesting that someone in her universe’s history did once successfully make these very arguments.

However, Slonczewski does introduce the idea that maleness is frankly undesirable so long as there are reproductive alternatives. That she is participating in an sf feminist tradition (*e.g.*, Joanna Russ's *Female Man* and "When it Changed") does little to soften this suggestion: unlike the virus in "When it Changed" or alternate dimensions which account for men's disappearance in other sf stories, her men were apparently bred out. There is a sense of deliberate and premeditated extinction.

What does this have to do with genetic engineering? For one, the genetic engineers on Shora have bred out males from their society, allowing for the creation of the society against which Slonczewski stages her whole story. Genetic engineering is critical to the premise of the novel, but it also offers a sense of a way forward. The people of Shora are incapable of reproducing through intercourse: for one, the Sharers are all female; for another, their sexual organs are incapable of intercourse even when a man is available. The only way for this mono-sex society to perpetuate is through genetic engineering. Children are constructed via fusion of two eggs: "Their sexuality is described obliquely as based on their sensitive hands and extra-long fingers. They reproduce by the 'fusion of ova,' a process that requires extensive management by the lifeshapers. The reason such intervention is needed is that eggs and sperm have different patterns of 'imprinting,' chemical modification of the chromosomes. In order to combine two eggs, one of them would have to be entirely remodeled to provide the imprinting patterns of sperm" (Slonczewski "Guide").

The fusion obviates the need for any sort of sexuality, at least as it is connected to reproduction. The decoupling of sexuality and reproduction is one of the most significant literary potentials for genetic engineering, and it manifests in different ways in the other novels this

thesis considers. Butler, for instance, has her aliens initially prevent all human reproduction that is conducted without Oankali intervention – and the Oankali intervention comes in the form of two other partners (a male and female Oankali) and an overseeing *ooloi* Oankali. In this way Butler’s use of genetics both severs reproduction from sexuality, and makes reproduction numerically more sexual (as well as significantly more bizarre). For Mawer in *Mendel’s Dwarf*, the decoupling allows for a classic case of cuckoldry and sexual violence, but without the two being directly linked, heightening the impact of each. For Atwood, the decoupling is coded onto her world as vast sexual dysfunction or, perhaps, by shifting sexuality out of the realm of reproduction and into the realm of commerce. Either way, child prostitution and other (slightly less abhorrent) forms of sexual exploitation rule, all while the scientific-industrial complex directly takes over matters of life and death, ultimately unifying in the figure of Crake who ‘births’ a race of posthumans before killing almost everyone.

An implication of this asexual method of reproduction is that it eliminates the need for intercourse, for sperm in any original form, and thus the need for a gendered sexual division. Slonczewski suggests that the Sharers did once have men, but that they were eventually bred out: “‘the Sharer race cannot interbreed with ours naturally.’ ‘For anatomical reasons only.’ After generations of breeding without males, Sharer anatomy no longer enabled heterosexual coupling” (89). Interestingly, the decoupling of intercourse and reproduction is merely a formal one. Spinel’s relationship with Lystra offers a rather direct insight into this dynamic:

“But couldn’t we try it the other way just once?”

Lystra considered for a bit. “Usha says it will make me sick.”

Spinel frowned. “Mothers and mothersisters always say that.”

“It’s true enough. It would cause toxic shock to my internal organs.”

“Your ancestors did it, all right.”

“So I’ve heard. And a billion years before that our ancestors were all one-celled and budded off like yeast.”

“Well, how does Usha know? *She* never tried it.”

“Traders used to try with us, a long time ago. Nisi calls it ‘rape.’”

“Well *I’m* not trying to ‘rape’ you.” He was highly indignant. “I love you.”

(162)

So the Sharers still have plenty of sex, and while they are unable to have heterosexual intercourse for physical reasons – in a divergence Slonczewski relates to the “kind of anatomical incompatibility [which] is common, for example, in widely divergent breeds of dogs” (“Guide”), emphasizing the related genetic humanity of the two peoples despite their apparent incompatibility – Spinel is still able to develop a robust sexual relationship with the Sharer Lystra. He simply, in the words of Ms. Slonczewski, “has to become reconciled to her own Sharer ways of lovemaking, giving up the need to ‘put it inside’” (“Guide”). And while there is no necessary connection between sex and reproduction, children are only born to mated pairs of Sharers. As much as anything, the necessity of genetic intervention functions as a sort of fool proof birth-control, regardless of gender.

The detail about the lack of men is slipped into the story but not developed. The history of this event is never really explained: we do not know, for instance, if men were eliminated by conscious choice, or if the change was simply the inevitable result of Sharer technology. What is clear is that the lack of men is explicitly tied to genetic engineering: “Sharer anatomy no longer

enabled heterosexual coupling. Sharer women ‘conceived’ by fusion of ova, a process requiring lifeshaper assistance and the consent of the Gathering” (89). And the evolution into a female-only society is not treated as entirely neutral: “Could it be that the persistence of malefreaks has kept the Valan race in a primitive state? Only lesser races produce males” (80). These remarks establish both the genetic factor in Sharer sex and the implied superiority of a mono-sex culture, but they do so relatively early in the story, long before the Sharers have been fully revealed to be as technologically advanced as they are ethically advanced. This serves to implant the idea of female superiority (and male inferiority) before such issues would seem problematic – that is, when the Sharers are still in the position of noble savage, and thus their beliefs can be dismissed as simple quirks of their culture, long before the Sharers and their culture is shown to be truly superior.

Explicitly linking genetic engineering to the all-female Sharer culture has some profound implications: genetic engineering, and by extension Slonczewski’s own specialty biological science, is rendered as an explicitly feminine praxis and body of knowledge. This stands in stark contrast to the approach seen in Margaret Atwood’s *MaddAddam* books, where genetics is generally portrayed as Crake’s realm, and thus implicitly as a masculine area. It also contrasts with the profoundly alien approach in Butler’s *Lilith’s Brood* series. The implication in *A Door Into Ocean* is that genetic engineering, if advanced enough, inevitably leads (or at least, led) to the eradication of an entire sex. Slonczewski leaves many important questions unanswered: Why did the Sharers stop producing men? Was it a conscious decision? Was it a trend which was never reversed? Was it simply convenient? Was it the result of some dogma? In short, what was

it about males which was, for whatever reason, unworthy of reproduction? Or, alternatively, what is it about females which is imminently worthy of reproduction?

That the male sex is the more aggressive, violent, hierarchical one is no accident. Indeed, Slonczewski reveals the culture, history, and technology of the Sharers very carefully throughout *A Door Into Ocean*, in a way which both heightens the contrast between Valan and Sharer (and thus, the technologies, cultures, and ethics they represent). In doing so, she constructs and idealized form of femininity and implicitly constructs a flawed version of masculinity as well. Because they are mostly introduced through the perspective of the Valan man Spinel, the Sharers start out looking primitive and irrational. They are only slowly revealed to be culturally, ethically, and technologically superior to the Valans; this slow reveal makes the revelation of Sharer technology seem almost majestic, as though it is a cure for all the ills brought on by Valan technology, even though it was developed long before the Valan technology.

Slonczewski plays on the trope of the noble savage before reversing the roles and revealing that the “savage” was, in fact, the truly cultured party. By the time it is clear to the readers and the Valans that the Sharers possess fantastically superior technology the Valan have been thoroughly discredited. The opposition between the (explicitly feminine) Sharers and the (implicitly masculine) Valans constructs the respective genders, and places the drive to hierarchy firmly in the camp of the masculine Valans. This is particularly notable because such a drive is at the center of Octavia Butler’s *Lilith’s Brood*. In Butler’s treatment, while males are likewise considered “unstable” and generally more difficult than females, this hierarchal drive is not gendered but rather a (even the) definitive human characteristic. For Slonczewski, the drive to

hierarchy is anti-utopian; and the technology of genetic engineering is the way to surmount this drive.

The absence of men in Sharer society, the impossibility of “normal” male/female reproduction, necessitates a technology like genetic engineering. The entire Sharer culture is built around an implicit reciprocity, encoded into their language and present in all parts of their culture. In fact, this is the origin of their name – the “Sharers” are linguistically incapable of forming possessive sentences. As Slonczewski describes in her study guide on the book, “Valan language, like ours, distinguishes between subject and object. Valans try to force Sharers to recognize the Valan invaders as the subjects turning Sharers into objects. Sharer language sees no distinction. Every subject and object are interchangeable; they “share” the action. Thus Sharers can prevent Valan control by failing to “share” their demands (that is, failing to obey orders.)” (Slonczewski “Guide”). From the perspective which Slonczewski develops in her own exegetical work on *A Door Into Ocean*, the linguistic indistinguishability of subject and object lies at the center of the Sharer’s cultural “Otherness” and the key to their utopian society. She seems to be suggesting that the insistence on seeing the world in binaries, as a series of “self” and “Others” is at the root of the many problems her fantastic society deconstructs. By losing the distinction between subject and object and implicit connection is forged between all things. This perspective is perhaps a curious one for a scientist like Slonczewski to adopt, given science’s drive to categorize the natural world and systematize that knowledge into a malleable, predictable form. If there is no distinction between subject and object, traditional lines of causality become blurred.

This reciprocity extends to Slonczewski's depiction of genetic engineering as well. Called "lifeshaping," the Sharers have the ability to manipulate biological life with great adeptness. The specifics of their techniques are left shrouded in mystery, but their capabilities are soon understood (to some extent, at least) by the Valan scientist and budding Sharer sympathizer Dr. Siderite. The science is notably capable of tremendous destruction, as Dr. Siderite points out: "Suppose that the Sharers take our threat seriously. They could spread an infection which would lie dormant within us for years, only to mushroom into a disease and wipe us out—unless Sharers are still around to halt it. Or the latency period could be generations; then we'll live, but our children and children's children will share their extinction" (349). But the Sharers are also quite reluctant to turn it in such a direction. So while genetic engineering is very much allied with the forces of good in *A Door Into Ocean*, it is not represented as an unambiguously positive force in and of itself. Rather, it is a force directed positively by the Sharer society. Although it is possible for the Sharers to construct diseases with the technology, to do so would violate the core principles of reciprocity and non-violence.

I say "core principles" but in reality the two are one and the same. Sharers are not barred from violence, culturally or physiologically. Indeed, as I mentioned earlier, one of Merwen's early experiences (and great failures) as a "wordshaper" was an attempt to reason with a psychopathic Sharer who had been exiled for murdering someone. Merwen fails to achieve any sort of understanding with this Sharer, and is nearly choked to death herself for her troubles. So not only are Sharers capable of violence, we are even shown examples of their violence. But, it must be noted, this character, Virien, explicitly rejects Sharer culture – "I hasten death because it suits me, that's all. I like it. . . . *Shora*, you're so anxious to be a martyr, and all the while you

loathe me like the rest of them” (166-67) – and is likewise rejected by the Sharer culture. Also, as a society, the Sharers do seriously consider and in some cases argue for eradication of the Valans on their planet. But they are ultimately barred by the structure of their language, ethics, and society. Because reciprocity is built into the very core of Sharer culture, they cannot separate themselves from violent acts enough to commit them without concurrently experiencing them. Thus, Sharer violence against another is the same as violence against the self. Hence, an ethic of non-violence pervades, because self-violence is so unpleasant.

But the distinction between capability and willingness is small. It may be unthinkable to wipe out a tribe of fellow Sharers, but it is not unthinkable to wipe out an unreasoning existential threat. Merwen visits Valedon at the beginning of the book on a fact-finding mission to determine whether the Valans were human or not. This is a large part of her motivation in bringing Spinel back with her: to show that even a Valan male-freak can learn to become a Sharer, and thus, a human. As the conflict wears on this distinction becomes critical, since calling Valans human protects them from the sorts of biological havoc that Sharers might bring to bear on a non-human threat. Central to their definition of human is the ability to “name oneself” and thus achieve a level of self-recognition that can be reasoned with, that it would be sinful to destroy. The relationship with Animal Studies is notable, because this gives an explicit example of how the Sharers delineate between “human” and non-human, thus highlighting how we make similar delineations. Interestingly, though, Slonczewski does not extend this argument

to include the actual animal perspectives. Rather, she implicitly excludes them because they lack the ability to name themselves.<sup>15</sup>

The implications for genetic engineering here are complicated: on the one hand, genetic engineering has led to a society as balanced and peaceful as the Sharers, which speaks to its potential for good; on the other, even in the hands of the Sharers genetic engineering can be quite scary. For instance, the Sharers all have a distinct blue tint to their skin which is the result of “breath-microbes,” oxygenated bacteria that rest on the skin and allows their “host” to stay underwater much longer than on lungpower alone. These bacteria are harmless – in fact they are decidedly beneficial – but to the Valans they also represent an alien threat. The Valan visitors to Shora take antibiotics to ward off the microbes. Spinel reacts with abject horror when his skin first starts changing color:

To Spinel, at that instant, it meant one thing: he was metamorphosing into a moon-creature.

The shock exploded through him. He screamed and lost his hold; the sky tilted over, a bottomless ocean. Somehow instinct brought him safely to the raft, but he was still screaming when he got there. Sharers reached out to him with livid limbs and flippers, grotesque signs of what he would become. Spinel thrust them away and ran, without knowing where. Somehow he craved shelter, a cocoon to hide away from them. (97)

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<sup>15</sup> They do acknowledge a mutuality with the other species on Shora, but have no ethical qualms about “lifeshaping” solutions to problems posed by non-human life; the main hesitation they seem to feel when it comes to manipulating other species is whether it will muck up the balance of Shora as a whole—which is to say, whether it will muck up life for the Sharers on Shora. There is a tension in the novel between acknowledged mutuality and hierarchical superiority which plays out explicitly with regards to the Valans, but could be extended to animals as well.

The breath-microbes initially function as a visual sign of Sharer difference, and Spinel's horror at his own changing skin can be read as a horror of the self becoming unfamiliar. While he eventually comes to accept the bluing of his skin, Spinel's reaction is an important clue as to how we might react in the same situation.

Later, once things have heated upon Shora in the wake of the Malachite's devious conflict-mongering, the horror of the blue-skin transforms: from a generalized fear of the Other manifesting in/on the self, it becomes an explicit metonym for genetic engineering as a whole. Playing their part in the growing tensions, some Sharers engineer strands of the bacteria which are resistant to the Valans antibacterial regimens. The consequences of this are conflicted. On the one hand, the Valans are no longer able to maintain their original skin tone, and thus become visually similar to the Sharers. This was likely the point for the Sharers who engineered the strain: an attempt to force the Valans to recognize their mutual humanity, at least if there was any there for them to recognize. On the other hand, casually overcoming the Valans only defense against the bacteria (and doing it again and again as the Valans try to adapt) serves as a powerful sign of the sophistication of Sharer technology. Thus the blue-skin also serves as a (likely unintentional) threat, a notice that the Sharers can defeat whatever biological safeguards the Valans think they have set up. The only real difference between the oxygenating bacteria and a deadly bioweapon is the Sharers' intention.

Many of the Valans react with the same sort of hysteria that first struck Spinel, in no small part because they perceived the implied threat much more than the implied unity. The gambit does pay some dividends, however, since it clues the Valan scientific minds into just how sophisticated the Sharer technology really is. It also induces a bit of literary analysis on the part

of the Valan leadership. As I mentioned earlier, the Malachite, speaking of the potential threat posed by the Sharers, says “[t]here is no threat to you, at present” (207), which the Valans reasonably interpret as an analysis of Sharer technologies. What they realize after the drug-resistant bacteria (and newly resurgent clicker-bugs, and the failure of their own anti-swarm chemicals, and a variety of other small but meaningful defeats) is that the Sharers are entirely capable of wiping them out. That they had not done so was a sign of restraint, an artifact of their pacifist nature.

Slonczewski performs a fairly complicated feat by showing genetic engineering to be potentially terrible, but nevertheless aligning it with the pacifist Sharers. The implications of this for a larger discourse on the place of genetic engineering in our world are not clear. Genetic engineering is possibly a terrible force, or, in the right hands, a utopian one. It is notable that genetic engineering is only clearly introduced later in the text. For the first half or so of the novel – up to the arrival of the Malachite – the Sharers technology is shrouded in mystery. It should be fairly clear to the modern reader that the Sharers are making use of something similar to genetic engineering with their “lifeshaping,” but the direct connection is eventually made, and so it is clear that there is nothing about Sharer genetic engineering which is inherently less fraught with ethical dangers than our own budding genetic engineering technologies.

I say this is complicated because, for all their pacifist ideals, the Sharer society could not have come into being without some genetic engineering, yet there is nothing in the technology which would necessitate a pacifist ideology. At the same time, Slonczewski diametrically opposes her genetic utopia against the destructive force of nuclear powered civilizations and highly advanced mechanical robots, suggesting that there is some essential difference between

the inorganic technologies and the organic technology of the Sharers. Instead, I agree with Sherryl Vint when she proclaims: “Crucially, in my view, Slonczewski's posthumanism is one that acknowledges the importance of the body to subjectivity and recognizes that the body is not a single and stable entity but is instead something that is shaped by cultural forces, that changes with time, and that is experienced differently according to how one's particular morphological features are positioned within cultural discourses” (“Theorizing the Global”). The cultural shaping is made explicit – *i.e.*, it is embodied – in the Sharers thanks to their genetic engineering. The cultural heritage and the technological praxis, the “Quaker ethic” which manifests as “scientific praxis” as Edward Higgins put it, are inextricably linked.

One reason that the Sharers do not weaponize their technology is suggested by Realgar, the Valan general in charge of the occupation (and ultimately in charge of the Valan retreat). Dr. Siderite asks him, “Now, what sort of people are likely to develop methods of confrontation which exclude violence?” to which General Realgar ultimately responds: “A people whose weapons are too deadly to be used” (349). This interpretation suggests two things: one, that genetic engineering may in fact lead to the sort of idealized society in which conflict is uniformly handled non-violently; two, that along the way, it might destroy us all. The premise of Slonczewski's utopia seems to suggest that both of these eventualities actually occurred: the embodiment of scientific achievement by the vector of genetic engineering led the way to an ideal society, a utopia, but in the process potentially did much violence to men and to the environment. Constructing an ideal society seems to implicitly involve destroying those things which do not fit.

The Sharers may only be alive ten-thousand years after the original, hyper-advanced humans colonizers, the Primes, who “lived as gods . . . Though they died as gods, as well” (208) because they developed a culture which allowed them to live with their technology and not self-destruct. Slonczewski (or at least, her characters Dr. Siderite and General Realgar) seems to be implying that the peaceful nature of the Sharers is inevitable if only for evolutionary reasons: if they didn’t figure this out, they’d have killed themselves off millennia ago. Here again the context of Slonczewski’s writing comes into play: there is a clear parallel with the aptly named MAD (Mutually Assured Destruction) approach to foreign policy which reigned from the mid-1950s until the collapse of the Soviet Union. And so the ultimate verdict on genetic engineering technologies is split: they enable a utopian society, but they are no less dangerous than nuclear technologies. And while the Sharers seem to have settled on a stable social model, there are suggestions of less-than-utopian elements in their past. It is these less than utopian strains which seem to be the literary focus of genetic engineering going forward. Slonczewski’s take seems to be a conditionally optimistic one: genetic engineering will save the world; it just may have to destroy the world first.

### CHAPTER 3: *LILITH'S BROOD*: THE AMBIVALENT CYBORG

Octavia Butler is a well-known master of the science fiction genre. Her series *Lilith's Brood* is a collection of three novels, *Dawn*, *Adulthood Rites*, and *Imago*, published in 1987, 1988, and 1989, respectively. Originally collected and released as the *Xenogenesis* trilogy, this collection and the new name came with the 2000 rerelease.<sup>16</sup> For the purposes of this essay, *Dawn*, *Adulthood Rites*, and *Imago* will be referred to as separate books, though they are now only available as a single volume, and my pagination is taken from the collected series. In this chapter, I look at the series as a whole to show how Butler deploys the idea of genetic engineering as a literal and grotesquely alien force. I've subtitled the chapter "The Ambivalent Cyborg" because Butler ultimately seems to be deploying the metaphor of genetic engineering for much the same reason as Slonczewski: as a means of achieving the sort of enlightened hybridity Donna Haraway encapsulated in her "Cyborg Manifesto," but to be doing so in a more self-consciously critical way. She premises the series on a nuclear war (which would destroy humanity) and thus positions her genetic engineers – the alien Oankali – as saviors. But the Oankali's goals are, in the long run, even more destructive than nuclear winter. For the Oankali, planetary life is only temporary, so it has a planned (and destructive) end. Genetic engineering thus fills an ambiguous role for Butler: savior and destroyer. Whereas Slonczewski seems to

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<sup>16</sup> The series is called "a minor masterpiece" by the *Houston Post*, quoted on the back cover. I agree, although I'm not convinced of the "minor" part. As a whole, this series tackles issues of race, gender, biology, and free will while still telling a damn fine SF story. The aliens are original, the science is reasonable, and the philosophy is heady. The only real problem with this collection is the new cover. Whereas the original novels and the original *Xenogenesis* collection were marketed as sci-fi (clearly seen from their covers) the re-release appears to be positioned more as feminine, romantic, and African-American literature. The cover shows the top of an apparently nude woman of African descent, with her hands covering her breasts and some towel-like white fabric over her. I (a young white man) found this book to be awkward to read in public. Once, a waitress who had read the series for a college class actually asked me why I was reading an "urban romance novel" at 3:00 at a Ruby Tuesdays. She was surprised to realize that she had read the book herself, and just as confused as I was as to why it had been marketed this way. Apparently, Octavia Butler's novels make more economic sense as urban romance novels than as science fiction.

favor the salvific potential, and Atwood the destructive potential, Butler seems profoundly conflicted. This conflict leads one scholar to label the series a “pessimistic utopia” (Stickgold-Sarah). Ultimately, I would call the series more of an optimistic apocalypse, since no superior society ever manifests in the novels. Rather, humanity's self-destructive tendencies are pervasive, but turn out mostly alright, thanks to the intervention of genetic engineering. The Ambivalent Cyborg achieves a higher sort of being, but does so at the cost of what makes us human: our contradiction; our free will.

The movement from human to cyborg unfolds chronologically in *Lilith's Brood*. The first book, *Dawn*, is written from the perspective of the eponymous survivor, Lilith Iyapo, while the second and third books are mostly written from the perspective of members of her eponymous Brood. Her narrative begins in a blank room where abductee Lilith wakes up without any sense of where she is, or why. We soon discover that Lilith's life is marred by tragedy: first, her husband and child are killed in a car accident. Then, this personal tragedy is matched on a global scale by a nuclear war. Published in 1987, this apocalypse likely refers to the long standing nuclear tensions between the US and USSR, but it is not given much thought in the book. The minimal focus on the initial disaster proves beneficial to the series: since the collapse of the Soviet Union in 1991, full on nuclear conflict seems a less likely source of apocalypse than rampant consumerism (as in Neal Stephenson's *Snow Crash*) or environmental catastrophe (as in Margaret Atwood's *MaddAddam* books, among many other). The nature of the disaster is secondary; in a talk titled “Octavia Butler's *Xenogenesis* Trilogy: A Biologist's Response,” Joan Slonczewski calls it “a fate that seemed all too plausible in the eighties, when the book was

written” and notes that it “remains a distinct possibility if the effects of humanity on our environment are not reversed.”

Structurally speaking, apocalypse is as close to a universal premise as we are likely to find; the method can vary but the end is the same, and for Butler the end is what matters. The nuclear apocalypse serves as a sly preface for the series. What is important is that humanity has destroyed itself. The premise accomplishes two things: first, it lends extra plausibility to the story told by the Oankali—the alien—that humanity is biologically destined to self-destruction, that there is a profound human flaw. As an Oankali tells Lilith: “Your people could not have fulfilled that destiny [leaving the Earth and living in space]. Their own bodies handicapped them. . . . You have a mismatched pair of genetic characteristics. Either alone would have been useful, would have aided the survival of your species. But the two together are lethal” (38). Second, it frames everything the Oankali do, especially in *Dawn*, in the paradigm of rescue.

For the purposes of this study, the rescue offered by the Oankali is not necessarily one from annihilation – the apocalyptic tone heightens the dramatic tension, but it is strongly implied that the Oankali would have made contact and initiated “trade” even if humans had managed not to destroy themselves. Rather, I read this text in line with scholars like Jessie Stickgold-Sarah who argue that the series participates in a three decade long “sustained conversation with questions of heredity and genetics, deploying unsettling visions of biological determinism, especially in regard to race and sex” (414). Here Butler makes use of genetic engineering to construct a world which is at once freed from the burdens of modern political, racial, and economic strife. This vision is nevertheless unsettling because this utopian world is only available to those who give up on traditional notions of individual free will. The Oankali are at

once monstrous and miraculous, and can be read as embodied metaphors for the technology of genetic engineering itself. This tension is what leads Stickgold-Sarah to label Butler's trilogy a "pessimistic utopia," offering as it does "Butler's 'favorite question,' about how much the body determines the self" (417). In *Lilith's Brood*, with respect to its deployment of genetic engineering, the question can also be reversed: how much does the self determine the body?

These questions speak to the central literary tension surrounding the issue of genetic engineering which I hope to explicate. The age old debate of nature versus nurture is plenty complicated already, and as genetics helps to statistically isolate elements of DNA (nature) which seem to be implicated in predispositions to certain behaviors (nurture), the debate becomes even more complex. Add to this the potential for our "nurture" to include manipulation of elements which were previously locked in the realm of nature and the debate circles around to eat itself, like a genetic Ouroboros. I consider this a literary tension because the knowledge and technologies (or, more simply, the praxis) need not actually exist to destabilize the debate. The *tabula rasa* conception of the uneducated, uncultured, or undeveloped mind loses its explanatory power when that tablet is subject to external manipulation. Where nature can be directly altered by the conscious intervention of (supposedly) rational beings, thus establishing a new (natural) baseline (from which further alterations can be made, on *ad infinitum*) a new series of metaphors is needed. Perhaps a concept of a sort of *tabula muto* is called for. Butler tackles this issue directly in *Lilith's Brood*, and for her the question is explicitly tied up with notions of freedom and identity.

