

The Rhetoric of Repugnance: Popular Culture and Unpopular Notions in the Human
Cloning Debate

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ABSTRACT

An ethical frame grounded in science fiction literature shaped the discourse on cloning following the announcement of Dolly-the-sheep's birth through nuclear transfer. Using methodologies drawn from the social shaping of technology (SST) and rhetoric of science, my analysis demonstrates how individuals and institutions, including the media, ethicists, policymakers, and legislators, appropriated this ethical frame. In doing so, they employed science-fiction stories as rhetorical tropes, providing the public with a frame for understanding the social issues involved with cloning. However, these institutions used science fiction as a way to simplify and present ethical arguments that silenced dissent rather than encouraged dialog. While ethics discourse can validly make use of literature in debates about technology, such a simplistic view of the literature misrepresents the themes the authors explored in their works and limits discussion. I conclude by offering a deeper analysis and reading of some of these stories, relying on the texts themselves rather than the myths that have evolved around these texts as my primary source material. Such a reading provides a valuable counter-narrative to the on-going debate, one that more adequately explains the effects of technology in a society. In short, this dissertation demonstrates that the reductionist interpretation of works from the science fiction genre had real effects on policy formulation. People utilized their literary-derived perceptions of cloning in political discussions about technology. Thus, policy discussions of the perceived effects of the technology developed much of their meaning and significance from fictional depictions of the technology.

Dedication

In loving memory of my father Hymen Klein (1910-1992)

and

The 32 members of the Virginia Tech community who perished on 4.16.07

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Chapter 1: Technology and Public Discourse

On the morning of February 23, 1997, people woke up to startling news. Across much of the globe, newspapers and television reports announced the successful birth of a lamb the previous July. Scientists in Scotland had created Dolly the sheep through a process of cloning called somatic cell nuclear transfer (SCNT). The scientists had transferred the genetic material from an adult mammary cell into an enucleated egg (having no nucleus), electrically stimulated the resulting embryo, and implanted it into the uterus of an adult sheep. In using this procedure, the scientists had created the first cloned mammal developed from an adult cell (Wilmot et al 811).

In reporting the news to the public, the news media framed the event not as the successful completion of the technology of mammalian cloning but as the potential for the yet-to-be-realized technology of human cloning. Drawing upon references to science fiction books and films, the media stories primarily discussed the ethical aspects of cloning. This focus on the non-existent technology of human cloning shaped the ensuing debate and the arguments used by participants.

Reactions to the news rapidly appeared in newspaper articles and magazine editorials. A *New York Times* article quoted Princeton biologist Lee Silver as saying that the news of Dolly's birth "basically means that there are no limits. It means all of science fiction is true" (Kolata 1A). In an editorial written in *The New Republic*, ethicist Leon Kass argued that the notion of reproducing asexually had developed because of our culture's changing opinions of families and children:

Thanks to feminism and the gay rights movement, we are increasingly encouraged to treat the natural heterosexual difference and its preeminence as a matter of

“cultural construction” [...] Thanks to the prominence and the acceptability of divorce and out-of-wedlock births, stable, monogamous marriage as the ideal home for procreation is no longer the agreed upon cultural norm. (“Wisdom” 18)

The quotations illustrate the two dominant descriptions of cloning used by individuals early in the debate. In making this connection between Dolly and science fiction—“science fiction is fact”—Silver acknowledges the role that works in this literary genre have played in creating the concept of the clone in the popular imagination. Silver’s notion that all science fiction now becomes possible because of Dolly’s birth represents a technologically deterministic viewpoint.¹ The single technological breakthrough of mammalian cloning would lead, in his view, to the development of other technologies predicted by science fiction authors. In making this statement, Silver ignores technology’s shaping of society and the subsequent effects such a change could have on scientific and technological developments.

Conversely, in responding to the news of the technology, Kass takes a socially deterministic view of cloning.² He believes discussions about cloning only exist because of our culture’s decadence and society’s acceptance of non-traditional families. In Kass’s opinion, social factors drive technological developments in a linear fashion without regard for the nature of the technology.

Both Silver and Kass’s statements fail to reflect an understanding of the means by which culture and technology reciprocally influence one another. The field of science and technology studies explores these relationships and provides insight into the means by which society shapes

¹ Technological determinism holds that a society’s technology determines its cultural and social history.

² Social determinism holds that only social interactions and constructs determine all individual behavior.

technological developments and, conversely, the broader effects of technology on society.

Technological developments do not come about independently of cultural beliefs and values. The acceptance of a technology depends upon more than just technological factors. Likewise, technologies do not exist outside of society. The technologies change the society that employs them in both large- (cultural) and small-scale (individual) fashions.

In this dissertation, I argue that following the announcement of Dolly's birth an ethical frame grounded in science fiction literature shaped the subsequent discourse on cloning. Ethicists had traditionally depicted cloning as a moral issue rather than simply a technological issue. The media appropriated the frame in reporting the story of Dolly by emphasizing the possibility of human cloning in news stories and referencing science fiction literature. Furthermore, national policy commissions considered the ethical aspects of cloning as a primary component of their deliberations. Finally, the U.S. Congress employed a similarly derived ethical frame in their deliberations on human cloning legislation.

In discussing the ethics of cloning people involved in the debate used oversimplified analyses of science fiction stories, making reference not to the works themselves, but to the myths these works had developed into over the years. These institutions used a reductionist vision of science fiction that emphasized hazards to individuals and society without considering the fuller meaning of the stories.³ While I believe that ethics making use of literary tropes can be a valid component of debates about technology, such an oversimplified view of the literature disregards many of the themes the authors explored in their works. I conclude the dissertation by offering a more nuanced reading of the actual stories rather than of the myths. Such a reading

³ By "reductionist," I mean the oversimplification of the meaning of these stories resulting in generalized descriptions of a work such as "*Frankenstein* illustrates how technology hurts society." Such a description ignores many of the author's deeper meanings found in the text and readers' subsequent interpretations of the work.

provides a valuable counter-narrative to ones presented by the media and ethicists involved in the debate that more faithfully reflects the effects of technology in society.

In short, this dissertation demonstrates that the limited and reductionist interpretation of works from the science fiction genre had real effects on policy formulation. People utilized their literary-derived perceptions of cloning in political discussions about technology. Thus, policy discussions of the anticipated effects of technology developed much of their meaning and significance from fictional depictions of the technology.

A Brief Note on Terminology

The word “clone” comes from the Greek word meaning “twig.” A clone is any organism, plant or animal, genetically identical to another creature. A cutting taken from a plant contains the same genetic material as the “donor” plant, and develops as a clone of the original plant. Similarly, many single-cell organisms replicate asexually, producing offspring that contain the same genetic material as the parent. In mammals, identical twins are naturally occurring clones of one another.

Ian Wilmut and his associates used somatic cell nuclear transfer (SCNT) to create the sheep Dolly in 1996. Scientists have used this technique for decades in the production of cloned animals.⁴ Scientists take a somatic cell—any body cell other than eggs or sperm—and remove the DNA from its nucleus. They introduce the genetic material from the cell into an enucleated egg (an egg with its nucleus removed) from the same species. Scientists electrically stimulate the embryo formed from the DNA and enucleated egg. The scientists then allow the embryo to grow in culture. In the case of Dolly, Wilmut then took the embryo out of culture and implanted it into the uterus of an adult sheep.

⁴ See chapter 4 in Ian Wilmut’s *The Second Creation* for a history of animal cloning research.

For the first time, Wilmut's research successfully used an adult, differentiated somatic cell for the process of nuclear transfer. While scientists previously used nuclear transfer in cloning, they always used the nuclei from undifferentiated cells that had not become a certain type of cell, such as skeletal, muscle, or skin. Wilmut's research demonstrated that differentiated cells—in this case, the cell from an adult mammary gland—retain the ability to become any cell type. This meant that, theoretically, scientists could produce a clone of any mammal simply by taking a sample of the organism's DNA.

Scientists can use SCNT for two general purposes: cloning-to-produce-children (or reproductive cloning) and cloning-for-biomedical-research (or therapeutic cloning). In the first instance, scientists would implant the cloned embryo in a womb (as they did with Dolly) and allow it to develop. The resulting offspring would have the same genetic makeup as the individual donating the original DNA. In the second instance, scientists would destroy the embryo while it was still in culture, harvesting embryonic stem cells (undifferentiated cells) for use in medical research. For both purposes, however, researchers use the same initial procedure: SCNT. In this dissertation, unless stated otherwise, I use the generic term cloning to mean the process of cloning humans using SCNT.

Policy Studies of Science and Technology

My analysis falls within the general field of policy studies of science and technology. In recent years, the field has included examinations of the role of language in policy debates, the so-called “policy-as-discourse” types of analysis.⁵ The 1993 volume *The Argumentative Turn in Policy Analysis and Planning*, co-edited by political science scholar Frank Fischer and public

⁵ See Bacchi for an overview of scholars' use of discourse in analyzing the policy decision-making process. See Danziger who argues for the incorporation of classical rhetoric into the training of policy analysts.

planning scholar John Forester, contains essays examining the role of language in policy argumentation. The editors' underlying assumption—"policy analysis and planning are practical processes of argumentation"—guides their understanding of policymaking (2). Their analysis focuses on two components of debate: the claims of an argument (epistemological aspects) and the process of making an argument (performative aspects) (5). In analyzing the language of the policy process, scholars provide insights into the means by which policymakers "make practical arguments that are internally coherent *and* externally compelling" (4). In other words, the most logical argument may fail if the audience does not respond to it in a meaningful manner—similar to Aristotle's notion of the requirement of both *logos* and *pathos* in arguments.⁶ I return to this point of *pathos* in policymaking later in the introduction.

Science studies scholar Stephen Hilgartner extends this policy-as-discourse analysis to include credibility (*ethos*) in his 2000 book *Science on Stage*. Borrowing from sociologist Erving Goffman's work in social theory, Hilgartner uses the metaphor of "performance" in describing the way the National Academies of Science (NAS) construct and deploy arguments. Policy bodies such as the NAS manage their performances through stagecraft, revealing to and obscuring from the public elements of their deliberations (11). This stage management helps establish and maintain the policy body's credibility in the minds of its audience (8). Similar to Fischer and Forester, Hilgartner examines the importance of the presentation of arguments as well as their content.⁷

⁶ According to classical rhetorical theory, practitioners employed three major persuasive appeal in making arguments: *logos*, appeals to logic; *pathos*, appeals to the emotions present within members of the audience; and *ethos*, appeals to the character of the speaker.

⁷ Hilgartner addresses some of the criticisms of his work, namely that the study focuses too narrowly on three reports thus failing to provide insights into larger issues of policy analysis, in his essay "The Credibility of *Science on Stage*." He states that reflection, not reformation,

My dissertation differs from much of the scholarly work conducted in the field of policy studies in an important sense. Instead of privileging the language of scientists and policymakers, I also examine how non-scientific actors such as the media and ethicists communicate scientific information with other non-experts. This provides a much richer description of the role of society and culture in policymaking decisions by ignoring certain lay-expert distinctions amongst participants in the debate.

In addition to analyzing the role of language in debates, policy studies of science provide a framework for understanding the role of artifacts in scientific debates. The work of Langdon Winner, among others, on the politics of technological artifacts informs an analysis of cloning technology. In the 1980 essay “Do Artifacts Have Politics?” Winner argues, “artifacts can have political properties” (22). Winner describes two ways this politicizing occurs:

First are instances in which the invention, design, or arrangement of a specific technological device or system becomes a way of settling an issue in the affairs of a particular community.... Second are cases of what can be called “inherently political technologies,” man-made systems that appear to require or to be strongly compatible with particular kinds of political relationships. (22)

In other words, either scientists and engineers can purposely construct technological artifacts as a political tool or society can view an artifact as political given the artifact’s role in the broader social context.

Winner discusses Robert Moses’s design of bridges on Long Island as an example of the

served as the main goal of his analysis of the NAS (450). Like Hilgartner, my analysis of the cloning debate serves as primarily a descriptive rather than normative analysis. However, in providing a more nuanced reading of science fiction texts invoked by those in the debate, I do provide an example by which those engaged in public policy can more fruitfully utilize literature as a site of inquiry.

first instance (23). Moses designed numerous low-hanging overpasses for the island, making it impossible for public busses to drive under them. This design feature had the effect of keeping those who usually took public transportation, the poor and racial minorities, from traveling to the beaches and other areas on the island. Members of the upper classes who drove private automobiles had no such limitations imposed on them by the overpasses' low clearance. The bridges served as a means of segregating the island based on race and class.

Some have criticized Winner's interpretation of the political significance of Moses's bridge designs. In his essay "The Turn to Technology in Social Studies of Science," sociologist Steve Woolgar faults Winner's connection of the effects of the bridges' design with the motivations of the designer (34). Woolgar finds that such an interpretation demonstrates assumptions of causality: "The preferred reading of the character of the technology is supported by a statement of the 'actual effects' of the technology in question" (35). In other words, Winner has found an outcome (low bridge design) that supports his thesis that artifacts contain politics and then ascribes political motivations to the process of design. Woolgar believes Winner's interpretation provides an oversimplified reading of the design process in that Winner treats as definitive "what might elsewhere be treated...as essentially contingent and contestable versions of the capacity of various technologies" (35).

However, as sociologist Bernward Joerges explains in a counterpoint to this and other criticism leveled at Winner, the real value of Winner's parable about Moses has been its effect on scholars in science studies: "The parable seems to possess a mighty didactic potential, precisely because it is presented as a thing to think with, a suggestive theoretical miniature" (421). While Winner provides a poor example, his thesis opens up the discourse on the political nature of technologies. The way the parable has appeared in subsequent discussions about the

politics of technology indicates the story's rhetorical power.

For the second instance of artifacts having political properties, Winner cites an example from business historian Alfred Chandler's work *The Visible Hand*. Paraphrasing Chandler, Winner argues that "many systems of production, transportation, and communication in the nineteenth and twentieth centuries require the development of particular social form—a large-scale centralized, hierarchical organization administered by highly skilled managers" (34). According to Chandler, implementing and maintaining such systems would have been impossible with "the previously dominant social form, the small traditional family firm" (35).

Opponents of the technology see cloning falling into this latter category of an inherently political technology. Arguments formulated against cloning often appealed to the preservation of the current social order or retaining traditional familial relationships. Adopting cloning would necessitate a reorganization of these social institutions in the critics' view, transforming society in the process.⁸

Of course, the fears expressed in these individuals' criticisms rely on conjecture, as the cloning of human beings remains non-existent as a technology. Science fiction provides the only examples of cloned humans. Those involved in the debate presented these fictitious examples as probable outcomes if cloning occurred. Presenting a history of the fictitious human clone, Peter Poon, former Health Policy Associate at the American College of Physicians, uses the term "science unfiction" in describing "the *process* by which scientific developments both shape and are shaped by the imaginative projections of the nonscientific community" (160). Poon traces the

⁸ In effect, the body of the clone became a contested space with those opposed to cloning seeking regulation of both the process and the product of cloning. Michel Foucault uses the term "bio-power" in describing the state's attempts to control the reproductive processes of individuals. See pp. 143-4 in *The History of Sexuality: An Introduction*.

cultural blending of scientists and ethicists' factual concerns about cloning with fictional portrayals of the technology.⁹

However, Poon stops short of examining the effects this process had on ethical and political discussions about cloning, focusing instead on how society has grown accustomed to the idea of a cloned human. I argue that while society may be accustomed to the concept of cloning, it remains uncomfortable with it—an example of “familiarity breeding contempt.” This feeling directly contributed to the way the media and policy bodies subsequently framed cloning.

SST and the Debate on Cloning Technology

In the argument that follows, I primarily employ the social shaping of technology (SST) framework. Developed by sociologists Donald MacKenzie and Judy Wajcman, SST rejects the technological deterministic notion that “the nature of technologies and the direction of change were unproblematic or pre-determined” (Williams and Edge 868). SST derives from a broader field of study, the sociology of scientific knowledge (SSK). Developed in Britain in the 1970s, SSK “consists of studying the development of a scientific field, and identifying points of ‘contingency’ or ‘interpretive flexibility,’ where, at the time, ambiguities are present” (869). Studies of this nature examine the role of controversy in science, explaining in social rather than scientific terms why certain scientific developments succeeded while others failed. This “symmetrical” style of analysis privileges the role of social mechanisms in the construction of

⁹ In her classic essay first published in 1985, “A Cyborg Manifesto,” feminist theorist and philosopher Donna Haraway explores the concept of the post-modern human by using the metaphor of the cyborg: “a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction” (149). Haraway argues that the rearrangement of social relations brought about by science and technology has created a new hierarchy she calls the informatics of domination (161). She traces the changes between the old and new hierarchies by offering a series of dichotomies including “the Bourgeois novel/science fiction,” “reproduction/replication,” and “sex/genetic engineering.” Her juxtaposition of these categories prefigures some of the language used in subsequent debates about cloning.

scientific knowledge, as explanations of why one interpretation succeeded “must be impartial to the truth or falsity of the beliefs under investigation” (869).¹⁰

SST recognizes that choices guide technological developments (866). The field also extends the analysis of technology to policy formulation: “By rendering the social processes of innovation problematic, SST has opened up policy issues that had been obscured by technological determinism, and by related simplistic models” (867). SST focuses its analysis on the development of technologies as well as the deployment of technologies. By examining technology formulation from its initial stages, SST can assist policymakers by incorporating the consideration of societal attitudes into their policy deliberations. For example, a national ethics commission acknowledged certain societal attitudes derived from science fiction by discussing fictional portrayals of cloning.

Recognizing a rapid growth in studies of technology, sociologists Trevor Pinch and Wiebe Bijker extended social constructivism to the field of technology in the 1980s. Social

¹⁰ See Woolgar’s 1991 essay for a critique of the turn to technology on the part of sociologists. Woolgar argues that by treating technology as an object of study, sociologists fail to retain interpretive flexibility in their analysis. That is, in stating that a technology has an affect on society, sociologists assume they can describe such an affect. However, this would contradict the sociologists’ notion that the analysis of technologies involves interpretive flexibility:

The construal of a technology as a causal factor seems to imply that there are definitive, identifiable features and characteristics of that technology, whereas the central thrust of social shaping is to suggest that such features and characteristics are contingent, that any such features we would wish to attribute to a technology are the temporary upshot of a series of complex social (definitional) processes, largely due to the efforts of particular social agencies (groups). (31)

Writing two years later, Bijker’s essay on the direction of socio-historical technology studies after constructivism (“Do Not Despair”) states that Woolgar “was confusing autobiography with historical analysis” when Woolgar claimed that sociologists were simply turning to technology as another subject of inquiry (132).

See also Star for an analysis of the relationship of sociology of science and technology to the larger field of sociology. Star argues that “science and technology are the vehicles for analyzing some very old questions” in the field of sociology (197).

constructivism holds that people create their reality by agreeing on what counts as knowledge in an ongoing process. In their essay “The Social Construction of Facts and Artifacts,” the two discuss the differences between SSK and their approach, the Social Construction of Technology (SCOT). Rather than exploring the “flexibility” of scientific interpretation, as SSK does, in SCOT “the developmental process of a technological artifact is described as an alternation of variation and selection” (28). In other words, SCOT investigates how members of society choose amongst different versions of an artifact without investigators arguing for the technological superiority of any one version.

The underlying assumption, that people view technologies in different ways, informs SCOT methodology. The exploration of periods when technologies undergo change, resulting in new iterations of the technology, reveals these different perspectives. SCOT explains the relative success and failure of deploying these new technologies in social terms. By examining the social forces influencing these outcomes, the studies create thick descriptions, resulting “in a wealth of detailed information about the technical, social, economic, and political aspects of the case under study” (Bijker, Hughes, and Pinch 5). These thick descriptions provide a more complex understanding of the nature of technological acceptance without relying solely on the technical aspects of the artifact.

Discourse and Rhetorical Analysis

In addition to SST, I employ discourse and rhetorical analysis as a methodological framework for assessing the cloning debate. Sociologist of science Michael Mulkey’s study of the debates on human embryo research served as an early inspiration for my work. Mulkey examines the role of language used by those involved in the debate, including politicians, scientists, and journalists. While Mulkey’s study focused almost solely on political aspects of the

1980's debate in Britain, a chapter discusses how the media's use of images of Frankenstein illustrated for the public potential problems with embryo research (119-20). The juxtaposition of Frankenstein with news stories about the legislative debates framed the procedure of embryo research as one fraught with dangers of a non-technological nature.

Mulkay's study grew out of his contention that discourse analysis plays an essential role in understanding the work of scientists. In *Pandora's Box*, co-written with Nigel Gilbert, Mulkay and Gilbert write in reaction to SSK, criticizing the field's attempts at deriving "definitive" models of scientific behavior. The two authors observed scientists' discourse as context dependent; it differed dramatically depending on how scientists defined their research methodology. Sometimes the scientists spoke of their research as based on evidence. At other times, the scientists stated that social and cultural factors played a role in their findings. Mulkay and Gilbert rightly felt that the differences embodied by these two ways of generating knowledge posed a problem for sociologists who developed explanations of science based solely upon the discourse of scientists (Shapin 308).

Unlike Mulkay, I examine non-scientific actors and cultural texts. In using this approach, I have situated my work within the recent literature in the rhetoric of science policy. Rhetorical analysis has proven useful in studying the role of language in science policy debates.¹¹ An especially relevant study, Craig Waddell's examination of the role of *pathos* in the decision-making process underscores the way scientists establish authority as they participate in science policy debates ("Role" 381). Waddell's analysis demonstrates that the use of emotional appeals in science policy plays an important role in persuading participants while still allowing for

¹¹ For example, see Bantz, Gross "Public Debates," Killingworth and Steffens, and Waddell "Reasonableness." For the first rhetorical analysis of science policy, see chapter 2 in Weaver's *The Ethics of Rhetoric*.

arguments based on traditional logical appeals. My examination of ethicist Leon Kass's arguments against cloning reveals his heavy dependence on *pathos* in the creation of arguments. Kass uses emotional appeals to convince his audience of the negative effects cloning will have on existing social structures.

Rhetoric of science emerged as a sub-field of science studies in the 1980s.¹² Early practitioners focused their analysis on the works of great scientists. John Angus Campbell's study of the writings of Charles Darwin and Michael Halloran's analysis of the papers of Watson and Crick examined the use of language by scientists in their written works. In the early 1990s, the field's emphasis shifted, moving from an examination of how scientists established authority and persuaded their audience to the nature of science as an institution. Alan Gross's *The Rhetoric of Science* argued that the field of science, itself, was rhetorical in nature, while Charles Bazerman's *Shaping Written Knowledge* examined the way experimental articles produced knowledge.

Jack Selzer's edited volume, *Understanding Scientific Prose*, extended the disciplinary framework in which rhetoric operates. His collection contained studies analyzing a single paper on evolution. Examining an article written by evolutionary biologists Stephen J. Gould and Richard Lewontin, rhetoricians provide multiple viewpoints of rhetorical analysis. Their essays include work from the disciplines of feminist theory, reader-response theory, cultural theory, and post-modern theory.

The flexibility of rhetorical inquiry allows an examination of texts from a variety of genres, including public hearing transcripts, institutional reports, newspaper stories, science fiction films, and literary works. My analysis of these texts reveals the expression of two

¹² For a discussion of rhetoric's contribution to science studies, see Campbell and Benson's "The Rhetorical Turn in Science Studies."

common rhetorical themes: an exploration of the means by which reproductive technologies re-conceptualize the traditional family, and the methods by which our actions construct and define our humanity.

One area of discourse I focus on is the means in which scientists communicate with the public. According to sociologist of health Alan Petersen, scientists often employ metaphors to convey complex information to audiences:

Increasingly, it is recognized that metaphors are inescapable and essential to the creativity and communication of science. When communicating with publics about issues that are complex and involve phenomena and processes that are especially large or small (e.g. molecular) scale, scientists need to find a language that connects with readers and audiences. (Petersen “Metaphors” 204)

Put differently, metaphors provide a framework for understanding complex information.

Scientists often remain unaware of their use of metaphors because the metaphor has become “dead.” This death occurs when metaphors solidify their meanings by becoming synonymous with the things they describe. People use the metaphor and the word for the object it represents interchangeably. A term such as “double helix” originally began as a metaphor describing the spiral-like shape and double-stranded design of a DNA molecule. However, individuals now so closely associate the term with the DNA molecule that the term has become part of the biological lexicon.

The category of “living” metaphors includes examples of metaphors that lack this consistent association with the object of comparison. “Cloning is copying” began as a living metaphor because individuals did not necessarily equate cloning with copying, though the metaphor helped explain the meaning of the term cloning in certain specific contexts. However,

through repeated usage in the recent debate the metaphor has become more closely associated with the technology of human cloning. People opposed to cloning use this and related metaphors in their arguments as both descriptions of the technology and justifications for its rejection by society.

Metaphors also help individuals conceptualize new information. For example, scientists' description of human reproduction illustrates cultural influences on depictions of biological functions. In her 1991 essay on scientific depictions of the sperm and egg in human reproduction, anthropologist Emily Martin provides an example of a conceptual system framed by cultural notions. In her examination of textbooks, Martin discovered that language describing the formation of sperm relied on words with positive connotations. Conversely, words associated with menstruation described it as wasteful. Scientists based these representations on the notion that sperm production represented "something deemed valuable" by our culture, while menstruation did not (487). In characterizing reproduction in this manner, Martin argues that scientists imbued the egg with stereotypical notions of femininity, while the sperm retained masculine characteristics (485). Such descriptions limit the way scientists conceive of reproduction and perpetuate bias by locating the origins of the cultural stereotypes at the cellular level, making them appear natural in origin (500).

Metaphors can also limit the discourse in policy debates about science and scientific research. Rhetorician of science Judy Segal argues that "since biomedicine supplies the terms in which the health policy debate takes place, its metaphors act not only on medicine as it is, but also on medicine as it will be" (218). Segal's contends that metaphors such as "the body is a machine" and "medicine is war" not only frame the way medical practitioners view patients and illness, but shapes the public discourse about policy issues such as access to medical care and

funding of treatment. The “medicine is war” discourse may shape the way doctors describe infection: as a series of foreign invaders bent on capturing or destroying the body’s mechanism for defense. “Medicine is war” necessitates that someone or something loses in the fight to find a cure for a disease or establish a treatment regimen. If doctors see the body as a battlefield in the war against disease, then policy makers may employ the treatment option that produces the least “collateral damage.”

The “cloning is copying” metaphor shaped public discourse by focusing attention on the perceived deficiencies of copies and the seemingly mechanistic nature of cloning. The metaphor implied that the creation of clones would deny individual uniqueness. It also equated cloning with an image of machinery, once set in motion, going about its task independent of human control.

As well as using generic metaphors like “cloning is copying,” individuals in the cloning debate used the names of science fiction works as metaphors. *Frankenstein* and *Brave New World* came to signify the dangers of technological development. Often, people offered no further explanation of the terms beyond their actual use. As I show in chapter 2, these metaphors shaped and limited the nature of cloning debate, focusing discussion on the implied dangers associated with the technology and its potential negative effects on society.

I use the term “cultural accommodation” as a label for this phenomenon of using science fiction references and frames. Cultural accommodation describes the process used by ethicists, members of the press, and other participants in the cloning debate in both informing, and persuading the public of the dangers of human cloning. By using the word cultural, I acknowledge the non-specialists’ use of embedded cultural beliefs, derived from prevailing

science fiction themes, as a context for providing information and as a mechanism for constructing arguments.

I derive the term from Jeanne Fahnestock's discussion of the media's accommodation of scientific facts. Fahnestock's work in the rhetoric of science in the mid-1980s examines journalists' shifting of scientific facts from one genre of discourse to another (277). Journalists and other science writers made this shift as a means of helping the general public understand the significance and scope of scientific developments. In doing so, journalists cast scientific developments as an extension of previous work, or as a mechanism for undertaking subsequent work.

My analysis illustrates a key difference between journalists solely providing scientific accommodation and those providing cultural accommodation. The articles' authors in Fahnestock's study employed a descriptive analysis of science. By contextualizing scientific developments within science itself, the journalists provided information for their audience. Journalists reporting on cloning, however, employed a normative analysis by using cultural tropes from outside of science. By embedding dangers within the process of cloning, the journalists argued that cloning would produce certain negative outcomes for the culture using the technology.

Summary of Chapters

In the remainder of the dissertation, I examine participants' use of culturally informed arguments in debating issues related to the technology of human reproductive cloning. Specifically, I analyze the way those arguing against the implementation of this new technology framed cloning as an ethical issue. Because my dissertation focuses on a non-existent

technology, I pay particular attention to the language opponents of cloning use in constructing the clone as a given “fact.”

In chapter 2, I argue that the media appropriated and employed two related frames in covering the story of cloning. Derived from early practitioners in the field of ethics, these frames shaped the subsequent discourse on the technology of human cloning. The first, an ethical frame, focused on the potential for human cloning and the potential problems associated with the technology. While usually rare, the inclusion of ethics in reporting provided a sense of urgency needed in stopping human cloning from occurring. This approach ignored the historical context of cloning research and the intervening scientific developments necessary for developing successful human cloning techniques.

The second frame used science fiction as a means of forecasting the technology’s effects on society. Because no one had actually cloned a human, the realm of science fiction became the only place one could see the effects of the technology on society. Juxtaposing the factual cloning of a sheep with fictional portrayals of reproductive technologies, the media established a link between present-day society and possible future outcomes. Ultimately, the two frames coalesced into one, with fictional portrayals of cloning providing a moral framework for discussions of the technology, as evidenced by the President’s Council on Bioethics’ (PCBE) methodology in formulating cloning policy recommendations.

In chapter 3, I analyze the rhetoric of Leon Kass, an ethicist, physician, and biochemist who chaired the PCBE. In two influential articles published 4 years apart, Kass argued against human cloning. In the first article, “The Wisdom of Repugnance,” Kass takes a socially deterministic approach, examining the decline in moral and social values that have led us into having a debate on cloning. Grounding his argument in the description “cloning is repugnant,”

Kass argues that feelings of repugnance individuals have when discussing cloning indicate a deep-seated wisdom people should acknowledge. In invoking the literal and metaphorical image of Frankenstein in the article, Kass emphasizes the destructive role clones will have in our culture.

In the second article, “Preventing a *Brave New World*,” Kass changes his rhetorical strategy, adopting a technologically deterministic viewpoint by framing his argument within Huxley’s novel. Rather than focusing on the clone in society and our culture’s decadence, Kass argues that the technology of cloning will take us toward a society similar to the one Huxley described. Kass’s use of science-fiction references belies a reductionist interpretation of the literature: cloning will lead to negative consequences. Only by stopping the use of this technology can we save society from a descent into disillusionment and loss of personal autonomy. The inclusion of literature in the cloning debate must reflect a nuanced reading of the works themselves rather than the myths associated with the works. These discussions should serve as a springboard for further examinations of the topic, not as a means of silencing voices and ending debate.

In chapter 4, I examine the role and function of ethics committees and legislative bodies in formulating policy recommendations. By acting as groups of experts, committees build consensus while limiting participation from non-experts. The two national ethical commissions held hearings on human cloning in part because of fears associated with this potential technology.

The first commission holding hearings, the National Bioethics Advisory Commission (NBAC), paid little attention to public perceptions about cloning, relying on discussions with individuals from constructed knowledge categories, such as science, religion, and law. By basing

their recommendations for a human cloning moratorium solely on safety issues, the NBAC exhibited a somewhat technologically (and genetically) deterministic approach to the role of cloning in society. They realized that the technology could profoundly affect society but they failed to fully recognize the manner in which the public's perceptions of the technology entered into the debate.

Reassessing cloning five years later, The President's Council on Bioethics (PCBE) incorporated different aspects of culture into their deliberations, including discussions on the role of literature in forming the public's perception of scientific advances. The PCBE based its recommendation to ban human cloning on factors other than technological safety, including cultural values, adopting the media's framing of cloning as an ethical issue grounded in science fiction portrayals.

During this intervening five-year period, members of the U.S. Congress held hearings and introduced numerous pieces of legislation banning cloning. The legislative response to cloning, while rarely overt in its use of science fiction metaphors, contained many metaphors directly taken from the debate. The structuring of the congressional hearings, with their use of ethicists as the primary experts, derived from the ethical frames grounded in science fiction literature the media used in covering the story of Dolly. The hearings focused on the potential social effects of cloning as portrayed in science fiction literature and the means in which to stop members of society from utilizing the technology.

In chapter 5, I argue that popular perceptions of cloning reflect embedded cultural values derived from science fiction texts and films. Metaphorical references to science fiction stories derive their rhetorical power and significance from the texts' transformation into modern myths. By examining two texts dealing with "non-natural" or artificial birth, *Frankenstein* and *Brave*

New World, I provide a re-reading of these narratives within their historical contexts. The authors did not believe that technology dehumanized society *per se*. Rather, a society that embraced new technologies, especially technologies of the body, could fall into turmoil if it sacrificed the qualities that make us human.

Cinematic portrayals of cloning reveal the concerns society currently has with cloning, moving away from an emphasis on the clone as depicted in *Frankenstein*, to an emphasis on the culture that produces clones as portrayed in *Brave New World*. The stories serve as indictments of the behavior of scientists, capitalists, and government officials who sanction the creation of these new progeny. Rather than feeling revulsion toward the clones and replicants, the audience feels repulsed by societies and individuals that abuse classes of people based on perceived differences.

The texts and films I examine raise the question of what makes us human. They also underscore the role of responsibility in scientific research and technological developments. By reevaluating the stories' meanings, I produce a counter-narrative challenging the notion that the texts simply prefigure the technology's detrimental effects on society. A closer reading of the works provides a richer understanding of the authors' ideas and the works' themes. Such a reading makes available a more fully developed means of discussing the potential effects of cloning in society.

In chapter 6, I conclude the work by summarizing recent events in the human cloning debate. I also draw lessons from what transpired in the debate over human cloning, suggesting topics for further analysis in policy studies of science.

My dissertation demonstrates that beliefs held by our society have real-world implications. An examination of the role of popular culture in scientific debates provides a

legitimate avenue of inquiry in determining how and why societies embrace and incorporate certain technologies. The cloning debate reveals how non-technical elements within a society influence a culture's acceptance or rejection of a new technology, or an accepted technology applied in a different manner. By looking at the cultural considerations utilized when forming technology policy, the dissertation illustrates the reciprocal relationship between technology and culture.

Chapter 2: Media, Experts, and Cloning

The ongoing debate about human cloning has its origins in the late 1960s, as the field of bioethics became an autonomous area of inquiry into moral issues related to developments in biotechnology. The early statements on cloning, written by philosophers, biologists, and theologians such as Leon Kass, Paul Ramsey and James Watson, took the form of editorials and articles in the popular press. In their writing, these individuals served as an interest group opposed to the technology of human cloning. Framing the issue of cloning as an ethical concern, they linked it to the horrors of reproductive technologies depicted in the genre of science fiction literature. By entering the debate at its onset and providing the initial framework for the debate on human cloning, these individuals cast themselves in the role of experts.

In their reporting of Dolly's birth, the media examined the larger implications of cloning by utilizing the previously articulated ethical framework. In doing so, they used ethicists as a source of expert information in the controversy. Like those writing before them, science writers juxtaposed these ethical concerns with science fiction literature, providing additional meaning and significance for the public.

Cloning as an Ethical Issue

Biotechnology as an independent field has existed since the early 1970s, and includes study in genetic engineering, *in vitro* fertilization, and embryonic research. As one of the first major developments in biotechnology, recombinant DNA (rDNA) technology produced organisms with genetic material from different life forms. Journalists generally reported positively on the science and policy debates about rDNA. The number of stories in the media on the subject peaked with the 1975 Asilomar conference, at which rDNA researchers proposed

self-regulation as a means of addressing safety issues with the technology (Nisbet and Lewenstein 372).

Increased coverage of biotechnology in the media often coincides with the reporting of significant discoveries in scientific journals (372). Traditionally, the media has framed biotechnology not as an ethical subject but as a sign of progress in the fight against disease and the improvement of humanity. Overall, the coverage in the first thirty years of the field by the media has been almost universally positive with the coverage of Dolly being a notable exception (368-9).

In certain situations, the media's coverage of news has influenced subsequent policy debates and the agenda of lawmakers (Kingdon 59). This display of influence emerges in their reporting on biotechnology, where "the mass media comprise the principal arena where policy-relevant issues come to the attention of decisionmakers, interest groups, and the public" (Nisbet and Lewenstein 360). For example, when debating the implementation of regulatory controls for the technology of rDNA, legislators took their cues from the initial framing of the subject by the media and scientists, focusing on safety issues in proposing regulatory standards, thereby giving less attention to competing frames (363).

Research in genetic engineering and nuclear transplantation spurred the first public discussions of human cloning in the late 1960s and early 1970s. The arguments written by scientists, theologians, and philosophers opposed to cloning insisted that any debates about cloning must include discussions of the ethical implications, "delimiting the arguments the opposition [could] make and screening them off from participation" (361). While occurring some 25-30 years before debates about human cloning prompted by Ian Wilmut's creation of Dolly in 1996, these original deliberations framed the debate as one based on primarily on the ethics of

cloning rather than other issues such as safety.

Numerous scholars have examined the role of experts in scientific controversies.¹³ While the public may assume that experts express impartial views based upon their research, such is not the case “in current controversies that involve matters of public policy or some other strong link to the broader community” (Scott, Richards, and Martin 477). Increasingly, experts have become “overt and committed defenders or opponents of one side or the other, as active participants in the debate” (Martin and Richards 506). This “taking of sides” leads to disagreement among the experts, often confusing members of the public uninformed about the issues under discussion about what counts as non-scientific expertise in scientific debates (Doble).

Individuals participating in the initial debates over cloning came from both within the scientific community and from outside. Those opposed to cloning, even if they had trained and performed as scientists, separated themselves from scientists advocating the use of cloning. In doing so, they called into question the assumption that the understanding of the technology and its effects had its basis solely in the realm of scientific knowledge. Instead of a disagreement among scientists, the debate on cloning became a disagreement between scientists and self-described ethicists, including those participants who had no formal training in moral philosophy. Although medical education started considering the knowledge of ethical issues an important component in the training of physicians during the 1960s, the field of bioethics did not formally come into existence until 1972 (Pellegrino 81).

The public discussion about human cloning started in 1966 (Kass “Wisdom” 17). In an article published in *The American Naturalist* and again in an editorial published in *The Washington Post*, biologist Joshua Lederberg discussed the possible benefits human cloning

¹³ See Epstein, Jasanoff *Science at the Bar*, and Mazur.

would provide because of the unpredictable nature of sexual reproduction in passing on genetic material to subsequent generations. Lederberg suggested research in human cloning would be “an interesting exercise in social science fiction to contemplate the changes in human affairs that might come about from the generation of a few identical twins of existing personalities” (“Unpredictable” A17).

Lederberg’s suggestion met with condemnation from critics, who found his cavalier attitude insulting and a throwback to the attitudes of those involved with the eugenics movement earlier in the century. In responding to Lederberg with a letter-to-the-editor, Leon Kass, then a researcher at the National Institutes of Health, wrote:

It is unfortunate that Dr. Lederberg is either unaware [of] or unwilling to discuss the moral and political problems involved; it is shocking that he chooses to speak as if these questions are trivial, and as if they are reducible to our prejudices concerning the people who might be asexually propagated. (qtd. in Kolata *Cloning* 90)¹⁴

Kass’s articulation of cloning as a technology with moral problems depicts scientists as simply producers of technology, unable to see the broader implications for their work and its effects on society. In making this statement, Kass portrays himself as someone apart from this community, as he does not understand the larger ethical issues involved.