Her conclusions are profoundly ambivalent. The three novels seem to roughly describe the metamorphosis of humanity from its original state, through an intermediate stage, and finally

emerging as a completed hybrid or, to use Haraway's terminology, the shift from human to cyborg; although contra-Haraway, this cyborg is decidedly alien. Also contra-Haraway, the cyborg figure in these novels is biologically hybridized. The trilogy is loosely structured around the life cycle of an insect, a structuring particularly indicated by the title of the final novel, *Imago*. In biology, Imago describes an insect in its final stage of metamorphosis, its fully adult form. In her study of identity in Butler's trilogy, Cathy Peppers comments on this name choice:

That Butler chose to title the ultimate volume of her trilogy *Imago*—which means the 'perfect stage' of an animal at the end of its evolution—suggests that she is indeed telling a story of evolution in which the "most fit" will survive. But there is an irony to this title, and to its teleological implications as well. This evolutionary use of the term "imago" was coined in Linnaeus' taxonomy for insects to name the final and perfect form after metamorphosis (56).

There is a further irony in the name of her second novel, *Adulthood Rites*. The novels are presented chronologically, so the placement of the "rites of adulthood" prior to the "imago," the actual achievement of the "perfect stage" or fully grown adult state, is pregnant with implications. This heightens the teleological overtones that Peppers notes. For one, does the final novel describe the perfection of humanity, or merely the end of humanity? Peppers asks, "In terms of the trilogy as a whole, what metamorphosis will humanity, and the paleoanthropological origin story, undergo before reaching 'perfection'? And what will happen to those 'innate' and 'interesting' qualities of human nature, aggression, xenophobia, male dominance?" (56). The implication, of course, is that the relentless drive of genetic manipulation will become a relentless pursuit of biological perfection. And in this drive, those things which make us humans

the best and the worst creatures we can possibly be – in short, what makes us human – must be eradicated. Like Joan Slonczewski in *A Door Into Ocean*, Butler utilizes genetic engineering to construct a utopia; unlike Slonczewski, she seems conflicted about the consequences.

Collectively, the novels tell the story of humanity's salvation and destruction at the hands of their alien rescuers, the Oankali. The aliens are deeply attracted to humans and what they call the "human contradiction": "Your bodies are fatally flawed. The *ooloi* perceives this at once. At first it was very hard for them to touch you. Then you became an obsession for them. Now it's hard for them to let you alone" (38). The Oankali race is divided into three genders: male, female, and *ooloi*. The *ooloi* serve as genetic engineers who, in the mating ritual, are responsible for properly mixing the genetic material of their bonded male and female Oankali spouses. The *ooloi* thus have an interesting place in the reproductive cycle: they do not contribute genetic material to future generations the way the other genders do, but they are nevertheless centrally responsible for the creation of offspring. In a particularly alien turn, Oankali males and females generally mate with their siblings. The biological prohibition of such couplings is mitigated by the *ooloi*, who generally bond/mate with an unrelated pair of Oankali, and who prevent any negative recessive traits from surfacing – the most significant biological repercussion of incest. This incestuous tendency is oddly reminiscent of the way early (and contemporary) geneticists induce reproduction within the same lineages for many generations; for instance, Mawer makes clear in his passages on Mendel that Mendel's inheritance experiments were done by carefully pollinating different lines with their "parent" strains. This allowed him to control which traits appeared in which lines. Dog breeders, too, have been doing this for centuries. So it is as if the coupling habits of Oankali were specifically designed to facilitate genetic manipulation.

Perhaps, as Joan Slonczewski notes, the system is too well controlled: “Paradoxically, because the Oankali are such successful genetic engineers, they tend to engineer themselves into an evolutionary dead end; losing all genetic diversity, they lose the ability to adapt to change. The only way they can recover genetic diversity is to interbreed with an entirely new species, which contributes new genetic strengths—and weaknesses” (“Biologist’s Response”). So the *ooloi* mediation is doubly important, not only for its facilitation of reproduction, but also because central to the Oankali psychology, and undergirding their reasons for rescuing the survivors of Earth’s (presumably nuclear) apocalypse, is a desire/drive to “trade” genetic information with other species. Thus, throughout *Lilith’s Brood* most of the mating groups we see consist of five members: human male, human female, Oankali male, Oankali female, and the *ooloi* who oversees the mixing of their disparate genetic material; the result of such unions are Oankali/human hybrids called “constructs” which are further distinguished as being born in an Oankali or a human woman. Genetics becomes both a tool for the betterment of human lives and praxis with an unfortunate telos of its own. Hence the appropriateness of Butler’s final title, with its implications of both perfection (or at least, full maturity) and a developmental end of the line.

In part, this dead end is a function of the environments which the Oankali painstakingly build. The Oankali paradise which the massive ship seems to represent is barely hospitable to an unaltered human, and they lack any sort of biodiversity. The cells where the humans are kept when the first emerge, for instance, are constructed from the same stuff as the rest of the Oankali ship: a specialized sort of biological material with a limited intelligence. The material can be shaped by anyone with the ability to interact with it, but the method of interaction is as alien as the Oankali:

“Can you show me how to make it open?” She asked.

The [Oankali] child hesitated, then took one of her [Lilith’s] hands and brushed it over the forest of its long head tentacles, leaving the hand slightly wet. Then it touched her fingers to the wall, and the wall began to open.

More programmed reaction to chemical stimuli. No special areas to press, no special series of pressures. Just a chemical the Oankali manufactured within their bodies. She would go on being a prisoner, forced to stay wherever they chose to leave her. She would not be permitted even the illusion of freedom. (56)

Thus, at least in the beginning, the humans are consigned to an environment where they are literally incapable of exerting any sort of control. For Lilith this control is soon granted once the Oankali are sufficiently convinced she can handle the responsibility – though it is worth noting that she considers these “rights” to be long overdue. Oankali biological omnipotence is not matched by an equivalent omniscience: they do make mistakes, especially when it comes to handling the humans.

For one, there is a startling lack of diversity within the Oankali holding cells (from a human perspective anyway): the uniform “light-colored—white or gray, perhaps” (1) color of the floors, walls, and various structures; the functional but bland food; outside communications are frustratingly monotonous. For Lilith and the other humans, this monotony is psychologically destructive.<sup>17</sup> The food she’s given is as nutritious as it is bland. Even when Lilith is allowed to

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<sup>17</sup> Lilith is actually chosen to be the human ambassador for the first few groups of humans returned to Earth specifically because she does not attempt suicide during her confinement. For the Oankali, this admirable self-restraint suggests that Lilith is less beholden to the human’s self-destructive tendencies. For the reader (at least, this reader) it is indicative of the psychologically torturous conditions of the humans’ confinement.

leave her cell, she is unable to open or otherwise manipulate any of the surfaces on an Oankali ship, and thus is utterly dependant on Oankali help to move about the ship.

Also, the inability of humans to usefully interact with their environment represents a profound loss of control. This in turn suggests the resulting enforced passivity is a potential consequence of living in an entirely artificial biological environment (*i.e.*, living with but not as the Oankali). Although the ship's environment is in principle more flexible than any human space habitation has ever been, control is only open to those who are at least partially Oankali. As Lilith discovers during her early captivity, all surfaces in the Oankali rooms are effectively indestructible. Even her attempts to leave some sort of mark fail: "She had beaten it [the wall], kicked it, clawed it, tried to bite it. It had been smooth, tough, impenetrable, but slightly giving like the bed and table" (30). In a severely controlled earth-based environment, like a maximum security prison or a hospital ward, a person can exert some level of influence, even if it is merely decorative or destructive. So although the Oankali did save Lilith from almost certain death, their subsequent heavy-handed treatment of her makes them seem less like saviors and more like slavers.

Cathy Peppers discusses this tension in an article which probes the way that Butler's story works as a sort of "origin story": "Lilith's perception of her situation echoes the discourses of both the slave narrative and sociobiology. Her 'awakening' to discover that she has been taken from Earth to be kept captive on an alien ship orbiting beyond the moon reconstructs the African slave's Middle Passage. Like the African slaves in America, she is (at first) denied access to reading or writing materials" (51). By locating in Lilith's story overtones of a slave origin story, Peppers captures the ambiguous nature of the Oankali's relationship with humans. For this study,

the slavery metaphor is appropriate, but requires some extra contextualization. Specifically, while Butler deals unflinchingly with issues of race in many of her works, *Lilith's Brood* included, race does not play a part with regards to genetic engineering, even though the concept of slavery does. The "slave" in this sense is the uninitiated or unenlightened human – the human who has not been granted access by the Oankali. Of course, the only way to grant a person such access is to alter them in much the same way that Lilith was granted increased strength and stamina: by making one less human, and more Oankali, in some small way. We can read the Oankali as an embodiment of a mature genetic engineering praxis. If we do so, then Lilith and the other humans operate as embodiments of contemporary humans (and contemporary humanism). They are faced with a decision between implicit enslavement by the Oankali and a sort of willing self-mutilating at the hands of the Oankali. To stay human, they (and by extension, we) must be willing to live at the mercy of those who do not – those who have allowed themselves to be changed by genetic engineering.

The Oankali's environmental monotony also reflects a lack of diversity in the Oankali in general. Since the Oankali are such masters of genetic engineering, they can control all aspects of the nature/nurture relationship: the environment is entirely of their own making, as are they themselves. But, as Lilith soon comes to realize, to live in an Oankali environment, one must become more like the Oankali. The relationship between a species' environment and their body exerts a sort of pressure, shifting their bodies (and behaviors) to best fit the environment. This pressure pushes both ways, however, leading those species with the requisite ability to also shift their environment in ways which better suit their bodies. The Oankali appear to have near-perfect control over both body and environment. Thus, they are able to achieve the perfect fit between

body and environment. This, however, leads to Joan Slonczewski's point quoted above: the Oankali are too good at genetic engineering, and lacking any sort of outside influences they are in danger of engineering themselves into a corner.

For life on Earth, genetic dead-ends are usually discouraged by the sheer variety of hostile environments. Imagine a bird which thrives when it is in some specific region; it has evolved to fit the environment perfectly. But there are other regions where the bird may not thrive at all. Thanks to genetic drift, some of the bird's descendants will be different. This difference may make them less perfectly suited to the original environment, but perhaps better suited to other environments. Thus the bird's descendants can evolve to survive in different regions. This becomes important when we realize that the environment itself is constantly in flux. Eventually, the original environment will change, and those species which cannot adapt to the changes will die out. For the Oankali, with their carefully controlled evolution and their perfectly controlled environments, there is no "Other" environment to which they need adapt. Over a long enough time line, the lack of pressure to change would result in a genetic conformity which, while perfectly suited to the life they live at the moment, is precariously sensitive to any outside shock. This is why the Oankali are compelled to "trade" their genetic material with other species, and it give Octavia Butler "a biologically plausible explanation for why the Oankali need to interbreed with humans" (Slonczewski, "Biologist's Response"). But wandering from inhabited system to inhabited system seems like a fairly extreme solution, compared to the possibility of simply consigning oneself to one part of a given biosystem and allowing the system to unfold without intervention. Every few million years there would be whole new ecosystems to sample. Even if the drive to search is insurmountable, the Oankali solution still seems extreme,

since they insist on “trades” rather than something less invasive (and permanent) like extractions or surveys. As it is, their compulsion to “trade” ultimately leads to the destruction (via breeding or feeding) of not just entire species but entire ecosystems.<sup>18</sup>

Thus the trilogy is bookended by parallel destructions of Earth: the premise of the entire series is the destruction of the earth via nuclear holocaust, and the inevitable postscript is destruction via resource mining. In the case of nuclear holocaust, at least some of the biosphere would have survived the fallout, even if it were only Twinkies, cockroaches, and generals in bunkers. The world as we know it would be done for, but life would go on. However, as we discover almost in passing, the Oankali represent an even more extreme telos. The land based Oankali settlement will eventually consume all the useful bio-matter on Earth before peeling off to become a new interstellar ship like the one Lilith wakes up in. Jodahs, the budding *ooloi* construct in *Imago*, explains as much:

We would not be here—the Earth he knew would not be here—for more than a few centuries. We, Oankali and construct, were a space-going people, as curious about other life and as acquisitive of it as Humans were hierarchical. Eventually we would begin the long, long search for a new species to combine with to construct new lifeforms. Much of Oankali existence was spent in such searches. We would leave this solar system in perhaps three centuries. I would live to see the leave-taking myself. And when we broke and scattered, we would leave behind a lump of stripped rock more like the moon than this blue Earth. He [a

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<sup>18</sup> I am reminded of my favorite Doctor Who villain/monster, the Weeping Angels. The Angels can only move when no one is watching them (they look like statues when they are being watched), and they kill their prey by sending them back in time to, as the Doctor says, “live to death” – that is, live out their normal lifespan but in the past, so that they are effectively dead by the time the Angels encounter them. They remind me of the Oankali because, while killers, they do seem to be almost kind about it.

human talking to Jodahs] would never know it. To tell him would be a cruelty.

(531)

The irony of this destruction seems lost on the Oankali and their construct descendants: a healthy, verdant Earth would be home to endless biodiversity, especially over time. Given the Oankali obsession with “tasting” new form of life, this move seems as self-destructive as the humans’ nuclear war. If anything, this consumption will mean a more complete annihilation than the mere extinction-level nuclear winter. For all the salvific overtones of the Oankali, they actually represent the same thing as humanity: a drive which results in the destruction of Earth. In terms of genetic engineering, even in the hands of the enlightened engineers, it represents destruction every bit as significant as that of nuclear weapons.

Notably, Butler introduces this concept in her final book, the only one written in first person. As I mentioned above, each book in the trilogy is written from a different perspective: *Dawn* is in third-person limited omniscient, centered on Lilith’s human female perspective; *Adulthood Rites* is similarly limited omniscient, but is told from the perspective of Lilith’s hybrid human/Oankali son Akin; *Imago* is written from the doubly hybrid human/Oankali *ooloi* perspective of Jodahs, and it is the only book of the trilogy which is narrated in the voice of the protagonist – an *ooloi* perspective that Peppers describes as “a cyborg identity which breaks down the boundaries between human/nonhuman, male/female, and natural/ technological” (60). Butler’s choice to write the third novel from the perspective of the most alien character but to narrate it in the most personal form is striking. In doing so she emphasizes the shift from human to alien, from a humanist ethic to a posthuman one, from a world where genetic engineering is grotesquely Other to one where it is emphatically Self.

Shifting focus onto the role of gender in each book, it becomes clear that the whole of *Lilith's Brood* is working towards dramatizing the shift from an origin as human/female to full cyborg. And, as Slonczewski notes, “[I]like the slaves and their descendents, Lilith and her children feel enormous ambivalence about her choice . . . the choice of ‘trading’ with the Oankali to produce half-human children, or having no family at all” (“Biologist’s Response”). She is torn between the choices of staying human – even if it means an earlier death, even if it inevitably leads to apocalypse, even if it entails embracing a “flaw” – or allowing herself and (especially) her descendants to become something biologically superior but frighteningly unfamiliar. The second option is presented by the Oankali as an obviously superior one, though Slonczewski correctly notes the ironic overtones of their offer: “The Oankali lecture her about the superiority of their egalitarian, nonviolent lifestyle . . . just as Americans told their African slaves they were fortunate to be rescued from barbarism by their ‘democratic’ masters” (“Biologist’s Response”). In terms of the discourse on genetic engineering, the choice may be largely the same: embrace the frighteningly unfamiliar life of genetic modification or perish. What Butler does in *Lilith's Brood* is to shake the foundations of this choice a bit and explore with greater clarity what our options really are.

This exploration starts in the first book, *Dawn*. When we are introduced to Lilith she is in a situation of powerlessness – she awakes, not for the first time, alone in a blank and unfamiliar room, with no explanation. Her captors/interrogators are frustratingly impossible to read or manipulate, and Lilith rebels against their restrictions, albeit futilely. In short, she inhabits a decidedly disadvantaged position, reminiscent of what she may have inhabited as a woman of color back on Earth, before the apocalypse. Her position is also reminiscent of the position of a

child: powerless in the face of incomprehensible forces who claim to want what is best for her (and everyone else) but so different that their authority is never entirely embraced. This reading is supported by the section's title: Womb.

Throughout the first book there is a tension between Lilith's role as a woman and the change brought about by her existence in a profoundly alien world. True to Haraway's cyborg dream, the impending hybridization implied throughout *Dawn* has an impact on the old gender roles, although the impact remains slight for the duration of the first book. For instance, after her release and a period of naturalization, Lilith is introduced to a human male who stays with another Oankali family (though one is just as tempted to say he is "owned" in the manner of a pet). The two are left together and ostensibly alone and the man forces himself onto Lilith. For her, this experience is doubly disturbing; first, of course, there is the shock of sexual aggression, but there is also the shock of an "old world" problem reappearing.

He stared at her for several seconds and she feared him and pitied him and longed to be away from him. The first human being she had seen in years and all she could do was long to be away from him.

Yet it would do no good to fight him physically. She was tall, had always thought of herself as strong, but he was much bigger—six-four, six-five, and stocky. (95)

From her initial awakening to this point, Lilith has had no need to fear sexual aggression nor, for that matter, any male aggression whatsoever. She is relatively helpless to combat the Oankali, but so are men. Besides that, she has already started to grow accustomed to living in a world

without men, and (given what happens when she first encounters a man on the Oankali ship) this situation seems to be clearly superior to the alternative.

In her own way Octavia Butler is painting males (and those aggressive, violent drives for dominance which are typically associated with masculinity) with the same brush as Slonczewski. Both even offer an outside force which to menace the masculine and feminine in equal measure – the Malachite in *A Door Into Ocean* and the Oankali in *Dawn*. But Butler complicates the picture a bit, because her menacing outside authority is the same force which creates the limited utopia (for Lilith) in the first place. Later, as Lilith is prepared to act as ambassador to newly revived humans, the Oankali enhance her strength, speed, and ability to heal. In doing this, they render her physically superior to any normal human (especially including any men) she may encounter. With this comparatively small change, the Oankali help Lilith take a big step towards transcending the gender dichotomy. The cost of this change is high, however. Lilith's first step toward hybridity – humanity's first step – renders her disturbingly Other to the newly awoken humans. Her enhanced strength and constitution render her unfeminine as well as suspiciously alien. And these humans are not wrong: in altering Lilith's abilities, the Oankali have taken Lilith away from her "natural" human state and made her something else.

Throughout the series, humans are placed in a feminized position, whether as the prisoner, the colonized, the endangered minority, or the sexually controlled. Much of humanity's story is premised on a sort of double-apocalypse: first there is the nuclear event on Earth from which the Oankali rescue the surviving humans; then there is the Oankali decision to strictly control the fertility of their wards. They declare no humans will be born outside their proscribed *ménage a cinq*. It is not clear what form this infertility takes: whether all humans are infertile or

if only the men or only the women are. It amounts to much the same thing. The only way to reproduce is to make alien babies – “‘But they won’t be human’ Lilith said, ‘That’s what matters. You can’t understand, but that *is* what matters’” (248) – and the result of that would eventually be the extinction of humans as we know them: “‘You should have known,’ Lilith said. ‘You’ve had plenty of time to study us. What did you think would happen when you told us you were going to extinguish us as a species by tampering genetically with our children?’” (231). While the humans do rebel, individually and in groups, their protests are ultimately ineffective. Humans only regain their reproductive abilities when Akin, an Oankali constructed male, decides to plead on humanity’s behalf. That is, even though the Oankali do eventually acquiesce to the human desire for unmediated reproduction (and thus, the potential to carry on humanity in an unmediated form), they reserved the right to make this decision without input directly from the humans.

If we believe Foucault that sex “appears as an especially dense transfer point for relations of power” (103), then the Oankali decision to forcibly limit human reproduction, and thus stake a claim in controlling human sexuality, plays out like an especially coercive power grab. For Butler, the power relations surrounding her Oankali are largely tied to their genetic engineering prowess, and so we once again have a direct link between the literary deployment of genetic engineering and the complex nexus of power which sexuality represents. From their introduction, the Oankali are incapable of staying out of humanity’s sexual politics. In *Dawn*, they coercively induce humans to experience the *ooloi* mediated version of sex. In *Dawn* and *Adulthood Rites* humanity is left to its own devices, but unable to reproduce; the Oankali have reserved that right for themselves, even to the point of denying the human opinion in the matter until Akin – Lilith’s

son and the focus of *Adulthood Rites* – comes along. In *Imago* the arguments are ultimately rendered moot, as the *ooloi* narrator, Jodhas, and its sibling develop pheromones which override the resisting humans’ desire for self-determination. These movements map onto genetic engineering as a possible course for the praxis: some people (children/babies) are subjected to genetic manipulation by their parents,<sup>19</sup> and soon the only way to compete in a world of enhanced abilities is to have your own (or your offspring’s) enhanced. Those who resist this are increasingly consigned to history, and before long the only way forward will be as genetic post-humans.

Since the Oankali indiscriminately control human reproduction, there would not seem to be much call for specifically gendered response. Yet, throughout *Lilith’s Brood* the burden seems to fall disproportionately on men; at least, men are disproportionately affected by their new place in the universe. This manifests early on, when some men in Lilith’s group are violently resistant to Oankali advances. Even when they are seduced, as the first round of survivors is, the experience maps as especially traumatic for the men. One explanation offered by Lilith is that the men are unaccustomed to being “taken” – that is, in their sexual encounters with Oankali they are invariably passive, as are the females, but since this is a new, un-masculine position for the men, the passivity registers as particularly revolting. As the series progresses, especially in the second book, we see the issue of infertility become a specific source of aggression in the men.

The Oankali do not render men strictly impotent – there is ample suggestion of a robust world of sexual encounters across the novels – but what they have done amounts to the same

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<sup>19</sup> This is what happens, to an extent, in Mawer’s novel when Dr. Lambert selects his offspring. It happens more explicitly in *Oryx and Crake*, when Jimmy’s father and step-mother plan on enhancing his prospective sibling. It also serves as the excuse for Crake’s Paradise project, the project where he engineers the “floor models” of his genetic posthumans, the Crakers whom he intends to repopulate his devastated world. They are supposedly built as examples of how sufficiently wealthy humans could enhance their offspring.

thing. It is a slower, reversible sort of castration (a term I use with Freudian/Lacanian overtones in mind), but a castration nonetheless. The violent reaction against this is seen clearly in the men's rejection of Lilith and her close relationship with the *ooloi* Nikanj. The humans – unable to match the wary and enhanced Lilith – kill her lover, Joseph, and severely injure Nikanj instead. Joseph is lost, and Nikanj is only saved thanks to Lilith's intervention. Akin, the voice of *Adulthood Rites*, is abducted by a group of men in part because he looks “as human as any I've seen since before the war” (308), and there is a suggestion that such abductions are a common approach to surrogacy in the infertile Oankali world. This practice only ends because Akin, upon maturity, convinces the Oankali to allow humans a colony on Mars where they can live, die, and reproduce free from Oankali interference.

Mapping this dynamic back onto our discussion of the *ooloi* as symbols for genetic engineering at large, there is a sense here that in submitting to the force of genetic engineering – however seductive it may be – one must give up yet another aspect of their understanding of the world, or more specifically, one's place in that world. In other words, not only does the world of genetic engineering seem grotesque to the uninitiated, it also places its users in the position of object – something which is acted upon. This gendering of the science seems to contrast with what we see in *A Door Into Ocean*, where biological sciences are explicitly related to the feminine Sharers and contrasted with the masculine inorganic sciences. However, in Slonczewski's novel the genetic engineering allows the inhabitants of Shora to evolve beyond men in some crucial sense by taking the place of men on Shora – positively in the sense that the females can still reproduce, negatively in the sense that the Sharers can potentially commit massively violent acts. But in *A Door Into Ocean*, the “masculine” potential of genetic

engineering is deployed by and in service of the women of Shora, and so the negative aspects of masculinity are somewhat neutered. Margaret Atwood, in her *MaddAddam* series, takes a slightly different track with regards to genetics, and aligns it specifically with the forces of the colonizer, the oppressor, the corporation, and (ultimately) the mad scientist, male *wunderkind* Crake. As I will argue in Chapter 5, Atwood envisions genetic engineering (and more specifically, cloning) as an unwelcome invasion by the masculine forces of science on the feminine realm of reproduction, thus completing the marginalization of women altogether. In *Lilith's Brood*, genetic engineering (metonymically represented by the *ooloi* Oankali) has a similarly masculine flavor, but it is deployed by a third party, a third gender. The effect is to “feminize” all humans; the implication is that, in the face of such a powerfully disruptive technology, humans could lose their agency, and that this loss will not go uncontested.

So it makes sense that men tend to have the most violent reactions to their situation in *Lilith's Brood*: they have the most to lose. Lilith, though she feels conflicted about her role, ultimately aligns with the alien forces. In part this may be because she so embodies what we could call a classic Western Other role; that is, she is a woman of color, a widow, a mother without a child, fairly tall and bulky. Put another way, she is a woman who does not fit well into any idealized (Western) models of femininity even before she became so closely aligned with the Oankali. Even though she functions as a sort of ambassador for newly awoken humans – helping them become acclimated to their new surroundings, training them to survive on a reconstructed Earth without the aid of modern civilization, and generally answering their questions – she is treated with hostility and suspicion. Lilith's first lover Joseph is killed because of his closeness with Lilith, and thus implicitly because of Lilith's closeness to the *ooloi* Nikanj.

The other humans assume that Lilith and Joseph will soon “betray” their humanity and consent to the Oankali’s indecent proposal. Of course they have misread Lilith’s own position: as their guide and ambassador, she does appear to possess a closer relationship with the Oankali, but she also harbors doubts about the Oankali’s plans. The other humans’ plan backfires, and by killing Joseph they force the Oankali’s hand.