Kass’s letter influenced Princeton theologian Paul Ramsey in writing two editorials for the *Journal of the American Medical Association (JAMA)* condemning both human cloning and the untested technology *in vitro* fertilization. In the second article, Ramsey writes, “Human procreation has already been replaced by the idea of ‘manufacturing’ our progeny. Unless and

¹⁴ Kass’s letter appeared in the November 17, 1967 edition of *The Washington Post*.

until *that* concept is reversed, mankind's movement towards Aldous Huxley's Hatcheries must surely prove irreversible" (qtd. in Kolata 90-1).¹⁵ Similar to Kass, Ramsey sets himself apart from those who view procreation as simply manufacturing a product. He also ties those willing to use cloning to a society lacking in moral fortitude, creating a comparison between Huxley's society and our own.

In 1971, Nobel laureate James Watson wrote an article in the *Atlantic Monthly* magazine, "Moving toward the Clonal Man," as a direct response to early fertility treatment research in Britain. Watson feared that procedures such as *in vitro* fertilization and surrogate pregnancy would become "general medical practice" in the next decade or two (3). From this development, Watson concluded, "The situation would then be ripe for extensive efforts, either legal or illegal, at human cloning," an idea previously belonging only "to the domain of the novelist or the moviemaker" (3, 2). Emphasizing the need for action before we no longer have a choice in the matter, Watson rearticulated the concerns of Kass and Ramsey: the use of non-traditional methods of reproduction would become inevitable unless scientists listened to those with his foresight in seeing cloning's destructive power.

Further discussion on cloning developed out of the establishment of The Hastings Center, "an independent, nonpartisan, and nonprofit bioethics research institute founded in 1969 to explore fundamental and emerging questions in medicine, health care, [and] biotechnology" ("About"). In setting up the center, moral philosopher Daniel Callahan hoped to stimulate meaningful discussions about biotechnology's role in society. A co-founder, psychiatrist Willard Gaylin, approached the editorial staff at *The New York Times Magazine*, appealing for an opportunity to write an article for the publication as a means of gaining publicity for the newly

¹⁵ This quotation comes from Ramsey's editorial in the June 12, 1972 issue of *JAMA*.

founded center:

Gaylin chose human cloning as the issue that would be most likely to catalyze public concern related to biological research since it symbolized the lure of science, represented the possible negative outcomes of biological research, and fit well with a public aversion to cloning that stretched back to Mary Shelley's *Frankenstein*. (Nisbet and Lewenstein 365).

In his article, "The Frankenstein Myth Becomes Reality—We Have the Awful Knowledge to Make Exact Copies of Human Beings," Gaylin uses the *Frankenstein* myth as a means of illustrating the dangers of scientific inquiry and questions whether scientists should attempt such research. Like those opposed to cloning writing before him, Gaylin insists, "with the serious introduction of questions of 'ought,' ethics have been introduced" into discussions about human cloning (qtd. in Kolata *Clone* 86).¹⁶

Kass and Watson's contention that debates over cloning should include discussions about ethics ultimately proved compatible with the press's desire in framing news events as controversial topics. Science and ethics treatment knowledge claims differently, with science grounded in empirical studies and ethics in philosophical inquiry. With both fields engaged in discussions about human cloning, the media could focus on their different approaches to the subject. Likewise, Ramsey and Gaylin's juxtaposing of cloning with *Brave New World* and *Frankenstein* foreshadowed the press's use of science fiction frames in subsequent discussions on biotechnology, especially cloning. All four established themselves as separate from the scientists who would conduct experiments in cloning, citing their ability in understanding the ethical problems associated with cloning as a criteria.

¹⁶ Gaylin's article appeared in the March 5, 1972 edition of *The New York Times Magazine*.

Media Frames and Accommodation

Sociologist Dorothy Nelkin, in her work *Selling Science: How the Press Covers Science and Technology*, examines the role of the press in disseminating scientific information. Nelkin argues that the press plays a significant role in educating the public: “For most people the reality of science is what they read in the press. They understand science less through direct experience or past education than through the filter of journalistic language and imagery” (*Selling* 2). Acting as intermediaries between scientists and the public, journalists may be the only source from which people receive scientific information (76).

The press uses two methods in educating the public about science. Journalists typically use the first, frames, in reporting on stories for two reasons. Not only do “media ‘frames’ offer a central organizing idea or storyline that provide meaning,” frames “also serve as working routines for journalists that allow journalists to quickly identify and classify information, packaging it for audiences” (Nisbet and Lewenstein 361). While frames provide journalists unfamiliar with a topic—such as those who do not regularly cover the science beat—a ready-made template for reporting complex information, frames also limit the way journalists can subsequently report a story to the public.

According to Nelkin, science journalists frame policy debates in such a way as to focus on controversial issues and to “stimulate demands for accountability” (*Selling* 80). In doing so, reporters use metaphors in articulating their message more clearly to their audience: “Metaphors in science journalism cluster and reinforce one another, creating consistent, coherent, and therefore more powerful images which often have strategic policy implications” (81). Subsequently, the metaphors begin functioning as shorthand notation for the issues under discussion.

Journalists employ metaphors in their reporting as a means of explaining scientific events to the public. Metaphorical language helps construct meanings and associations for individuals. However, metaphors not only function as a way of gaining understanding, they also provide a way for human comprehension of the world: “Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature” (Lakoff and Johnson 3). For example, in the metaphor “argument is war,” individuals do not simply speak of arguments as a type of warfare. They also use metaphorical language in conceptualizing and describing the nature of arguments: one *wins* arguments by *destroying* the opponent’s logic, thus *defeating* the opponent. The use of terms like “win” and “defeat” shape perceptions of the way people engage in argument.

The intended audience and rhetorical context of an article determines the journalists’ choice of specific metaphors, which “have to resonate with wider cultural myths and interpretations” (Hellsten 214-15). In providing this wider cultural relevance by using metaphors, the journalists translate “the unusual into the familiar, the unknown into the known” (Huxford 188). The translation imparts meaning to the audience, facilitating better understanding of the topic.

An example from biology demonstrates this type of conceptualization through metaphor. In their book about the cultural significance of the gene, *The DNA Mystique*, Nelkin and sociologist M. Susan Lindee examined the ways that the genes and DNA have taken on significance outside of the realm of science. Rather than just functioning as a way to pass on genetic material from one generation to another, the gene “has also become a cultural icon, a symbol, almost a magical force. The biological gene—a nuclear structure shaped like a twisted ladder—has a cultural meaning independent of its precise biological properties” (2). Part of this

cultural meaning can be seen in the way advertisers use the words like “gene,” “heritage,” and “DNA”:

The metaphorical power of the gene is especially striking when inanimate objects—particularly automobiles—are marked as “successful” by virtue of genes. A Sterling’s remarkable handling is “in its genes;” a BMW sedan has “a genetic advantage;” a Subaru is a “genetic superstar;” and a Toyota has “a great set of genes.” (97)

While such associations may appear innocuous, they indicate the role the gene has taken on in the minds of citizens as an example of genetic essentialism. The use of DNA in this manner also indicates a certain pride on the part of individuals about their own, particular genetic heritage, and a need for distinguishing individual identity.

As well as providing meaning for their audience, journalists explain the significance of stories to their audience through the second method of accommodation. Rhetorical scholar Jeanne Fahnestock’s article “Accommodating Science” examines the way scientific “facts” change as they move from one genre of discourse to another in scientific reporting. While scientific papers appearing in journals are forensic in nature, dealing with the impact of past events, “scientific accommodations [information transferred from expert to lay audiences] in more mainstream publications are overwhelmingly epideictic; their main purpose is to celebrate rather than validate. And furthermore they must usually be explicit in their claims about the value of the scientific discoveries they pass along” (278-79).

A shift from explanation to celebration has significant consequences for the character of the information transmitted to an audience. As Fahnestock indicates, in a study of scientific discourse, sociologists Bruno Latour and Stephen Woolgar categorize scientific statements into

one of five categories based upon their level of certainty (Latour and Woolgar 76-80). Type 5 statements indicate absolute certainty and do not require any support. Type 4 statements often appear in teaching texts, as they convey information generally accepted by the scientific community. Type 3 statements appeared in review articles due to their “more contentious” nature. Type 2 statements generally take the form of “tentative suggestions,” while type 1 statements “comprise conjectures or speculations.” As scientists conduct further experiments, existing statements move between these different categories as they gain or lose support in the scientific community.

In reporting on science, journalists often move descriptions of scientific discoveries from lower to higher categories. Statements that scientists often hedge with terms like “perhaps,” “maybe,” or “possibly,” (type 2 and 3), become much more certain in the journalists’ writing (type 4). This shift implies to the science writer’s audience that the scientific knowledge unquestionably reflects scientific consensus, rather than serving as an indication of the researchers’ beliefs derived from the specific experiment. This category shift becomes evident through examinations of the reporting done on Dolly’s birth and its implications for scientific developments.

Science writers use this celebratory tone because they assume that lay audiences cannot recognize the significance of events on their own (Fahnestock 279). In explaining the scientific information to this “uninformed” audience, science writers appeal to audiences in one of two ways. First, they use deontological methods, whereby the writer attaches the scientific fact to some other significant event (“this is the greatest discovery since Einstein’s Theory of Relativity”). Second, they use teleological methods, whereby the writer links the discovery to

potential future applications (“this new knowledge could lead to a breakthrough in cancer research”).

Fahnestock’s interpretation of science writing for lay audiences offers an explanation for the press’s shift from reporting on Dolly’s birth to reporting on human cloning, resulting in coverage that “consisted of comment and discussion in the form of lengthy features, rather than news stories, about the implications for human cloning” (Wilkie and Graham 155). While Wilmut carefully avoided mentioning the word cloning and focused solely on the creation of a sheep using SCNT, reporters shifted the discourse to a more celebratory one. They linked the cloning of a sheep with the potential cloning of a human. This teleological appeal made the scientific discovery both more interesting and comprehensible. While the average person may not understand how scientists developmentally reprogrammed a mature, body cell of a sheep and reintroduced it into a uterus, they appreciated the problems inherent in the concept of cloning a human.

The shift in emphasis in reporting, with a resulting focus on human cloning, framed the story as one based in ethics. Though journalists usually do not focus on ethics in their reporting, “both the norms of professional journalistic practice and a particularly American cultural perspective contributed to the prominence of this story, creating a novel news ‘frame’” (Priest 59). In part, the journalists echoed the initial framing of cloning as an ethical problem by those working in bioethics decades earlier. The story of cloning became an examination of how society should respond to Wilmut’s work and its implications for human cloning. The journalist’s use of this frame created an emerging controversy “over the appropriate ethical response rather than over scientific facts” (64).

Furthermore, in reporting on Dolly the press's use of *Brave New World* and *Frankenstein* as framing devices encompassed the significance these works' meanings held for the public. In focusing on this possible event, the cloning of a human, journalists made a deliberate choice in using science fiction as a frame:

Located, by its very nature, in a speculative future, science fiction proved a vital mechanism through which prophecy might be encompassed. In effect the frame offered a temporal displacement which propelled the narrative into a (threatening) future, in which the fears and concerns intrinsic to science fiction could be enacted. (Huxford 197)

Invocations of *Frankenstein* and *Brave New World* resonated with audiences because of the meanings inherent in those terms. References to these texts provided both meaning *and* significance for the audience: the technology of cloning changes the society in which they, the audience, reside. As with the ethical frame, the use of cultural tropes mirrors Ramsey and Gaylin's use of these two works in their initial treatment of the subject.

In analyzing the media's reception to the news of Dolly's birth, sociologist of medicine Allan Petersen argues that the subsequent news stories on possible developments in human cloning cited Dolly "as evidence of the scientific 'fact' of cloning, providing a reminder of where the technology might be leading" ("Cloning" 73). In the reporting he found in three Australian newspapers from February 1997 until May 1999, "Dolly's birth seemed to provide incontrovertible proof of widely circulating fictional accounts of human cloning. In other words, 'science fact' was seen to be moving closer to popular images" (85).

Petersen observed an imbalance in reports about the benefits and dangers inherent in human cloning, with the dangers emphasized far more frequently (76). While the articles never

elaborated upon the potential threats, they depicted human cloning as inevitable:

None of these initial articles spelt out in detail the nature of the threat/s posed by human cloning. However, the use of terms and phrases such as “Brave New World”, “the ghosts of Hitler and eugenics”, “Master race”, “the production of clones on an industrial scale”, ‘mass production of identical people’ and “make armies of genetically identical slaves” evoke a strong image of social engineering and authoritarian control. (78)

By framing the discussion in such a way, the journalists provided a context that would be familiar to the readers while reinforcing “a particular public definition of cloning, which may have fuelled fears about the imminence of human cloning” (86). Statements of this nature without any explanation of the nature of the technology’s threat would be type 5 (absolute certainty), signifying that the audience should readily accept the implied threat.

Articles on Dolly’s birth utilized three primary science fiction themes: science versus religion, in allusions to *Frankenstein*; tyranny versus equality, in allusions to *The Boys from Brazil*; and, society versus individuality, in allusions to *Brave New World* (Huxford 192-6). Allusions to *Frankenstein* focused on the mistrust of scientists, the future of the scientists’ creations, and a general mistrust of science itself. Allusions to *The Boys from Brazil* focused on the recreation of evil and its spread, the evil of dictators, and the “anti-egalitarian implications of cloning” along with “the essentially depersonalizing consequences of the process” (195). Finally, allusions to *Brave New World* focused on the loss of individuality, the totalitarian nature of science in control of society, and the dangers of mass culture.

As I previously mentioned in chapter 1, I use the term “cultural accommodation” as a label for this phenomenon of using science fiction frames as a means of providing

contextualization for the audience. The cloning of a sheep may have lacked significance for the layperson, but the media's framing of the procedure as one derived from science fiction resonated with audience members. By focusing on human cloning, cultural accommodation increases the significance of the event for the audience. Furthermore, by linking the negative themes of fictional accounts of cloning with a factual event, cultural accommodation emphasizes the potential problems associated with human cloning.

Reporting on Dolly

The New York Times article breaking the news of Dolly nationally on February 23, 1997, reads more like the beginning of a suspense thriller than an article about technological innovation:

In a feat that may be the one bit of genetic engineering that has been anticipated and dreaded more than any other, researchers in Britain are reporting that they have cloned an adult mammal for the first time” (Kolata “Scientist Reports” 1A).

Through her use of hyperbole, science writer Gina Kolata subtly implies that the anticipation and dread associated with cloning has more to do with the possibility of cloning a human than cloning a sheep. Later on in the piece, Kolata quotes Princeton biology professor Lee Silver as saying in reaction to the news of Dolly's birth that ““it basically means that there are no limits. It means *all of science fiction is true* [emphasis added].”” This additional science fiction frame complements the earlier ethical frame, as science fiction literature often portrays the effects of genetic engineering on the societies developing and using it.¹⁷

¹⁷ Throughout this chapter, I provide a close reading of representative articles about cloning. I take this qualitative approach because it reveals much more about the specific language used by science writers than a quantitative approach. For examples of quantitative studies of the press's coverage of Dolly and cloning, see Holliman, Neresini, and Nisbet and Lewenstein.

The media immediately reacted to the events reported on in *The New York Times* article, with all three major networks running stories that evening on their national broadcasts. Because the news broke on a Sunday, the networks ran detailed reports the following evening, February 24. Public Television's "The News Hour with Jim Lehrer" dedicated their first story of that evening to Dolly. In providing scientific background for the audience, the first segment intercut explanations of the procedure by Ian Wilmut with clips from the film *Jurassic Park* and a picture of the book *Brave New World*, stating that "cloning has long been a staple of science fiction" ("Multiplicity").

Journalists framed cloning by using a variety of metaphors. They used two general types of metaphors in evoking ethical themes, one focused on what the technology produced—the clone—and one focused on the methods the technology employed. The first type, such as "cloning is copying," implied that the creation of clones would deny individual uniqueness. Predicated on a belief in genetic determinism, journalist's use of this metaphor privileged a person's genetic heritage as the primary characteristic of their individuality. The metaphor also implied that copies devalued the original and were somehow inherently deficient in comparison to the original (Hopkins 8).

The second type of metaphor, often articulated as "the mass production of humans," portrayed cloning as a mechanistic process, with humans products turned out on an assembly line. It equates cloning with an image of machinery, once set in motion, going about its task independent of human control.

Journalists used two methods in framing the news of Dolly as an ethical story. The first method involves shifting the focus of a story that initially begins as a report on the creation and birth. In a story discussing Ian Wilmut's production of Dolly in *The New York Times*, science

reporter Gina Kolata provides an overview of the research involved in the creation of Dolly. After stating that Wilmut's experimentation only produced one successful live birth from an initial sample of 277 embryos, Kolata stresses the significance this has for research on human cloning:

That means that even if scientists wanted to clone a human, they would have to wait for improvements in technology to make cloning more efficient and to insure that the babies that resulted would not have terrible, even fatal, defects. Scientists once thought that cloning was biologically impossible—now that they know it can be done, they need to learn how to do it better. (“Workaday” C1)

With the second half of the story addressing issues in human cloning, Kolata has shifted the emphasis away from Dolly, moving the possibility of cloning from a type 1 statement (speculation) to a type 3 (contentious) or a type 4 statement (accepted knowledge). While Kolata acknowledges the technology remains deficient for such a procedure in the present day, her assertion that scientists “need to learn how to do it better” insinuates that such attempts are forthcoming.

The second method involves the writing of entire stories about the ethical aspects of cloning. In “With Cloning of a Sheep, the Ethical Ground Shifts,” Kolata summarizes the opinions of experts who say “the public must come to grips with issues as grand as the possibility of making carbon copies of humans and as mundane, but important, as what will happen to the genetic diversity of livestock if breeders start to clone animals” (A1). The metaphorical nature of the phrase “carbon copies of humans” depicts cloning as manufacturing identical copies in a mechanical fashion. Kolata's report also underscores and magnifies the conflict that exists among scientists, ethicists, and theologians on the matter of human cloning

technology.

In “Suddenly, Religious Ethicists face a Quandary on Cloning,” *New York Times* religion correspondent Gustav Niebuhr reports on the theological impact of the technology. In his lede, Niebuhr writes:

The cloning of an adult mammal offers a striking example of how technology can outpace the moral and social thinking that would guide it, setting off a debate among ethicists, psychologists and theologians over how this new science might change the world. (A1)

Niebuhr frames the issue of cloning not only as an ethical dilemma but also like Kolata as one that requires society’s immediate attention because of the potential it has for changing the world. Niebuhr’s sources, which represent various religious denominations and traditions, portray the concept of cloning a human as “playing G-d.” In discussing technology’s emphasis on replicating the traits expressed through genes, Niebuhr quotes the Reverend Richard A. McCormick who asks, ““who decides what are the desirable traits, what are the acceptable traits?”” This question of who retains authority in these decisions raises the specter of eugenics and its emphasis on selective breeding only for the most “desirable” traits.

While other national papers framed their coverage in this manner, even regional papers focused their stories on ethics. For example, just days after the announcement of Dolly’s birth, *The Richmond Times Dispatch* ran a story with the headline “Human Cloning: Ethical Questions Abound.” Interviewing bioethicists Doris Zallen of Virginia Tech in Blacksburg and John Arras of the University of Virginia in Charlottesville, writer Deborah Kelly focuses on the “myriad ethical questions about human cloning” and the unnecessary and unethical reasons for such a procedure (B4).

News reports generally contain the ideas of the writer's sources, not the journalists themselves. However, in choosing those sources, deciding what quotations to include and where to place them in the story, the journalist consciously shapes the story to provide a specific perspective. What reporters do not focus on in a story can be as important, as well. In a story about drug company's efforts in increasing production, the author begins, "Leaving aside the science fiction scenarios and ethical debates, the first products to emerge from the remarkable cloning of an adult sheep by British researchers will probably be animals that can serve as drug factories" (Fisher B8). Though the story reports on the application of cloning in producing transgenic animals, the author subtly reminds the audience of the larger social issues associated with the technology in stating what he will not write.