In the wake of Joseph’s death, Nikanj decides to impregnate Lilith with a child without asking her consent: “‘You’ll have a daughter,’ it said. ‘And you are ready to be her mother. You could never have said so. Just as Joseph could never have invited me into his bed—no matter how much he wanted me there. Nothing about you but your words reject this child’” (246). Here Nikanj is essentially claiming that Lilith is mistaken in her free will, that biologically she was giving consent, even if she would never do so intellectually. Nikanj’s claim that “nothing about you but your words reject this child” serves as a quintessential example of Butler’s “deploy[ment of] unsettling visions of biological determinism, especially in regard to race and sex” (Stickgold-Sarah 441). On the one hand, it is difficult to separate what Nikanj does from rape: Lilith was impregnated without her consent and against her (conscious) will; moreover, it was done at a moment when she was emotionally vulnerable. On the other hand, we have Nikanj’s word as to Lilith’s body’s desire, and of course the alien separation between Oankali and human can at least somewhat mitigate the violence. For *ooloi*, genetics and biology speak as forcefully as any words – they “manipulate DNA as naturally as we manipulate pencils and paintbrushes (167) – and if they don’t have the same respect for what we consider our free will, neither do humans have much respect for what their biology tells them.

Lilith's reaction to this violation is one of understandable ambivalence. She is angry that the choice was made for her, and she is uncomfortable with the idea of her children being not entirely human. But she acts the loving mother nonetheless, eventually birthing a large contingent of human/Oankali hybrids, including the first male and the first *ooloi* of the new hybrid species – the protagonists of the second and third books. This ambivalence sometimes manifests in the other novels as wanderings and discontent which confuses her children but does not seem to bother the Oankali:

Lilith had these flares of bitterness sometimes. They never seemed to affect her behavior, though often they frightened people. Margit had said, "It's as though there's something in her trying to get out. Something terrible." Whenever the something seemed on the verge of surfacing, Lilith went alone into the forest and stayed away for several days. Akin's oldest sisters said they used to worry that she would leave and not come back. (274)

The tension between what she has done – or what has been done to her – and her discomfort with where it will all lead persists through the series. On the one hand, her impregnation all but forces her to side with the Oankali. By impregnating Lilith, Nikanj has essentially aligned the role of mother with the role of Other. On the other hand, she never does completely reconcile herself with the Oankali. Unlike Tino, a new visitor to the Oankali enclave, Lilith "never had a chance to run off and pine for the good old days!" (273).

It is important that Lilith never really makes the decision to align with the Oankali: from the beginning she plans escape, and the hope that she will eventually be able to leave the clutches of the Oankali drives much of her action in the first book. Her closeness to Nikanj in *Dawn* has

as much to do with Stockholm Syndrome and pheromones as with an actual meeting of the minds: “It released her [Lilith], but was not completely focused on her. It had felt her body’s leap of response to its wordless suggestion—or its chemical suggestion” (187-88). Even after Lilith has had many children and chosen to live in an Oankali habitation on Earth, she is conflicted. She only really seems to resolve herself to the life she has once her son Akin ensures that humanity’s encounter with the Oankali will not mean extinction.

Nikanj does appear to care deeply for Lilith, but this is colored by a deep attraction, described in somewhat sexual terms. The sexual undertone is made explicit in *Adulthood Rites*, when Nikanj encounters Tino:

“Slow,” she [Lilith] whispered. “Give him a moment. Give me a moment. Don’t defeat your purpose by hurrying.”

For a moment, Nikanj’s lumps looked worse—like some grotesque disease. Then the lumps resolved themselves again into slender gray body tentacles no more grotesque than usual. Nakanj drew its sensory arm from Lilith’s hands, then stood up and went to a far corner of the room. There it sat down and seemed almost to turn itself off. Like something carved from gray marble, it became utterly still. Even its head and body tentacles ceased to move.

“What was all that?” Tino demanded.

Lilith smiled broadly. “For the first time in my life, I had to tell it to be patient. If it were Human, I would say it was infatuated with you.”

“You’re joking!”

“I am,” she said. “This is worse than infatuation. I’m glad you feel something for it, too, even though you don’t yet know what.” (293)

Although the Oankali are distant and alien through much of the first book, and although they assume an air of superiority based, in part, on their superior understanding of biology (thanks to genetics), their project is ultimately colored by the very unscientific emotions of lust. Like Lilith, Tino is predisposed to cancer, and cancer is apparently a novel condition which the Oankali had never encountered before. It is thanks to the “example” of Lilith’s cancer that Nikanj is able to reattach its injured tentacles near the end of *Dawn*. Because the *ooloi* experience much of the biological universe through “tastes” of molecular structures, people like Lilith register as extremely attractive. Lilith understands this herself, and she tries to describe it to Tino:

“So that’s it. That’s why Nikanj is so attracted to you. Cancer killed three close relatives of mine, including my mother. I’m told it would have killed me if the Oankali hadn’t done some work on me. It’s a filthy disease to us, but to the Oankali it’s the tool they’ve been looking for for generations.”

“What will it do to me that has to do with cancer?”

“Nothing. It just finds you a lot more attractive than it does most Humans. What can you do with a beautiful woman that you can’t do with an ugly one? Nothing. It’s just a matter of preference. Nikanj and every other Oankali already have all the information they need to use what they’ve learned from us. Even the constructs can use it once they’re mature. But people like you and me are still attractive to them.”

“I don’t understand that.”

“Don’t worry about it. I’m told our children will understand them, but we won’t.” (294-95)

Note that Tino is being approached and appraised much in the same way as objectified women often are: his value to the *ooloi* is very much tied to his physical (well, molecular) attractiveness and his reproductive potential. Since he was raised mostly post-apocalypse, Tino does not seem unduly put off by the gender implications. But this does serve as further evidence that, at least in terms of contemporary gender roles, all humans are placed in a feminized position, with the third-gendered *ooloi* mostly occupying masculine positions.

Butler does not make the *ooloi* explicitly masculine, however. Kahguyaht, the *ooloi* of Lilith’s adoptive Oankali family, and parent of Nikanj, notes that, originally: “I didn’t want to accept you, Lilith. Not for Nikanj or for the work you’ll do. I believed that because of the way human genetics were expressed in culture, a human male should be chosen to parent the first group. I think now that I was wrong” (111). Or as Jessie Stickgold-Sarah puts it: “A woman, in short, is closer to the Oankali ideal of a parent. Lilith’s ultimate success in working with the group indicates, narratively, that this is the right choice” (422), thus the Oankali and *ooloi* ideals are implicitly aligned with femininity. The Oankali are also wary of human males. *Adulthood Rites* takes place some thirty years after *Dawn*, and its protagonist Akin is the first human-born hybrid-Oankali male to be attempted. “Be content, Lilith. One group of us believed it would be best to dispense with Human-born males altogether. We could construct female children for Human females and male children for Oankali females. We’ve done that until now” (259). The shift, from Kahguyaht’s belief in the superiority of males to the Oankali reluctance to construct any human-born males represents a subtle commentary on both the fundamental nature of males

and the place of men in contemporary society. The human flaw is suggested to be a trickier fix in males than in females. This seems to have given men a cultural advantage, until they blew everything up.

This may relate back to the nature of the “human contraction”: the first of the two incompatible traits is described as intelligence – “That’s the newer of the two characteristics, and the one you might have put to work to save yourselves. You are potentially one of the most intelligent species we’ve found, though your focus is different from ours. Still, you had a good start in the life sciences, and even in genetics” (39). The second of these traits is described thus: “You are hierarchical. That’s the older and more entrenched characteristic. We saw it in your closest animal relatives and in your most distant ones. It’s a terrestrial characteristic. When human intelligent served it instead of guiding it, when human intelligence did not even acknowledge it as a problem, but took pride in it or did not notice it at all. . . . That was like ignoring cancer. I think your people did not realize what a dangerous thing they were doing” (39). There is an implicit suggestion that men are closer to this contradiction than women; not that they are more intelligent, but more hierarchical, more likely to embrace the destructive side of the equation. Indeed, Akin is specifically described as: “less Human than your daughters” (254), which, it is suggested, is how the Oankali “solved” the problem of the human-born males.<sup>20</sup>

This reluctance to engage with the male aspects of humanity is reflected in *A Door Into Ocean’s* all female society which, though not apparently bigoted towards men, bred them out of

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<sup>20</sup> There is some suggestion in the text that children born to humans are more human, children born to Oankali are more Oankali, although at maturity they would more or less converge. The challenge with Akin is, apparently, making a human male who is human enough for Lilith to bear but not so human as to inherit the destructive humanness which males seem to possess in greater abundance.

existence millennia ago. It is also noted in Mawer's *Mendel's Dwarf* that the single biggest factor in committing crime is the possession of "a Y chromosome. Not the possession of an *extra* chromosome, but the possession of just *one*. It is the simple fact of being male" (144), an ironic view that is nevertheless scientifically valid – though a modern scholar would probably note that testosterone, rather than sex or gender in general, is the more likely culprit.<sup>21</sup> Regardless, the reluctance of Oankali to attempt creating male constructs suggests that there is something particularly troublesome about the Y-chromosome. And, ironically, for all the uncertainty surrounding Akin, he is born looking more human than any construct before him. He is kidnapped and ultimately raised by humans in a Resister colony in large part because he looks so much like the human child which they have been denied. Eventually he acts as a force for reconciliation, negotiating for a human colony on Mars free from the Oankali-induced infertility. Of all the characters in the series, Akin probably does the most unambiguous good, restoring to the flawed humans a sense of agency and futurity, and thus ending the violent human resistance.

This irony is intentional, because it dramatically highlights the limitations of genetic engineering to solve all problems in an ethical manner. Though the male construct may be the least desirable from the Oankali perspective, it is also the one which ultimately helps humanity to reach some sort of recovery point, some level of freedom. The *ooloi* are one of Butler's cleverer creations because they give a separate and profoundly alien face to genetic engineering praxis while nevertheless emphasizing the fundamentally embodied nature of the praxis. She shows

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<sup>21</sup> Indeed, according to Paul Zak in his TED talk ([www.ted.com/talks/paul\\_zak\\_trust\\_morality\\_and\\_oxytocin.html](http://www.ted.com/talks/paul_zak_trust_morality_and_oxytocin.html)), testosterone is associated with aggression and a desire to be hierarchically on top, while oxytocin seems to be associated with a sense of well being and empathy (leading Dr. Zak to call it the "moral molecule"). Both hormones can be found in abundance in the members of successful sports teams; they are aggressive enough to win but cohesive enough to function as a good team. Since men generally have more in the way of testosterone production, it may be that testosterone is the key to apparent behavioral manifestations of sexual dimorphism, more than any fundamental element of genetic destiny.

that, like all technology, genetic engineering is not so much a force for good or ill as it is just a force; and it perhaps overstates the case to say the *Lilith's Brood* is focusing on the limitations of genetic engineering: it focuses on the limitations of genetic engineers to use the technology for good. Throughout *Dawn*, Butler emphasizes the frustrating aspects of being saved by a truly alien species, from the merely annoying (bad food, inability to open doors) to the far more troubling (seizure of reproductive rights, forced impregnation). Akin represents a challenge to the Oankali in part because the "human contraction" – the way humans often place intelligence in the service of hierarchy – seems to manifest more strongly in male humans. And yet, nowhere in the novels is there a truly comprehensive account as to *why* hierarchy is such a bad thing. The canny premise, the nuclear "humanicide," as Butler calls it, seems to give the truth of Oankali claims without the need for more rigorous defense. And yet the whole *raison d'être* of the Oankali is to spread forth and diversify – genetically and culturally. Not only is their superiority questionable, the Oankali know it. Certainly, much of the Oankali groping in the beginning sounds torturous, even if this was not the Oankali's intention; their unwillingness to respond to Lilith elevate her sense of confinement and hopelessness, while in their mind no response was appropriate. For all their understanding of human physiology, the Oankali lack a fundamental understanding of human psychology. So while the denial of a human future is done on the basis of an Oankali certainty that humans are hopelessly flawed and ultimately self-destructive, it is nevertheless cruel. And, whatever the Oankali's reputed intelligence, it clearly functions in thrall to their biological need to "trade" with foreign species – a need which seems to be of a type with humanity's need to establish hierarchies. The result of the Oankali drive is, ultimately, identical to the human drive: the end of humanity. It simply takes longer. So there is an implicit warning

in the Oankali: do not presume your technological advances are necessarily matched by equivalent ethical ones.

By embodying the technology in an alien species – an alien gender of an alien species, at that – Butler emphasizes both that genetic engineering is an embodied (and embodying) technology, and that it is fundamentally strange. Throughout the series, but especially in *Dawn*, the forces of genetic engineering are explicitly alien. The reaction of humans to the profoundly alien Oankali is initially one of revulsion. This despite the fact that the Oankali have manipulated themselves to better resemble anthropods; if anything, the uncanny closeness of these aliens to human forms serves to heighten the disgust: “‘You should notice,’ he said, ‘that what you probably see as hair isn’t hair at all. I have no hair. The reality seems to bother humans’” (*Lilith’s Brood* 13). The disgust described is almost instinctual: “‘Relax from your unnatural position and let’s see what happens.’ He hesitated, then let his tentacles flow free. The grotesque sea-slug appearance resumed and she could not stop herself from stumbling away from him in panic and revulsion” (26). Even when the alien creatures are accepted, or at least, cease to provoke outright disgust, Lilith finds the genetic-modifying sensory arms of the *ooloi* off-putting. This disgust is balanced against the tremendous gains offered by the Oankali: no pain, no cancer, improved strength and healing capabilities, longer life, better memory (the merits of this one are debatable – forgetfulness can be a valuable tool as well), and so on. Yet the Oankali are nonetheless rejected by many humans—especially men.

In the second book, Akin wonders at one of the sick humans who abducted him: “Why didn’t they find an *ooloi*? How could they just let their friend bleed? He might bleed too much and die” (326). In *Imago*, the third and final book, Jodahs encounters an isolated enclave of

humans who discovered early on that some of their number could reproduce. The cause of this “miracle” is a subtle genetic defect the Oankali chose not to alter, which manifests as a terrible recessive disease in the later generations – recessive but ubiquitous because of the constant (unavoidable) inbreeding. Jodahs is able to instantly fix all of the disease’s ravages, and Jodahs’ older and more experienced *ooloi* ancestors would have been even more capable; but the short, painful, disfiguring lives were considered a small cost compared to mating with the Oankali. These are conflicted moments, by any measure. Certainly most readers feel the tragedy of the situation, the closeness of relief pitted against the injustice of the Oankali’s (benevolent) oppression. For Akin, the experience is instructive, and it informs his later decision to press for a separate human enclave: the disgust some humans feel at the prospect of sharing the Oankali plan is stronger than a fear of pain or even death. This, he sees, invalidates the Oankali dogma (deeply felt though it may be, even by the construct Akin) that the humans are fatally flawed and that the only moral option is to ‘trade’ with them all.

It is not just the genetic engineers who are grotesque. Those who are genetically modified become increasingly alien as well. Lilith starts the trend, giving up some small part of her humanity in exchange for superior strength and longevity. She suffers for this decision, even if she was by most accounts a perfect candidate already. Her offspring continue the trend. Though Akin is extremely human looking as a child, he is not completely “normal”: his eidetic memory and inhuman cognition mean he remembers his time in the womb with clarity, and can communicate with his adult abductors with adult-like fluency, something which they find very

disconcerting;<sup>22</sup> he has light-sensitive spots around his body which will eventually become the eye-like tentacles which feature so prominently on Oankali; and his tongue serves as his Oankali genetic sensory organ for “tasting” cellular structures. However, like all construct children, he experiences a significant physical change upon reaching maturity which leaves him looking much more Oankali than he did previously. During his time with the human abductors, Akin meets two sibling constructs who are more obviously constructs – they have tentacles on their bodies and head – and he has to talk his captors out of attempting to surgically “fix” them. Even with his warning of the children’s lethal sting reflex and the ethical pleas of some of the captors, a contingent is determined to amputate.

The disgust that the humans feel is emblematic of typical real-world reactions to the implementation of genetic engineering. Look, for instance, at Margaret Atwood’s grotesque description of the headless “Chickie-Nob” creatures, or the public outcry in America to the idea of genetically modified animals. The Oankali are initially disgusting to humans at a level beneath cognition; it takes a tremendous force of will for most humans to even bear the presence of an Oankali at first, much less touch one. Eventually, though, many humans do overcome their disgust and learn to live with the Oankali, even if they never quite embrace them. In terms of genetic engineering, this suggests what seems to have been a very accurate representation of people’s reaction to genetic engineering potentially leaving the laboratory and entering their lives

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<sup>22</sup> Akin find this fact hard to understand at first, but he soon realizes that “Human beings talked to trees and rivers and boats and insects the way they talked to babies” (327). He soon remembers some advice which Lilith gave him: “Humans fear difference. . . . Oankali crave difference. Humans persecute their different ones, yet they need them to give themselves definition and status. Oankali seek difference and collect it. They need it to keep themselves from stagnation and overspecialization” (329). This leads him to strike a deal with the kidnapper: “I will be valuable to you . . . All I have to do is be quiet. Then you can be rid of me and I can be rid of you” (329). These two tendencies – the human and the Oankali – reflect the dual nature of genetic engineering: it enables the creation of tremendous (unnatural) differences by reducing the origins of this difference down to one common language: DNA. It universalizes and disrupts in the same movement.

(and pantries): a gut-level rejection, without apparent recourse to rationality. In part, this could be due to the disruption of previously settled notions of what is “natural” and what is not. Having structured our concepts of “self” and “Other” along the lines of “culture” and “nature,” the merging of what we once considered nature with the intentionality of our rational culture casts so much in doubt that it is easier to just reject the change.

The way this dynamic unfolds in *Lilith’s Brood* could suggest that while the fruits of genetic engineering may initially seem difficult to accept, the benefits will eventually outweigh the creepiness and we will slowly learn to embrace the new technology. However, Butler complicates this in a few ways. First, as noted above, none among the humans – ideal candidate Lilith included – ever really embrace their brave new world. Those who throw in with the Oankali seem as much consigned to it as anything else, and large numbers never join up. Second, the acceptance of these alien Others does not necessarily come from (or only from) a place of growing understanding and acceptance. Rather, (or concurrently), the Oankali are capable of inducing tremendous pleasure in their partners, and bonds are formed through pheromones which cast some doubt as to the free-will and self-aware judgment of any who choose to accept the Oankali lifestyle. The relationship between human and Oankali (especially human and *ooloi*) resembles nothing so much as a drug addiction, something Lilith’s first lover, Joseph, brings up: “Is it . . . like a drug?” (170). Lilith denies this, but she and the other awoken humans are nonetheless easily sated or aroused by the *ooloi*. At first, this addiction is fairly unsophisticated: Lilith feels a bond with her *ooloi*, but she is troubled nonetheless. Resisting humans can be pacified, but doing so requires direct contact and a constant flow of chemicals. By the end of the third book, this all reaches ambiguous new levels.

Jodahs, another of Lilith's children and protagonist of *Imago*, unexpectedly matures as an *ooloi*, becoming even less human than its older siblings. In the process, Jodahs becomes the first construct to fully merge a human ancestry with the heights of Oankali genetic understanding and manipulation. A descendant of Lilith, Jodahs has the cancer "talent" which, in its capable *ooloi* construct hands, translates to an unparalleled ability to shape shift. But this ability comes at a cost: Jodahs' sibling Aor also matures as an *ooloi* but unlike Jodahs does not meet some humans when it does so. As a result, its shape shifting leads it almost to a complete self-dissolution: it needs to bond with some humans. When it finally does, it can solidify its shape easily. Thus Aor, Jodahs, and the painfully disfigured human siblings Tomás and Jesusa track back to the isolated human village to find new mates for Aor. These humans, living for more than a century on the belief that Oankali were evil and revolting (they did not know of the human colonies on Mars) are initially hostile but quickly come around, in many cases as if against their own will:

"You've done this to me," he said. "I would have gone to Mars."

I said nothing.

"I can't even hate you," he whispered. "My god, if there had been people like you around a hundred years ago, I couldn't have become a resister. I think there would be no resisters." He stared at me a moment longer. "Damn you," he said slowly, sadly. "Goddamn you." He walked past me and went to Ahajas and the waiting Oankali family. (740).

Butler makes clear that the cause of the miraculous change of heart is pheromonal: "As you said once, pheromones" (740). One particularly violent village member seems unpersuaded by their

arguments, mainly (they realize) because his nose is broken and so he is immune to their pheromones. Once they repair his nose, he falls into line. Representing the ultimate union of human and Oankali – humanity and genetic engineering – Jodahs and Aaor overcome the humans’ disgust, reluctance, and (apparently) free will.

To return to our guiding questions, *Lilith’s Brood* suggests that living in an environment entirely of our own creation is part paradise, part purgatory. The Oankali’s living ships are peaceful, abundant, and eminently changeable to suit the whims of their inhabitants – a veritable clean, well-lighted place for a civilization to exist. But humans in the Oankali habitations must compromise some small part of their humanity or be utterly incapable of exerting any influence on their environment. Thus, control comes with a price of conformity. And, of course, it comes at the cost of challenge in general; too much comfort may ultimately be as bad for a civilization as too little. To live in such a totally mediated environment we just give up something of the challenge which helps shape us all as human. But that is not all: since the ships are both biological and ravenous, they require something like the Oankali to exist, and come at the cost of our natural planet and all its biodiversity.

Ultimately, *Lilith’s Brood* suggests that genetic engineering comes at the cost of nothing less than our humanity, and possibly our free will. ‘Possibly’ because those who lose their choice only lose it in one regard, the ability to resist the siren cyborg’s song of Oankali hybridization, and there is plenty of reason to think that their post-human children will retain it. Certainly, Lilith’s children (her Brood) have maintained their free will, with some (Akin, for instance) going so far as to buck conventional wisdom and shape a new world. As Jessie Stickgold-Sarah suggest, these texts are often seen in terms of biological determinism. This is appropriate given

both the human pension for self-destruction and the Oankali pension for Borg-like assimilation of others. But it also seems besides the point; if we are biologically determined to apocalypse, then, Butler seems to suggest, we will just have to change our biology. The gains are the same as what Haraway identifies in her manifesto: permanently partial identities ending ages of oppression and the “hierarchies” which the Oankali find so disturbing. An end to suffering seems possible, too. But the cost is extreme.

What this means for Butler’s position on genetic engineering is not clear. So when Jessie Stickgold-Sarah declares this vision a “pessimistic utopia,” the epithet fits. At the end a sort of utopia is achieved, a world where no one will ever have to suffer from human ailments ever again. But before reaching that point humanity self-destructs; all along the path to that point is violent and (largely) pointless resistance; finally reaching that point entails nothing short of the elimination of human free-will; and the consequences of such a utopia is, ultimately, the end of humanity as we know it. But I do not think *Lilith’s Brood* is best described as utopian. Its ending recalls the end of Haraway’s famous manifesto: “I’d rather be a cyborg than a goddess” (181). From the beginning the destruction of humanity is a foregone conclusion: nuclear apocalypse (or if not that, something else, inevitably) leads to “humanicide” and the Oankali are torn on whether to interfere or let us just go crazy and die. They decide to interfere, and all along the way humanity’s demons flourish, resulting in plenty of kidnapping and death. The only way forward for a fatally flawed humanity is a conditional extinction: we must give up the goddess; we must embrace hybridity even if it is not as human as we all might wish to be. So while “pessimist utopia” fits, it is also a bit of a misreading. *Lilith’s Brood* is no utopia: it is a tale of the end of the world, and the end of humankind as we know it. And for all of that it is not relentlessly grim.

There is a note of hope in her story. If humanity is doomed to destruction, at least there is something after. So, with apologies to Ms. Stickgold-Sarah, I would call these books an Optimistic Apocalypse.

## CHAPTER 4: MENDEL'S DWARF: GENETIC PATERNITY AND THE REAL WORLD

Understanding the distinction between what counts as science fiction and what does not is important for understanding how Mawer's novel differs from the others in my thesis, and thus how his deployment of the literary tropes of genetic engineering differ. From the early "scientific romances" and "scientific fantasies" of H. G. Wells to the contemporary disavowals of Margaret Atwood's preferred appellation "speculative fiction," the genre broadly called "Science Fiction" has a history of being difficult to define. This definitional instability is not unique to science fiction – as Atwood says "it's like every other form of literature: genres may look hard and fast from a distance, but up close it's nailing jelly to a wall" ("Aliens" 513). But it does seem to get more play in sf scholarship than in studies of other genres. Take, for instance, Jonathon Lethem's *Village Voice* article "Close Encounters: The Squandered Promise of Science Fiction" where he imagines a contrafactual world where Thomas Pynchon's *Gravity's Rainbow* had won the 1973 nebula instead of Arthur C. Clarke's *Rendezvous With Rama*. This moment, Lethem (an author of both sf and mainstream novels himself) contends, was an inflection point in the polarization of "science fiction" and "literary fiction" which could have heralded a literary mainstreaming of the genre, but instead stands as a "tombstone marking the death of the hope that science fiction was about to merge with the mainstream" (Lethem, quoted in Kelly 7).<sup>23</sup> This distinction between

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<sup>23</sup> The quote I use can be found in James Kelly's wonderful collection *The Secret History of Science Fiction*. This collection contends that Lethem is generally correct, except, "at the same time that, on one side of the genre divide, sf was being written at the highest levels of ambition, on the other side, writers came to use the materials of sf for their own purposes, writing fiction that is clearly science fiction, but not identified by that name" (8). I find this thesis persuasive.

science fiction and mainstream fiction persists, both as a marketing reality and a structuring decision of this thesis.