Reporters' use of science fiction as a frame mirrored the method of reporting on ethical issues. Occasionally, journalists provided a brief summary of a fictional work as a means of introducing the actual news:

In the film *The Boys from Brazil*, Hitler is cloned from cells taken from his hair. The idea that such an evil, genocidal dictator could be replicated over and over again was chilling enough when contemplated from the comfort of a cinema seat. But the news that Dr. Ian Wilmut and his colleagues in Edinburgh have cloned a lamb from a cell taken from a sheep's udder, has again raised the fear that the technique could be used on humans. (Cochrane 5)

The reporter does more than raise the fear of human cloning; she raises the fear of cloning Hitler. The idea of recreating Hitler, or someone like him, by any means inspires repugnance in most individuals. However, framing it this manner portrays the technology of cloning as the means by which this most likely will happen.

More frequently, as Petersen notes, journalists would offer casual references to the field of science fiction or a work of science fiction. For example, in this lede from *The Boston Globe*, the author writes “Dolly, the cloned sheep, was introduced to the world yesterday, and once again science fiction became fact” (“Clone Encounters” A18). Or again in this story from the Australian newspaper, *The Hobart Mercury*:

As they [the scientists who created Dolly] introduced the world's first cloned adult sheep to dozens of reporters and photographers, seven-month-old Dolly—named after country singer Dolly Parton—hardly seemed the sinister harbinger of a brave new world of cloned humans that some say she represents. (“‘Happy’ Clone”)

Many stories reported cloning as “fiction becoming fact” in their original stories with no further support than the reference to cloning. The statement implies that not only has the literary version of a technology become real but also the associated issues portrayed in science fiction. Similarly, in the second article, by telling the audience that Dolly “hardly seemed the sinister harbinger of a brave new world,” the reporter reminds the readers of the darker implications of Dolly’s birth as it relates to Huxley’s vision.

Reporters also combined the ethical and science fiction frames within single stories. Both Kolata, in her piece on the shifting ethical grounds, and Niebuhr refer to science fiction in their reporting. In her original story on Dolly’s birth, Kolata switches between the two frames on three occasions. In some stories the two frames inexorably link to one another, as in the example above which includes both a reference to *The Boys from Brazil* and the issue of cloning a human. In another example, a story entitled “Clone Alarms Scientists” contains three direct references to *Frankenstein* and *Brave New World*, as well as numerous indirect references to the ideas propagated by science fiction literature. An example, in the form of an indirect quotation from a

doctor who writes on “genetic matters,” references three scenarios that cloning enables: “people with serious diseases could have themselves cloned for spare body parts, dictators could have themselves cloned or dead film stars could be resurrected in the form of a clone.”

While such scenarios might appear repulsive or silly, they imply that society can find the answers to ethical problems in science fiction. From a particular reading of *Frankenstein*, we learn that “playing G-d” and creating life will cause our personal destruction. From *Brave New World*, we learn that employing reproductive technologies will allow society to dehumanize people. As neither one of these scenarios—our destruction nor dehumanization—seems appealing to most individuals, one might conclude, as Kass posits in his essay “Preventing a *Brave New World*,” that a decision in banning this technology, saving us from these ends, would be a rational choice to make.

The ethicists and media’s portrayal of cloning as an ethical issue grounded within science fiction literature would have far-ranging effects in the cloning debate. This framing mechanism would carry over into subsequent aspects of the debate. Policymakers and members of Congress would also use this framing mechanism when discussing the topic and formulating policy and legislation.

Chapter 3: Leon Kass, Repugnance, and a *Brave New World*

I exaggerate, but in the direction of the truth, when I insist that we are faced with having to decide nothing less than whether human procreation is going to remain human, whether children are going to be made rather than begotten, whether it is a good thing, humanly speaking, to say yes in principle to the road which leads (at best) to the dehumanized rationality of *Brave New World*.

—Leon Kass, “The Wisdom of Repugnance,” 18

The above epigraph illustrates how the rhetorician must shape arguments for the intended audience for increased persuasive effect. However, audience sentiment can change over time, producing a different context for an argument. In order to accommodate this shift, the rhetorician must change the rhetorical strategies employed.

One observes such a change by examining the rhetorical strategies used by Leon Kass in two articles advocating a ban on human cloning. Kass has played an important role in the cloning debate, arguing against all forms of human cloning for over 30 years. In giving testimony before the National Bioethics Advisory Commission (NBAC) and United States Congress, and in serving as the Chair of the President’s Council on Bioethics (PCBE), Kass has enjoyed considerable autonomy and authority in framing the issue of cloning at the national level.

In the first article, initially presented in a meeting on ethics before the NBAC in 1997, Kass grounds his argument in conceptions of the traditional family and cultural norms. Appealing to *pathos*, he depicts the clone as an entity that will disrupt familial relationships. Kass employs the description “cloning is repugnant” as an explanation for the negative feelings associated with the clone, assuring his audience that such feelings indicate a valuable source of wisdom.

In the second article, given as testimony before a congressional hearing on cloning considering legislation banning the procedure in 2001, Kass changes his approach. Almost abandoning the concept of repugnance, Kass overtly invokes the specter of *Brave New World* as a means of rallying support for the anti-cloning legislation. His appeals to the inevitable dangers of the reproductive technology on society indicate a shift from a socially to technically deterministic paradigm in his argumentation. This shift in tactics illustrates Kass's adoption of the media's use of popular culture in addition to ethics in framing cloning.

“The Wisdom of Repugnance”

As I explained in chapter 2, Kass has been involved with the public debate on human cloning from the beginning. Initially a Harvard-trained biochemist at the National Institutes of Health (NIH), Kass stopped conducting research and entered the field of ethics because of his anxiety about human cloning (Kolata 90). Kass has always held the view that concerns about technology never reside solely within the realm of science. Writing in *Science* in 1971, Kass states:

Questions of [the] use of science and technology are always moral and political questions, never simply technical ones. All private or public decisions to develop or to use biomedical technology—and decisions *not* to do so—inevitably contain judgments about value. This is true even if the values guiding those decisions are not articulated or made clear, as indeed they often are not. Secondly, the value judgments cannot be derived from biomedical science. (Kass “New Biology” 781)

In making this distinction between scientific and non-scientific values, as well as the claim that these values reside outside of biotechnology, Kass presents himself as an ethical authority in the debate over cloning because of his work conducted outside of science.

His unwavering opposition to human cloning as a new reproductive technology remains consistent with his conservative views on the roles of marriage, family, and childrearing in society. Writing in 1997 in the journal *Public Interest* on “The End of Courtship,” Kass laments the loss of the more traditional “wooing” that went on before an increase in teenagers’ proclivity for casual sex. He states, “most young women strike me as sad, lonely, and confused.” Kass believes courtship has ended because of numerous factors, including, but not limited to, “the ideology of feminism and the changing educational and occupational status of women [and] the destigmatization of bastardy, divorce, infidelity, and abortion.”

Such views reappear in his article “The Wisdom of Repugnance,” establishing the underlying thesis that moral degeneration has contributed to acceptance, in some circles, of human cloning. In his essay, Kass argues for the inherent immorality of cloning using all three persuasive appeals of rhetoric: *logos*, or appeal to reason; *ethos*, or appeal to the character of the speaker/writer; and *pathos*, or appeal to the emotion present in the audience. In appealing to *logos*, a speaker makes a coherent case by providing and structuring evidence in a logical fashion. In appealing to *ethos*, the speaker demonstrates knowledge of a subject, as well as fairness in the treatment of the subject. Finally, in appealing to *pathos*, a speaker demonstrates to the audience a sense of shared values and beliefs. Much of Kass’s argument appeals to his audience’s sense of a morally sound and good society. However, the argument speaks less of the problems of cloning and more of the problems of a society that would even debate the possible use of cloning.

Rhetoricians’ examination of audience has a long tradition. Much of Book 2 of Aristotle’s *On Rhetoric (Ars Rhetorica)* examines the audience in rhetorical situations. However, as rhetorical scholar James Porter points out, Aristotle had a very limited view of audience. For

Aristotle, audience existed outside the scope of the rhetorical discourse (17). In other words, while a rhetorician might tailor a speech to a specific audience, the audience existed as something apart from the rhetorician. The rhetorician assumed the audience's ignorance of the topic and educated the audience by teaching them the "truth" about the subject. Only in the more philosophical method of debate called *dialectic* would the audience and speaker interact as equals.

To a certain extent, this concept of audience carried through to the twentieth century. While audience analysis has been an important part of rhetoric, only recently has such an analysis broken with the Aristotelian tradition. With the advent of poststructuralism, analysis of audience shifted from a passive to active element of the speaking/writing experience (82). Accordingly, the writer does not so much write to an audience, but become a member of it through socialization (115). Thus, the writer becomes aware of the norms and values of the community and shares in them.¹⁸ Such a step becomes essential for the writer to effectively communicate with members of that community. An examination of Kass's argument reveals the manner in which he demonstrates, through shared values, that he is a member of a shared community with his audience.

First published in the right-of-center weekly magazine *The New Republic* in June 1997, Kass's piece influenced the debate on reproductive cloning by appearing in a number of different venues. The journal *The Human Life Review* reprinted the article later that same month, as did *Valparaiso Law Review* the following year. Editors included it a number of times in anthologies on the ethics of human cloning: in Michael Brannigan's *Ethical Issues in Human Cloning*; Glenn McGee's *The Human Cloning Debate*; and, Gregory Pence's *Flesh of My Flesh*. As well as

¹⁸ For one of the earliest examinations of the formation of institutional norms in the scientific community, see Robert K. Merton's "The Normative Structure of Science."

presenting the arguments of the piece in his testimony before the NBAC, Kass republished the essay as a central part of a book he co-authored with James Wilson, *The Ethics of Human Cloning*, and included a revised version of the essay as chapter 5 in his book, *Life, Liberty and the Defense of Dignity*.

Early in the article, Kass establishes the positive nature of his character by discussing his involvement in the debate on cloning for over thirty years. His assertion demonstrates his deep knowledge of the subject, as well clarifying his continued opposition to the procedure. Kass's credibility, established by both technical and moral knowledge, reinforces his expertise for the audience.

Kass builds a bridge to his audience by asserting viewpoints he shares with them. Displaying a socially deterministic outlook, he sees the notion of reproducing asexually as one that has developed because of shifting cultural values about families and children. Because the traditional family has eroded over the past 25 years, society has reconceived the traditional method of producing offspring:

Thanks to feminism and the gay rights movement, we are increasingly encouraged to treat the natural heterosexual difference and its preeminence as a matter of “cultural construction” [...] Thanks to the prominence and the acceptability of divorce and out-of-wedlock births, stable, monogamous marriage as the ideal home for procreation is no longer the agreed upon cultural norm. (18)

Kass believes that this new cultural norm has given those who consider human cloning a viable option in reproduction a foothold in the debate it would not have had just a few decades earlier. Because of this shift in what society deems as acceptable, the clone takes on a new function as “...the ideal emblem: the ultimate ‘single-parent child’” (18). By treating the

“opposition” in this manner, Kass exhibits shared values with his audience (appeal to *ethos*), while appealing to their sense of morality (*pathos*).

Kass also lists numerous harms already present for naturally conceived children:

We surely know that people can harm and even maim children in the very act of conceiving them, say, by paternal transmission of the AIDS virus, maternal transmission of heroin dependence, or, arguably, even by bringing them into being as bastards or with no capacity or willingness to look after them properly.

(22)

The indictment of these examples operates on three levels. First, Kass’s statement echoes views espoused by some conservatives about societal problems, especially with single-parent families. Second, it reinforces his earlier statement about the decline in morals and values exhibited by our society. Third, it juxtaposes actions of unequal consequence. While AIDS and dependence on heroin endanger the life of a newborn, it remains less clear what the effects of single parents are on raising a child. While Kass does use the word “arguably,” the rhetorical impact of listing these items together outweighs his qualification. This juxtaposition of unequal actions plays a significant role in his argument.

In his essay, “Concealed Rhetoric in Scientific Sociology,” the rhetorician Richard Weaver made the following observations about how rhetoric functions and how members of a society utilize it:

This art [rhetoric], whether it presents itself in linguistic or in other form...meets the person to whom it is addressed and takes him [sic] where the rhetor wishes him to go, even if that “going” is nothing more than an intensification of feeling about something [...] To something that we wish to see accepted, we apply a

name carrying prestige; to something we wish to see rejected, we apply a name that is distasteful. Rhetoric thus works through eulogistic and dyslogistic vocabularies. It is the thing-to-be-identified-with that provides the impulse, whether favorable or unfavorable. (140, 144)

Weaver makes two key points in these passages. First, rhetoric acts by intensifying feelings already present in members of an audience (Aristotle's notion of *pathos*). Rhetoric does not necessarily persuade one of new ideas or viewpoints; often, it only seeks to have those feelings reassert and solidify themselves within the minds of the audience members. Second, and more importantly, objects appear as good or bad in the minds of an audience simply by the way a speaker links these objects to other terms. Neutral objects could take on *either positive or negative* connotations depending on their juxtaposition with other concepts. Thus, the rhetorician has the power to manipulate the relationship between the audience and the object under discussion.

Kass's rhetoric about the "travesties" of the new society resonates with his audience and exemplifies Weaver's first point: rhetoric intensifies pre-existing feelings. At the time of his essay's publication, *The New Republic* advanced conservative viewpoints and many of the points he touches upon—traditional family values, the negative (as he sees it) repercussions of the gay and feminist movements, the rising acceptance of "non-traditional" households—have been strongly associated with the conservative movement in their critique of our current society. Because of his sympathetic audience, Kass first performs a function of rhetorical discourse: solidifying the feelings conservatives already have about these issues in articulating his argument.

Kass then reaches out to his audience through an exploration of shared values. He explains the negative feelings he believes they have about cloning while simultaneously justifying the appropriateness of these feelings. Throughout much of the initial part of the essay, Kass rationalizes the “repugnance” people feel (when thinking about human cloning) as a valid reason for banning cloning technology. When introducing this concept into the essay, Kass purposefully uses negative and emotionally charged language in describing the reactions of people when they think of cloning:

People are *repelled* by many aspects of human cloning. They *recoil* from the prospect of mass production of human beings, with large clones of look-alikes, *compromised* in their individuality; the idea of father-son or mother-daughter twins; the *bizarre* prospects of a woman giving birth to and rearing a genetic copy of herself, her spouse, or even her deceased father or mother; the *grotesqueness* of conceiving a child as an exact replacement for another who has died; the *utilitarian* creation of embryonic genetic duplicates of oneself, to be frozen away or created when necessary, in case of need of homologous tissues or organs for transplantation; the *narcissism* of those who would clone themselves and the *arrogance* of others who think they know who deserves to be cloned or which genotype any child-to-be should be thrilled to receive; the *Frankensteinian hubris* to create human life and increasingly to control its destiny; man playing God [emphasis added]. (19-20)

While Kass points out that “revulsion is not an argument,” he quickly reverses himself in the next sentence by stating, “in crucial cases, however, repugnance is the emotional expression of deep wisdom, beyond reason’s power fully to articulate it” (20). Words like “repelled,” “recoil,”

“bizarre,” and “grotesqueness” evoke emotional responses in his audience, and “set the stage” for his thesis. Those who agree with Kass in finding cloning repugnant retain a correct moral compass. Those who would endorse reproductive cloning, not only display the qualities of “narcissism,” “arrogance,” and “hubris,” but a degenerative moral standard indicative of the current culture. Kass says to his readers that people’s views of cloning indicate a deeper sense of the good and that such views indicate they remain either morally upright or morally bankrupt in all aspects of their lives.

Kass exhibits Weaver’s second point above that ideas appear good or bad depending on their contextualization by linking cloning to other actions most people find offensive. Kass contends that we (at least most of us) have an inherent repugnance for actions like “having sex with an animal, or mutilating a corpse, or eating human flesh, or even just (just!) raping or murdering another human being” (20). He says it would be ridiculous to ask people to try to put into words the reason for their repugnance. The repugnance tells us something we know to be true, though we cannot articulate it. In an appeal to *logos*, Kass concludes by saying that because we feel repugnance for these actions, the repugnance we feel for reproductive cloning indicates a need for a ban on cloning.

Kass’s linkage of violent crimes with cloning does serve a vital purpose. In his essay on the role of *pathos* in science policy decision-making, rhetorical scholar Craig Waddell examines why *pathos* has often been excluded from such debate, saying, “the privileged position enjoyed by *logos* in Western culture has often lead to the denial of any appropriate role for *pathos* in science-policy formation” (381). Waddell explains that while some might feel that the use of emotions can be manipulative, Aristotle believed that the exclusive use of rational appeals could provide similar outcomes (382). By denying the validity of emotional appeals, decision-makers

force themselves to rationally reconstruct decisions made on emotion. Including emotional appeals in argument “should open up the decision-making process and foster the critical skills needed to counteract demagoguery” (382).

By openly bringing emotion into the debate, Kass has a means of counteracting many of the arguments put forth by those who believe cloning holds some potential. Those who argue that cloning could reproduce a dead child or provide a compatible donor for a person with an illness also make emotional appeals through the imagery they invoke. The first example lacks any real logical depth unless one accepts genetic determinism. Even if a child has genes identical to one that had died, the child still develops and functions as a different and unique person. Having another child through procreation produces the same effect of replacing the dead child, but without the physical similarities.

The Problem with Repugnance

Kass leaves the reader with the impression that people’s feelings of repugnance provide the *only* reason for society making these actions illegal. Many of the acts he mentions result in harm to a person against their will. Murder, cannibalism, and rape are acts of violence against a person. They are mostly destructive acts; cloning, on the other hand, is a creative act (though one fraught with dangers according to critics).

Some of the actions he names function as legal definitions. In our society, murder is illegal, not killing. While killing must take place for murder to occur, not all killings are murders. In a sense, murder is killing not sanctioned by the state. Killings sanctioned by the state (during warfare, execution of prisoners after a trial of their peers, etc.) do not fall into this category because our society says they do not. However, many people feel repugnance when they hear about the killing of civilians in a war zone or even the execution of prisoners. Most often, society

does not consider these acts murder, yet people feel repugnance towards them. Kass's lack of an explanation for the differences exhibited in these situations undermines the logic of his argument.

Kass does point out actions, similar or dissimilar to cloning, that most people find repugnant. However, Kass fails to mention that society no longer considers illegal or views as immoral certain actions previously deemed repugnant (or still found repugnant by elements of society). For example, while many individuals found slavery repugnant the founders of this country condoned the action in parts of the United States. However, many in this country including members of the Supreme Court found desegregation—the “intermingling” of the two races—unacceptable. Even today, some people do not accept the idea of a multiracial marriage or even “worse” an offspring of that union. The government does not consider repugnance when deciding legal matters because repugnance does not represent a reaction based on logic, balance, or rights but rather a reaction based solely on what individuals think is correct. It would be fallacious (and impossible) to create laws based on solely on what people liked or did not like with only repugnance as a justification for their feelings.

Of course, Kass is not a racist and I can well imagine that Kass would (rightly) explain that this is one of the times when the repugnance felt by many in this country was misplaced and just wrong, as would most people nowadays. This forces one to ask the inevitable question: why should we feel repugnance about cloning but not about race relations? Unless this question can be satisfactorily answered, unless we can easily separate out “false alarms” from times when true feelings of repugnance tells us something meaningful, then whole notion of banning the use of a technology solely based on the “yuck” factor people feel when considering it becomes highly problematic. While people should explore their feelings of repugnance, these feelings should

initiate a conversation about why we think a certain way rather than ending the discussion about the object that inspired the feelings.

Literary Allusions

While Kass's argument relies on the concept of repugnance as its central theme, it also makes oblique references to literature. Kass only makes two references in his writing to works of fiction: once to *Brave New World* and once to *Frankenstein* (both quoted above). Given Kass's later emphasis on the use of literature when he presided as the chair of The President's Council on Bioethics in debates over cloning, one can assume that his use of literary allusions indicates an awareness of their rhetorical power. While just two allusions to literature might appear insignificant, the article contains a visual reference to *Frankenstein* that also has persuasive value.

The original "Wisdom of Repugnance" article contains a number of photo-illustrations. Three of these depict male and female babies from different ethnic backgrounds. In appealing to *pathos*, these images reinforce the notion that society must maintain the uniqueness of life, especially the uniqueness of "naturally conceived babies." The babies appear happy and healthy, a smile appearing on the faces of two of them. These natural babies represent everything parents could want in a new child: "perfection" through *sexual* reproduction rather than the technology of cloning.

The one exception to these pictures of babies depicts the Creature from *Frankenstein* that many around the globe have grown accustomed to over the years. The high-browed, flat headed, hulking monster, complete with neck electrodes, reminds the audience of Karloff's depiction of the Creature in the 1931 film. In this illustration, the creature wears a t-shirt covered with a number of seemingly identical sheep. At first glance, this union of Creature and sheep represents

a loose amalgamation of the debate at hand (the cloning of a sheep), the potential danger the technology holds (the cloning of humans), and a readily identified figure from popular culture (the *Frankenstein* Creature).

Through this juxtaposition of real and imaginary images, the artist unites in the minds of the viewers these two distinct stories: the fictional story of Frankenstein and his creation, the Creature, mutated and changed over two centuries of retelling, and the real story of Ian Wilmut and his creation, Dolly the sheep. The image presents the audience with the idea that the controversy over cloning intertwines with familiar literary representations of alternative reproductive strategies. The shirt covering the Creature subtly says that discussions over mammalian cloning *obscures or hides* the real horrors that lie beneath: the potential for human cloning gone horribly wrong. In making this link between fictional representations and factual events, the artist brings more credence to the idea that the fictional human clone may become the factual human clone of the near future. What was just science fiction a few months prior has now become the potential future.

This inclusion of a limited number of references to popular culture indicates Kass's awareness that these depictions of reproductive technologies may be a contributing cause for the repugnance individuals feel for cloning. It reflects an understanding of the power popular culture has in shaping people's view of technical issues, reflecting the initial framing of the technology years earlier. Even so, Kass uses it sparingly, relying mainly on his contention that repugnance indicates deep-seated wisdom, wisdom we cannot ignore at this crucial juncture. When revisiting this topic four years later in a subsequent essay, Kass's rhetorical strategies will change dramatically as will the intended effect on his audience.

“Preventing a *Brave New World*”

Kass returned to the topic of human cloning again in his article “Preventing a Brave New World,” published in the May 21, 2001 issue of *The New Republic*. As with “Wisdom,” this article subsequently appeared in other forums. The journal *Human Life Review* republished the article the following month. Editors included it in anthologies on ethics and genetics: in William Kristol and Eric Cohen’s *The Future Is Now: America Confronts the New Genetics*; and, Morton E. Winston and Ralph Edelbach’s *Society, Ethics and Technology*. As well as submitting the article as a prepared statement before a 2001 congressional hearing on human cloning legislation, Kass delivered the article at the Siegel Memorial Lecture in Ethics at the Duke University Law School.

In “Preventing,” Kass retains a sense of horror towards human cloning and the path it will lead us: his discussion of repugnance remains, though truncated and no longer the focus of his argument. Whole sections of “Wisdom” appear in the text of “Preventing,” with little or no modification (Kass’s substitution of the name “Bill Clinton” for “Mel Gibson” in describing the arrival of Clinton’s clone as “hairless, toothless, and peeing his diapers” stands as a noteworthy exception). The opposition still receives criticism for their support of cloning, but Kass no longer explains away their views as caused by moral degeneracy within society, but rather a lack of understanding of the issues.

Kass makes appeals to *ethos*, *logos*, and *pathos* in a fashion similar to his earlier essay. However, his awareness of a contextual change for his argument becomes readily apparent. Kass’s articulation for a call to action on the part of his audience represents a key difference between the two articles:

Four years ago I addressed this subject in these pages, trying to articulate the

moral grounds of our repugnance at the prospect of human cloning. Subsequent events have only strengthened my conviction that cloning is a bad idea whose time should not come; but my emphasis this time is more practical. To be sure, I would still like to persuade undecided readers that cloning is a serious evil, but I am more interested in encouraging those who oppose human cloning but who think that we are impotent to prevent it, and in mobilizing them to support new and solid legislative efforts to stop it.

Given the secondary audience of Kass's argument, this call to action becomes an appropriate part of his argument. The following month Kass would use this article as his prepared testimony for a congressional hearing on legislation banning human cloning. Serving as the audience for that incarnation of the argument, the members of congress would have the power and authority to stop cloning through legislation.

This shift in purpose represents a shift in strategy on Kass's part. He no longer takes a socially deterministic view of cloning as he did previously with statements about the impact of the "feminism and the gay rights movement" on conceptions of the family. Instead, his argument now contains a decidedly more technologically deterministic approach as evidenced by his inclusion of the literary framework supporting his argument. Kass's argument hinges on the assumption that if society stops cloning it will also stop society's descent into Huxley's brave new world.

The title of his article only hints at this new approach, as Kass's essay begins with an invocation of the prophetic powers of Aldous Huxley who "saw it coming" when describing the "transforming powers" of today's biomedicine. As he did in "Wisdom," Kass links dissimilar elements in making his laundry list of biomedical technologies: "in vitro fertilization" with

“bottled embryos” and “surrogate wombs” with “cloning.” Kass’s summary and critique of *Brave New World* (adapted from a review he wrote the previous year for the journal *First Things*) underscores the dystopic nature of the society Huxley envisioned. His analysis points out the similarities between futuristic technologies of Huxley’s World State and technologies currently used in our own society:

Huxley's novel, of course, is science fiction. Prozac is *not yet* Huxley's “soma”; cloning by nuclear transfer or splitting embryos is *not exactly* “Bokanovskification”; MTV and virtual-reality parlors are *not quite* the “feelies”; and our current safe and consequenceless sexual practices are *not universally* as loveless or as empty as those in the novel [emphasis added].

In establishing distinctions between elements of Huxley’s society and our own, Kass subtly emphasizes the similarities. Though differences still exist between the two cultures, the differences may very well diminish over time. His use appeals to a negative future through the use of this science fiction scenario “make[s] vivid the meaning of what looks to us, mistakenly, to be benign.”

Kass insinuates that technology will drive this change in society throughout his article. He states, “all contemporary societies are traveling briskly in the same utopian direction. All are wedded to the modern technological project; all march eagerly to the drums of progress and fly proudly the banner of modern science.” He announces, “we can take ourselves to a *Brave New World* all by ourselves-and without even deliberately deciding to go. In case you had not noticed, the train has already left the station and is gathering speed, but no one seems to be in charge.” Thus, in his view, only by stopping the technology of cloning can we avoid this otherwise inevitable outcome.

In this later article, Kass recognizes the importance of the public in the debate over cloning. By invoking science fiction, Kass links popular culture and public perceptions with policy deliberation and legislative agendas. Rather than simply instilling a sense of evil in his audience about cloning, he calls on their assistance in banning cloning. Instead of assuring them of their wisdom in feeling repulsed by the idea of cloning, he ties the horrors of Huxley's science fiction vision to their own world. Kass shifts his discourse from one using subtle hints of *Frankenstein* to one using overt references to *Brave New World*; from a socially deterministic perspective to a technologically deterministic one; from the narrative of the "Monster in Society" to the narrative of the "Society as Monstrous."

Kass's role in the cloning debate would expand when President Bush appointed him chair of the President's Council on Bioethics. In that role, Kass continued to espouse his opposition to human cloning, again using literature and an ethical frame as points of discussion. However, his new role would also provide him with a forum with a much broader audience than simply the pages of *The New Republic*.

Chapter 4: Policy and Legislative Responses to Dolly

Both the executive and legislative branches responded to the announcement of Dolly's birth. Mirroring the initial framing of cloning as an ethical issue, two national ethics committees created by the president debated policy measures concerning the technology. My examination of the two bodies reveals similarities and differences in their formulation of recommendations on human cloning. In creating a policy governing human cloning, the newly established National Bioethics Advisory Commission (NBAC) examined the political, scientific, religious, and moral issues related to this technology. Nonetheless, the NBAC proposed a moratorium on federal funding of cloning solely based on the current (1997) dangers of the technology, leaving the debate open for further discussion.

In a similar fashion, The President's Council on Bioethics (PCBE) re-examined the issue five years later. In proposing a permanent ban on reproductive cloning, the PCBE considered cultural, ethical, and theological perspectives in arriving at their decision. The PCBE also included discussions about literature in their deliberations, reflecting the public's awareness of the technology through connections made between cloning and science fiction by the media. The NBAC's omission of consideration of cultural considerations, though not surprising, provides an example of those crafting policy overlooking the media's framing of the subject and the public's subsequent perception of the technology. In doing so, the NBAC left the issue unresolved for many involved in the public conversation about the technology.

During this five-year period, members of the U.S. Congress held hearings and introduced numerous pieces of legislation banning cloning. The legislative response to cloning, while rarely overt in its use of science fiction metaphors, contained many metaphors directly taken from the debate. The structure of the Congressional hearings, with their use of ethicists as the primary

experts, draws from the ethical frames grounded in science fiction literature the media used in covering the story of Dolly.

National Bioethics Committees

Ethics committees operate on the boundary of science and policy (Jasanoff “Contested Boundaries”). They allow for the formulation of policy without direct interaction with scientists, and leave legislators freedom in making laws governing scientific research. By operating in this intermediary position, the ethics committee reflects the belief “that ‘science’ should not be influenced by politics and that judgments as to what constitutes ‘good’ science should be left to scientists” (199). By working outside of the realms of science and politics, ethics committees maintain the independence of science and scientists in conducting research without direct political influence.

The use of commissions represents an underlying mechanism in policy formulation. An emphasis on consensus building marks one of the primary functions of the ethics committee (Kelly 346). Through consensus, policy bodies provide the appearance of representing a variety of competing claims, and resolving the differences amongst these claims.¹⁹ However, in gathering knowledge claims about the topic under discussion, policy bodies often rely on networks of experts. The committee acts as a filtering device; in doing so, they marginalize potential counter-claims that lack the status as “expert” opinion.

In the United States, four national ethics bodies preceded the NBAC and the PCBE, with some producing recommendations later implemented by the government. Congress established the National Commission for the Protection of Human Subjects of Biomedical and Behavioral

¹⁹ See Halfon for his argument that consensus represents the metaphorical “enrolment in a common socio-technical network” rather than “cognitive, strategic, nor practical agreement on basic facts” (784).

Research (National Commission) in 1974 as part of the then Department of Health, Education, and Welfare (DHEW) (United States OTA 7). Congress directed the National Commission to “undertake a comprehensive study of the ethical, social, and legal implications of advances in biomedical and behavioral research and technology” (National Research Act §202). The Secretary of DHEW appointed eleven members to the Commission: five scientists, three lawyers, two ethicists, and one person in public affairs (United States OTA 10).

The National Commission operated until 1978 and produced ten reports including recommendations on the treatment of human research subjects codified in 45 CFR 46, the Code of Federal Regulations’ section on the protection of human subjects. In another publication, *The Belmont Report*, the Commission focused on three themes regarding research with humans: respect for persons, beneficence, and justice (Hanna 207). Subsequently, these three themes have served as guiding principles in the treatment of research subjects in any studies at institutions receiving federal funding. Because of its success, the National Commission “recommended that a successor body be created, but with broader authority to address issues beyond protection of human participants in research” (207).

Responding to this recommendation, Congress authorized the President’s Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research (President’s Commission) (207). Congress made the President’s Commission, another eleven-member committee, relatively autonomous by raising it to “independent presidential status” (United States OTA 12). Between 1980 and 1983, the President’s Commission issued eleven reports dealing with such diverse issues as safeguarding whistleblowing in biomedical research, the benefits of genetic screening, developments in human gene therapy, and access to health care (Hanna 209-10).

Other variations on the theme, like the Ethics Advisory Board (EAB—1978-1980), which grew out of the National Commission, and the Biomedical Ethics Advisory Committee (BEAC—1988-1989) met with less success, mainly because both entangled themselves in issues of abortion (211). Their lack of success represents a potential weakness with the congressionally mandated committee. Appointment to the committee requires bi-partisan consent and subsequent ratification by the Congress. In making appointments, members of Congress screen potential committee members based upon their perceived ethical and political leanings. For non-contentious topics, this bi-partisan membership had few consequences. However, in the case of the EAB and the BEAC, which attempted to address the issue of abortion, this bi-partisan arrangement resulted in internal dissent and lack of consensus. In raising the President's Commission to independent presidential status, Congress avoided this impasse by having the president select the commissioners.

Tackling Dolly: The NBAC and Human Cloning

From the late 1980s until the mid-90s, the United States lacked a national body with as large a scope as the National and President's Commissions. On August 12, 1994, the Office of Science and Technology Policy proposed the formation of a new national ethics panel. Rather than relying on an act of Congress, President Clinton created the NBAC for a period of two years through executive order in 1995. The president gave the NBAC a broad scope, including the "consideration of protection of the rights and welfare of human research subjects; and issues in the management and use of genetic information, including but not limited to, human gene patenting" (Clinton).

The Commission consisted of 15 (later 18) individuals, picked from among five disciplines: philosophy/theology, social/behavioral science, law, medicine/allied health

professions, and biological research, with each discipline having at least one representative. The president had the authority to pick commissioners, who served two-year renewable terms subject to the president's wishes.

The announcement of the birth of Dolly interrupted the work of the NBAC. President Clinton wrote to the NBAC's Chair Harold T. Shapiro, instructing him that the NBAC had 90 days to make recommendations about the ethics and regulation of human cloning (NBAC *Report* 1). The Commission put their regularly scheduled business on hold and moved quickly to comply with the request. The Commission created special committees and examined the legal, ethical, and scientific issues created by the prospect of human cloning (Capron 171). Within two weeks of the announcement of Dolly's birth, the NBAC started holding public meetings, soliciting feedback and advice. Over the next three months, the Commission consulted with, and commissioned papers from, some of the leading thinkers of this country in the fields of science, ethics, law, and religion.

The commissioners wanted to be thorough in their investigation. For example, in dealing with religious perspectives on cloning, they sought opinions from Catholic, Protestant, Islamic, and Jewish clergy. Additionally, they examined the works of Hinduism, Taoism, Native Americans, and other religions to understand their views on the issues surrounding the creation of life, the notion of human individuality, and other topics related to the cloning of a human being.

Their report addressed numerous scenarios that might necessitate the creation of a clone. If a family had a dying child that needed a bone-marrow transplant, a clone of the child would be a perfect donor, because the clone and child would have identical immune systems. If a couple carried a recessive gene for a genetic disease, cloning would produce a biological offspring that

would not have both copies of the gene necessary for the expression of the disease (NBAC *Report 76*).

The Commissioners found these two scenarios the most compelling. However, some considered cloning intrinsically wrong no matter the outcome. This view mirrored the opinion of the Catholic Church, which has consistently taken conservative views on all forms of reproductive technology, including *in vitro* fertilization and birth control. Other Commissioners found cloning acceptable only if the reasons for it proved appropriate. These views mirrored those of the mainstream Protestant and Jewish faiths (Childress 10). However, representatives from all three of these religions agreed that while a clone might be treated as less-than-human or as a second-class citizen by members of society, the clone would be a full person, with a soul, and created in the image of G-d (11). Even so, it would be too risky to assume that all people would have this viewpoint; i.e., some could treat clones less as autonomous individuals and more like possessions, such as a slave-caste (NBAC *Cloning 69*).

The NBAC submitted its report to President Clinton in June 1997. Though the report contained the Commission's findings on the ethical, legal, and theological inquiries it had made, the report unanimously recommended a moratorium on cloning because SCNT remained unsafe for use in creating human embryos (104). Commissioners split their opinions on other issues, and discussed them in only general terms. Among its recommendations published in their report, the Commissioners recommended a total ban on human cloning using federal funds for a period of three to five years, upholding a previously initiated ban on federal funding for cloning (Childress 9). They also called for the cooperation of private institutions and those not receiving federal funds to voluntarily comply with the ban (NBAC *Report 105*).

Reflections on the NBAC Report

While ostensibly a discussion about the technology of cloning, the scenarios raised in the report demonstrate assumptions that underlie the NBAC's primary focus on the product of the technology, the clone, rather than the technology, emphasizing the role of genetics in creating the clone's identity:

- Opponents and supporters of cloning spoke for the hypothetical clone, the clone that did not exist. They said that the clone “would feel different” or “would be treated differently” by those in society; that the clone lacked “a proper sense of individuality.” Ironically, in usurping the voice of the clone, these individuals denied the clone autonomy.
- In speaking for the clone, commission members treated clones as a homogenous group. While some clones might feel a lack of individuality, or some in society might treat the clones differently, certainly this would not be true for all clones. Just as other groups of people are not homogenous, individual clones would differ in their individual thoughts and feelings.
- The commissioners raised issues without acknowledging the parallel situations in natural child rearing. For example, critics stated that family members might place undue expectations on the clone. A famous athlete might push his/her clone into sports, dictating the clone's future. The clone could not make choices about what s/he wanted in life. However, such concerns exist with naturally conceived children. Athletes may have expectations for their son or daughter to go into sports. While finding real world counterparts to these examples should not be a

rationale for allowing cloning, they do undermine the logic of the assertion that these are issues solely caused by the clone's origins.

More significant, the report contains apparent contradictions about the notion of genetic determinism. While the NBAC dismissed the idea, stating, "the concept of complete genetic determinism is wrong and overly simplistic," many of their scenarios focus on conceptions of individuality fostered through genetic difference (NBAC *Report* 32). The NBAC held discussions on how cloning "caused the lack of personal autonomy," "the feeling of living someone else's life," and "the conception of the genome determining one's future," all of which point to a certain genetic deterministic sensibility (64-5). While not endorsing such positions completely, the NBAC's consideration of them acknowledges recognition of their role in framing the debate.

While the NBAC considered the importance of cultural considerations in their preparation of the report, the testimony given before the NBAC contains very few references to literary texts even though the NBAC chair Harold Shapiro likened the writing of the report to the writing of a novel (Shapiro 2). Two references to *Brave New World* appear in the proceedings, the first by legal scholar John Robertson who criticized its usage as a "flawed scenario" by "opponents of cloning [who] have been very nonspecific and speculative about the harms possible from cloning" (Robertson 77). The second, an indirect reference by future PCBE Chair Leon Kass, states that cloning "leads at best to the dehumanized rationality of the brave new world" (Kass Presentation 94). Kass also references "the Frankensteinian hubris to create human life," the only such reference to *Frankenstein* in either the testimony or any of the publications the NBAC issued on human cloning (95).

The NBAC's report also contained very few references to literature. The first volume of the report, which included the conclusions and recommendations of the NBAC, contained a single reference to literature: in a footnote on page 6 with a list of "interesting fiction" for consideration. In the second volume of the report, which included commissioned papers from experts in different fields, most references came in a paper on ethical issues involved with cloning by Dan Brock, president of the American Association of Bioethics. In writing about the topic of ethics, Brock acknowledged the role the media and popular culture played in the initial debate over human cloning:

In the popular media, nightmare scenarios of laboratory mistakes resulting in monsters, the cloning of armies of Hitlers, the exploitative use of cloning for totalitarian ends as in Huxley's *Brave New World*, and the murderous replicas of the film *Blade Runner*, all fed the public controversy and uneasiness. A striking feature of these early responses was that their strength and intensity seemed to far outrun the arguments and reasons offered in support of them—they seemed often to be "gut level" emotional reactions rather than considered reflections on the issues. (NBAC *Commissioned E-3*)

Brock correctly believed that such gut level reactions would eventually overshadow the actual moral considerations that need addressing. While moral considerations should come first, the NBAC missed an opportunity in its public meetings to gain a greater sense of these emotional reactions.

Responses to the NBAC Report

Just three days after the NBAC submitted its Report to the president, the Subcommittee on Technology of the House Committee on Science held its second hearing on human cloning.

NBAC Chair Harold T. Shapiro and Dr. Harold Varmus, Director of the National Institutes of Health, gave testimony before the members of the subcommittee. Shapiro reiterated the steps taken by the NBAC in formulating its response to President Clinton's request, outlining the Commission's findings and recommendations.