This chapter stands as something of an aberration in my thesis as a whole: it is not a science fiction text, not even in the broadest sense. It also represents a significant jump in time from the first two works I study. Mawer is writing in the mid-1990s, and while some of what he describes may have read as rank sf in the mid-1980s, by the time he was writing it was all science fact. I chose this novel because it offers an interesting counter reading to the more solidly sf works: since he is working with ideas drawn from contemporary science and technology, Mawer is crafting a much less speculative text. Yet he nevertheless focuses on many of the same issues which drive Slonczewski, Butler, and Atwood. Genetic engineering ultimately leads Mawer to dwell on many of the same ethical questions that we find (examined or otherwise) in more fantastic texts; he simply casts them in a more mundane or microcosmic light. The actual existence of genetic engineering (versus its mere possibility or the idea that it may someday be possible) ironically makes genetics less of an issue in and of itself; rather, it becomes yet another vector to discuss other, more timeless issues: nature vs. nurture; self vs. Other; disability vs. normativity; adultery, faithlessness, love; and the illusion of control.

Up to now this thesis has focused on science fiction texts. Both Slonczewski and Butler are considered fully sf authors, with Butler standing out as one of the field's most notable figures. In this chapter we move to Simon Mawer's *Mendel's Dwarf* and into a new genre, one that can be found under "Literature" at the local bookstore. In the next chapter we look at Margaret Atwood's first two *MaddAddam* books which are similarly filed under literature, despite their strongly sf themes. But, beyond bookstore designations (and the marketing tactics

they represent) it is not immediately clear why Mawer's book would be classified differently. Many definitions of science fiction fit Mawer's story as well as they fit a given episode of *Star Trek*. His story of geneticist and achondroplastic dwarf Benedict Lambert is centrally concerned with "scientific or technological change" (Gunn, *The Road to Science Fiction* 1). The story is both about science and centrally concerned with the implications of scientific developments. Like *A Door Into Ocean* and *Lilith's Brood*, genetics plays a central role in the plot, conflict, and resolution. Like Slonczewski and Butler, Mawer makes use of genetics to craft a tale of ethical exploration. Even more so than the sf authors, Mawer's ethical dilemma is a direct product of the science and technology of genetics. So why is *Mendel's Dwarf* not science fiction? It is fiction, and science plays a critical role in the story.

Perhaps one of the most common themes is the sub-literary status of sf in the eyes of many readers – evidenced by sf's banishment to a special, shared Science Fiction/Fantasy ghetto in most book outlets. The denigrating association of the terms goes back at least to originators like H. G. Wells, who "makes them [Wells' 'scientific fantasies'] out to be slighter in substance or more tendentious in tone than the serious reader coming upon them now would find them" (Philmus 530). The shift to literary fiction represents a mainstreaming of genetic engineering compared to its place a decade before; it is becoming a valid theme for books set in our mundane world. For all of science fiction's marginalization, though, there is considerably less scholarship on Mawer than on either Slonczewski or Butler (and Atwood seems to have a veritable

exegetical industry built up around her work), suggesting that genetic engineering in mundane plots may be less academically respectable than the same issues in sf novels.<sup>24</sup>

Of course, defining sf is a tricky proposition; the range of definitions is considerable. Joanna Russ, for instance, categorizes the genre thus: “Science fiction is What If literature. All sorts of definitions have been proposed by people in the field, but they all contain both The What If and The Serious Explanation; that is science fiction shows things not as they characteristically or habitually are but as they might be, and for this ‘might be’ the author must offer a rational, serious, consistent explanation, one that does not (in Samuel Delany’s phrase) offend against what is known to be known” (32). Other famous sf authors too have variously defined their genre in terms of materialism – “Materialistic cause and effect; the universe conceived as comprehensible object of exploration and exploitation; multiculturalism; multispeciesism; evolutionism; entropy; technology conceived as intensive industrial development, permanently developing in the direction of complexity, novelty, and importance; the idea of gender, race, behavior, belief as culturally constructed; the consideration of mind, person, personality, and body as objects of investigation and manipulation; such fundamental assumptions of various sciences or of the engineering mind underlie and inform the imagery and the discourse of science fiction” (Le Guin 23) – or discourse communities – “[W]e must think of literature and science fiction not as two different sets of labeled texts, but as two different sets of values, two different

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<sup>24</sup> This marginalization of science fiction may very well be decreasing, as respected writers like Atwood – in *The Handmaid’s Tale* as well as her *MaddAddam* books – Cormac McCarthy with *The Road*, Nick Harkaway with *The Gone-Away World*, Jeanette Winterson with *Stone Gods*, Kazuo Ishiguro with *Never Let Me Go*, and others who come from a literary background find fertile grounds in those themes, topics, and forms which were once mostly associated with sf genre-fiction. It may also decrease as canonical figures (e.g., Kurt Vonnegut, Thomas Pynchon) who straddle that boundary are incorporated into the academic sf canon. Evidence of this marginalization may also be evident in the fact that these authors are nonetheless marketed as literary authors, regardless of whether their work could count as sf, and many of them actively decry any attempt to label their work as sf. With Atwood, this distinction is particularly interesting; more on that in Chapter Five.

ways of response, two different ways of making texts make sense, two different ways of reading—or what one academic tradition would call two different discourses (and the meaning of *discourse* here is not simply explanation, but rather a range of understanding that involves certain characteristic utterances: the larger process that allows explanations to be and be a part of). The encounter, then, is between two discourses, science fiction and literature, and it is won or lost through pleasure and use” (Delany 102). Thus, to answer the question posed above in terms of Delany’s discourse community, *Mendel’s Dwarf* is not science fiction because it is neither presented nor received as science fiction.

But the shift from sf to literary is perhaps best captured by Darko Suvin’s definition of sf as “a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author’s empirical environment” (8-9). Perhaps what distinguishes *Mendel’s Dwarf* from sf, what elevates it out of the sf ghetto, is that the plot is constructed as a character study revolving around the ethical implications of one man’s use of genetic information. In this sense, while the science is central to Mawer’s story, it is less central to the ethical questions than the many choices of Benedict Lambert. And indeed, while genetics enables Dr. Lambert to do some of the things he does, the plot is propelled by an adulterous relationship and an ironically symmetrical family history as much as any scientific advancements. And, of course, the science which Mawer uses all actually exists. First published in 1997, Mawer fictionally reimagines a 1994 discovery of the FGFR3 gene’s link to dwarfism by Dr. John J. Wasmuth. The selection of fertilized eggs, while deeply unethical, would have also been within the realm of a reality where *in vitro* fertilization is standard practice.

I bring up this whole issue of generic definition now because these definitional distinctions are, in fact, critically important to any study of genetics and genetic engineering in literature. Slonczewski and Butler were writing in the mid-1980s, a good four decades after the discovery of the structure of DNA, in a time when genetic sequencing was just starting to be well-developed enough that it could yield clinical results, but before any serious applications of genetic engineering had been accomplished. Mawer, working not much more than a decade later, was writing in a context of significant genetic discoveries (such as the genetic causes of dwarfism) and accomplishments (such as Dolly, the first successfully cloned mammal). In fact, Mawer explicitly experienced this while writing the book: “As I began to research the book, and as my dwarf protagonist made his first acerbic observations on life, I learned that reality was catching up with me: the gene for achondroplasia had just been located on the short arm of chromosome 4, and the precise detail of the mutation revealed” (“Gestation”). In this period genetic engineering was making the subtle but crucial shift from “on the horizon” to “here,” and its place in literature shifted accordingly. Or as Veronica Hollinger puts it: “The story goes like this: many of us who live in technoculture have come to experience the present as a kind of future at which we've inadvertently arrived, one of the many futures imagined by science fiction. We apprehend a version of the future in the features of the contemporary science-fictional moment. . . . There is not much distance anymore between the facticity of realism and the subjunctivity of science fiction” (452). Put another way, the science in *Mendel's Dwarf* is not fiction; genetics has come of age.

It is appropriate, then, that *Mendel's Dwarf* is structured partly as an historical novel. The great-great-great nephew of the father of genetics, Georg Mendel, main character Dr. Benedict

Lambert suffers from achondroplasia, a genetic condition which leads to dwarfism. The novel presents two parallel stories: Mendel's discovery of the fundamentals of genetics and Lambert's quest to find the genetic causes of his condition. The title is a sort of double entendre referring to: (1) the dwarf pea plants which Mendel cultivated, and whose lineages and proportions were a key factor in helping Mendel unlock the secrets of genetic inheritance; and (2) intellectual and biological Mendel descendant Dr. Lambert, whose own dwarfism operates according to the same genetic rules as Mendel's original pea plants. The parallel stories appropriately reflect the course of many scientific achievements, from origins in clever, dedicated observation to their embodiment in real-world applications, and real life anxiety about what it all means.

More broadly, these two storylines encapsulate the shift of genetics from a passive (if growing) body of knowledge to an active form of knowledge. One of my favorite axioms in the story, which I noted in the introduction, comes apocryphally from Ernest Rutherford: "Science is physics; or it is stamp collecting" (222). I suggested that science of the first kind (what cheeky Mr. Rutherford calls "physics") is defined by its rigorous rationality, which is to say math, and indeed I do believe that is what Rutherford is suggesting. But in the context of modern science this comes up a bit short: there are no branches which are immune to mathematical methods, and yet the distinction does still hold somewhat. For instance, the structure of DNA as determined by Watson and Crick was determined by analyzing the two-dimensional shadow which DNA cast. The method which generated the shadow was an achievement in itself, and was the closest science could then come to visualizing object at that scale. It took an act of creativity and math to determine the three dimensional structure which could cast such a shadow. But this advancement

did not lead in any direct way to actionable knowledge. There were still decades of passive data-collection before more active knowledge could be obtained.

In quoting Ernest Rutherford, Dr. Lambert sardonically suggests that his work is little more than stamp collecting: he may use tremendously sophisticated techniques to find his “stamps” but he is nevertheless simply collecting and sorting information. His self-deprecation has an edge: as an achondroplastic dwarf he is, in essence, studying himself. But identifying the culpable gene does not allow Dr. Lambert to change anything about himself; for him that knowledge is fundamentally passive. Perhaps, after decades accruing this sort of knowledge, coupled with decades of bio-engineering advances, some praxis may emerge which would enable some meaningful therapy. Even then, assuming Dr. Lambert is still alive and healthy enough for massive medical intervention, it is hard to fathom the consequences of changing something so fundamental after early childhood development. More likely such therapy would only be effective for fetuses and young children.

Like Mendel’s first realization of the genetic nature of inheritance, Dr. Lambert’s discovery can help only future generations. For most research scientists this is simply the cost of doing business, and the knowledge is valuable/desirable in its own right. But for Dr. Lambert there is a sense of futility in all of this. His interest in genetics arose from his condition, as well as his interest in his famous great-great-great uncle. Such a motivation is eminently understandable, as if he models his life’s work off the Greek aphorism “know thyself.” But the knowledge is too specific, too basic to have any effect on Benedict Lambert. There is something poetic in this premise: the futility of self-knowledge, the emotional sacrifice of basic research; and a faith in the scientific endeavor that such work will someday help change the world. But, of

course, there is more to the premise of *Mendel's Dwarf*: the first chapter opens with Dr. Lambert speaking to a crowd at the Mendel Symposium, and closes with him talking on the phone with a woman who is about to deliver his child.

Thus the sardonic edge to Dr. Lambert's assertion: his work may not affect his condition much, but it has given him the opportunity to do something he had previously not thought possible; namely, father a child. To be clear, he is not incapable of having children, but any natural born child of his would have a fifty percent chance of carrying the mutant gene and thus suffering from achondroplasia. His appearance also makes life difficult for him socially. As a child he was often singled out. Girls were never interested in him, or at least that is how he sees it: "Let me tell you a joke. He who has sides to split, prepare to split them now. When I was still an undergraduate, I thought a girl had fallen in love with me. A normal girl, I mean" (47). His prospects for children already socially limited, the heritability of Dr. Lambert's condition effectively renders fatherhood a near-impossibility, at least in his own eyes.<sup>25</sup> But more than that, he is marked by his appearance, his stature, and proportions as Other, or as he would put it, phenotypically abnormal.

This physical marking is significant, and it shows up in each of the novels I survey. In Slonczewski's *A Door Into Ocean* the Sharers all have a bluish hue to their skin, a hue which is a result of genetically engineered bacteria, and thus a mark of their genetic engineering as a whole. For the Valans – characters which are essentially identical to Earth humans in their appearance

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<sup>25</sup> There are many counterexamples about the social stigma of dwarfism documented on the Little People of America's website, to name just one place. For Dr. Benedict being a dwarf is identical to being unlovable. I must admit that upon first reading the novel dwarfism seemed like a terrible fate, and thus the conflicted ethics of selecting against dwarfism seemed a bit more straight-forward. It is only in the course of researching dwarfism and reading positive testimonials that I realized the case was hardly so straight forward. Chalk it up to persuasive writing on Mawer's part, or my own phenotypically-normal bias; I am not sure which is culpable. Suffice it to say, dwarfism may not be a lamentable life, but for Dr. Lambert, being a dwarf is a terrible fate indeed.

and many of their manners – this hue marks the Sharers as Other. For the Sharers, this hue marks them as human, and the lack of it signals Otherness. In both cases visible identity cues are directly associated with genetic engineering (or the lack thereof). In Butler’s *Lilith’s Brood* genetic engineering is similarly associated with Otherness, with the grotesque appearance of the Oankali aliens, their profoundly unfamiliar (de-familiar?) third sexed *ooloi*, and the visibly different “construct” human/Oankali hybrids which populate the later books. In other words, she explicitly and consistently associates genetic engineering with some readily recognizable visible distinction. Atwood, too, associates genetic engineering with visually grotesque hybrids: her genetic engineers may be “normal” looking people; the semi-fantastical chimeras they produced are decidedly not. So it is fitting that in Mawer’s novel genetic engineering is similarly marked by a visible Otherness even though this distinction is not necessary in any practical sense. The lead scientist of the real-world team that identified the FGFR3 gene mutation was an average looking man. Most scientists, whether they work in cutting edge genetics or high energy particle physics or Cetacean biology, are not visibly marked as Other, except perhaps by questionable fashion decisions.<sup>26</sup>

So it is especially notable that Mawer chose to center the modern-day portion of his genetic tale on a figure who is visibly Othered. It suggests that even in non-sf tales genetics, or rather the potential of genetic engineering, occupies the same cultural space as physical deformity, visual alterity, and the grotesque. In other words, it is tied up with issues of normativity, which makes sense if it is also tied to Cyborg theory. This may help explain why sf authors like Slonczewski and Butler chose to construct their Other cultures around the

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<sup>26</sup> And then what’s to distinguish them from art historians or philosophers or English scholars?

technologies of genetic engineering. They each use this genetic Otherness in different ways: Slonczewski to ground her benevolent utopia and draw a stark distinction between it and her (our) contemporary reality; Butler to dramatize issues of gender, race, and xenophobia. But their uses are united in that they depict aliens who are much more human (and humans who seem much more alien) because the alterity is grounded in genetic technologies. They both blur the line between normative and not.

*Mendel's Dwarf* moves this issue from the fantastic realms of science fiction to the mundane (in the literal Latin sense, from *mundus*, the world; mankind). Instead of aliens manipulating genetic information, for good or for ill, we have an otherwise mundane human who studies genetic information in part because it has marked him out as Other. The Otherness of genetics is double in Dr. Benedict Lambert. First, he has a mutated gene which has marked him with dwarfism, so genetics is an agent of alterity. Second, the Othered Dr. Lambert, marked by his physical deformity, essentially exists in another space from most other people, a facet one television director noted: “‘I want it to be your story, from your viewpoint. Literally, as well.’ He crouched down, just to make it clear. ‘Lots of low camera angles. The world according to Ben’” (250). It is from this space that he engages with the world; it is his social exclusion which leads him to study genetics in the first place; it is his condition which necessitates his ethical quandary; and (Mawer implies) Dr. Lambert’s outsider position is at least partially responsible for his unethical behavior. While genetics has transformed into reality in Mawer’s novel, it is no less associated with the forces of alterity. These forces are simply now mundane: instead of aliens and epic adventures we have the dwarf, the unethical genius, the unfaithful wife, the unwilling

sex. Benedict Lambert, marked from birth as an Other, fulfills his place in the world and with the help of the burgeoning science of genetics he plays the monster.

I hear overtones of Richard III here in the marked figure of Dr. Lambert. He is charming even while “evil,” sympathetic even while committing unethical acts. Some of Dr. Lambert’s problems do seem to be a function of his personality and his choices more than his condition: for instance, he meets other achondroplastic dwarves who live seemingly fulfilling lives of their own. Jean stands as a possible love interest when they first meet, and they become friends soon enough when they meet again as adults. If he were nicer, if he were as charming to certain women as he is to the reader, his condition may not stand as such a social impediment. The origin of his Otherness is clearly a genetic mutation, but his continued exclusion may in some part be due to his inability to rise above his circumstances. Indeed (like Richard III) Lambert wields his condition like a weapon, using it for great rhetorical effect: “The Klosterplatz was the place where fairs were held . . . It was also the place of freak shows, the kind of place where monsters were put on display, the kind of place where people with deformities were exhibited for all the world to gaze at in horror and revulsion and amusement. . . . And you, ladies and gentleman, would have gone to stare. At people like me” (2-3). So while his nature marks him as different, he does not really try to escape from this fate: if anything, he embraces it; he chases it.

The question of Dr. Lambert’s ethics relates back to a much older question of Nature vs. Nurture. Is the story’s climax predetermined by Benedict’s condition? Was his choice of research determined? Certainly his dwarfism seems to condition other peoples’ responses to him, and thus his responses to other people. For instance, the ethical crux of the story centers around his paramour Jean’s indecent proposal that Dr. Lambert use his sperm for her *in vitro* procedure

instead of her husband's, and that he make sure the embryo she gets will grow into a healthy (meaning non-achondroplastic) baby. Dr. Lambert agrees, but demands that Jean sleep with him one last time in exchange for his help in fathering her child: "Did understanding dawn a moment before I made it explicit? Did she realize? It seems reasonable, doesn't it? More than reasonable: logical. Isn't that how babies are made?" (207). The ugliness of his demand – and of what he does with it – reflects the ugliness of the situation as a whole: he is more fit than the "normal" if occasionally violent husband to provide semen for the *in vitro* procedure, but not fit enough to be Jean's husband, or boyfriend, or even acknowledged lover. His progress in genetic engineering does little to change what he sees as his genetically determined situation in life.

There is a cruelty to all of Jean's relationship with Benedict: for her, Dr. Lambert – the dwarf, the geneticist, the friend – never quite registers as a man. She is in an unhappy relationship with her husband, from which she flees to Dr. Lambert, but she does not leave her husband. Her relationship with Benedict is, for the most part, frustratingly platonic (for Benedict, anyway) because Jean does not see Benedict in the same terms she sees her husband. Even when they do start sleeping together the arrangement is largely predicated on a denial of his difference: "I didn't move into the bedroom with her. I suppose I wanted to spare her the fright of seeing me as I was; and as she never suggested that I should, I guess that she was happy to be spared. So it was in all-forgiving and all-absorbing darkness that we actually coupled" (175). As he makes a point of noting, his genitals are normative, and hence, in the dark of a bedroom he is hardly a dwarf at all. Jean's tacit daylight denial of Benedict contrasts with her long suffering acceptance of her husband.

The denial extends to Benedict's paternity in general. Benedict accidentally gets Jean pregnant during their affair, before they make plans to swap *in vitro* samples. She decides to abort the pregnancy, confessing: "The child might be like you. And I wouldn't want that" (179). She gets this abortion with Benedict's aid: as he explains to the abortion counselor, "I'm the father. Not Of Jean Piercey,' I added with a smile. 'Of her child. . . . That makes it pretty incontrovertible, doesn't it? The argument for abortion, I mean. No adequate prenatal test. Fifty-fifty chance of ending up like me. Who'd bet a lifetime on the toss of a coin?'" (181). This equation of dwarfism with serious handicap, and thus an ethically permissible cause for abortion, is problematic, as the Little People of America attests: "LPA believes strongly that prospective parents who become familiar with the full, productive lives led by little people will not likely choose termination" ("Frequently Asked Questions"). Jean only conditionally accepts a sexual relationship with Benedict, and she ends it quickly to return to her husband. In her decision to abort her pregnancy with Benedict's child, she is implicitly rejecting Benedict himself. In his decision to support her, he does the same. Even when she does accept him as a potential biological father, she does so with every intention of fooling her husband into thinking that he's the father, denying Benedict full masculinity in denying him full paternity. The prowess of his genetic knowledge does not change his fundamental condition, not in his own eyes, and not in his society's eyes.

Ironically, Jean's husband Hugo also denies Benedict's masculinity, failing to perceive him for the threat that he is, even calling him for advice on getting his wife back:

He settled into one of the armchairs—"nice little place you've got here, convenient"—and it was clear from the way he spoke that he had no idea what

had happened between us [Benedict and Jean] . . . Presumably it was something he would not have believed even if he had been told outright. I have the perfect alibi, don't I?

“I want her back” he said.

“Well I haven't got her.”

He seemed amused at this idea. (187).

The condescension Benedict perceives here is identical to what he gets from Jean; it is based solely on his genetic condition, and not mitigated in the least by his success with genetic science. In short, Dr. Lambert is used by both parties because he is perceived as safely impotent (in the physical sense of “without power”; but also therefore sexually). It is an unfair perception, one against which he understandably chafes. And yet, chafed or not, he seems to stand for it, at least when it comes from Jean. He enables the perception that he is not a threat, perhaps even encourages it, since this allows him to become closer to Jean. The question is, then: was the nature of this relationship – its evolution from casual friendliness to mutual exploitation to the violent climax – somehow predetermined? How much does his appearance shape his role in the world (thus making him somehow genetically determined to be an adulterous cynic) and how much is the result of his own decisions? In short: nature or nurture?

There's another layer to the question of how much Jean and Benedict's relationship was determined by his genetics: her main (stated) reservation seems to be the potential that their children could be born dwarves like him. Whether Benedict could have ever found love as a dwarf with the somewhat small-minded Jean is rendered something of a moot point by his research. His ability to pinpoint the cause of his genetic mutation and (more importantly) to

identify it simply in very early stage embryos – along with his status as a scientist above suspicion – gives him a level of unnatural control over the previously “natural” course of pregnancy. His interference changes the course of nature, and as such, he becomes like a force of nature himself. As Lefebvre says, “To say natural is to say spontaneous” (70). His research allows for the spontaneous division of DNA, the purely statistical chance of Benedict passing on his achondroplasia, to be brought under the control of the scientist. So, over-determined by his situation or simply the result of a poor exercise in free will, Dr. Lambert’s decision to demand sex from Jean is only possible because he has conquered nature, albeit only in a small way.

That Benedict’s demand carries strong overtones of prostitution and rape – two facets of sexuality strongly coded as unethical – associates these sexual codes with the *in vitro* procedure. Genetics becomes like a new sort of sexuality, in the same sense that Foucault mentions in his *History of Sexuality*: “as an especially dense transfer point for relations of power” (103); it becomes politically charged like the Child in Lee Edelman’s *No Future*: “political insofar as the fantasy subtending the image of the Child invariably shapes the logic within which the political itself might be thought” (2). Genetic engineering represents a mastery over nature, a new focal point for exercises of power; it also becomes a new way to write the biological future, and thus a position of structural significance.

The microcosm of Benedict Lambert reflects the macro shift that genetics promises. Dr. Lambert is in a position to choose for or against one genetic trait. Just one trait, note; the ethical implications become even more complicated when you consider that “on average every one of us carries about four harmful recessive mutations. Sometimes, if you are unlucky like me, you carry a dominant one” (252). Even this one decision throws him (and us) into a situation of difficult

decisions and ethical confusion. Although many of Dr. Lambert's actions clearly lack a strong ethical grounding – should one really demand sex as payment? should one enable adultery? – others are more ambiguous. Dr. Lambert is struck, in his moment of decision, with the eugenic implications of choosing one embryo over another on the basis of a genetic trait. There would appear to be a material difference between selecting embryos prepared for an *in vitro* procedure and “euthanizing” grown humans. But just what that difference is, and where it ceases to be meaningful, is a contentious issue. Is Dr. Lambert's intervention really so different from what the Nazi's did to people like him? Is it really so different than the infanticide which is so common in some countries, where babies are left out in the elements to die because they are not the desired gender? Is it really so different from an abortion performed once a fetus has developed enough for ultrasound to identify the deformity? This progression from murdering a grown person to “preventing” life from occurring represents a complex continuity which exists in pre-genetics debates over abortion and family planning. Genetics maps into this debate quite well, because on the one hand, it extends the possible range of human intervention – intervention which may be wise or foolish, ethical or monstrous; and in any case which operates in a different ethical space than mere chance. On the other hand, genetics can potentially provide much more information to inform our choices, though too much information is not always a good thing.

For Benedict Lambert, the decision has other implications as well: is his decision to have a “normal” son really so different from the sexually shunning he has experienced as an achondroplastic dwarf? In choosing against his own genetic condition, Benedict performs an act of self-destruction, one mirroring (at some level) every rejection he has ever experienced. He considers “[Option] 2. select the four achondroplastics, the four stunted little beings, the four

children of Ben, and send them over instead, and curse the whole bloody world and all its machinations and injustices” (239) which would in effect mean giving Jean a dwarf simply to punish her and her husband. Condemning a child to live a life he has repeatedly bemoaned simply for the sake of poetic justice would be cruel, from his perspective if not necessarily from society’s at large (*cf.* Little People of America). But in acknowledging this potential cruelty, Dr. Lambert also acknowledges his life as one he would not wish on a child. He implicitly decries a central facet of his own life. It is unclear whether he chooses against the achondroplastic embryos for the sake of the child (his child) or for Jean’s sake. The capriciousness with which Benedict makes his decision is chilling – surprisingly so considering that the alternative: random genetic drift, which exhibits no consciousness at all and thus no conscience either. We have forever lived in a world where such events were entirely up to fate. In that moment of decision Mawer dramatizes the shift from “spontaneous” to “choice”; from the adirectionality of the genetic drift to the complex intentionality of human intervention; from random and meaningless to ethically charged.