Members of Congress warmly received the report but with some provisos. Some, like Representative James Sensenbrenner, believed that cloning was implicitly wrong. Therefore, the recommendations of the Commission did not go far enough in only recommending a five-year moratorium on human cloning:

The Commission takes the position that the current state of science clearly makes cloning humans ethically wrong. However, the Commission recommends that as the technical aspects of cloning humans improve, the issue be revisited. I disagree with this stance. While science and technology change with time, our ethical and moral standards must remain constant. (United States *Hearing* 225-26)

Others, such as Representative Eddie Bernice Johnson, envisioned potential benefits from some types of human cloning and believed the NBAC should differentiate between types of cloning more explicitly (226).

Scholars writing in journals representing different disciplines expressed similar mixed reactions. The Hastings Center dedicated most of an issue to the NBAC report. In the journal issue, the NBAC commissioner James Childress defended the report, stating that the Commission reached a moral conclusion, writing: "*Safety is a fundamental ethical consideration*" (9). With less than 1% success rate, Childress argued that safety became a legitimate factor to base a decision on. NBAC contributed the first statement in an ongoing

dialogue, a dialogue left open by the recommendation for a moratorium rather than an outright ban on cloning.

Writing in the same issue, law professor Susan Wolf saw the moratorium as a potential problem for the dialogue:

NBAC was wrong to urge a ban. Cloning undoubtedly warrants regulation. But the ban proposed will not yield the sort of regulation required. Instead, it will reduce cloning to a political football in Congress, raise serious constitutional problems, and chill important research. (12)

Wolf felt that NBAC mistakenly took “cloning out of context,” and ignored important issues that go beyond safety. After the five-year moratorium, the ethical issues would still be problematic, and the Commission would be back at square one.

Other publications, such as *Jurimetrics*, the oldest law journal focused on science and technology, and the *Cambridge Quarterly of Healthcare Ethics* dedicated entire issues to responding to the NBAC Report and Dolly. Opinions also surfaced in more mainstream publications. Writing in *The New York Review of Books*, biologist Richard Lewontin took both the Commission and the report to task for not dismissing the notion of genetic determinism outright:

If the widespread genomania propagated by the press and by vulgarizers of science produce a false understanding of the dominance that genes have over our lives, then the appropriate response of the state is not to ban cloning but to engage in a serious educational campaign to correct the misunderstanding. (153)

Lewontin believed that examining the way twins in society function dismiss many of the cultural objections to cloning. Even with certain expectations placed on them due to being genetically

identical, twins often exhibit very different behavioral patterns. According to Lewontin, the problem is not with having clones but with people's misunderstandings about what is truly the same between clones.

The reactions to the report reflect the public's irritation with what they perceived as a delaying tactic. After the moratorium ended, the issue would remain unresolved yet the technology might improve in the interim. The reaction may have also been a reflection of the NBAC's justifications for their recommendation not coinciding with the media's portrayal of the issue as an ethical one. President Clinton's push for a quick response from the NBAC appears hasty, as the technology to clone humans did not exist. In rushing their findings, the NBAC took a middle course between allowing the technology and banning it, leaving those on both sides of the issue frustrated.

Legislating Cloning

Before the NBAC's recommendations became public, members of Congress in both houses introduced legislation banning cloning in some form. Between March 1997 and December 2001, members of Congress introduced no less than 22 bills for consideration. The bills fell into four major categories, from least to most restrictive. In the first category, the legislation would have prevented the use of federal funds for conducting human cloning research. In the second category, bills would have prevented using SCNT as a procedure to clone humans. In the third category, legislators attempted in differentiating between reproductive and therapeutic human cloning, banning only the former. Finally, the most restrictive legislation sought a ban on all research involving human cloning. Such a broad definition could include work involving the replication of any human cells in the laboratory, such as HeLa cells, an

immortal line of human cancer cells used in medical research. Scientists found this last category of legislation troubling in that it could lead to unforeseen and devastating consequences:

It is critical that they [legislative restrictions] be implemented very carefully to assure adequate protection of constitutional freedoms of scientific inquiry and to avoid the policy consequences of an overbroad response. A ban on *all* human cloning either would force our best researchers to conduct their important work elsewhere, depriving the United States of the fruits of their efforts, or would send reputable research underground where it would proceed without any regulation or review. (Shapiro "Legislative" 398)

Many urged restraint in legislative action, stating that the moratorium on federal funding would allow time for thoughtful discussions on the subject.²⁰

Public opinion polls taken over a ten-year period indicate a discrepancy in the numbers of people opposing the science of human cloning and those favoring an outright ban through legislation. In a *Time/CNN* Poll conducted in November 1993, 75% of those surveyed opposed human cloning, but only 46% supported a ban ("Large Margin" B9). The poll, conducted in response to the news that scientists had successfully cloned human embryos by splitting them, demonstrated that the public, though fearful of cloning, did not believe that the government should ban the procedure entirely (Macklin). After Dolly's birth, a *Wall Street Journal/NBC* News Poll conducted in January 1998 found the number of those supporting a ban had risen to 58%; a number that remained relatively unchanged at 54% four years later in January 2002

²⁰ The overly restrictive nature of some of the legislation, often created unintentionally through awkward or poorly chosen language, led to difficulties in passage. Even members of Congress opposed to cloning in principle would hesitate in supporting legislation written as a ban on "all human cloning."

(Nisbet 152). While a solid majority, the number is still significantly less than the 80% opposed to cloning.

This apparent inconsistency between not wanting cloning and not wanting a ban on the procedure underscores the reticence the government has had in banning cloning. Unlike most western nations, other than a five-year moratorium on cloning enacted in 1997, to date no legislation permanently banning human cloning has passed both houses of Congress. In her study reviewing legislative attempts to limit or ban human cloning, professor of political science Andrea Bonnicksen examined the role of government in technological regulation. Traditionally, the government has not enacted legislation curtailing most scientific research. Bonnicksen theorized that “optimism about the technological future, an inclination not to impose public controls on research and development, and unresolved issues about the beginnings of life” all have contributed to the government’s reluctance to prohibit technology (28).

After an initial flurry of activity in 1997 and 1998, members of Congress introduced only two bills banning cloning in 1999 and none in 2000. However, that changed with the announcement by two scientists in 2001 that they would clone a human being. American Panos Zavos, a professor of reproductive physiology, and Italian Severino Antinori, a fertility expert known for helping post-menopausal women conceive, claimed throughout the year that they could clone humans (Zimonjic A13).

The scientists’ announcement spurred Congress to introduce new legislation that year banning cloning; members of Congress introduced seven bills between January and June. Two subcommittees of the Committee on the Judiciary of the House of Representatives held extensive hearings on two bills designed to regulate reproductive and therapeutic cloning. Like the media coverage of Dolly, the hearings focused on the ethical aspects of cloning.

Even though Congress failed to enact any legislation banning cloning, one bill did pass in the House. Members passed H.R. 2505, *The Human Cloning Prohibition Act of 2001*, by a vote of 265-162 on July 31, 2001. The bill prevented the transportation of human clones created through SCNT across state lines. The results of my examination of the testimony given in hearings on related bills and the language of the bills indicate many parallels between the development of this legislation and the media's ethical framing of cloning.²¹

For example, witnesses and members of Congress used the metaphors “slippery slope” and “Pandora’s box” numerous times in deliberations on cloning. Those in favor of a ban on all human cloning stated that cloning-for-medical-research would inevitably lead to cloning-to-produce-children. Professor of ethics Jean Elshtain believed that once scientists perfected the general cloning technology, rogue scientists would utilize SCNT and implant embryos in women regardless of any bans in place:²²

There really is a slippery slope and this is one. That is, it seems to me that once you start creating embryonic human clones, that you can imagine a subterranean traffic, if you will, in those—in those clones. And that those who were—the originators of them, so to speak, could deny the intent of creating actual cloned

²¹ The use of the names of science fiction texts and the term “science fiction” as part of this ethical frame appears in many of the hearings held by Congress, with references to *Brave New World* the most frequent. For example, in the hearing “Issues Raised by Human Cloning Research” in March 2001, a search of the transcript reveals two references to *Frankenstein*, 13 to *Brave New World*, two to *The Boys from Brazil*, and six to the generic term “science fiction.” Similarly, in the hearing “Human Cloning” held in June 2001, a search of the transcript reveals two references to *Frankenstein*, 14 to *Brave New World*, none to *The Boys from Brazil*, and three to “science fiction.”

²² In another example, the Chair of the Subcommittee on Health Michael Bilirakis opened hearings on human cloning by stating “Human cloning rises to the most essential question of who we are and what we might become if we open this Pandora’s box. I look forward to the testimony of our witnesses who will help us understand just what might be in that box” (United States *Human Cloning Prohibition Act 2*).

human beings out if it. But once you start doing that, and doing that en masse, it seems to me that you would start to get this traffic in cloned human embryos.

(United States *Human Cloning* 76)

Similar to the media, the members of Congress treated these ethicists as experts on the subject of human cloning. These witnesses often used metaphors derived from the media, like “science fiction is fact” and “cloning is the mass production of humans,” and pointed to the horrors of *Brave New World* as reasons for banning cloning. Three of the four witnesses giving testimony on the first day of hearings before the subcommittee on crime represented the fields of ethics and bioethics, the lone exception being a professor of life sciences (iii). Witnesses giving testimony on the second day included two professors of law and another ethicist, as well as a corporate executive. The inclusion of only one scientist in a hearing on technology policy indicates the extent to which ethics and law, rather than technological feasibility, framed the discussions before the subcommittee. In a similar fashion, only one of the nine witnesses testifying before the subcommittee on health conducted scientific research, with most of the witnesses representing the fields of ethics and public policy (United States *Human Cloning Prohibition Act* iii).

The witnesses included the ethicist Leon Kass who presented “Preventing a *Brave New World*”—an article I analyzed in my previous chapter—as much of the first testimony of the hearing. Daniel Callahan, a co-founder of the Hastings Center and one of the original opponents of human cloning, echoed Kass in testifying, “parents ought not to manufacture children to their specification” (United States *Human Cloning* 19). Callahan’s statements echoes the media’s use of the metaphor “the mass production of humans,” which differentiates between conceiving a child naturally and producing a child through cloning. Alexander Capron, a member of the

NBAC and professor of law at USC, also framed his discourse in a manner similar to that of the media and Kass by referencing science fiction, testifying, “allowing reproductive cloning would be the decisive step toward the Brave New World” (49).

The subcommittee members’ statements also echoed the media’s framing of cloning through the metaphor “science fiction is fact” and references to *Brave New World*. In his opening statement, the subcommittee Vice Chair Charlie Norwood stated, “what was once considered science fiction now has become a reality” (United States *Human Cloning Prohibition Act* 13). Representative Joseph Pitt stated, “As science rapidly advances in our Nation and our world, we, as legislators, are faced with ethical dilemmas as we attempt to make sure that our world doesn’t begin to resemble Huxley’s ‘Brave New World’” (16). In a similar vein, Representative Gene Green stated that science fiction might become reality by referencing Huxley’s *Brave New World*:

Cloning was once the subject of science fiction novels. Many of us associate cloning with the disturbing notion of designer babies or a human race that is void of individuality or spirit. And we remember Huxley’s ‘Brave New World’ and the frightful images it conjured up of genetically manipulated and cloned individuals. What was once science fiction could become a reality. (16)

The hearings shaped the issue of cloning as an ethical rather than scientific issue. By reasserting the connections between cloning and science fiction through references to specific works, the subcommittee members and witnesses reaffirmed and reinforced the media’s initial framing mechanisms.

This ethical framing of cloning carried over into the actual language of a bill banning the technology. H.R. 1644, *The Human Cloning Prohibition Act of 2001*, closely resembles the bill

the House passed in July 2001, H.R. 2505. A statement at the beginning of the bill includes numerous findings derived from the hearings on the legislation. The first finding acknowledges Zavos and Antinori's announcements on cloning humans as an impetuous for the introduction of the legislation:

Congress finds that some individuals have announced that they will attempt to clone human beings using the technique known as somatic cell nuclear transfer already used with limited success in sheep and other animals. (United States HR 1644 1)

Some of the subsequent findings echo Kass's rationalizations for banning cloning in his two articles I analyzed in the previous chapter. These include statements that cloning marks "a new and decisive step toward turning human reproduction into a manufacturing process" and "confounds the meaning of 'father' and 'mother' and confuses the identity and kinship relations of any cloned child" (2).

The inclusion of these two statements underscores the means by which early public discussions about cloning and the media's framing of cloning as an ethical issue shaped the subsequent policy and legislative debates. The use of ethics as a framework helped undermine Congress's traditional "optimism about the technological future." As the technology of cloning improved, consideration of the negative effects of cloning imbedded in the ethical frame would become more relevant.

Reconsidering Policy: The President's Council on Bioethics

While the Senate prepared to take up H.R. 2505 after passage in the House on July 31, 2001, the terrorist attacks of September 11 interrupted deliberations. After a few months, President Bush wanted further consideration of the issue of cloning so that the American people

understood the importance of the issue (President's Council "Remarks"). With the five-year moratorium approaching its end, The President's Council on Bioethics (PCBE) initiated discussions on the issues relating to human cloning in January 2002.

The previous November, President Bush had created the PCBE through executive order (after NBAC's third two-year charter had ended) with the directive to "advise the President on bioethical issues that may emerge as a consequence of advances in biomedical science and technology" (Bush). President Bush selected the 18 members of the Council for two-year terms, naming Leon Kass, professor on Social Thought at the University of Chicago and Fellow in Social Thought at the American Enterprise Institute, as the Council Chair (President's Council "White House"). Kass held a medical degree from the University of Chicago and a Ph.D. in biochemistry from Harvard and had previously conducted research in molecular biology at the National Institutes of Health.

The PCBE held a number of public meetings over a four-month period, gathering testimony in a manner both "searching and open" (President's Council *Human* xviii). Members of the council held degrees in science, medicine, law, the social sciences, humanities, and theology. They sought input from experts in these and related fields, as well as availing themselves "of the wisdom contained in the great religious, literary, and philosophical traditions" (xix). As a catalyst for discussion in the meetings, the PCBE commissioned the writing of working papers (Kass Opening 6). The papers discussed scientific aspects—including the use of clear terminology—related to the technology, and initiated ethical inquiries into the subject matter.

In formulating a policy recommendation, the PCBE investigated social and scientific aspects of the technology. These societal aspects included discussions about literature raised in

the meetings, and published in the final report.²³ The PCBE discussed Nathaniel Hawthorne's "The Birth Mark" in its first meeting on cloning. The story tells of a scientist who tries to remove the birthmark from the face of his wife. The scientist ultimately succeeds, but his wife dies because of the procedure. In his remarks preceding the discussion "The Birth Mark," Kass explained the PCBE's rationale for the inclusion of a work of literature in a debate over bioethics:

First it ["The Birth Mark"] does deal with certain important driving forces behind the growth and appreciation of modern biology and medicine, our human aspiration to eliminate defects and to pursue some kind of perfection [...] Second, I hope, as a matter of process that we can start conversing at this table not as scientists or humanists but as fellow human beings thoughtful about these matters and reacting responsively to the story. Finally, I hope that this will illustrate in case anybody needs persuasion that there is a wide and wealthy treasury of materials beyond the kind of literature produced by people like myself that can be fruitfully used to deepen our understanding of the meaning of biomedical advance. (Kass Council 56-7)

The PCBE's recognition and use of literature proved significant though perhaps self-serving. By including literature as a legitimate topic of debate, the PCBE opened the door to discussions of fictional portrayals of reproductive technologies. A few months earlier, Kass had published an editorial calling for a ban on cloning, using *Brave New World* as an example of the destructive nature of cloning. As I will discuss in the next chapter, Kass took a technologically deterministic

²³ See Russo for a commentary in the journal *The Scientist* noting the unusual strategy of using literature to initiate ethical deliberations.

view of cloning in illustrating similarities between Huxley's society and our own, echoing initial discussions of the technology in the 1960s.

While references to a "brave new world" occurred five times during just the first meeting of the Council, one such instance stands out. In speaking of the challenges that lie before the Council, Kass remarked:

Safeguarding the human future rests on our ability to steer a prudent middle course avoiding the inhuman Osama Bin Ladens on the one side and the post-human Mustafa [sic] Amans [sic], Aldas [sic] Huxley's (?) spokesman for the brave new world, on the other. (Council 10)²⁴

Just four months after the events of September 11, 2001, Kass linked the name of the real terrorist leader bin Laden with Huxley's fictional leader Mond. While diametrically opposed in Kass's view, the two leaders' worldviews represent equally dangerous social realities: the loss of personal autonomy and freedom. Kass linked what almost all people find repugnant—the killing of innocent civilians—with what he believed all people should feel repulsed by—the cloning of humans.

All the commissioners agreed to a ban on reproductive cloning, but they split their views among three options regarding biomedical cloning: permit now with regulation, limit temporarily with a moratorium, or ban completely. In formulating their final report, *Human Cloning and Human Dignity: An Ethical Inquiry*, a majority of PCBE members recommended a complete ban on human reproductive cloning and a four-year moratorium on cloning for research (256). They arrived at this conclusion by weighing the above mentioned policy option against an option calling for regulation of (rather than a moratorium on) biomedical cloning research (225-26).

²⁴ The other four references occur on pp. 9, 116, 178, and 192 of the transcript.

Their recommendation reflects a consensus view on the options, and a consideration of “human cloning...within its larger human, technological, and ethical contexts, rather than to view it as an isolated technological development” (xli).

Some scientists have had concerns with the work performed by the PCBE. As one of only three scientists on the PCBE, cell biologist Elizabeth Blackburn believed that the PCBE did not reflect upon the scientific aspects of cloning enough. She also felt uncomfortable with the non-scientific way the PCBE discussed topics: “When I read the council's first discussion documents, my heart sank. The language was not what I was used to seeing in scientific discourse—it seemed to me to present pre-judged views and to use rhetoric to make points” (B2).

More seriously, Blackburn felt the final recommendations made by the PCBE did not accurately reflect the prevailing viewpoints expressed by the members on the issue of therapeutic cloning:

10 of the council's 17 members (one had retired) initially voted against recommending a ban on therapeutic cloning. A late change to the question being voted on turned the minority who were in favor of a ban into a majority of 10 favoring a four-year moratorium, an option the council had not discussed in meetings. (B2)

The results of the vote and her sense that Kass's tolerance for dissent slowly diminished over the next 18 months lead Blackburn to conclude that her dismissal from the PCBE resulted from her disagreements with Kass. With her dismissal, the number of scientists dropped to only two out of 18 members.

The PCBE's work has also not escaped criticism from some in the ethics community. Ethicist Arthur Caplan “charged that the council is little more than a politically conservative

mouthpiece for President Bush. ‘There’s no danger of the president getting any advice out of this group that would unsettle him’” (qtd. in Russo 23). In a 2004 article written for *The American Journal of Bioethics*, ethicists Ruth Guyer and Jonathan Moreno criticized the PCBE for their use of literature in formulating policy recommendations. While the two authors recognized the value of discussing literature, they believed that “too much contemporary bioethical discourse is weak on science, lazily citing and adopting science fiction scenarios rather than science facts in the framing of analyses and policies” (14). In the next chapter, I provide a richer reading of science fiction texts as a means of improving the discussion of the ethical issues associated with cloning.

The PCBE’s method of including non-technical considerations (especially literature) in making their recommendations stands in stark contrast to the procedure followed by their predecessor, the NBAC. The NBAC made their recommendations for a moratorium on reproductive cloning based solely on the issue of the safety of the procedure. While examining non-technical factors in their meetings, the NBAC excluded discussion of literature as a basis for forming a policy recommendation.

The final recommendation of the NBAC report called for the initiation of a dialogue with the public at large about issues addressed in the report:

Federal departments and agencies concerned with science should cooperate in seeking out and supporting opportunities to provide information and education to the public in the area of genetics, and on other developments in the biomedical sciences, especially where these affect important cultural practices, values, and beliefs. (106)

Entering into this dialogue would reveal the public's growing awareness and conceptualization of cloning through the frame of science fiction. In the five-year period between the announcement of Dolly's birth and the PCBE's report, references to literature and popular culture had gone from mere framing mechanisms used by the media to topics of debate in legislative hearings and a national ethics panel.

Chapter 5: Rewriting the Science Fiction Narrative

Popular culture plays a large role in influencing public perceptions. Whether in the form of books, magazines, advertisements, or films, these cultural works have a significant effect in shaping our view of events and topics. In the case of cloning, as I have demonstrated, references to science fiction helped fuel the debate on the problems associated with the technology. The media, echoing ethicists' use of these texts, provided little analysis of what the works meant, using them simply as cultural tropes. However, a closer assessment of some of these cultural texts reveals more nuanced messages than just "cloning is copying" or the negative effects of the "mass production of humans."

An examination of books and films reveals the underlying concerns of the authors and directors. Science fiction operates as a form of modern myth in our technological culture. Individuals who invoke the names of these works, such as *Frankenstein* and *Brave New World*, in the debate over human cloning reference the myths, not the actual stories. Although the two works comment on the power of science and technology in a society, this does not represent the primary critique offered by either author. For both authors, the idea of technology without regulation and without regard for human dignity outweighed concerns about just technology *per se*.

A similar examination of films finds that their critique of science impugns the morals of the scientists and industrialists who develop genetic engineering and cloning for selfish purposes, not the offspring of modern biotechnology. Rather than be alarmed by the creation, these films direct the audience to fear the creators of these non-traditional offspring. In holding a mirror up to our own society, these films say we should not use this alternative forms of reproduction; not because of the destructive nature of the new offspring, but because of our potentially destructive

nature. In analyzing the original works, and re-reading the originals against the myths that have developed from them, I create a counter-narrative challenging Kass's suggestion that the works anticipate the inevitable negative aspects of modern technology.

Science Fiction as Myth

Critics often cite Mary Shelley's 1818 novel *Frankenstein* and Aldous Huxley's 1932 novel *Brave New World* as fictional works demonstrating the problems of technology. The power that the tale of *Frankenstein* has within our culture emanates, in part, from our culture's integration of the story over the past 200 years. *Frankenstein* the novel has become *Frankenstein* the *myth*, a myth that has been recast by those who wish to argue against different aspects of the scientific endeavor: "Mythology is metaphorical thinking in which the metaphor assumes independent and continuing existence... For metaphor can develop and change, and it is just in the process of such development that it becomes myth" (Small 14-15). As a myth, *Frankenstein* has taken on significant meanings in our culture, meanings that change when individuals invoke the name in different situations. Thus, metaphor begets myth, which further begets metaphor.

Frankenstein's transformation over time serves as an indication of how science fiction has taken on a more significant meaning in our technological age. In their study of the history of science fiction, authors and critics Alexei and Cory Panshin argue, "science fiction has been the mythic vehicle for one particular culture, the rational materialistic, weigh-and-measure, science-and-technology minded culture that has arisen in Europe and America since the Renaissance" (3). Just as myths from previous ages taught individuals how to function in the societies they lived in, science fiction tells modern people how to live in our own society, a society that relies on science and technology.

According to the Panshins, the myths of science fiction replaced the myths of antiquity. As rationalism became the reigning paradigm in western thought, the myths of scientific discovery replaced the older myths of magic and superstition. We no longer fear ghosts or tell tales about gods with human traits that live on the tops of mountains. Instead, our stories focus on robots, aliens, and scientists that create artificial life in the laboratory. Our lives have been transfigured by the technology we use everyday to such an extent that we sometimes do not even realize how invasive the technology has become.

Authors of science fiction texts have foreseen much of the technology we use, though usually inadvertently. While these authors did not seek to prophesize the future, they understood science and technology's increased role in the lives of ordinary people. The examination of the role of science in people's lives represents the core of science fiction, not the forecasting of the future:

Science fiction is too often mistaken for a literature of prophecy best measured by the accuracy of its predictions, whereas it is better judged as *Frankenstein* invites judgment, by its ability to pose challenging questions about the human condition in an age of science. (Alkon 28)

This questioning at the core of science fiction resonates with people of different cultures and ages. The role the tale of *Frankenstein* now plays in debates about biotechnology illustrates this. Professor of English Chris Baldick's *In Frankenstein's Shadow* provides one of the most detailed and in-depth analyses of the way *Frankenstein* developed into a myth. Partially a history of the novel's transformation through various incarnations of plays and partially an assessment of the figure of "the monster" in nineteenth-century writings, the analysis underscores the importance of Shelley's work on subsequent generations of writers and readers. The work

achieves this importance by becoming more than just a story about a scientist and his laboratory creation. It becomes larger by becoming a myth. However, in doing so, much of the meaning of the actual story becomes lost:

Most myths, in literate societies at least, prolong their lives not by being retold at great length, but by alluded to, thereby finding fresh contexts and applications.

This process strips down the longer stories from which they may be derived, reducing them to the simplest memorable patterns. (3)

Frankenstein's status as a series of "memorable patterns" serves as one of its greatest strengths: its adaptability by a variety of people who use it to their own ends. As Baldick says, "The vitality of myths lies precisely in their capacity for change, their adaptability and openness to new combinations of meaning" (4).

Historian of science Jon Turney illustrates this adaptability by tracing the evolution of meaning. Turney argues in his book *Frankenstein's Footsteps* that we comprehend the new technologies of the body through the lens of the *Frankenstein* story. While Shelley could not anticipate the biotechnological revolution of the twentieth century, "she did, at the very start of the modern era, identify concerns which go to the very heart of our response to science" (3). Her story of the creation of life in the laboratory, and its subsequent effects on the society in which it occurred, has become "one of the most important myths of modernity" (3).

In retelling the history of biological science for the past 150 years framed by the story of *Frankenstein*, Turney illustrates the way non-scientific actors responded to scientific "progress." Journalists and bioethicists alike would often invoke images from fictitious works to try to have the public comprehend what these technological breakthroughs meant for society. For example, in covering the birth of Louise Brown, the first human child conceived through *in vitro*

fertilization, many publications invoked the specter of future concerns through allusions to either Aldous Huxley or his dystopic work, *Brave New World* (185). Thus, the promise of what this new technology heralded commingled with fears of the dangers it posed for society. While the positive potential of cloning anticipated future developments in scientific research, the negative fears associated with cloning stimulated the creation of similar critical portrayals of society in other science fiction works.

Sociologist of science Michael Mulkey's study of the human embryo debates in Great Britain in the 1980s provides an example of an invocation of *Frankenstein*. Mulkey traces the political and ethical debates, examining the way activists and the media contributed to the ongoing dialogue. In a chapter called "The Myth of Frankenstein," Mulkey outlines the way the fictional character of Dr. Frankenstein took on a particular role in arguments against human embryo research. Opponents to the research invoked the name of Frankenstein as a way to show the horrors associated with such research; he became "the scientific villain" (116). Even more telling, some newspapers covering the story would juxtapose pictures from the 1931 movie with headlines about the ongoing debate, a practice denounced by scientists and science journals at the time (119-20).

Proponents of the research countered with the historic figure of Galileo, silenced by the Church centuries before for his views on the structure of the solar system. For the proponents, Galileo stood for all of those practitioners of science and technology silenced by the state on religious or theological grounds. They saw this debate in much the same light, with the opponents of embryo research taking on the mantle of the Catholic Church in this modern account.

Mulkay's work illustrates the way discussion of fiction, especially science fiction, has entered debates about technologies of the body. As Mulkay explains, "in thinking and arguing about the shape of things to come, they [people involved in technology policy debates] have no alternative but to create some kind of story which goes beyond these facts" (117). The creation of these stories often blurs the line between fact and fiction, and thus, there arises the invocation of "fictional treatments of science that have become part of our common cultural repertoire" (117).

Two meta-narratives exist in literature and films dealing with issues of reproductive technologies. The "Monster in Society" narrative posits that the mere existence of a clone will upset the natural order of society. The clone becomes a force that destroys definitions of the traditional family, familial relationships, and the established social order. The narrative privileges the product of cloning technology rather than the technology itself, and presents a socially deterministic view: social relations impose order and create cultural change. This narrative derives from stories such as *Frankenstein*, in which an abomination terrifies members of society. We identify with the society portrayed in these works because of our recognition of similarities in our own society.

The second meta-narrative, "Society as Monstrous," speculates that the technology of cloning will change the nature of society. Society changes because the culture accommodates this new technology, eventually incorporating it and naturalizing it. The narrative focuses on the technology of cloning, not the product, and presents a technologically deterministic view: technology imposes order and creates social change. This narrative derives from stories like *Brave New World*, in which technology has altered society to such an extent that we find it unrecognizable. Rather than identifying with the resulting society, we identify with individuals

who, like us, find the society oppressive or unfamiliar. The shift from the focus on the Monster in *Frankenstein* to the World State in *Brave New World* reflects the growing influence in technology on society.

Analyzing *Frankenstein* and *Brave New World* illuminates their role in debates about science as “many of the current ethical dilemmas can be seen to be the issues presented by these two myths” (Back 330). Opening the black boxes that these stories and myths have become allows us to rewrite the narratives associated with them.

Frankenstein: Tension between Science and the Natural Order

Frankenstein stands at a crossroads, bridging the gap between the two literary genres of romanticism (especially the gothic) and science fiction. While romanticism dealt with nature and conditions of natural society, writers conceived science fiction as a response to the rapid change in science and technology brought about by the Industrial Revolution in late eighteenth-century Europe. This bridging function becomes evident in the way the novel deals with the subject of the reanimation of the dead set against the role family. Instead of using the supernatural to explain what takes place in the action of the novel, something quite common in gothic literature, *Frankenstein* uses science to explain the construction of the Creature. This tension between familial duty and scientific inquiry represents the primary theme of the novel.

Many critics of science fiction call it the first work of this literary genre; chief among them noted science fiction author and critic Brian W. Aldiss (18). In his Hugo winning study *Trillion Year Spree*, Aldiss starts his account with an analysis of the way literature changed at the end of the eighteenth century. Though Shelley had no concept of the term ‘science fiction’ (editor Hugo Gernsback introduced the term in 1929 and only then as the unwieldy “scientifiction”), her writing stands as its origin. While audiences still wanted to be thrilled and

shocked by what they read, authors such as Shelley, influenced by the changes in industrial and scientific innovation going on in the world around them, turned to science and scientists as foils.

The Industrial Revolution served as the most significant change affecting society when Shelley wrote *Frankenstein*. Beginning in Britain and still in its infancy in 1818, the Industrial Revolution rapidly transformed manufacturing processes and the production of material goods. Machinery starting producing traditionally handcrafted items, as the early stages of semi-automation began. Interchangeable parts on machinery made them more resilient to failure and, eventually, more prevalent than previous manufacturing methods. A subsequent dependence of workers on the scientific processes and technological products became an integral part of society. Managers no longer valued the skilled worker; machinery could turn out materials of equivalent worth in much shorter amounts of time.

Shelley's novel serves as a critique of man's changing interaction with nature through scientific methods not as an indictment of science itself:

The myth of Frankenstein registers the anxieties of the period inaugurated in the twin social and industrial revolutions in France and Britain.... The myth which [sic] develops out of it turns repeatedly upon these new problems of an age in which humanity seizes responsibility for re-creating the world, for violently reshaping its natural environment and its inherited social and political forms, for remaking itself. (Baldick 5)

Frankenstein portrays the tension between the old and the new—the early modern and the modern—and becomes the rallying cry for those who believe technologies impinge upon society's stability. Instead of just re-creating the world, science stands on the brink of re-creating the human.

Shelley uses a series of nested framing narratives to tell the story of Frankenstein, distancing the reader from the action of the novel. Shelley constructs the first frame as a series of letters written by an arctic explorer by the name of Walton to his sister in England. In his letters, Walton relates how he and his crew seek a shortcut to the North Pacific. He outlines his specific motivations to his sister in his first letter:

I may there [the Arctic] discover the wondrous power which [sic] attracts the needle; and may regulate a thousand celestial observations, that require only this voyage to render their seeming eccentricities consistent for ever. *I shall satiate my ardent curiosity with the sight of a part of the world never before visited, and may tread a land never before imprinted by the foot of man* [emphasis added]. (Shelley 7)²⁵

Walton describes what Victor Frankenstein hopes to accomplish with his research. Frankenstein wants to visit a place “never before visited,” the reanimation of dead flesh. Shelley intentionally draws parallels between Walton and Frankenstein. In both cases, the two risk their lives by transgressing the previous boundaries of knowledge, and do so in relative isolation:

All three of the narrators in the novel are self-educated, and fall victim to this problem; seeking knowledge *in* solitude, they are condemned to find only a more distressing knowledge *of* solitude. Bearing in mind this implied critique of solitude...we can concede that the novel is indeed about the perils of discovery. (Baldick 46)

By setting up these parallel stories, Shelley demonstrates that the story depicts more than just the creation of artificial life. It also represents any sort of discovery done in isolation, free

²⁵ All references to Shelley’s work are to the original 1818 *Frankenstein* text.

from the norms and values of society. Such knowledge seeking becomes hazardous, as two of the three narrators ultimately discover. While their own actions destroy Victor and the Creature, Walton saves himself by learning from their example and does not conduct secretive work. The audience feels sympathy for those on his quest. While it may be too late for some to learn from their mistakes, Shelley indicates that others have a choice about how they will proceed.

As Walton continues to send letters to his sister, the reader learns that the journey starts to become quite hazardous. The men start grumbling about the trip and want to turn back and return home. As Walton debates his course of action, the crew observes a figure in a sledge traveling on the ice. The next morning, the crew comes upon a second figure, and rescues him. As he nursed back to health by Walton, he begins to relate a story.

The man, Victor Frankenstein, serves as the primary narrator of the text. The nested narrative, as well as distancing the reader from the action, also calls into question the reliability of the stories as one party relates them to another. This framing narrative becomes even more multi-layered later in the novel when Victor relates the story the Creature tells him—the entirety of Volume II.

At first glance, the novel does indeed seem to be solely about the foibles of scientific research that pushes the boundaries of knowledge. At an early age, Victor becomes enamored of the works of Cornelius Agrippa, Paracelsus, and Albert Magnus, physicians and scientists of the middle ages. However, after witnessing the effects of a lightning strike on a tree and his father's subsequent explanation and demonstration of electricity, Victor stops examining the works of the past and enrolls in the University of Ingolstadt to study. This transition from the old to the modern as the focus of Victor's studies proves pivotal, as it sets him on his way to explore the possibility of reanimating dead flesh by using electricity. Victor eventually succeeds by applying

the scientific method to his studies. In essence, this represents one of Shelley's themes: the creation of the modern world through scientific developments.

While ultimately successful in his quest to reanimate life, Victor expresses moral repulsion for the Creature's physical hideousness:

His yellow skin scarcely covered the work of muscles and arteries beneath; his hair was of a lustrous black, and flowing; his teeth of a pearly whiteness; but these luxuriances only formed a more horrid contrast with his watery eyes, that seemed almost of the same colour as the dun white sockets in which they were set, his shrivelled [sic] complexion, and straight black lips. (Shelley 34)

Victor runs away from his laboratory, hoping to distance himself from the hideous creature. In abandoning his offspring, Victor sets the events of the novel in motion: the work demonstrates the necessity of parental responsibility and familial relations, not the destructive power of science.

Victor's rejection of his "son" causes the Creature to go out on his own and experience the world. Because he inspires almost universal repulsion, the Creature hides away from other people, learning about the world and teaching himself how to speak through the reading of books, including *Plutarch's Lives* and *Paradise Lost*. Milton's work, in a fashion similar to *Frankenstein*, tells the story about a new type of offspring (Adam) and his relationship with his father (God). However, the Creature notes the dissimilarities between himself and Adam when speaking to Victor:

Like Adam, I was created apparently united by no link to any other being in existence; but his state was far different from mine in every other respect. He had come forth from the hands of God a perfect creature, happy and prosperous,

guarded by the especial care of his Creator; he was allowed to converse with, and acquire knowledge from beings of a superior nature: but I was wretched, helpless, and alone. Many times I considered Satan as the fitter emblem of my condition...

(87)

While G-d punishes Adam for his transgressions and casts him out from the Garden of Eden, Victor casts the Creature out for simply existing. Furthermore, the Creature's identification with Satan explains the adversarial nature between him and Victor for the rest of the novel.

The books Shelley chooses for the Creature's education accentuate the tension between the old, pastoral ways of the Romantic period and the modern world unfolding in the early nineteenth century. Plutarch's *Parallel Lives* describes the virtues of famous individuals from the ancient Greek and Roman cultures. Milton's *Paradise Lost* helped formulate the western representation of Satan—who receives little mention in the Judeo-Christian Bible—as well as a more detailed story of the creation of Adam and Eve in the Garden of Eden. Both these works pay homage to the classical world, and the belief systems embraced by them:

The subject-matter of *Paradise Lost* happens to be the most powerfully authorized creation myth in Western culture. Moreover, it elaborates upon the connections between *two* kinds of myth: a myth of creation and a myth of transgression.

Frankenstein does this too, but its sinister travesty collapses the two kinds of myth together so that now creation and transgression appear to be the same thing.

(Baldick 40)

By having the Creature learn from reading this story, Shelley clearly sets the Creature and Victor's up bringing and worldview in opposition. The Creature adheres to the old, romantic

notions of life he learned about in his studies while Victor embraces the more modern aspects he learned about at university, such as science.

Frankenstein's subtitle *The Modern Prometheus* alludes to the myth of Prometheus and his punishment for the theft of fire and the creation of the human race. Unlike Prometheus, punished for his transgressions by the gods, Victor receives retribution from his offspring, not for his act itself but for his subsequent behavior. Victor's reluctance in acknowledging his paternal responsibilities to the Creature infuriates the Creature and starts him on his homicidal spree. Through this portrayal, Shelley offers a critique of science without responsibility and without governance.

In examining the plot of *Frankenstein*, it becomes clear that Victor represents the real "monster" in *Frankenstein*. While the Creature exists alone in the world, educating himself in secret, Victor has had all the advantages of modern society. Even so, he squanders his potential not by creating the Creature but by doing so in isolation without guidance and without conceiving of the potential effects. When the Creature confronts Victor, he lays the blame for his nature at Victor's feet:

"Remember, that I am thy creature: I ought to be thy Adam; but I am rather the fallen angel, whom thou drivest from joy for no misdeed. Every where [sic] I see bliss, from which I alone am irrevocably excluded. I was benevolent and good; misery made me a fiend. Make me happy, and I shall again be virtuous." (66)

Given this opportunity to redeem himself by creating a mate for the Creature, and thus finally taking responsibility for his offspring and his actions, Victor refuses. The Creature's kills Victor's wife Elizabeth on their wedding day as the ultimate revenge for this response. Now

alone, Victor pursues the Creature to the Arctic with fatal results for Frankenstein and presumably the Creature.

Brave New World: The Imperative of Societal Control

If *Frankenstein* serves as a tale that warns of science without supervision or boundaries, then *Brave New World* demonstrates what happens when society regulates everything. Written in 1932, the novel portrays modern society, a society now highly mechanized and further removed from the concerns of ordinary workers. While Huxley did not see his future world as inevitable, he did see it as a possible future to a world that put more faith in science and technology than in its human members.

Huxley bases many of the characters in his novel on historical figures, their name often a subtle allusion to their real world counterparts. Many, like Bernard Marx and Lenina Crowne, represent those directly or indirectly related to the Communist Revolution of 1917 and the establishment of the Soviet Union. Ironically, Henry Ford becomes one of the few figures of the novel that retains his actual historical name. Ford's work served as the antithesis of the communist ideal.

Huxley similarly exploits incongruities for satiric effect by linking technology and religion. By making the deity ("Our Ford") a motor manufacturer, Huxley satirizes the way in which technological and scientific progress is worshipped as an end in itself; in the society of the future the salient qualities of the machine—efficiency and productivity—have become the cardinal virtues of mankind. (Ferns 141-42)

Ford has become the deity of the populace of the World State. Instead of invoking "our Lord," the populace invokes the name of "our Ford"; instead of a cross, this society uses a capital letter

“T” as its religious icon, a tribute to Ford’s Model-T automobile and the production line that made it.