The moment of genetic decision is the moment achondroplastic dwarfism exits nature and becomes a social condition. There is the very real possibility that, through the wide-spread adoption of screening and selection processes, dwarfism would become a thing of the past. The actual scientist who discovered the gene, and consequently discovered the relative ease with which it could be identified in fetuses recommended against testing in most situations, specifically to avoid this ethical quandary; he only recommended testing in cases where two copies of the achondroplastic gene could be present (so a union between two achondroplastic

dwarves), because fetuses with two never survive childbirth (Wasmuth, quoted in Emmons). The Little People of America address the ethics of this extensively on the website:

Some members were excited about the developments that led to the understanding of the cause of their conditions, along with the possibility of not having to endure a pregnancy resulting in the infant's death. Others reacted with fear that the knowledge from genetic tests such as these will be used to terminate affected pregnancies and therefore take the opportunity for life away from children such as ourselves and our children. The common thread throughout the discussions was that we as short statured individuals are productive members of society who must inform the world that, though we face challenges, most of them are environmental (as with people with other disabilities), and we value the opportunity to contribute a unique perspective to the diversity of our society. (“Frequently Asked Questions”)

Dwarfism has long been associated with freak-shows and, in the age of scientific stamp collecting, has long been categorized as a disability. The little people community has made great strides in normalizing perceptions of the condition, yet the ability to choose, for the first time, for or against achondroplastic mutation threatens to restart a serious debate about whether such a condition is “normal” or a disability. In a larger sense, there is the danger that we, like Octavia Butler’s Oankali, may engineer ourselves into mono-cultures. The eugenic implications of Dr. Lambert’s fictional decision (and Dr. Wasmuth’s real life research) are fraught and far reaching, and they only concern one specific genetic trait which affects around 1 in 20,000 people. What about those two traits that each affects 1 in 2 people?

I have been focusing on the genetic implications of Dr. Lambert's decision, but he did more than just select the against his dwarfism trait. He also implies that he selected the gender of his child: "I *do* know he's a boy. I do know he's a boy and I do know he will be tall. I didn't play God, Jean. Unlike God, I chose . . . with something approaching love" (248, italics original). Gender selection has been a reality for humans since the late 1970s, albeit with only about a 70% success rate, or 20% more than leaving it random (Beernick et. al.). The method which allows Benedict to check for dwarfism would also allow him to check the embryo's eventual sex. The questionable ethics of selecting for/against dwarfism are compounded and drastically expanded when applied to checking and choosing the sex of a child. To the extent that Benedict and Jean perceive dwarfism to be an undesirable disability, they have some moral ground to stand on when it comes to selecting against this trait (whether their perception is correct is another matter). When the choice becomes one of sex selection, the ethics would appear to become clearer: the lives of boy and girls have, in principle, equal potential for full and fulfilling lives, thus there is no rational basis for making such selections. For all of human history, all of cultural history, the sex of a child has been randomly determined, and thus often taken to be an essential identity characteristic. A society cannot produce more boys just because it needs to fight a war soon; all a society can do is encourage the production of more children, half of which will be of each gender. Put another way, even if a culture valued one sex over another, there has previously been no way, absent abortion or infanticide, to act on any bias at the level of birth rates. The ability to control this previously untouchable facet brings sex-selection into the same morally conflicted framework which governs the rest of life.

But the ethics of sex selection are no more arbitrary than the ethics of selecting for any trait. As the LPA attest, many Little People live happy and fulfilling lives; Dr. Wasmuth even noted “a case in which a dwarf wanted his pregnant wife to be tested. If the child was not going to be a dwarf, the father wanted an abortion” (Emmons). His reasoning was directly contrary to Benedict and Jean’s: “‘He wanted a “normal” child, and to him, a dwarf is normal,’ Wasmuth says. ‘This is just the other side of the coin. These are not simple issues’” (Emmons). At its heart, this modern-day eugenics brings to stark light our understanding of just what “normal” means. In terms of the sex of new-born children, it has been normal for them to be either male or female, in roughly equal proportion. (Intersexed children present a problem to this model, and were until recently labeled – socially and medically – as abnormal, leaving them to be socially shunned or medically altered until they better fit one of the two accepted categories.) As a society we have long assumed that it is normal to be either man or woman. I make this claim in acknowledgement that, until the civil rights and feminist movements, a certain race of a certain gender was favored, set up as the “standard” against which all Other (women, minorities, foreigners, etc.) were understood. But I do not believe that this amounts to considering non-white, non-males as abnormal. Rather, with apologies to Orwell, white men were simply more normal than everyone else; it was completely “normal” for non-white, non-males to be inferior. Imagine, then, what would have happened if the Victorians (for instance)<sup>27</sup> had the ability to choose or alter the genetic gender and/or racial destiny of embryos. Thankfully, they did not have this technology; but we do. The central thesis of *Mandel’s Dwarf*, in so far as it is a tale of genetic woe, is

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<sup>27</sup> We could also say “The Nazis” or “The Harvard Professors in 1930” or any number of other pre-Civil Rights designations. I say Victorian specifically with Foucault’s chapter “We ‘Other Victorians’” in mind.

surprising similar to one I identified in Butler's *Lilith's Brood*: do not assume that your genetic advancement means you have also made similar ethical advancements.

Now, a small digression: If every family wants a daughter, and keeps having children until they have a daughter and then stop, what would the gender ratio be? (Assume each pregnancy has a 50% chance of being a daughter and a 50% chance of being a son.) The answer is: 1 to 1. That is, if you have 20 couples trying to have a daughter, half will have daughters, and half will have son (10 daughters, 10 sons). Now those who had a son try again, and again, half have daughters and half have sons (10 + 5 daughters, 10 + 5 sons). Expanding this mathematically (since we can't actually have half of a male or female in this scenario), we would get an infinite set of  $10 + 5 + 2.5 + 1.25 + \dots$  for both daughters and sons; infinite sets which converge on the same value and thus, an equal ratio. Of course in real life there may be some temporary discrepancy, with some small favoring for females, but taken over a large population it would be negligible. Thus gender preference could not meaningfully manifest in birth rates even in sex-biased societies. As Mawer dramatically implies, genetic engineering changes the math. Of the first 20 couples, 20 would have daughters and that would be the end of it: the end of sons. There are unacknowledged overtones of this in Slonczewski's *A Door Into Ocean*. The all-female Sharers have, by their own admission, long since bred men out of their society. Although they are presented as utopian, simultaneously more natural and more advanced than the familiar Valans, there are troubling implications to this apparently uncontested decision.

This is an unusual theme which runs through the sampling of genetic-oriented texts: with genetic engineering comes a new and generally negative appraisal of men/masculinity/maleness. Butler alludes to this in *Lilith's Brood* with the Oankali reluctance to breed new males – though

it is worth noting that the Oankali are even more resistant to the idea of *ooloi* constructs, suggesting that maleness, while more volatile than femaleness, is nonetheless safer than unmediated genetic engineering. Slonczewski goes further and suggests maleness is frankly undesirable, so long as there are reproductive alternatives. Only Atwood avoids addressing this issue directly, although her bleakly anti-feminine society suggests many of the same things about the relative places of men and women in the world. Mawer, the lone male writer in my thesis, gives perhaps the most robust explanation of the genetic reason one would want to eliminate men:

I feel obliged to report that in the course of my own research, I, Benedict Lambert of the Royal Institute for Genetics, have discovered an inherited factor that is a *certain* causative agent in criminal behavior. . . . Perhaps this one ought to be the Benny factor. . .

Ninety-five percent of the total British prison population possess the Benny factor; the proportion goes up to ninety-seven percent when you consider violent crime. With sex crime the correlation between the Benny factor and the crime is virtually total, complete, one hundred percent. . . .

You've guessed it, haven't you? The Benny factor is the Y chromosome. Not the possession of an *extra* chromosome, but the possession of just *one*. It is the simple fact of being male. Whenever the biological determinists, the eugenicists, the E. B. Fords of this world, start mouthing their rubbish, remember that: lock up all the males and violence will disappear from the streets. (143-44)

The numbers he cites are similar in those in the US,<sup>28</sup> and they reflect an unpleasant truth about crime and gender. For Benedict (and presumably Mawer as well, since he is the writer putting these words in Benedict's figurative mouth) the statistics are proof positive that claims of eugenics are inherently problematic, since that logic must inevitably lead to the erasure of men altogether, and (he rhetorically asks) who would want that? The irony in this statement is that Benedict does; at least, he willingly participates in a moment of eugenic decision. Perhaps his choice of a male child functions as an attempt to minimize the self-negating impulses of his decision, to put a limit on the uses of eugenics: "fixing" deformity (or more properly, normalizing anti-normativity), is a good reason for cleansing; limiting violence is not a good reason. The eugenic impulse is common throughout my selected works: Atwood's *Crake* attempts to cleanse the entire human population save one friend and a race of genetic posthumans; though to be fair he is a mad scientist. The Oankali are explicitly concerned with crafting a new, superior species; though to be fair they are earnestly working under what they strongly consider a moral imperative. Slonczewski's *Sharers* have bred out males entirely; though to be fair the payoff is a genetically developed utopia which just happens to be a model of eugenic cleanliness, menaced by the very thing which it silently purged untold generations ago. And anyway, to be fair to all, genetics does give an apparently strong scientific grounding for the desire to eugenically "write out" men.

I should note that the literary genetic praxis is not explicitly feminine or anti-masculine, either in its implications or in its cultural treatments. Rather, it seems to be strongly associated with Cyborg theory, which was principally a meditation on the future of feminism. Thus, most

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<sup>28</sup> 7% of US inmates were women in 2009: 1,500,278 men to 113,462 women, according to West et. al.. PDF accessible as of June 18, 2012 at the following link: <http://bjs.ojp.usdoj.gov/content/pub/pdf/p09.pdf>

serious deployments are interested in deploying it to help interrogate and resolve contemporary feminist discourses. But there is more than one way to resolve a discourse. Heather Schell, for instance, offers a nice counterbalance in her study “The Big Bad Wolf: Masculinity and Genetics in Popular Culture.” She notes the preponderance of aggressive male figures in ostensibly female fiction. Of romance novels, she notes:

Because masculine behavior is biologically, that is, genetically based, it doesn't reflect poorly on the hero's attitudes; similarly, in cases in which biological compulsion drives the hero to inflict physical harm on the heroine, we can forgive her for forgiving him. The genetic origin of the alpha male's drive for mastery allows the novels to circumvent the traditional feminist criticism of the genre's seeming validation of battery and other abuse. Resolution finally arrives when the hero accepts that the heroine has a right to basic human liberties (although he does not like them), while the heroine recognizes that her poor mate is helplessly hard-wired to try to dominate her. Their route to compromise is, moreover, facilitated by terrific sex. (119)

She goes on to suggest that this “genetically based” drive to dominate becomes embodied in werewolf figures throughout the 1990s and 2000s, in a sort of mainstreaming of the romance novel solution to feminism: he’s a good guy, except that his blood makes him go crazy whenever the moon is full.<sup>29</sup> The genetic issues here are identical to the ones that Mawer notes (and with which Butler and Slonczewski play) albeit treated in a more facile way. Faced with a choice to either purge or accept these helplessly domineering men, the women in the romance novels

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<sup>29</sup> We can all agree, for the time being, to ignore the irony of linking these explicitly male mood swings to lunar cycles.

accept them. The choice is not explicitly anti-feminist – as Schell notes, the inevitability of the aggression ostensibly excuses the “validation of batter and other abuse” by men. That is, the novels cannot validate the violence on its own terms, because to do so would violate some hard won rules which feminism set down about civil, equitable, humane conduct; but that does not mean such men are therefore censured: a third way is offered, a genetic excuse. Such devices are not anti-woman, but neither are they conceivably feminist. So rather than suggesting that genetic engineering would necessarily lead one to fantasies of male-less societies, I would say rather that it facilitates such fantasies in explicitly feminist texts, like Slonczewski’s. Butler and Atwood, while also feminist in general orientation, treat the issue more complexly, and seem to decide that women are equally doomed in our new genetically engineered world. In terms of a literary genetic praxis, the use is the same throughout: to help resolve feminist issues. They are simply many ways to do this.

Lest we think that gender-scrubbed worlds are purely the purview of feminist science fiction, Mawer helpfully notes that we have achieved small pockets of such in our own time, albeit for capitalist purposes:

In trout hatcheries you don’t want males. Males are inconvenient. Quite apart from the fact that they don’t produce babies, they mature earlier than females and once mature they show aggressive tendencies . . . So, just as with humans, fifty percent of trout are male and fifty percent are female. And your next generation has fifty percent nonproducers, fifty percent that are nothing more than bags of sperm, fifty percent with criminal tendencies.

It’s that damned Y chromosome again.

So this, in trout hatcheries at least, is how it's done.

You rear some female trout (XX, of course), but you dose them with male sex hormone. This turns them into males of a kind. They produce sperm, for example. But genetically they remain XX, and so every sperm cell produced carries an X chromosome. Using these "males" as a source of sperm, every fertilization will be by an X sperm and an X egg. Every baby trout that these "males" father (if you'll forgive the expression) will turn out female. (149)

Mawer's example offers a good explanation of how males could be effectively bred out. For the fish, this process is fundamentally hormonal, since androgen is what induces sperm production. Such a method is possible in fish because while "[i]n numerous species of fish, sex is determined principally genetically. . . . For most fish species the differentiation of the gonad into a testis or an ovary can be strongly influenced by hormonal, environmental or social factors" (Maybank). That is, the genetic process (altering the genetics of a fish population so that all gender-linked chromosomes come out XX) is predicated on a hormonal process (dousing the "father" fish with androgen to stimulate sperm production). This is a blunt sort of genetic engineering, to say the least. It is not far removed from mere selective breeding, which itself functions thanks to changes in the genetic makeup of the creature. This long description of primitive genetic manipulation, so closely following Dr. Lambert's discourse on males' genetic tendency towards aggression, elicits perhaps the perfect response from Jean: "I think that's disgusting," Miss Piercey said, but it didn't stop her eating the fish" (149).

Margaret Atwood's treatment of genetics in her *MaddAddam* books hits a similar note, although the disgusting aspect is more prominent. Jean's reaction is perfect because it mirrors the

contradictions of our emerging genetic engineering. Genetic Engineering is fictionally drawn out and envisioned as a fully formed technology in Butler and Slonczewski. Atwood claims her depictions of genetic engineering to be closely rooted in reality, having only projected it out a small bit, and indeed, her novel contains reference to many real-life genetic experiments and products. But, her protestations of Speculative aside, she also fictionally projects genetic engineering out into the future and in the process, like Butler and Slonczewski, projects on to genetic engineering as well. Mawer speaks from a sort of middle ground: the praxis he describes actually exists, so his projections are more firmly rooted in contemporary discussions rooted in the reality of genetic engineering. Central to these contemporary discussions are exclamations of disgust coupled with robust consumption. Genetically modified organisms, when created via breeding, are perfectly normal; when created via hormonal baths, they are disgusting but delicious; when created in a lab, they are deeply troubling.

With reference to the claim I made in my introduction, that we are now living in a post-natural world (28), “natural” works as a perfect synonym for “normal” in this case. The divergent perceptions seem to come down to pace of change: the countless hundreds of generations separating wolves from poodles reflect a far more gradual, though no less intentional, change than the one generation between Alba (the glowing green rabbit from my introduction) and her biological parents. One is hardly noticed while the other spawns protest novels. One is normal, the other is unnatural.<sup>30</sup> Genetics brings the ambiguity of our lines between nature and culture into uncomfortable focus. For Atwood, such focus is a harbinger of

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<sup>30</sup> As Dr. Murphy noted in the defense of this thesis, there is a material difference between selective breeding and genetic engineering: namely, that genetic engineering can pick one trait from countless millions, while breeding has to include consideration of all those countless millions, as they are all passed on with each new generation along with the desired (selected for) traits.

the apocalypse; for Butler, no less a harbinger, though it also functions to interrogate issues of femininity, race, motherhood, descent, control, and free will, all themselves issues with fuzzy and contested boundaries; for Slonczewski the focus helps to blur the lines together, suggesting that her postulated utopia has grown out of this very conflation of nature and culture. In all three cases, sexuality is implicated, though never quite so directly as in Mawer.

Benedict demands one last night together with Jean as his price for practicing eugenics on his own progeny. This encounter contrasts with the “normal” intercourse Jean and Benedict shared during their liaison—intercourse which resulted, as such things sometimes do, in pregnancy. The first pregnancy, commenced under the usual course of things, is deemed too risky (both for Jean’s fraught relationship with her husband and for the 50% potential for dwarfism) and thus terminated. The intercourse which “results” in her artificial impregnation by a specially chosen non-dwarf, male embryo is explicitly not “normal” – that is, it is anal instead of vaginal:

But it was that. While she buried her face in the pillow and made muffled mouse-sounds of pain, it *was* that. . . .

Afterwards it was soft tears and gentle recriminations and apologies. I couldn’t help myself, I pleaded. You must understand. To possess you as no other ever has or ever will. Very poetic. To take a virginity from you that will never belong to anyone else. Surely you must understand. And she claimed that she did, more or less, although it didn’t seem right, that’s all. Not natural.

But what is natural? Nature is what nature does. Am I natural? Is superovulation followed by transvaginal ultrasound-guided oocyte retrieval

natural? Is *in vitro* fertilization and the growth of multiple embryos in culture, is all that natural? Two months later, in a lab in the Hewison Clinic for Human Fertility, I watched shivering spermatozoa clustering around eggs, *my* spermatozoa clustering around *her* eggs. Consummation beneath the microscope. Is that natural?. . .

Nature is what nature does.

Was Great-great-great-uncle Gregor's artificial pollination natural? (214-15)

Here Mawer hits on a confluence of themes: the instability of the definition for "natural"; the collapsing connection between intercourse and reproduction; the gender associated with this new (pro)creative science; and the violence associated with that new sort of (pro)creation, all wrapped up in one grotesque scene. In their first liaison, Benedict sincerely could not prevent Jean's impregnation, not once their relationship had been consummated *sans* birth control. She could not abide the natural product of that union, and so they artificially ended the pregnancy. His actions were natural, hers unnatural. In this scene Benedict most certainly could prevent himself from doing what he does; he chooses to do it does as revenge, as a poetic violation of Jean which parallels the way that they are violating nature. Is this any more violent or unnatural that what she had done? Or, rather, is it merely a reflection of the nature of their relationship? Mawer, in a sense, inverts Slonczewski. In *A Door Into Ocean* genetics and femininity work together to link the Sharers to nature; in *Mendel's Dwarf* the two are opposed with an implied severance of nature. With his final question, Dr. Lambert brings us to a central question for genetic engineering and, indeed, science more broadly: science can study nature, but can it understand nature? When nature is finally understood, is it still nature? I am drawn to Lefebvre's discussion

of natural spaces – “To say natural is to say spontaneous” (70) – specifically because of these questions. Nature is the origin of the geneticist’s work: Gregor Mendel carefully crossbred sweet pea plants to test his theories about inheritance and to prove that evolution was not an incremental gradient but a series of discrete changes. In doing so, he took the first major step from passively recording nature (collecting stamps, in Rutherford’s sarcastic estimation) to modeling nature, understanding at a more than intuitive level the mechanisms by which nature worked. From this comes control.

Genetic engineering represents a sort of final frontier in the realm of control over nature. As material sciences have progressed, we have been able to construct ever-more durable habitations and transportations. As the electrical power and digital information become ever-more pervasive, we are able to exert much more control over the objects in our life. It is possible to spend most of one’s life without stepping foot in non-temperature controlled environments for more than a few minutes. With genetic engineering, we can begin to extend this sort of influence to the realms of internal environments as well; that is, we can begin to extend the control we are able to exert over the places we live and work to the body which does the living and working. *Mendel’s Dwarf* explicitly plays with this idea, but ultimately settles on an ironic negation: for all his and Jean’s cleverness in tricking Jean’s husband, for all the sophistication Dr. Lambert exhibits in his eugenic experiment on his own progeny, they are given away by a stray genetic marker: “I’ve done my homework, Ben. I know about all this Mendel stuff. And I know that I’ve got blue eyes and Jean’s got blue eyes—well, one of them’s green, but you explained about that, didn’t you?—and the baby’s got brown eyes. That just not possible is it?” (283). For all the work that went into playing God, into specially selecting his own offspring, Dr. Lambert is unable to

control everything. Jean suffers from complications after her pregnancy and goes into a coma. Her son has brown eyes. Hugo, the cuckolded husband, finds out everything and walks into the hospital room and does . . . something, something unpleasant. Mawer never says, beyond hints that it was prosecuted and possibly “premeditated” (291). So while genetics does offer the possibility of significantly greater control, Mawer seems to be suggesting that there are limits even to this. Contra Butler, Mawer seems to be suggesting that no amount of genetic insight will change human nature. There is always a limit to control. And control always comes at a cost.

## CHAPTER 5: MADDADDAM AND THE COMPLETE BREAKDOWN OF NATURE

“The function of science fiction is not always to predict the future but sometimes to prevent it.”

– Frank Herbert (apocryphal)

Margaret Atwood’s first two *MaddAddam* novels, *Oryx and Crake* and *The Year of The Flood*, form the ending point of the literary spectrum I am considering for this thesis. Together they offer a bleak vision of our future if genetic engineering is allowed to run its course, although like Slonczewski she seems to be suggesting that this future is as much the fault of capitalism run amok as anything else – that is, that while the technology is central to the story she wants to tell, its failures are very much tied to the social system rather than innate features of genetic engineering itself. Like Mauer, Atwood’s novel is not considered science fiction by those who sell books, although, unlike Mauer, this generic distinction is ambiguous and contested. Atwood uses genetic engineering in *Oryx and Crake* as a means to dramatize the worst excesses of capitalism. She participates in many of the same conversations as we see in the previous texts, including the role of gender in a genetically altered world, the role of parenting, and of the future of the environment in a genetically altered world. And her books go further than any of my other texts in exploring the ethics of using genetic engineering in a world where definitions of self, Other, and nature have been compromised. In a sense, the very existence of genetic engineering renders old (liberal humanist) boundaries always-already compromised: the cultural systems out of which emerged a practical genetic engineering were themselves built on liberal humanist

understandings of the boundaries between self and other, a humanist conception of the relationship between nature and culture and control; yet these very boundaries are rendered moot by the existence of genetic engineering. A strict division between different species of (for instance) pea plants leads to a complex classification system for these plants and their traits. These classifications of difference lead to theorizations about the origins of the difference, and later of the mechanism for passing on such traits. This theorizing leads to a better understanding of the mechanisms by which the distinct differences are transmitted. But in understanding the mechanisms, we see that visually obvious differences are not so fundamental to (pea plant) identity after all, compromising the mission of clear and distinct classification in the first place. Thus the system for classifying as a means of identity creation leads to its own destruction. For Atwood, the implications of genetic engineering are grim. Instead of collapsing the old boundaries of violent, capitalistic, patriarchal societies, the hybridity of genetic engineering simply allows all these forms to achieve a sort of total victory, followed soon after by a total collapse.

Atwood uses the apocalyptic form in a way that is at once similar to and different from Butler's in *Lilith's Brood*. Like Butler, Atwood situates her story after a global level apocalypse. They do so for similar structural reasons: for Butler the apocalypse lends authority of the Oankali assertions that humanity is fatally flawed; for Atwood it lends a sort of implicit authority to her dystopian glimpses of the world *before* the apocalypse. That is, the apocalypse essentially confirms that things which seem grim and dystopian in the flashback portions of the plot are, in fact, as bad as they seem, because they ultimately lead to the end of the world. And, for Atwood as for Butler, this initial authority eventually becomes questionable: just as the Oankali

eventually admit that they deserve to let humanity make its own decisions (even if they continue to feel at a gut-level that it is cruel to do so), so too does the astute reader start to wonder how much of the apocalypse was inevitable and how much was simply the work of an isolated mad man.

Sorting this question out is made somewhat more difficult by the fact that Atwood rewrote her world's story six years after it first came out. As Atwood describes her novels, "I would say *The Year of the Flood* is not a prequel, not a sequel, but a 'simultaneal' to *Oryx and Crake*" ("On *The Year of the Flood*"). The actions of the two novels take place in the same world and generally during the same time. The perspective of both novels are at once deepened and complicated by the story told in the other. *Oryx and Crake* is told entirely from the viewpoint of Snowman, a survivor of a genetically engineered JUVE virus which wipes out most of humanity. The novel is split between Snowman's travails in his post-apocalyptic world, and his memories of being Jimmy, an upper class kid who grew up in the corporate owned (and secured) Compounds. He is a childhood friend of Crake, the mad scientist and genetic savant who engineers the apocalyptic plague as well as the posthumans who are intended to survive it (called "Crakers"). Jimmy survives because Crake specifically inoculated him against the virus. *The Year of the Flood* follows a few characters who also survive the virus (an event they call "the Flood"). Toby is a poor woman who held, among other positions, a place as a senior member of the God's Gardeners, a religious cult who cultivate gardens on slum-roofs and generally oppose the corporations. Ren, a peer of Jimmy's who remembers him far more than he remembers her (she is mentioned in passing in *Oryx and Crake*, and even then by a different name) is dragged from a life with the God's Gardeners to a life in the Compounds by her despondent mother. She

ends up as a young sex-worker at the time of the Flood, which she survives by being inside her club's quarantine room. The two books overlap, especially at their respective ends, where *Oryx and Crake* ends in a cliffhanger which is partially worked out at the end of *The Year of The Flood*. Throughout both books, scenes of biological devastation mix with descriptions of a world collapsing. My central interest is in the role that genetic engineering plays in Atwood's construction of a dystopian future.

Throughout, I will refer to these books collectively as the *MaddAddam* novels for three reasons: one, in recognition of the possible third in the series which has not been published in time for this thesis but should cast even more light on the world which the first two revealed; two, because this mirrors the title which online speculation and apparently Atwood's publishers have given the two books and their long awaited companion; three, because the two books currently available, published six year apart though they were, deal with an overlapping series of narrative times and places, and since much of my discussion is concerned with the world Atwood constructs and populates rather than the specifics of plot, it is convenient to have a term to refer to the books *in toto*.

As I mentioned in the Chapter 1, Atwood's two novels compare well with Slonczewski's *A Door Into Ocean*. Genetic engineering is central to both worlds, as is the ethical role of science and scientists in shaping these worlds. Feminist concerns are prominent, as well as ecocritical issues. These similar interests manifest, however, in profoundly different ways. Whereas Slonczewski crafts a narrative about an ecofeminist utopia's contact with – and conflict with – a less enlightened (and more familiar) society, Atwood crafts the inverse: rather than embodying an ecofeminist ideal, her world realizes all the fears of an ecofeminist critique; instead of an

enlightened culture's contact with a familiarly flawed culture, the enlightened and unenlightened are both present –and both complicit – in a profoundly flawed culture; in short, instead of a genetically enabled utopia, Atwood writes a genetically devastated dystopia.

In labeling Atwood's *MaddAddam* novels "dystopian" I am in good company, as most Atwood scholars refer to her *MaddAddam* novels as dystopian.<sup>31</sup> Prominently missing from this list, however, is Ms. Atwood herself: "What about *Oryx and Crake*? I would argue that it is not a classic dystopia. Though it has obvious dystopian elements, we don't really get an overview of the structure of the society in it, like the one provided in the epilogue of *The Handmaid's Tale*. We just see its central characters living their lives within small corners of that society, much as we live ours . . . It's an adventure romance—that is, the hero goes on a quest—coupled with a Menippean satire, the literary form that deals in intellectual obsession" ("Aliens" 517). For Atwood this distinction is borne out of her understanding of the structure of "classic dystopias" as being centrally concerned with the society's (unpleasant) structure.

This distinction is partially valid, I think, because it acknowledges the history of the utopian novel with its origins in Plato and Thomas Moore. The classic utopia would be a literary world with a perfect social, legal, political, ethical, military, and/or education systems. Thus the opposite, the dystopia, would share a focus on the systems of the culture and demonstrate their failings. Atwood's contention is seconded by Veronica Hollinger, who contends: "While *Oryx and Crake* borrows freely from Orwellian-style dystopian fiction, it even more obviously plays off Wellsian scientific romances" (457). Put another way, while Atwood does set the novels in a

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<sup>31</sup>For an idea: cf. Bouson "Game Over" 140, 141, 151; Bouson "Using up the Earth" 11, 16, 23, 24; Davis 237, 239, 241, 243; Dunning 86, 88, 98; Hollinger 455, 456, 457; Howells' entire article "Margaret Atwood's Dystopian Visions"; Ku 109; Parry 242; Rao 108, 112; Stael 433; and Wolter 267.

dystopian world, her novels are not concerned with the structures of the governing society, but rather with the stories of specific characters who have the misfortune to live in this world. But this distinction is reductionist as well. The “adventure-romance” aspect of *Oryx and Crake* describes less than half of the novel: the plot is split between Snowman’s unfolding memories and his struggle to survive in the post-apocalyptic world. For much of the first half of the novel, Snowman does no adventuring whatsoever, he simply visits with the Crakers and hides out in a tree. Although he does eventually go off on an adventure, this is still split between many scenes from his memories. So far less than half of *Oryx and Crake* consists of anything which could reasonably be called an adventure, while most of it consists of elements which fit easily into classifications of dystopian and science fiction. *The Year of the Flood* follows the same general progression: the “present” is marked by isolation and a lack of movement, broken up by memories of the past. Eventually something happens which drives the protagonists into action, at which point the appellation “scientific romance” may apply.

The genre of Atwood’s *MaddAddam* books is a source of contention in the literary world, and settling this issue is strongly relevant to my discussion here. Margaret Atwood admits to starting a bit of a row because she “liked to make a distinction between science fiction proper . . . and speculative fiction,” a distinction made “not out of meanness, but out of a wish to avoid false advertising: I didn’t want to raise people’s hopes. I did not wish to promise, for instance, the talking squid of Saturn if I couldn’t deliver them” (“Aliens” 513). It is this very suggestion—that to be science fiction a story must needs resort to fantastical beasts in space—which so offended fans of the genre. In part, it offends because it essentially equates science fiction with the cheapest, least respectable sf stories, as though the genre never left the 1940s serials. It also

implicitly denies that a work which is engaged with the literary canon or ethos can also be rightfully marketed as science fiction. This is probably true. Certainly, many of my favorite sf authors, figures like Atwood, Thomas Pynchon, Jorge Luis Borges, and Kurt Vonnegut, are marketed as literature rather than science fiction. What separates them from authors like Octavia Butler, Ursula Le Guin, Neal Stephenson or William Gibson – writers with big ideas, scientifically informed narratives, and novels which are as engaged with issues in contemporary society as anything produced under the banner “literature” – is far from clear.

But the marketing distinctions are a matter for publishers and bookstores. Atwood’s insistence that what she writes in not science fiction is curious, since she seems to be defending her work from charges of science fiction on grounds of reception theory: “My aim is to avoid false advertising. I’m a child who in youth was disappointed by cereal boxes because it said ‘Amazing Magic Decoder Inside!’ and you would open it up and there’d be this little piece of plastic crap. [laughs] So I don’t want people thinking they’re going to get Martians and galaxies far far away and purchase the book and open it up and there aren’t any of those in it” (“On *The Year of the Flood*”). Setting aside her apparently reductionist assumptions of what science fiction is, it is notable that many fans of Atwood’s novels are the very people leveling charges of science fiction. She writes literature which reads like science fiction; if you believe (as I do) that literature and science fiction are not mutually exclusive, then it is a small step to simply admit that the *MaddAddam* books (as well as *The Handmaid’s Tale*) are science fiction literature.

I belabor this point, brought up in the last chapter as well, to emphasize the literary dimension which genetic engineering has achieved by the dawn of the twenty-first century, and thus to underline the shift in our own perceptions of genetic engineering. This also, I think,

highlights the broader relevance of Cyborg Theory to our contemporary culture, not just as a fruitful theoretical perspective but as a legitimate guide for identity construction. Genetic engineering has become mainstream (or mundane) enough that it can be deployed heavily in a novel, even in a speculative manner, and that novel can still maintain a reasonable claim against science fiction. The conflict over defining Atwood's novels also emphasizes the fact that culture at large seems resistant to accepting genetic engineering as mundane. In a way, this confirms the anxieties central to Atwood's novel about the increasingly central role genetic engineering seems to be playing in everyday life.<sup>32</sup> That many people are unwilling to accept such a plot as merely speculative (rather than full-on science fictional) suggests that these people are unwilling to accept (or acknowledge) how much genetic praxis is present today, or how much more pervasive it will likely be tomorrow.

At one level the distinction between "science fiction" and "speculative fiction" which Atwood insists on making is just a matter of semantics (as suggested by the accepted scholarly designation of sf, which works equally well for both terms, conveniently sidestepping the argument). At another level, though, the distinction is important for what it says about the state of literature (writ large) today. Veronica Hollinger writes specifically about this in her essay "Stories about the Future: From Patterns of Expectation to Pattern Recognition":

[T]he sheer extravagance of contemporary technoscience leads to the implosion of science fiction and science fact – only the future is rich enough to provide us with

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<sup>32</sup> With respect to the current state of the art, it is probably more correct to say "decreasingly peripheral" than "increasingly central"; genetic engineering is still not a fact of everyday life for most people in Atwood's likely audience (educated and Western), but some inroads have been made in this regard. The legalization of cloning in American husbandry, as well as the lack of any labeling requirement, means that genetic engineering could become a central facet of American diets and most people would be none the wiser. Indeed, this is already the case with soybeans and somewhat with corn—that is, animal feed, which is just one step removed from many Western diets.

the image bank through which to interpret the present. But what does it mean to name the present after a narrative genre devoted to the imaginative creation of future worlds? And what about the genre in question? Science fiction is ‘the literature of change,’ but change is exactly what now defines the present. It no longer guarantees the future as the site of meaningful difference. (453)

So Atwood’s *MaddAddam* books are situated in between a realist/literary drive to show the world how it is today and the connotations that such a drive now carries. Namely, our world today, the world which Atwood dramatizes, is so marked by rapid and accelerating technological change that her realist impulses read as science fiction.

The fact that fans of Atwood’s novels (at least those who are also fans of science fiction) continually label them as science fiction—and that scholars who write about *The Handmaid’s Tale*, *Oryx and Crake*, and *The Year of the Flood* uniformly label all three as dystopian—suggests that for all of Atwood’s attention to the realism underlying her use of science, the novels still read as science fiction and dystopia, regardless of her intentions. Many of the dystopian elements do exist in our contemporary world (the environmental degradation, the corrupt security apparatus, the extreme inequality and profound poverty, the sexual exploitation and its internet enablers, just to name a handful). Linking these to apparent neo-conservative corporate consolidations (Atwood is writing in the immediate shadow of 9/11) does not require any tremendous imaginative leap. The extent of environmental change depicted in her novels is extreme (given the apparent proximity of Atwood’s plot to the contemporary world), but it is not outside current projections of the earth two or three generations from now. Nevertheless, the *MaddAddam* novels read as science fiction dystopia, and the reason why, I suspect, is the

centrality of genetic engineering to the plot. Genetic engineering, however close to mundane reality it may be, is still in the literary category of science fiction.

The relationship between Atwood's *MaddAddam* novels and dystopia is very much like the relationship between the novels and science fiction. In an interview posted on YouTube, Atwood delineates why her books would not qualify as dystopias: "I see these books [*The Handmaid's Tale* and *Oryx and Crake*] being referred to as dystopias, ok, that's a whole other term. Dystopia can be one that exists on our planet, it can be one that really does exist today, like for instance North Korea, or it can be on another planet; it just means 'a very unpleasant planned society,' different from a complete breakdown, in my opinion" ("On *The Year of the Flood*"). This is a useful distinction – first because it locates the dystopia in a separate generic space from sf, and second, because it offers an easy definition which would seem to exclude the *MaddAddam* novels from traditional dystopia. In part, it is difficult to classify the *MaddAddam* novels as dystopian because, contra-Orwell, Huxley, or even Atwood herself in *The Handmaid's Tale*, we see little of the world beyond our central characters.

Our broader understanding of the world-system in which Jimmy, Ren, and Toby live is compromised because, as Atwood notes: "We just see its central characters living their lives within small corners of that society, much as we live ours. What they can grasp of the rest of the world comes to them through television and the Internet, and is thus suspect, because edited" (Atwood, "Aliens" 517). However, I believe that the society we see through the cracks is a valid example of a dystopia: the novels suggests that the structure of the society is marked by the unsteady fragmentation we see. Veronica Hollinger again: "Much of the action in the novel takes place in memory, through a series of flashbacks to Snowman's lost life as Jimmy. In these

memories Atwood also outlines the shape of her near-future dystopia. Jimmy has grown up in a society of corporate control and grotesque simulacra” (456). We have no particular need to see the inner machinations of the government because it is hardly clear that there is a government. Presumably some central bank exists to enable commerce between the semi-hermetic Compounds where Science Is Done and the Pleeblands where, as Crake memorably tells Jimmy, “our stuff turns to gold” (*Oryx* 288). But it matters not. Our current society has such mechanisms in place, and in lieu of any textual hints, we can safely assume the mechanisms of Atwood’s “speculative fiction” are functionally unchanged.

As I said above, I do think Atwood’s distinction between “classic dystopia” and *Oryx and Crake* is valid. As she suggests here, classic dystopias are inverted utopias, they are planned societies which go terribly wrong; and, as she suggests, the *MaddAddam* books largely detail the collapse of society altogether, rather than the unpleasant results of a planned society. Can we call the novels dystopian if they do not have any coherent system leading to the “very unpleasant planned society”? I would say yes, because classifying the *MaddAddam* world merely as an unplanned collapse fails to take into account our own society’s relationship with the utopian vision of Francis Bacon, particular as noted in *New Atlantis*. I described this utopian vision more fully in Chapter 2 (*cf.* 33-34), where I suggest that Slonczewski rewrites Bacon’s vision for a more peaceful, feminist world. Atwood, in contrast, presents a society where the Baconian centrality of a university-style education system has gone too far. Rather than a college which collects and disseminates knowledge for the betterment of its society, Atwood shows this system transforming into something monstrous: a corporate-owned, profit-driven, ethically-blind knowledge economy. The collection and distribution of knowledge is still central to her

(collapsing) society, but it has been perverted into a corporate interest rather than (as in Bacon) a public one.

So when Atwood suggests a complete breakdown would better describe her work, I suspect she is referring: first to the breakdown of nature (signified by apparent climate change and the grotesque hybrid animals); then to the breakdown of government (signified by the corporation's undue power over non-corporate interest); then to the breakdown of society (signified first by *Oryx's* movement from an oppressed periphery to a corporate center, then by the actual apocalyptic virus); and finally the collapse of culture altogether (signified by Snowman's loss of identity as Jimmy, by his obsession with losing words; also embodied by the members of the God's Gardeners). These collapses are fundamentally predicated on what I see as a complete breakdown of the boundaries defining (and separating) nature and culture, a breakdown whose proximate cause is uncritical genetic engineering, and whose ultimate cause is the failure of the research model of society, a failure of Baconian utopia.

So, with all due respect to Atwood's distinction, for the purposes of this thesis I will rhetorically side with the legions of published scholars who favor the dystopian appellation. For while the plot is certainly more concerned with the movements of individuals than society at large, the society we do see (especially in *Oryx and Crake*) is explicitly built around a corporatized research model. The hole in Bacon's ideal world is in its more extreme applications: research is done for its own sake, knowledge is pursued as its own end, but this knowledge and research is eventually meant to affect the world in some way. In fetishizing the pursuit of knowledge, the ethics of such a pursuit can be lost; one thinks of early scientists who vivisected animals with the aim of better understanding how bodies work. Modern universities have ethics

boards, and advanced countries have regulations and concerned citizens to make a ruckus, but none of this is necessary to the Baconian method. The collapse against which Atwood sets her stories is one of governance, accountability, and ethics in the face of a relentless pursuit of (genetic) knowledge and (genetic) technology. *Oryx and Crake*, and, I would argue by extension, *The Year of the Flood*, do qualify as dystopian because they depict an unpleasant version of Bacon's planned society – one where the central authority is in thrall of the pursuit of knowledge, but without the corrective moral system of Christianity (which Bacon includes) or government, art, even simple human morality (which Atwood depicts as notably disempowered).

As I noted in chapter 2, Joan Slonczewski's *A Door Into Ocean* also fits the Baconian model, except that hers represents a world where the relationship between the "Solomon House" (the scientific endeavor / the college central to the society's structure) and the society at large has stabilized around the genetic engineering prowess of the Sharers. Slonczewski's cyborg-women are hybrid posthumans who largely fulfill the goals of Haraway's manifesto. For Atwood, hybridity functions differently: chimeras abound, and they function in ways that disrupt previous distinctions between nature and culture. In part, the chimeras are abhorrent because they are created so casually: "create-an-animal was so much fun, said the guys doing it; it made you feel like God. A number of experiments were destroyed because they were too dangerous to have around" (Atwood *Oryx* 51). Those which are destroyed – like the "snats" which are a hybrid snake and rat – do not do much to harm local ecosystems.

Some hybrids, however, do manage to stick around: Rakunks, a hybrid of Racoons and Skunks which "caught on as pets" (*Oryx* 51); Wolvogs, a hybrid of Wolf and dog which "still look like dogs, still behave like dogs, pricking up their ears, making playful puppy leaps and

bounces, wagging their tails. They'll sucker you in, then go for you" (*Oryx* 108); bobkittens, which "were supposed to eliminate feral cats, thus improving the almost non-existent songbird population. . . . All of which came true, except that the bobkittens soon got out of control in their turn. Small dogs went missing from backyards, babies from prams; short joggers were mauled" (*Oryx* 164); the luminous rabbits discussed in Chapter 1. The surviving transgenic animals are uniformly more aggressive and/or invasive than natural species, and thus quickly take over the ecosystem. The not-so-subtle implication of these hybrids reflects the theme and tone of the *MaddAddam* series in general: the products of human ingenuity, let loose without proper oversight, will destroy the world. The sense of global, catastrophic-level climate change also plays into this as well, as it suggests that even prior to the virulent apocalypse the effects of human activity had not just marked its environment, but done so in ways that were unintended and destructive. Similar themes apply to privatization, agriculture, public safety, and lifestyle: "*Remember when you could drive anywhere? Remember when everyone lived in the pleeblands? Remember when you could fly anywhere in the world, without fear? Remember hamburger chains, always real beef, remember hot-dog stands? Remember before New York was New New York? Remember when voting mattered?*" (*Oryx* 63, italics original). The world which Atwood constructs is, over and over again, implicitly marked by some process run amok. Following Atwood, it is clear that these processes were all well underway when she was writing: climate change fears became mainstream, "superviruses" were being discovered (the result of antibiotic mis/overuse), the American administration was preaching privatization, terrorism had drastically changed the foreign policy landscape, etc.

Atwood dedicates little narrative space to these real-world allusions, however. They form the background of Jimmy's life, and certainly the *MaddAddam* stories do function as satiric commentary in that regard. But the focus of the narrative of *Oryx and Crake* is split between Jimmy's life growing up in the Compounds, where the future was being engineered, and Snowman's struggles to survive in the post-apocalyptic landscape Crake has wrought. And these landscapes are marked by two very different genetic creations: the beautiful posthuman Crakers and the most grotesque hybrid of all, the pigoons. These two creations form a convenient binary opposite and, between them, nicely illuminate the position of genetic engineering in Atwood's novels. Unlike the various hybrids mentioned above which disturb the line between nature and culture, the pigoons and Crakers disturb the line between nature and human. Both could qualify as visions of posthumanity, as unwilling cyborgs.

The Crakers are Crake's ultimate creations. Constructed as "floor-models" (*Oryx* 305), they ostensibly show off the variety of possible human genetic modifications. The idea, as Crake casually lays out to an incredulous Jimmy, is to sell these modifications to parents for their children (305). The business idea is that the Crakers "represent the art of the possible" (305) when it comes to human modification. The actual idea behind the floor models, as Crake suggests to Jimmy in bits and pieces which only really come together after Armageddon, is for the Crakers to seed the world with an enhanced version of humans. The Crakers are uniformly beautiful, present in a variety of colors, and have been engineered by Crake to correct everything he thinks is wrong with humanity. Like the hybrids in Butler's *Lilith's Brood*, the Crakers are

putatively non-hierarchical.<sup>33</sup> As J. Brooks Bouson notes: “With their altered ancient primate brains, the Crakers lack the destructive features of racism, hierarchy and territoriality” (“Game Over” 150). The Crakers are, however, at least somewhat territorial: the males regularly urinate in a circle around their habitation in order to ward off unwanted guests (pigoons, wolvogs, and the like). So while they are not designed as territorial with respect to each other, they are territorial with respect to the rest of the world. And since the Crakers are such a small group in the beginning, it is unclear how far their lack of territoriality among themselves would extend as their number increased. Also, there is no guarantee that the Crakers will grow up as designed, as evidenced by their apparent idol of Snowman which shows up at the end of *Oryx and Crake*, as well as their singing march which ends *The Year of the Flood*, both signs of culture which Crake sought to eliminate.

The many “improvements” promised by the Crakers are achieved thanks to Crake’s hard-minded approach to genetic engineering. He constructs the Crakers to be what he considers to be the best possible model of humans. The costs of this project are hinted at occasionally, such as when Snowman ruminates on the Crakers’ ability to purr. This ability, which Crake borrowed from cat DNA after he “discovered that the cat family purred at the same frequency as the ultrasound used on bone fractures and skin lesions” (*Oryx* 156) has some basis in reality – cats do purr at frequencies shown to “improve bone density and promote healing” (Lyons). But grafting this ability onto the Crakers was not a trivial enterprise; even Crake had to work “for years on the purring” and along the way there were “quite a few botched experiments” (*Oryx*

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<sup>33</sup> Lilith notes, in *Dawn*, that for all their insistence on non-hierarchicalism, the *ooloi* seem to function as the centers of households and the decision makers for the Oankali. Her contention is not entirely borne out by the rest of the series, especially with regards to Akin and his negotiations on behalf of humanity, but the incredible control her *ooloi* child Jodahs exhibits toward the end of *Imago* does seem to suggest much the same thing.

156). What ultimately happened to these botched experiments, the “batch of kids [who] had manifested a tendency to sprout long whiskers and scramble up curtains” or the “others [who] had vocal expression impediments,” is never mentioned. But these imperfect models are certainly not among the perfected Crakers.

And, of course, the Crakers’ new life comes at a tremendous cost. Crake kills nearly everyone – for most of *Oryx and Crake* Snowman/Jimmy believes that he is the only human survivor; in *The Year of the Flood* we follow the stories of more survivors who in turn encounter still more survivors, but nevertheless the vast majority of people are dead. Crake’s reasons for doing this are opaque, to say the least, but that he did it is not in doubt. He intentionally inoculated Jimmy (before destroying the vaccine, *cf. Oryx* 346) and left him to take care of the Crakers: “If anything happens to me, I’m depending on you to look after the Paradise Project. Any time I’m away from here I want you to take charge. I’ve made it a standing order” (*Oryx* 320). Oryx makes a similar request: “Jimmy, I want you to promise me something. . . . If Crake isn’t here, if he goes away somewhere, and if I’m not here either, I want to you take care of the Crakers” (*Oryx* 322). Her level of awareness, whether she suspected what Crake was up to, is never clear. Nor, for that matter, are Crake’s intentions ever clear. But the implication, drawn from his continual comments about human flaws, the Crakers’ corrections to those flaws, his insistence that Jimmy take care of the Crakers if/when Crake is gone, and his construction of the JUVE virus all suggest that Crake ultimately decided to wipe out the destructive human race and replace them with something genetically superior. In this, he is much like Butler’s Oankali, although he works on a faster, crueler timescale.

Then there are pigoons, pigs built with the intention of “grow[ing] an assortment of foolproof human-tissue organs in a transgenic knockout pig host – organs that would transplant smoothly and avoid rejection” (*Oryx* 22). These creatures are as fanciful/fictional as the Crakers, even though they are based in reality – the pigoons are based on real-life attempts to grow human organs in pigs (an attempt which is still underway, still largely unsuccessful). But, as Coral Ann Howells summarizes, there are factual issues with Atwood’s claim that these genetic creatures are fully rooted in reality: “A Canadian geneticist has criticized Atwood’s invented creatures like the pigoons and the Crakers as literally impossible because scientists do not have the technology to create them. To this Atwood’s reply would surely be ‘Not yet’” (174, nt. 10). Whether the pigoon is even a practical reality is largely beside the point, however, because Atwood takes her transgenic animals one step further with the project Jimmie’s dad spends much of Jimmie’s youth working on: “We now have genuine human neo-cortex tissue growing in a pigoon” (*Oryx* 56). The growth of human neo-cortex tissue – the same tissues involved with high-level processes like language and critical thinking – transforms the pigoons into an almost human-level creature. Snowman is aware of this, noting it when confronted with a pack of pigoons: “A brainy and omnivorous animal, the pigoon. Some of them may even have human neocortex tissue growing in their crafty, wicked heads” (*Oryx* 235). Toby notes much the same thing when she encounters the pigoons from a distance in *The Year of the Flood*: “‘Get away from there!’ Toby shouts at them. They peer up at her, dismiss her. . . . ‘I’m warning you!’ she yells. Amazingly they seem to understand her. They must’ve seen a weapon before – a spraygun, a stun gun. They squeal in alarm, then turn and run” (*Year* 18). The pigoons are clearly capable of

some level of rational thought: they recognize that Toby is no threat when she is just shouting, but when she gets a weapon they recognize that as well and flee from it.

The pigoons provide an interesting contrast for the Crakers. Both the product of genetic engineering, both represent a hybridization of human and non-human. On the one hand, the Crakers are built with genes pulled from throughout the animal kingdom, they are herbivores whose sexual behavior is strongly regulated by pheromones, they can heal wounds with purrs and fend off animals with distinctively scented urine. Their natural resistance to bugs and the intense rays of the sun leaves them smelling like fruit. For all this, they still have language, and while Crake works hard to eliminate all traces of art from their genome, they still build an idol. The pigoons, on the other hand, are a patchwork of human organs and human brains, all grafted piecemeal onto the genome of a pig. The closeness of pigs and humans has been commented upon for ages – Polynesian cannibals used to call human flesh “long pig,” for instance. The pigoons that both Jimmy and Toby encounter in their respective books operate with a level of cooperation and intelligence which indicates that the practice of growing human brain tissue in the pigs has yielded unintended consequences. Even before they are endowed with human brains, the pigoons are associated more closely to humans than other animals: “Also, to set the queasy at ease, it was claimed that none of the defunct pigoons would end up as bacon and sausages: no one would want to eat an animal whose cells might be identical with at least some of their own” (*Oryx* 23-24). Jimmy in particular identifies with the early pigoons: “‘Pigoon pie again,’ they would say [jokingly] . . . This would upset Jimmy; he was confused about who should be allowed to eat what. He didn’t want to eat a pigoon, because he thought of the pigoons as creatures much like himself. Neither he nor they had a lot of say in what was going on” (*Oryx*

24). The young Jimmy's confusion of the boundary between himself and the pigoon is representative of a larger confusion throughout Atwood's world. In that final line, Atwood most clearly expresses her novels' central anxiety: most of us have very little say in what is going on with regards to genetic engineering. Genetically modified plants are the norm for many agricultural businesses, and cloned animals are sold in the US without any sort of differential labeling (they are banned in Europe).

Two different visions of a genetic future are embodied in the hybrid figures of the Crakers and the pigoons. The Crakers are intentional creations, and the virus which wipes out humanity is similarly intentionally created. The implication is thus that the Baconian utopia will collapse as a function of its own cleverness; or, inversely, that the ultimate result of the tremendous self-knowledge genetics represents is willful self-destruction, as this knowledge both highlight our flaws and provides an apparent solution. The pigoons with human neural tissue (and the apparent ability to reason) represent a contrary vision, one where genetic engineering has gruesome unintended consequences. The pigoons are the extreme case of the argument suggested by the glowing green rabbits: playing god and being God are two different things. Either way, the headlong rush towards ever greater genetic knowledge and genetic engineering techniques is also rushing us towards a ghastly *telos*. Either genetics will enable willful destruction or lead to accidental devastation, but the end result is the same. Like Mawer ironically concludes, even with tremendous advances in genetic knowledge, there are limits to our control. Regardless of whether our posthuman future comes from deliberate or incidental changes, it will be something so different, so alien, as to exclude the human as we would recognize it today: "The whole world is now one vast, uncontrolled experiment – the way it

always was, Crake would have said – and the doctrine of unintended consequences is in full spate” (*Oryx* 228).<sup>34</sup> The cost of a post-genetic future is, for Atwood, frighteningly high.

This point is subtly emphasized by the way Atwood plays with gender roles/issues in her novels. As I noted in the introduction and in Chapter 4, the technology of reproduction is strongly tied to issues of genetic engineering. As I noted in the Chapter 1, there are feminist arguments to be made against procedures like *in vitro* fertilization – “Currently scientific achievements allow women to become mothers through in-vitro fertilization, to control when and where motherhood occurs, to know the sex of their child in advance; in other words, it is possible to give birth to a new life without involving emotions, empathy, and sociability” (Botta 251). Slonczewski takes a contrary approach, and uses artificial reproduction technology as a way to construct a utopia. Butler seems ambivalent, since Lilith does have a large and healthy family, but she gets it in a way she did not choose. Mawer makes a point of showing the male-scientist’s outsider role in the *in vitro* process by allowing Dr. Lambert to not only cuckold another man, but to select for/against his own genetic heritage in the process. For Atwood, the scientific encroachment into matters of reproduction is rendered grotesque. So long as science is a rational and objective pursuit, she seems to suggest, such reproductive technologies will represent a diminishment of the woman’s role in reproduction. Giuseppina Botta concurs: “If fertility can be manipulated and monitored through technology and the female womb is only an incubator in which ovules and gamete react, then the dehumanization of maternity is not a surprise, but a product of the biotechnological era” (251).

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<sup>34</sup> This is the subject of Bill McKibben’s non-fiction book *Eaarth*, in which he describes possible ways of moving forward in a world which has been suddenly and dramatically marked by massive environmental change – the unintended consequences of 20<sup>th</sup> (and 21<sup>st</sup>) century industry.

The most extreme and powerfully dramatized version comes from *Oryx and Crake*, where Atwood simply draws the procedure out to its logical conclusion, allowing for the villain Crake to create a whole human-like species without reference to any particular man or woman. The origins of the Crakers are obscured beneath a mound of scientific intervention. Eggs and sperm are presumably harvested from somewhere, or perhaps he simply confiscated embryos; or, perhaps, the entire process is artificial. Regardless, while Crake hardly works alone on his projects (he has a whole team, which he calls MaddAddam, kept under lockdown until his projects are finished) he is the visionary and the lead designer, and accordingly, while the Crakers are not Crake's biological descendants, they are nonetheless characterized as "children of Crake" (*cf. Oryx* 10, 95, 158). When the Crakers first ask who created them, Oryx, functioning as a sort of mediator and enculturator, answers with "the truth. I told them it was Crake" (*Oryx* 311). The Crakers thus have no mother. The gender consequences are somewhat complicated, in no small part because these distinctions are largely made by Snowman, one man doing the best he can. And in the mythology Snowman spins for the Crakers after he leads them out of their hermetic home, women are not written out: animals become the children of Oryx, thus establishing Oryx's place in the grand mythological scheme of things, not as a mother but as an equal to Crake, just on the natural side of things; a familiar binary encoded onto a new world.

Also, while Crake's project implicitly denies women's role as a necessary reproductive force, this does not necessarily mean that the Crakers are the product of a masculine process, or that women as a force have been written out of Atwood's world. Rather, the lack of a (present, active, traditional) mother functions as a motif throughout the two novels, and this lack may be as culpable as any explicit masculinity. Jimmy's mom runs off (with the help of the God's

Gardeners) when Jimmy is young, taking his pet rakunk with her. His father remarries a woman about whom Jimmy is, generally, ambivalent. Ren, in *The Year of the Flood*, is dragged around by her mother from one radical lifestyle to another, accounting in part for her participation in the world's oldest profession when the world ends. And Crake, as Hilde Stael discusses, has maternity issues of his own, which may account for his overly technocratic approach to the world: "Crake, however, tries to conform to the masculine, technocratic world of the compounds, and completely seals off his inner life. He expels the maternal body, which reminds him of his own mortality and corporeality, to the other side. Thus, he witnesses the horrifying death, the slow decay of his mother's body, yet refuses to be overwhelmed by irrational 'unmanly' emotions" (Stael 438). The point about maternity is well made: perhaps Crake's desire to rewrite humanity (in general) and human sexuality (specifically) is strongly shaped by the lack of maternal guidance in his life, and a desire to fix that. But the equivalence between "masculine" and "technocratic" is problematic, even if such equivalences are in good company. There is no *necessary* connection between technocratic thinking and masculinity; certainly nothing in Atwood's novels suggests this: there are both men and women working in the Corporations described in *Oryx and Crake*, and both men and women in the upper echelons of the resistance movement explored in *Year of the Flood*. Carol Ann Howells makes a similarly unnecessary connection between science and masculinity, even though she immediately notes how this connection is complicated by Atwood: "Though *Oryx and Crake*, told in the third person and focalized through a male narrator, is closer [than *The Handmaid's Tale*] to dystopian masculine discourse (and to the discourse of science), Atwood does manage to surprise the reader, not least by telling her story for the first time from a male perspective and by switching the plot at the

end” (264). I agree with her assertion that, for all its masculine features, *Oryx and Crake* does not entirely follow the mode of a masculine discourse. Snowman is never in a position of power, and Jimmy rarely is. Jimmy is a word man in a world which only values STEM students, and throughout the literary is implicitly set up as a(n unheeded) counterweight to the relentlessly Baconian pursuit of knowledge. Still, I am reluctant to equate the discourse of science with a dystopian masculine discourse, or with a technocratic worldview.

Atwood complicates the gender politics of science by centering her narrative on a man who witnessed everything but did little to participate. Jimmy is never terribly masculine, but neither is he explicitly feminine. The technocratic society in which Crake excels is, apparently, equal opportunity. For instance, while Jimmy is shunted to the marginalized art school Martha Graham Academy (with their motto: “Our Students Graduate with Employable Skills” [*Oryx* 188]) – a school named after the famous female dancer – Crake goes to the prestigious Watson-Crick institute – a school named after the two men who uncovered the structure of DNA. In the school names there is an implicit argument that the arts are feminine and the sciences masculine, but Atwood leave such inferences lightly made. When Jimmy visits Crake at Watson-Crick, the only man explicitly he meets there is Crake; the rest of his attention is spent unsuccessfully chasing women. Similarly, while Jimmy certainly spends a lot of time with women at the Martha Graham academy, he also rooms with a couple of guys and generally interacts with a diverse group of students. The gender break-down of each institute (and each area of knowledge, or way of life) is never clearly spelled out, and the textual clues suggest something like parity rules. And if every major female character yet introduced in the series comes from an exceedingly

disadvantaged position, there are plenty of minor female characters who are as successful as Jimmy or Crake's fathers.

For all his apparent technocratic compartmentalization, Crake seems to be highly aware of sexual issues. He constructs his Crakers with sexual politics in mind, including one major feature with no obvious marketable advantage to pre-apocalypse customers. That is, the Craker's regular mating cycles: "There'll be the standard quintuplet, four men and the woman in heat. Her condition will be obvious to all from the bright-blue colour of her buttocks and abdomen . . . Since it's only the blue tissue and pheromones released by it that stimulate the males, there's no more unrequited love these days, no thwarted lust" (*Oryx* 164-64). There is a pornographic edge to this procedure, with its overtone of "gangbang" and a sense of being "an athletic demonstration, a free-spirited romp" (*Oryx* 165). But the solution is elegant, in its own way. Paternity is intentionally indeterminate, and sex is purely seasonal. If the sexual cycle reads as pornographic to a modern human, Crake took steps to wipe out that perspective, and minus the voyeuristic potential we are left with "[n]o more *No means yes*, anyways, thinks Snowman. No more prostitution, no sexual abuse of children, no haggling over the price, no pimps, no sex slaves. No more rape" (*Oryx* 165). This particular upside even seems a bit utopian, in the least ironic sense. Much like the male-less society of the Sharers in *A Door Into Ocean*, Crake has created a society (potentially) without sexual violence.<sup>35</sup> Like the Oankali in *Lilith's Brood*, or Dr. Lambert in *Mendel's Dwarf*, Crake has utilized genetic engineering to forcefully correct the

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<sup>35</sup> I say potentially in part to reflect the question of how Crakers interact with humans. When Ren and Toby encounter the Crakers, the Crakers become aroused because Ren "smells very blue" ("Flood" 410). Whatever pheromone they are responding to is apparently made by non-Craker women, and its significance is different to human women, a difference the Crakers may not appreciate. The long-term implications of this may be sexual violence, intentional or not (or even understood as such, or not) which could very well undermine the utopian overtones.

ills of humanity. There is an implication here, at least from Snowman's pessimistic perspective, that the *only* solution to humanity's problems is complete destruction. This perspective is explicitly seconded (if less forcefully) by the Oankali in *Lilith's Brood* and implicitly seconded by the Sharers ancestors in *A Door Into Ocean*, which suggests that apocalyptic overtones are somehow inherent in the literary idea of genetic engineering.

Those "natural" flaws which so much of human society attempts to regulate and correct or condemn and eliminate are suddenly rendered mutable by the potential of genetic engineering.<sup>36</sup> But since so much of our social order is currently built on policing the natural body of the liberal human subject, this potential to go in and rewrite what was previously whole and inviolate threatens the entire system. To the extent that such a system is flawed and unjust, this upheaval can be construed as a positive development; and, indeed, that is the current in Slonczewski's *A Door Into Ocean*. But the construction of a new sort of human, as Atwood bluntly dramatizes, is far from a lossless proposition. Rather, it represents nothing short of the end of the world as we know it. This remains true even to the extent that we slowly rewrite our place in the world through less drastic interventions – the animal projects which aim at improving life for people, the energy production which fuels the modern world, the admirable desire of parents who want the best possible life for their children. Even without blunt and (at this date still) fantastical genetic engineering, Atwood envisions a grotesquely changed world. Genetic engineering simply speeds the process up, and in this faster framework, patterns which were previously so slow as to be hidden are rendered starkly obvious. To the extent that *Oryx*

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<sup>36</sup> Here I'm thinking specifically of Foucault's discussion in *The History of Sexuality*, and the historical shifts towards governance of the body, or what he calls "biopower" (140). This particular discourse is explored in depth by Sheryl Vint, whom I quote in Chapter 2, and who has done much work on the intersection between biopower, animal studies, and science fiction.

*and Crake* represents one vision of a possible world which (as this chapter's epigraph suggests) Atwood would prefer we avoided, it offers a bleak diagnosis and little more. Jimmy is fully implicated in the end of the world: he was close friends with the man who ended it all, and he did nothing to stop him.

In *The Year of the Flood*, Atwood's parallel story of life immediately before and after the genetically engineered apocalypse, she moves beyond *Oryx and Crake's* (admittedly compelling) descriptions of ruin and decay and offers some possible alternatives. J. Brooks Bouson describes one such alternative: "Drawing on the idea that environmentalism will not work if it does not become a religion, Atwood mixes together science, religion and environmentalism as she imagines the eco-religion of the pacifist and vegetarian God's Gardeners" ("Using Up the Earth" 18). The God's Gardeners are a good example of what I called "intentionalism" in the introduction: they make use of nature as it is rather than attempt to exploit and control it. However, while Atwood does create an eco-religion with the God's Gardeners, it is not clear that the Atwood does so because "environmentalism will not work if it does not become a religion" as Bouson suggests. Adam One, the charismatic leader of the Gardeners, and his followers do perform the environmentalism as a sort of religion, but in private it becomes clear that the movement is far more pragmatic than orthodox. This reading is supported by the fact that we mostly see the God's Gardeners through the eyes of the agnostic Toby. She is drawn into the Gardeners when their leader, Adam One, rescues her from her brutal boyfriend Blanco. She stays because the Gardeners offer security, and she advances through the ranks of the organization largely because she carves out a reliable life with the Gardeners. But, while the Gardner's teachings do enable Toby to survive the "waterless flood" of the JUVE virus, she has left the

Gardeners by the time the flood strikes.<sup>37</sup> Her survival has at least as much to do with her own cleverness and will as it does with her time in the Gardeners. Her triumph is, in other words, a triumph of Toby the strong woman rather than Toby the environmentalist.

That the God's Gardeners operate like a religion lends a useful spin to the option they represent. Drawing the discussion explicitly back to genetic engineering, the God's Gardeners include many former scientists – Adam One was a corporate engineer much like Crake before he decided to leave that world and start the Gardeners. He and his organization represent an explicit rejection of genetic engineering praxis, but this rejection goes further than simply rejecting one sort of science. Their movement can only cohere, Atwood seems to suggest, if it rejects the purely rational discourses of science entirely. Adam One's decision to create a religion suggests that the way to combat the anxiety-inducing breakdown of nature caused by genetic engineering is to publically reject the systems of thinking which led to genetic engineering in the first place. I find this interesting for two reasons: first, because it implicates the entire scientific enterprise in what is ostensibly a narrower problem. Second, because neither Adam One nor his closest followers actually survive the Flood – they perish soon after gathering together in the aftermath of the virus. Their failure to survive the Flood they predicted (and possibly precipitated) suggests that the Gardeners movement is not the most tenable solution. The radical environmentalism is appealing from an aesthetic sense (their rooftop gardens are some of the few habitations in the series which could be described as beautiful), but this is not enough. In rejecting all of science, the Gardeners seem to be trying to put themselves into a sort of modern Eden, but they are also

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<sup>37</sup> She doesn't just up and leave; the Gardeners are targeted and disrupted because of their association with radical environmentalists. But Toby nevertheless distances herself from the movement, choosing not to stick it out with Adam One and the core of true believers, opting rather to take a job at a beauty salon.

putting themselves at the mercy of those who have not joined them in their rejection. One possible problem with the God's Gardeners is that their leadership is not entirely forthright about their relationship to technology – they still make use of cancer biopsies and have an internet connected computer, for instance. They lack the ideological purity which the other paradise-dwellers, the Crakers, have as a condition of their isolated upbringing. But I think there is also something to be said for the Gardener's naiveté, which mistakes a pre-human nature for a human paradise. In ideologically giving up on science as a whole (and the various societal structures which go along with it), the Gardeners valorize a return to a state of nature. But when they are returned to such a state, they discover the truth of Hobbes's "solitary, poor, nasty, brutish, short."

Against her description of an aesthetically appealing environmentalism, Atwood offers another alternative, one apparently spearheaded by Zeb, the other powerful leader in the God's Gardeners. This option is embodied by a group of genetic engineers, apparently led by (or at least, coordinated through) Zeb who actively resist the corporate world: they release asphalt-eating bacteria, to mess with transportation; they have dissidents working in the compounds to help bring the system down from inside; and, most tellingly, they take as their name MaddAddam, the same name ascribed to Crake's elite team of bio-engineers. In their active resistance, the MaddAddam group seems to embody the ideal of organized resistance. They adhere (broadly) to the ideals of the Gardeners, but they do not deny themselves the weapons of their foes. This option seems to be a bit more appealing, at least in terms of survival rate – we meet a handful of MaddAddam survivors at the end, stationed and well equipped to ride out the Flood. This option is not without its pitfalls either, though.

For instance, Crake makes an early appearance among the God's Gardeners – he smuggles out a tissue sample for biopsy and we learn that his actual name is Glenn. His connection to the Gardeners is opaque, to say the least. Certainly, Jimmy had no inkling of the connection. It is not even clear how Crake manages to leave the tightly controlled Compounds, and his appearance in *The Year of the Flood* is fleeting enough that it offers few clues. But it appears that, for better or for worse, Crake was originally connected to the Gardeners, and it is probable that his is also connected to the MaddAddam group and Zeb.<sup>38</sup> He certainly seems to have plundered their numbers for his Paradise project which built the Crakers and, ultimately, the JUVE virus which wipes out most of human-kind. There is some ambiguity here as to how much the Gardeners had to do with MaddAddam, and how much they had to do with Crake, and thus how much they had to do with the Flood and its consequences. Atwood refrains from clarifying. The suggestion seems to be that, regardless of their intentions, these active resisters turned into the agents of humanity's destruction.

It is not clear how we are supposed to react to this development. I said earlier that Atwood offers some alternatives, but perhaps it is more appropriate to say she imagines a couple of alternatives; neither seems to receive much in the way of an endorsement from her. Regardless, Atwood deploys genetic engineering for a familiar purpose: complete destruction. Rather than using genetic engineering to explain the elimination of men or to affect the eventual end of humanity, she uses it to enact a violent rupture between the human world of invasive technology and the world returned to its natural state. Unlike the apocalyptic overtones in either Slonczewski's premise or Bulter's conclusion, Crake (and thus, Atwood) has returned the world

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<sup>38</sup> If there is a third novel, and Atwood has suggested that there will be, it will apparently focus on Zeb.

to a natural state. Perhaps not natural in the sense of an untouched space: between the genetic hybrids, the global climate change, and the millennia of human industry, the post-apocalypse world is profoundly marked by human activity. But by removing humans from the equation, life can return to a spontaneous course, the world can move on no longer marked by human intervention. In this way, Atwood seems to be deploying Cyborg theory in a novel way: as a pessimistic appraisal of the state of the post-second wave feminist world. Haraway puts the Cyborg forward as a possible means of reconciliation between feminism and a budding postmodernism. Atwood puts it forward as a sign of everything that is wrong in the world. In giving up the cohesion and political power of a clearly defined “feminine” for the feminist movement, Atwood seems to be suggesting that women will lose all their hard-won advances. To the extent that the post-modern boundary disruption is inevitable, this loss is inevitable too. The only really resolution, she seems to suggest, is to throw it all out and start over from nothing.

## CHAPTER 6: CONCLUSION

“I could not persuade myself that the men and women I met were not also another Beast People, animals half wrought into the outward image of human souls, and that they would presently begin to revert.”

– H. G. Wells, *The Island of Dr. Moreau* (245)

I suggest, in Chapter 1, that “The trend across time for these stories is one from optimism to dread” (17), and I stand by the assertion. This apparent movement is most obvious when comparing Slonczewski to Atwood. Slonczewski’s deployment of genetic engineering is nothing short of utopian, while Atwood’s deployment is starkly dystopian, and they are writing approximately twenty years apart. In this time genetic engineering milestones were achieved, such as the first successfully cloned mammal – the sheep Dolly (1996) – which was soon followed by successful cloning of nearly every variety of farm animal; the human genome was fully mapped (2003); genetic splicing of disparate animal became a reality. In short, over the time period between the earliest text – *A Door Into Ocean* (1986) – and the latest – *The Year of the Flood* (2009) – genetic engineering made the leap from theoretical to practical. Concordantly, the literary deployment of genetic engineering seems to have shifted from utopian optimism (Slonczewski) to utopian pessimism (Octavia Butler) to cynical realism (Simon Mawer) and finally depressed dystopia (Margaret Atwood). But, while this trend does seem to be unfolding over time, it is important to note that there are other potentially fruitful explanations which account for this variation.

For instance, as I emphasized in Chapters 4 and 5, there are also important generic considerations at play – not even so much in the marketing of the texts as in the orientation of their authors. Perhaps the apparent shift from optimism through ambivalence to pessimism has less to do with time passing and more to do with generic expectations. The more “literary” and respectable the author, the less positive their deployment of genetic engineering. Optimistic approaches to the potential of scientific developments may be less a factor of time and more a factor of genre: those who write of science’s potential as a positive are classified as science fiction writers, while those who cast a skeptical eye to science’s potential are labeled literary. This may account for the “science fiction” classification of Neal Stephenson when his first novel, *Snow Crash*, is set (like Atwood’s *MaddAddam* books) in a bleak ultra-consumerist society where (as in the *MaddAddam* books) the government has all but disappeared, and believable extensions of contemporary technology dominate the plot (as in Atwood’s story). But his story is not relentlessly bleak, it is barely even cynical; rather, it is ironic and humorous, and if the world is dystopian, the plot is not.

There are also issues of scientific literacy to consider: Joan Slonczewski is a microbiologist at Kenyon College, and has published numerous articles in biology journals.<sup>39</sup> Her perspective on genetics, what it can and can’t do, is thus strongly rooted in a scientific perspective. When she describes the “lifeshaping” of her utopian Sharers, she avoids issues like cloning, or massive modification. Rather, much of the lifeshaping occurs at the level of microbes: the breathmicrobes which change their skin color, the eggs which must be modified

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<sup>39</sup> Her specialty is *E. coli* – Sherryl Vint notes: “In her research she [Slonczewski] explores the relationship between humans and *E. coli*, asking how and why some strains enhance human digestion while other can cause illness and death. In her fiction, Slonczewski similarly considers how communities can be formed among different subjects with competing interests and needs, how the relationship between the environment and various subjects can be conceived in terms beyond the metaphor of parasitism” (“Theorizing the Global”).

for fertilization, the seed which grow into life-rafts. Although the potential for such genetic engineering to wreak havoc is still present, the spectrum of potential applications is apparently limited, thus neutralizing the potential of genetics somewhat.

Atwood, contrarily, has no immediate scientific background, though she is the child of an entomologist. When she “speculates” from current technology, her speculation is grounding in a far different perspective than that of the scientist.<sup>40</sup> For instance, while there are real-world attempts to use pigs for organ harvesting, these cutting edge attempts have more to do with genetically modifying the pigs’ own organs to be more compatible with humans than simply growing organs in pigs. This may still seem like a grotesque deployment of genetic engineering, but it does not represent a significant shift in the literary value of genetic engineering. Atwood deploys the metaphor to suggest that anything whatsoever can be grown or manipulated in any arbitrary being; genetic engineering as a praxis which collapses nature and culture completely. A scientist like Slonczewski would likely note that there is a significant and possibly insurmountable distinction between small tweaks to the genetic code and wholesale alterations. When Atwood projects out from a creature like Alba – the transgenic glowing rabbit from the introduction – she does so without knowing whether this sort of modification was simple or complex. The fact that it is where Kac and his artistic/scientific team started suggests that it was low-hanging fruit.

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<sup>40</sup> I should note here, in response to a question in my thesis defense, that I am in fact a huge fan of Margaret Atwood’s work. I was first introduced to her poetry in high school, I fell for her novels in college, and I like *Oryx and Crake* so much I wrote an overlong thesis around it. If, at times, I seem overly critical of her relationship to science (or science fiction) this is largely an artifact of my desire to have her legitimize the science fiction discourse. A peripheral focus of this thesis is an attempt to claim Atwood for science fiction; although ideally she would claim science fiction for Atwood. Her deployment of science in her novels is no more fanciful than the deployment of another of my favorite authors, Octavia Butler. Since we are approaching a time where even literary heavyweights are turning to science fiction themes for their work, I nurse a dream that these heavyweights will eventually recognize some of the overlooked heavyweights (again, I say, Octavia Butler!) as one of their own. If I doth quibble too much with Atwood, it is out of love.

Mawer addresses this issue more obliquely: first, in the choice of eugenics as a related metaphor, and second in his description of the project. Although genetic engineering may seem fantastical and futuristic, Mawer, writing a contemporary story built from contemporary science, links it backwards to older, problematic, and largely discredited discourses—namely, eugenics. There is much room, I think, for an extended study of the connection between genetic engineering (as deployed in literature and in film, specifically) and the eugenics movement of the 19<sup>th</sup> and first half of the 20<sup>th</sup> centuries.<sup>41</sup> Rather than representing a collapse of nature as we know it, for Mawer, the genetic praxis serves to highlight how little progress we have really made, at least if we don't mind the lessons of the past. In this, he is more closely aligned with Atwood than Slonczewski, because Atwood seems to link the genetic praxis with an ultimate triumph of the old world order: genetic engineering may be doing something new, in Atwood's world, but it is nevertheless serving the old.

Mawer, however, restricts the scope of his commentary to one extraordinary man in surprisingly ordinary circumstances. He highlights the potential (and often unacknowledged) complexity of genetics in his description: dwarfism is caused by one mutated gene; moreover, it is easy to detect very early in development because its manifestation is marked by a unique chemical signature. This is the very definition of low hanging genetic fruit. He hints at the deeper complexities when he notes the similarities between the Y-chromosome and the genetic disorder which leads to dwarfism: both arise from an easily identifiable “mutation” and both are strongly linked to some undesirable trait (dwarfism in one case, crime in another). However, just

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<sup>41</sup> Michael Rembis's “(Re)Defining Disability in the ‘Genetic Age’: Behavioral Genetics, ‘New’ Eugenics and the Future of Impairment” and Alys Eve Weinbaum's “Racial Aura: Walter Benjamin and the Work Of Art in a Biotechnological Age” are two good examples of this sort of study, although neither deals with Mawer specifically, *Mendel's Dwarf* would be a good fit in either study.

identifying does not necessarily lead to sophisticated genetic solutions; if anything, it just creates more problems. We can identify the gene responsible for dwarfism, or strongly associated with violent crime, but thus far the only way to “fix” either is simply to select against them. This is sort of like lowering lung cancer rates by shooting smokers. Or take the issue of intelligence, which Dr. Lambert notes is associated with hundreds of genes and located in none of them. When it comes to intelligence, there is no way to even select for or against the trait: the complexity is too great. I don’t mean to suggest that Mawer is more genetically literate than Atwood (they both seem to have done their homework) but by restricting himself to the present, to actually realized technologies, he avoids making fantastical assumptions about genetic engineering’s impact on our future. Perhaps not so coincidentally, his novel is much less grim than Atwood’s; he writes a cynical and bitter vision of the world, but the tragedy is contained, and does not play out over an apocalyptic scale.

Butler fits somewhere uncomfortably between the two extremes. She was not a scientist, but she was a well-regarded science fiction writer. She spent most of her career working with the praxic possibilities of scientific advancements. So if her deployment of genetic engineering was not strictly believable based on current science, neither did it contradict this science.<sup>42</sup> This lack of contradiction is probably the most important characteristic of science in good science fiction: the science can be fantastic, but it must still somehow fit into what is currently known. So rather than constructing a discourse around the science of genetic engineering, Butler builds from this science a useful metaphorical system for telling a story about many things, just not genetic

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<sup>42</sup> We still have yet to make bodies just reabsorb cancer, for instance, although there is particular no reason this could not happen.

engineering.<sup>43</sup> Consequently, her use of genetic praxis is less bleak than either Mawer's or Atwood's. Butler's pessimism comes from the inherent flaws of the human condition, flaws which can be fixed with genetic engineering if we are willing to pay the cost: that which makes us human.

I think there is also something to be said for the distinction between scientific theories, which exist as potentials for future implementation, and scientific praxis, which has been implemented and embodied already. When looking at the potential of some new praxis, you are free to choose from any of a variety of outcomes, and can thus be as optimistic as you please. When dealing with an actual, enacted praxis, the variety of potential outcomes shrinks considerably, and you are more pressed to account for the ways life has not become perfect as a result of this new technology. I hasten to add that the purpose of this thesis has not been to specifically track the *changes* in genetic engineering as a literary metaphor. I am also interested in how this metaphor stays the same across perspectives, across authors, and across time. I have attempted to chart the contours of genetic engineering as a metaphorical function in a variety of texts. The issues of gender, sexuality and reproduction, the environment, and the ethics of free-will reoccur across the selected texts.

I start with gender, although "sex" would be more appropriate, because I am specifically speaking of the division between male and female, rather than masculine and feminine. I use the

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<sup>43</sup> This may seem like an odd claim, especially given how much space I've devoted to her work. I would say that Butler, like Slonczewski, explicitly uses genetic engineering as a literary praxis, as an acknowledged metaphor, to enable and flesh out her discussions of gender, race, environment, biological determinism, and free will. Atwood, by contrast, comes close to claiming that the *MaddAddam* books are principally concerned with the real development of a real scientific enterprise in a real society. Thus I would say Atwood does write specifically about genetic engineering, as well as deploying it as a metaphor for her discussion of gender, capitalism, feminism, and such. The two are not mutually exclusive, nor are they mutually dependant, although I would say you cannot have a literary discussion of real genetic engineering without also encountering its (Cyborg/posthuman) theoretical roots.

more culturally contingent term of gender because while the genetic issue is about a person's sex, the literary dimension is one of sex presentation, or the way that sex (that genetic category) informs how one is in the world.<sup>44</sup> Put another way, sex at birth and gender presentation in culture are directly linked in all these novels. So while the genetic issue is sex, the literary issue could more easily be called gender, with the caveat that gender is, in this case, determined by sex. We see the issue of gender in Slonczewski's exclusion of men from her utopia's history.<sup>45</sup> We see this in the Oankali hesitation in building a human-born male. We see this in Mawer's cynical discussion of the link between the Y-chromosome and crime, and implicitly in his gender selection of his child. And finally, we see this in the starkly anti-feminist world Atwood constructs from a speculative genetic engineering.

I also use the term gender to emphasize the distance between the sex of an individual and the issues of sexuality and reproduction. Though ostensibly related, the latter two terms refer specifically to the ways we produce children – both the physical act which is historically responsible for reproduction, and the science which is (increasingly) actually responsible for reproduction. Specifically, there is a distinct separation of sexuality and reproduction, one which threatens a sort of theoretical rupture between sexuality as a location of control (à la Foucault)

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<sup>44</sup> Even though I am writing about distinctions between “gender” and “sex,” I am intentionally skirting the Queer Theory discourse. These texts are largely operating independent of the Queer discourse because there is no distance between one's biological sex and one's gender identification in any of the novels. The two are effectively one and the same; a common understanding of gender prior to the work of Judith Butler, Eve Sedgwick, and others in the Queer Theory community. I also skirt the issue because none of the novels include much discussion of homosexual relationships, even (surprisingly) Slonczewski's, where the homosexual component is apparently so obvious none of the characters bother commenting on it, beyond some basic explanations of how reproduction can work in a single-sex society. None of the characters from Valedon mention homosexual relationship, and since there were no other options on Shora, no one considers their apparent lesbianism to be indicative of any sexual alterity. Slonczewski gets away with this in part because she is writing in the tradition of new-wave feminist sf where all-female societies are something of a trope (e.g., Joanna Russ's *Female Man*), obviating the need for an in-depth explanation.

<sup>45</sup> Although, again, she does not permanently exclude them; Spinel is fully incorporated, and other men are on their way to “self-namer” status by the novel's conclusion. But the implicit exclusion of men from the idealized Sharer society suggests that, all things being equal, men will disappear from the equation.

and children as metonymic icons of our future (a la Edelman). There seems to be no necessary conclusion on this count, at least across the works I survey; what is consistent is the rupture, not its effects. Sexuality and reproduction are linked in both Slonczewski and Butler, even though there is no technical reason for this.<sup>46</sup> Mawer plays with the distinction, having his characters abort the pregnancy which occurred through intercourse and instead select a normal zygote for *in vitro*. Atwood dramatizes the decoupling through dual elements of a scientific (and thus asexual) creation of the Crakers, as well as through the trafficking of women for sex. This rupture between sex and reproduction reflects the modern age, to some extent: birth control enables essentially the same relationship, albeit in a negative way (that is, it can only prevent pregnancy). With genetic engineering, the rupture is made positive, and thus completed.

Genetic engineering also seems to come with a built in environmental discourse, although again the shape of this discourse is variable. The general geography of the discussion unfolds around questions of the distinction between nature and not-nature, and in particular along the lines of environmental devastation. Slonczewski explicitly links genetic engineering to her Sharer's enlightened and environmentally sensitive society, although the suspicious compatibility of Shora's life forms and humanity implicitly suggests that their environment may not be so natural after all. In Butler this issue manifests in the form of a living spaceship, as well as Earth-bound habitations which will someday grow into ships themselves, stripping the Earth bare in the process. Mawer deals with this obliquely in his discussions of nature vs. nurture, but the implication is the same: what was once natural is, thanks to the intervention of genetic

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<sup>46</sup> Both have the technology to extract the necessary materials, mix them, and implant the fertilized zygote without any sexual contact whatsoever. Nevertheless, reproduction is only shown occurring between sexually connected people – a couple in *A Door Into Ocean* and a quintet in *Lilith's Brood*.

engineering, startling unnatural. Atwood takes this issue the furthest, depicting a near-future Earth infested with genetic hybrids and devastated by overconsumption.

Finally, broadly tied into all the previous issues, there is what I'm calling the ethics of free-will. I do not necessarily mean free-will in the grand philosophical sense (although Butler, in particular, does go there). Rather, I mean something narrower: the ethics of extending the range of (human) free-will into previously spontaneous situations. Slonczewski's whole story is predicated on the notion that the Sharers have survived when so many other Primes were destroyed because they have found the proper ethics for extending human control into all parts of existence: specifically, they predicate their whole culture on an innate sense of reciprocity, which allows them to manage the potentially tremendous influence they could exert over their environment and themselves. The horror and pessimism of *Lilith's Brood* comes from the Oankali's lack of respect for what humans consider free-will – they read what humans biologically “want” and this overrides any conscious decisions that the humans may make. For Mawer, this issue is dramatized by Dr. Benedict's dwarfism (a statistical, random condition) and his scientific breakthrough which allows him to overwrite nature, at least when it comes to dwarfism. Suffice it to say, the intrusion of conscious will into a previously spontaneous situation does not turn out well. For Atwood, this issue resolves itself, in a way, by enabling the creation of a species-ending virus.

I call genetic engineering a literary praxis to suggest that when authors make use of the metaphorical idea of genetic engineering – as a premise for their story, as an element in their narrative, as a concern for their characters, as a condition of their world – they are *doing* something, enacting or inscribing theory into narrative. What this thesis suggests is that genetic

engineering functions as literary praxis for Cyborg theory and the related discourses of posthumanism. The recurring issues we see across the texts are united in their concern with those boundaries we erect to define the self; more to the point, they are concerned with crossing, confusing, and even collapsing these boundaries. The political reasons for which authors deploy genetic engineering can vary. For Slonczewski, this boundary collapsing is distinctly related to the mission laid out in Haraway's "Cyborg Manifesto," namely as a way to reconcile second-wave feminism with a post-modern, post-feminist world, and perhaps as a means of revitalizing a disheartened movement. For Atwood, this boundary collapsing is symptomatic of a world gone mad. But in both cases, the same metaphor is deployed to achieve the same hybridizing effect.

As a metaphor, genetic engineering is particularly well suited for the task of manifesting Cyborg theory. I suspect that this is because genetic engineering is situated across so many boundaries – gender (and thus sexuality), reproduction (and thus reproductive futurism), nature/culture, and the role of free-will in a chaotic world. As this chapter's epigraph suggests, the self/Other, nature/culture, human/animal boundary confusion did not originate with the last few decades of genetic research. But the boundary being tested in *The Island of Doctor Moreau*, born from an imaginative take on vivisection, does not extend to questions of gender, sexuality, or (put broadly) futurity. These questions are more explicitly linked to recent discourses surrounding genetic engineering and Cyborg theory.

This is not to suggest that genetic engineering can or must only be deployed as a means of instantiating Cyborg theory into a text. Rather, I hope I have shown that this is how genetic engineering has been used thus far. So long as the old boundaries are thrown into doubt by genetic engineering, I suspect that this new technology will continue to be used as a literary

means of testing, threatening, and even torpedoing these boundaries. To support this claim, I offer a possible precedent: space. I offer this as a supporting example, one which could be followed up on as possible confirmation for my broader claim.

The argument broadly goes thus: for thousands of years, the skies were a mystery, full of stars and wanderers, signifying something. What they signified varied across time and cultures, but these significations were united in a conception of the skies as generally flat and fairly close. The Enlightenment began the process of destroying this view, but it wasn't until the Victorian age that the true vastness of space was both understood and this understanding broadly disseminated. As a result, the metaphorical place which "space" once occupied was shifted, and so the literary uses of space changed as well. This first came to my attention when I was reading H.P. Lovecraft and noticed a connection to Thomas Hardy's *Two on a Tower*. Although the two may seem like odd bedfellows (they are), they both use descriptions of the vastness of space to communicate a sense of unspeakable horror, the sense of losing oneself in the abyss. I postulated in a conference paper that this concordance is due to the recently shifted image of space in the public imagination. Today, the shift is meaningless to most people, because everyone alive today was born after space was conceptualized as truly vast and mostly empty. Hence, space is not a metaphor with the same horror-inducing currency. Similarly, I suspect that genetic engineering will too someday run its course, and the old boundaries will be refortified or broken down and rebuilt elsewhere, and the literary potential of a genetic engineering metaphor will fade, or at least, change to signify something else.

In the meantime, there are numerous other places where an examination of genetic engineering would be appropriate. There is a case to be made that Stephenson should have been

part of this thesis: his novel *The Diamond Age* is premised on the ubiquity of nanotechnology, mechanical devices which are so small they can operate on the atomic level. This allows for fantastic feats of technology, such as the mass production of diamonds, which replace glass and crystal as the transparent building material of choice in Stephenson's novel. The distinction between mechanical nanomachines and genetically modified bio-organisms is subtle, and may come down to whether the materials are sourced from mineral technologies or organic ones. But at some level even this distinction breaks down: our cells, organic though they may be, nevertheless make use of inorganic compounds in their regular functioning. The overlap between nanomachines and genetically engineered organisms is significant enough as to merit further study. I ultimately decided against *The Diamond Age* because the nanomachines did not function as a literary praxis, at least not in the same way that genetic engineering did. So while the real-world or theoretical overlap between the two may be suggestive, thus far their literary connection is vague.

I restricted myself to novels or series of novels, but this restriction was arbitrary. Many computer games make significant use of genetic engineering as a ludic (game-play) element, as well as a story element. The *Bioshock* series, in particular, comes to mind. In the realm of comics, the *Swamp Thing* series written by Alan Moore in the 1980s offers a very interesting proto-genetic posthuman take on the character, and this element has been maintained to some extent in subsequent *Swamp Thing* issues. Films are perhaps the most studied medium I neglected: 1997's *Gattaca* would be an exemplary case.<sup>47</sup> James Cameron's *Avatar* would work

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<sup>47</sup> And, indeed, it has been studied in this regard before: David Kirby's "The New Eugenics in Cinema: Genetic Determinism and Gene Therapy in *Gattaca*" and Alan Wood's "Genes and Human Potential: Bergsonian Readings of *Gattaca* and the Human Genome" are perhaps the most relevant examples.

as well, although it is less concerned with genetic engineering *per se* and more with issues of disability, ecology, and posthuman embodiment. Television series have broached this issue frequently as well, especially the Borg in the various *Star Trek* series and the Cylons in the *Battlestar Galactica* reboot. The transgenic artwork which created Alba, discussed in the Introduction, has continued, both from Eduardo Kac's group and others. The question of how genetic engineering manifests in extra-literary creative productions is beyond the scope of this thesis, but such a study could be fruitfully cross-referenced with this one to better understand how the idea of genetic engineering operates in culture and the world at large.

One element which I have come to believe could fit within the scope of the study, were there space, is the connection between language and genetic engineering. The nomenclature of genetics is connected to the way we talk about literature: the genetic code is envisioned as a sort of language, abnormal sections of the code are described as misspellings or typos, even the way we encode the biological matter of a strand of DNA is fundamentally literary: as a series of letters. There is a connection, I suspect, between this literary angle of genetics and the use of genetics in literature. The idea of writing and rewriting, especially as it applies to identity, is strikingly similar between the two practices. That is, the idea of re-writing or "writing back" against the center as a way of establishing identity (*cf.* Edward Said, bell hooks, Gayatri Spivak, etc.) offers a fruitful comparison for the writing and rewriting genetic codes as a way of challenging identity.

An emphasis on language appears in each of the texts I study: the utopia of *A Door Into Ocean* is built on a novel linguistic system which conflates subject and object, a conflation which may have profound effects for the understanding of "lifeshaping" – which is to say, for the

deployment of genetic engineering. Octavia Butler relates genetics not to language so much as other senses, explicitly taste. This represents a challenge to idea that genetics functions like a language.<sup>48</sup> However, there are still numerous connections to writing. Specifically, the scene where Lilith is denied any tools for writing – the Oankali enhance her memory instead, so that she has no need to inscribe words in order to remember them. For the Oankali, all information is contained in memories, and their retrieval and manipulation of these memories is similar to the way they (for instance) hold the group discussion to decide the fate of Akin’s request in *Adulthood Rites*. These genetic memories and pheromonal exchanges *are* the language of the Oankali, at least as much as any of their verbalizations. Although they enhance Lilith’s memory, and thus enable her to somewhat experience their “language,” she is never integrated enough – never “Oankali” enough – to fully participate in Oankali discourse. The distinction is thus framed as one between literature (and the modes of thought associated with it) and Oankali genetic language. *Mendel’s Dwarf* explicitly makes use of language-grounded terminology to describe Dr. Lambert’s work, and the genetic project at large, specifically with references of typos in the genetic code. Finally, Atwood dwells on language as an issue in her two currently available *MaddAddam* books.<sup>49</sup> Snowman/Jimmy in *Oryx and Crake* and Ren in *The Year of the Flood* are both associated with words and language – pre-apocalypse Jimmy had a perverse fondness for antiquated words and studied the most literary major available (which is essentially

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<sup>48</sup> This, in case you were wondering, is why I did not pursue the linguistic line of inquiry: it does not fit with the (otherwise) most perfectly situated of my selected texts. I felt that Butler’s implicit rejection of the notion that genetic engineering is a language rendered the issue of language beyond the purview of my study; it was not an issue which came up in each text, and so was not a part of the implicit literary praxis. For the reason detailed below, I’ve come to change my mind.

<sup>49</sup> Atwood has suggested that she will write a third book in this series, one which follows Zeb and the MaddAddam members more closely. Unfortunately, she has not done so in time for this thesis, and so I must simply presume that what is true for the first two novels with respect to genetic engineering will remain true for the third as well. Consider it my testable hypothesis.

advertising); post-apocalypse Snowman lingers on memories of words which (he assumes) will be lost with him, words without any meaning in a destroyed world, words which don't even wait for his death before they leave; Ren's passages in *The Year of the Flood* are written from her perspective much like diary entries, an act which feels transgressive to her because it was forbidden by the God's Gardeners. Both characters are positioned as outsiders with respect to genetic engineering, and both are strongly literary.

Ecocriticism is a theoretical paradigm which I address somewhat tangentially, mostly when discussing the ethics and implication of rendering natural environments fully controllable. I expected, at the start of this project, that ecocriticism would play a much larger role in the literary genetic praxis, since it is (a) so central to my original reading of Atwood, as well as clearly present in Slonczewski and Butler, and somewhat present in Mawer; and (b) a collapse of the category "nature" would imply a collapse of the environment, thus implicating ecocritical concerns. So I was surprised to find that ecocriticism does not seem to play much of a role in the genetic engineering literary praxis. What I found instead was that while the ecocritical discussion is certainly central to any reasonable, philosophical, real-life discussion of genetic engineering, it does not seem to be central to literary deployments. Rather, the issue at hand seems to be the deconstruction of the humanist subject. I would note that I do not push very far into what genetics means for the modern green movement (of which Atwood is a notable supporter), nor do I do much with the broader implications of genetic engineering on our understanding of nature in general. The deconstruction of natural identity seems to be a means to an end (namely, instituting Cyborg theory) rather than an end in and of itself.

There is also room in related studies for a more prolonged meditation on issues directly addressed in Animal Studies. I decided early on to mostly leave Animal Studies on the sideline, largely because Sherryl Vint has done so much admirable work in this field. Also, while Animal Studies is very relevant to Atwood and somewhat relevant to Slonczewski, I knew it was less relevant to Butler and not at all addressed in Mawer. Although animals and the distinction between animal and human are also certainly relevant to any philosophical discussion of the ethics of genetic engineering (ethics which are directly addressed in Atwood's novels), in terms of the literary praxis of genetic engineering, this boundary (like the nature/human boundary) is mostly important only insofar as it affects human identity. In my judgment, Animal Studies necessitates an equally long look at animal identity. Thus I set the issue aside in favor of more universal issues.<sup>50</sup> Both Animal Studies and Ecocriticism may become more important in the genetic engineering praxis as time goes on, as these two discourses are relatively recent, especially compared to the feminist and Marxist movements which Haraway's "Cyborg Manifesto" addresses. Given how central the "Manifesto" is to my reading of genetic engineering in literature, I think it is reasonable to look to Haraway for an idea of where this issue may go in the future, and as she stands as one of the founders of Animal Studies, this will probably be fruitful territory for future scholarship.

There are some real-world developments which may also intrude on the genetic engineering literary praxis: for instance, the growing study of epigenetics, which looks specifically at gene expression. Epigenetics offers a more complex view of the biological determinism implicit in a strictly genetic model. Some genes may give predispositions, but how

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<sup>50</sup> I use universal carefully here, to mean "common to all the texts I studied" and to suggest that they should show up in other texts which fit into the same general category. I do not mean to claim more than that.

the gene eventually manifests or “expresses” often heavily depends on environmental conditions: the ultimate conflation of nature and nurture. This field is not new, but it is starting to get more attention with respect to humans and genetic engineering. If epigenetics does have an impact on popular understandings of genetic engineering, I suspect this will manifest as a greater appreciation of the complexity of life. Dwarfism may be directly and causally related to one altered gene, but psychopathy, for instance, is more likely triggered by certain environmental conditions in conjunction with genetic quirks, and these quirks and conditions may not be stable themselves.<sup>51</sup> A similar complexity has manifested in discussions of the animal kingdom, in particular the metaphor of the tree of life. Evolution has long been visualized as a linear sequence of changes, such that we can trace our genetic ancestry backwards and draw a line (albeit a jagged one) from any given ancestor to us. However, this perspective misses the very important fact that much of our day to day survival is dependent on microbes and bacteria (which digest our food, for instance) and that these do not follow the same linear path as our genetic

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<sup>51</sup> Incidentally, this sort of development is why I insist on categorizing Atwood’s *MaddAddam* as science fiction. It may seem like a reasonable jump from “glowing rabbit” to “wholly altered human beings,” so long as you hand wave in a genius and a couple of decades, but the levels of complexity which separate the two are hard to overstate.

By way of analogy, in physics (which I ill-advisedly studied and even got a Bachelor’s degree in as an undergraduate) it is fairly trivial to solve the equations for the motion of two masses interacting with each other; someone who doesn’t know the math may then assume it will be equally trivial, or at least just a matter of time, before the same can be said of systems with three masses. It’s only one more mass, after all, right? The problem is that the Newtonian equations which behave so well with two bodies completely lose their mind when you have three or more bodies, except in very specific situations. These specific situations are not nothing, and they can lead to lots of spectacular science, but if you move beyond these specific instances at all the system becomes literally chaotic and thus mathematically unsolvable (and again, I would direct the interested reader to James Gleik’s fabulous *Chaos: The Making of a New Science*).

This is the sort of jump between importing one specially selected trait and rewriting an entire genome. What makes Atwood’s two novels science fiction is that she imagines a fantastic creation (the Crakers) and explains it as the product of science. If she’d explained the Crakers as “magic” it would be fantasy. This, by the way, is what makes things like *Star Wars* science fiction in my book as well. Jumping between diverse locales and fighting epic large scale space battles is not inherently science fictional, but explaining the fantastic elements of these things as mechanically (and thus scientifically) feasible is what renders *Star Wars* science fiction. It is fiction built on a fantastic deployment of the tropes, movements, and affects of science. (Okay, this is the last I’ll bring up Atwood and sf, I promise. If I ever write an sf manifesto, I think I’ll call it “Margaret Atwood Writes Science Fiction.”)

heritage but rather are common across vastly divergent species (Lima). If you manufacture a human just from human DNA, you are missing hundreds of other critical organisms which are both essential to and genetically distinct from human life. The centrality of these varied microbes both shapes evolution and confounds it. A broader recognition of this could also complicate our current understanding of the potential of genetic engineering.

I would like to end on a brief justification for this project, and for the study of science in literature in general. What place does English have in discussions of science anyway? First, literary scholars are uniquely qualified to study literary perspective of science. These perspectives may not be identical to science, or the way the scientific discourse views itself (I'd argue that they rarely are), but this does not mean they have no place in the scientific discourse. Only a handful of people truly understand what is going on in any one particular subsection of science, yet our society as a whole benefits (or suffers) from what science reaps. Our society as a whole is also structured such that science can be done. Thus, although few people are scientists, everybody is implicated in the scientific discourse in some small way. Literature is a more broadly accessible discourse, even (or perhaps, especially, given the rabid readership) disreputable forms like science fiction. Literature has as much potential power to shape scientific discourses as scientific discourses have to shape literature. It is the job of literary scholars to try and understand how literature functions. To the extent that literature and science are intertwined, it is the job of some literary scholars to study science as it manifests in literature.

Second, science is made up of a tremendous number of theories, models, and (if I may be a touch metaphorical) possible narratives.<sup>52</sup> Many if not most of these will be rendered obsolete

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<sup>52</sup> I must recommend Neal Stephenson's *Anathem* for a brilliant meditation on this very point.

as the field progresses, but some number will work well enough that they can become instantiated in the real world, becoming scientific praxis. Because science often works with profoundly new and tremendously bizarre ideas, the impact of the transition between science theory and science praxis presents a number of unknown unknowns. Literature is an ideal mechanism for exploring these sorts of unknowns and potentially working out some of the ethics before the actual situation comes up. James Gunn suggests as much when he said: “Science fiction readers are not susceptible to future shock; they were part of the space generation long before anyone else” (*Alternate Worlds* 37). As the pace of technological advancement accelerates, there may be less time than ever before to slowly try out changes, and thus insulation from future shock is only one part of what science fiction (or, more generally, fictional engagements with science) can do. That it is being used even by literary giants suggests that the ethical (emotional, psychological, social) concerns which historically drive literary-minded writers are starting to become best addressed with science fiction. This is a use of literature to not just prepare us for the future, but to shape what our future should be.

Finally, literary studies can comment beyond the level of narrative. I asserted at the end of my introduction that “we are now living in a post-natural world” (28). While I stand by this point, I do not think it is enough to simply note the instability which genetic engineering has introduced to our previously convenient category “nature”; nor is it enough to append an easy “post-” and call it a day. That is the beginning of my project. I would like to end with a minor nomenclature suggestion which may offer some clarity in the decades ahead as we renegotiate just what is meant by nature and natural, and thus how we construct ourselves. Rather than calling the pig from the local factory-farm who is the latest progeny of a millennia-long project

of selective breeding “natural” and the pig’s close cousin who has been genetically altered to grown human-compatible organs “unnatural,” I would offer the term indigenous. Indigenous animals are those which predate genetic intervention. Indigenous environments are environments as they functioned prior to human intervention. (This intervention need not be intentional.) I offer these terms because the boundary damage wrought by genetic engineering – and exploited by literary deployments of the trope of genetic engineering – has already been done. A strict adherence to the old categories may prove unhelpful. Thus, we should take a note from Messrs. Lakhoff and Johnson, and search for new metaphors to help us create new understandings and, in the process, a better reality.

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