Brave New World depicts a society in which the state manufactures everything (including people) on a grand scale, thus embracing the ideals of mass production that had taken hold in Huxley’s own time. As historian Thomas P. Hughes writes in his history of American technology *American Genesis*, the industrialist Frederick Winslow Taylor also had a profound effect on industry. Taylor’s scientific approach to the management of workers quickly spread to Europe and the Soviet Union (188). Taylor analyzed the movements of workers performing specific tasks. He then broke those movements down into discrete steps, hoping for the elimination of any wasted motion. In this way, Taylor sought to make human activity as similar to the activity of machines as possible:

He [Taylor] asked managers to do for the production system as a whole what inventors and engineers had done in the nineteenth century for machines and processes.... Taylor and his followers unfeelingly compared an inefficient worker to a poorly designed machine member. (188-89)

Taylor’s philosophy, outlined in his 1911 work *Principles of Scientific Management*, did not sit well with workers who often resisted this push to mechanize their behavior in the workplace. While often successful, Taylor’s methods also failed on numerous occasions, sometimes leading to Taylor’s dismissal (195).

Even with Taylor’s influence on American industry, Huxley appropriately singles out Ford for his contributions and creates his fictional society with Ford as its godhead. Ford’s creation of an assembly line at his motor vehicle plant truly ushered in the age of mass

production. Historian David Hounshell believes that, although contemporaries, Taylor's work only minimally influenced Ford:

The Ford approach was to eliminate labor by machinery, not, as the Taylorites customarily did, to take a given production process and improved the efficiency of the workers through time and motion study.... Taylor took production hardware as a given and sought revisions in labor processes and the organization of work; Ford engineers mechanized work processes and found workers to feed and tend their machines. (252)

While Taylor made workers more machine-like, Ford eliminated the need for so many workers. Instead, the workers who remained became subservient to the machines that did the actual work. Similar to the Industrial Revolution of the nineteenth century, the mass production movement of the twentieth century initiated societal change through the application and use of new technologies, often at the expense of people. This situation eerily mirrors the society Huxley envisioned in *Brave New World*, a society whose foremost goal became overall stability rather than individual freedom.

Huxley projects his scenario in the 26th century, when society manufactures humans in an assembly line process. With the Bokanovsky's Process, a procedure through which fertilized embryos divide multiple times, humans decant embryos from jars in large, identical batches:

One egg, one embryo, one adult—normality. But a bokanovskified egg will bud, will proliferate, will divide. From eight to ninety-six buds, and every bud will grow into a perfectly formed embryo, and every embryo into a full-sized adult. Making ninety-six humans grow where only one grew before. Progress. (Huxley 6)

Humans develop in such large batches because there needs to be uniformity in the human population. Uniformity eliminates difference, which could result in prejudice or hatred, all impediments to the society's foremost goal: stability.

Uniformity also ensures that individuals from the same batch will have the same intelligence and potential for learning. This becomes especially important for the welfare of the State, because groups of individuals perform similar tasks. Society designates the tasks according to that class of human an individual belongs to Alpha through Epsilon. Alphas display high intelligence and independent thought, while Epsilons perform only rudimentary tasks. Betas, Gammas, and Deltas fall somewhere in between these two extremes.

Society breeds all of the types to enjoy their particular status. Epsilons would never want to be anything else. Breeding techniques, reinforced with hypnotherapy and drugs, retains these perspectives in people:

Hot tunnels alternated with cool tunnels. Coolness was wedded to discomfort in the form of hard x-rays. By the time they were decanted the embryos had a horror of cold. They were predestined to emigrate to the tropics, to be miners and acetate silk spinners and steel workers. Later on their minds would be made to endorse the judgment of their bodies. "We condition them to thrive on heat," concluded Mr. Foster. "Our colleagues upstairs will teach them to love it." (16)

In this manner, the society achieves stability: everyone knows their role and function in society, and everyone expresses pleasure with their role in society.

With the creation of humans in the laboratory, the traditional family no longer exists. Children grow up in public crèches, separated according to their class and function. The World State now considers words such as "mother" and "love" offensive, and forbids any sort of long-

term human relationships. The State entertains its citizens through its own form of bread and circuses, including feelies, mildly pornographic films that stimulate all the senses, and *soma*, a drug dispensed freely to the populace to keep them happy. Art and literature no longer exist because their contents made people uneasy and unhappy, and even science produces only applied technologies.

Though most of the inhabitants appear happy with their lives, a few become dissatisfied, such as Bernard Marx, the apparent protagonist of the book. Though an Alpha, Marx remains unusually short for his caste, shuns promiscuity (a virtue in this loveless society), likes being left alone, and does not enjoy taking the drug soma. The other Alphas believe that alcohol contaminated Marx's birthing chamber during his development, thus disfiguring him and leaving him in this unusual emotional state.

John the Savage, who lives on a New Mexico reservation, replaces Marx as the actual protagonist. John resulted from an "unnatural" conception and birth, and lives with his mother. While regarded as a savage by those in society, those on the reservation consider him an outcast because his mother originally came from the World State.

Like the Creature in *Frankenstein*, the Savage displays naiveté when it comes to the norms and values of his new society. Like the Creature, the Savage educates himself: the works of Shakespeare have shaped his world-view (the title of Huxley's work comes from a passage in the *Tempest*). A romantic, John immediately falls in love with the mysterious Lenina, a woman who has been seeing Marx. However, Lenina's forward behavior shocks him, as he does not believe in premarital sex. This reticence in his behavior, in turn, makes him even more attractive to her.

Marx brings the Savage and his mother back to the World State, where he immediately becomes a celebrity because of his unique background. While initially fascinated with what he sees, the Savage eventually becomes disillusioned and despondent in the World State. Overwhelmed by the stimulation of his senses, the Savage seeks refuge. Although the population remains happy through use of conditioning and drugs, the Savage, aware of life outside the World State, cannot accept the rigid order placed on life.

In a climatic scene near the end of the novel, the Savage talks with the World Controller Mustapha Mond about the reasons for society's current condition. Mond explains to him that after World War III, the survivors decided that such an event could never take place again. Thus, the state must take it upon itself to provide order for its inhabitants. A well ordered society provided all the necessities for its inhabitants and precluded future conflicts by eliminating anything unnecessary, including art. "But that's the price we have to pay for stability," Mond tells the Savage. "You've got to choose between happiness and what people used to call high art. We've sacrificed the high art" (220).

Thus, this artificial dichotomy depicts the core of Huxley's critique:

Through their [the Savage and Mond] conversation, Huxley focuses on the central problem that *Brave New World* is set up to explore: the extent to which happiness must necessarily exclude freedom and to which freedom must include unhappiness. The new world civilization is predicated on the conviction that happiness and freedom are mutually exclusive and that happiness is the greater good. (Nance 80)

Like Shelley before him, Huxley examines society's use of science and technology but does not condemn them outright. Rather, Huxley depicts a society embracing technology while casting

aside other social endeavors, especially the drive for creativity. While order may be necessary to a certain extent in society, personal expression, be it through art, literature, or even the love of another person through social bonds, make us uniquely human and become necessary for us to retain our humanity. Science is not bad; but a society that only focuses on science to the exclusion of all other accomplishments becomes wretched.

Ultimately the Savage becomes unwilling and unable of making a choice between happiness and freedom. He refuses to turn his back on works such as *Othello* that have shaped his own view of the world. Powerless to cope with this “brave new world” that he now lives in, unable to “claim the right to be unhappy,” the Savage ultimately commits suicide. While also an outcast on the reservation, his status in the World State becomes truly unbearable: a man raised on and shaped by the works of Shakespeare in a society that has no love, or place, for literature or art.

Representations of Science in Film

In examining the role of cinema in culture, anthropologist Debhora Battaglia notes that the cinema reflects the values and fears of society: “In late modernity’s image-conscious condition, popular films are major cultural documents of the social life of the public moment” (495). Films not only reflect the beliefs of a culture on a specific topic or set of topics; films also help to articulate and codify those beliefs. In a sense, films reify the beliefs by putting them before the members of a culture who see a film. This cinematic event acts as a mechanism to keep people, at least in a subconscious sense, aware of the meta-narrative of values and fears shared by the larger societal group.

Science fiction films have allowed writers to envision potential futures often fraught with significant imperfections. As the audience watches these stories play out, the images both inspire

fright—because of what may come—and cathartic relief because it has not transpired. Science fiction films also help people understand the world they live in and come to grips with the culture they have created:

As the representation of the future, or of an alternate present, science fiction addresses the psychological and philosophical questions that human beings pose about the universe and their place in it. Driven by the urge to settle these questions, writers of these films and television series imagine scenarios in which they address issues based on differing economic, social, religious and technological values. The stories critique current events and social trends, and also reflect the conscious or unconscious biases of the writer(s). The end of the film or television show presents possibilities for resolving the issues addressed, or leaves the viewer with a dire warning for the future should present conditions continue. (Corcos 1044)

By examining the culture from the external viewpoint of a fictional or futuristic society, science fiction looks inward at the factual society of the present. In watching these stories, the audience, often subtly, gains a better understanding of contentious topics debated within their current culture.

For decades films have been a barometer of this nation's feelings about science and scientists. Science studies scholar Stephen L. Goldman notes that these images have generally been negative: "Science-fiction films are overwhelmingly dystopian, projecting the consequences of science and technology as politically or environmentally disastrous, or as inevitably co-opted by antidemocratic vested interests" (278). Goldman argues that such representations often reflect feelings of powerlessness created when "scientists and engineers are

depicted as servants of corporate, political, or military institutions, committed to executing the at best misguided, and frequently insidious, agendas of those institutions” (276-77). This connection of scientists with larger institutions not only depicts science as a mysterious process but also demonstrates that the agents who undertake scientific research lack control of the fruits of their labors. Rather, large agencies with hidden agendas guide the direction the research takes, often ignoring the consequences.

When examining the films of a culture, we act as cultural anthropologists, not only interpreting the message of the film but the public’s anticipated/actual reception and reaction to the film and its message. In a general sense, science fiction and science fiction films increase awareness of the potential dangers of science and technology, especially when the propagators of science and technology ignore the human and focus exclusively on technology as a means unto itself. When technology becomes a tool we must use, it starts using us. Science fiction films bring these fears to light as a warning of what might happen if we consider technology as a substitute for humanity rather than as an extension.

The Celluloid Scientist

The cinematic portrayal of scientists as untrustworthy or mad owes its roots to their portrayal in literature. As literary scholar Roslynn D. Haynes notes in her study of the representations of scientists in literature, fictional characters, like Frankenstein and H.G. Wells’s Dr. Moreau, have influenced society’s perceptions of scientists (1). As well as serving as a template for future fictional portrayals, these depictions have “provided a model for the contemporary evaluation of scientists and, by extension, of science itself” (4). Members of society judge scientists not only on their deeds, but also in the way their actions compare to those of their literary and cinematic counterparts.

These ideas, embedded in the works of western literature, then found their way into films. While the depiction of Dr. Frankenstein in 1931 has become emblematic of Hollywood's portrayal of scientists, such portrayals have not been steadfast throughout the twentieth century. Often, the way filmmakers depicted scientists had as much to do with the current state of real world events as the needs of the plot. During the 1940s, when American science and technology proved instrumental in defeating fascism in Europe and Asia, films portrayed scientists more favorably. Scientists helped win the war (especially through the use of nuclear weapons in Asia) and Americans became interested in science.

However, with the advent of the red scare and subsequent McCarthy period, the sense of the "other" returned. Suddenly, one did not know who they could trust as communists supposedly "infiltrated" society, including the government. This fear became manifest in movies with a scientific theme which further exploited the apparent dangerousness of the unknown:

The extremely pro-scientific attitudes exemplified in the fiction and movies of the 1940s that supported development of the atomic bomb and portrayed scientists as the saviors of the free world metamorphosed into cultural attacks on those scientists in the 1950s and 1960s, with portrayals of scientists as traitors (as J. Robert Oppenheimer was portrayed) because of their regret for their participation in development of the Bomb, or re-invigorated Dr. Frankensteins. The transition of the scientist to traitor because of his dislike of war to the scientist as traitor because of his embracing of Communism was an easy one for filmmakers and writers to make. (Corcos 1059-60)

This shifting portrayal embodies the underlying tension that exists between society and the culture of science. As film historian M.Z. Ribalow points out in his article on depictions of

scientists in film, while people enjoy the benefits of science and technological developments, they remain wary of those who practice science:

Many people are in awe of scientists, and live in holy terror of them. We want what they have, but fear what they will do with it. We admire their intellectual curiosity, but doubt whether they understand the full implications of their knowledge. We need them, but mistrust both them and our need. Movie scientists are a reflection of all those conflicting attitudes. (“Script Doctors” 27)

Ribalow believes this ambivalence derives from the way scientists often portray themselves as intellectual elites. This, in a sense, alienates them from the public and makes them easy targets in films that “represent and appeal to mass culture and therefore tend to exude a populist, anti-intellectual sensibility” (28).

Film theorists contend that such a shift in attitudes depicted in movies has started taking place again. In a 1985 article for *Discover* magazine, film critic Richard Schickel laments the “mutation” of the Hollywood mad scientist: “Where have all the mad scientists gone? How come, when the movies investigate scientific enterprise these days, we don’t find any crazies lurking there?” (72). Schickel claims, based upon an examination of the films of the early and mid 1980s, that the traditional mad scientist, the lone figure working to subvert the natural order, has been replaced by a figure who works with others within society, particularly members of the government. The scientist, often the victim of governmental conspiracies, must become the hero of the film by subverting the evil designs of a shadow government bent on the control of nature (74).

Writing 12 years later in the online publication *Slate Magazine*, science journalist Arthur Allan echoes Schickel’s opinion when commenting on the depiction of geneticists in books and

films: “In the new genetic thriller, the scientist is no longer mad, because he has no illusions of mastery. Instead, he's a lone and often belated moralist, eaten up with remorse and anxiety, pushed into unsavory experimentation less by runaway curiosity than by unscrupulous corporate overlords.” Allan, like Schickel before him, believes that the traditional portrayal of the mad scientist has changed, making the scientific character more sympathetic to the audience members.

While I agree with Schickel and Allan that depictions of scientists in films have changed since the arrival of Dr. Frankenstein on the screen in 1931, usually such changes have not demonstrated an improvement in the moral character of the cinematic scientist. While the scientist has evolved from a loner to a character more integrated into society, such a change has resulted in negative consequences for the scientists. Audiences may very well find depictions of power-hungry scientists who seek financial gain, such as those in *The Island* or *The 6th Day*, far more troubling than “mad scientists” who lose control of their mental faculties. The monetary imperative represented by the former type of films implies premeditated and rational action on the part of the scientists.

An examination of films dealing with alternative reproductive strategies, while ostensibly about the creations, really focuses on the creators and how society defines humanity. In my analysis, I have chosen two films—*Frankenstein* and *The Boys from Brazil*—that the media used, as I examined in chapter 2, as the predominant cultural frames for their reports about cloning. I have also chosen two films—*Blade Runner* and *GATTACA*—participants mentioned in a 1998 Wellcome Trust survey on public reactions to cloning (they, too, identified *The Boys from Brazil* and *Frankenstein* as significant). The Wellcome Trust conducts research on the history of medicine and the public understanding of science. The survey consisted of public discussions

amongst 79 adults, most of whom rejected the idea of cloning humans, being “shocked by the implications” (Wellcome 4). The discussion of movies by the participants proved cursory, without benefit of analysis or further discussion:

Classic stories such as *Frankenstein*, *Brave New World* and, to a lesser extent, *The Boys from Brazil*, were not referred to in detail, but were often simply cited as examples. Just the reference to a film or book appeared to be sufficient to describe participants’ concerns, and there was an assumption that others in the group would be able to understand these instantly” (12).

As well as identifying specific films the participants associated with cloning, the study also reported that the social consequences of cloning “were often described in the context of popular cultural imagery such as science fiction films and media stories portraying the lives of public figures,” while “scientific news coverage appeared to have a lesser impact upon views (12). Similar to the way the media treated the subject of cloning, the survey provides examples of members of the public framing human cloning by using shorthand references to popular culture artifacts.

The 1931 Film Version of Frankenstein: Family and Science in Opposition

Most people recognize the story of Frankenstein not through the original novel, but through the viewing of Universal’s 1931 version of *Frankenstein* directed by James Whale. Based upon a 1930 London stage play written by Peggy Webling rather than the original novel, the movie starred Colin Clive in the role of Henry Frankenstein and Boris Karloff as the now renamed “Monster” (Skal 113). Though different from the novel, the film contains many of the same themes and elements essential to the story.

In Whale's version of the story, the Monster transforms into a shambling brute, inarticulate and scared of Frankenstein and his assistant Fritz. This vision of *Frankenstein* has become the quintessential view of the dangers of science. However, the film's main themes have more to do with family and "traditional" values than with science. Whale sets in opposition the relationship Frankenstein has with his fiancée Elizabeth and his relationship he has with his creation, The Monster. The two come from different worlds, with The Monster tucked away in the isolated castle far from the doctor's more tranquil domestic world. The doctor's need to finish his creation so that "it lives" drives him to ignore Elizabeth.

Whale emphasizes Frankenstein's physical transformation as he moves between these two worlds. While with Elizabeth, he wears dapper suits and appears quite sane. He keeps his hair kempt and appears relaxed. However, while engaged in work in his laboratory, Frankenstein takes on a different demeanor. His hair flows messily; his eyes open wide like a maniac. He becomes abrupt with those around him yet retains a vitality he lacks when with Elizabeth. As he completes his work, Frankenstein becomes secretive.

The screenwriters and Whale establish a dichotomy between Frankenstein as a fiancée and husband to Elizabeth and Frankenstein as scientist and "father" to the Monster. The term incommensurable, coined by the sociologist of science Thomas Kuhn, seems to best describe this set of relationships, because it captures the essence of the two roles of Frankenstein and their relationship to one another. Reminiscent of Stevenson's schizophrenic protagonist Dr. Jekyll and his antagonistic other half Mr. Hyde, only one of the two personas of Frankenstein ever presents itself, and ultimately, only one can exist at the end of the film.

An analysis of the different characters reveals a juxtaposition of incongruent pairings. Frankenstein cannot maintain concurrently his relationship to his offspring, the Monster, and his

relationship to his partner, Elizabeth. In a traditional family, familial bonds would unite the three. However, because of the Monster's genesis at the hands of only Frankenstein, the three individuals function as two sets of pairs that cannot reconcile their relationships to one another. In turn, the two sets of pairings interact differently within the larger society, represented by the village.

Frankenstein fashions the Monster from the sewed together parts from the corpses of dead humans, into which he has placed the brain of an insane criminal. Frankenstein creates the Monster to better determine how the spark of life comes to reside within a body. In doing so, he brings about the formation of life as a single parent; i.e. the creation process lacks the presence of a woman.

Frankenstein's fiancée Elizabeth remains mostly absent from the proceedings and stands in as a passive player in the drama. Absent from the process of the Monster's creation (except at its revival), she serves no role in his development. She becomes Frankenstein's companion only when it becomes convenient for him to allow her into his life, namely when he leaves the lab. Frankenstein functions as the sole guardian to the Monster, and a poor one at that.

The times when Frankenstein works in the lab remain clearly distinct from when he interacts with Elizabeth as her partner. Shelley intentionally separates Frankenstein as scientist (in the first part of the film) and Frankenstein as partner (in the second half of the film). Clearly, the viewer takes away the message that there exists an incompatibility between the life of a medical researcher reproducing through artificial means and the life of a husband becoming a central figure in a traditional family. These two worlds remain separate throughout most of the movie, except at the end of the film when the Monster interrupts Elizabeth and Frankenstein's wedding festivities.

Only a few characters, all of who have personal ties to Frankenstein, observe his work. At no time does Frankenstein allow society as a whole to enter the confines of the laboratory. Elizabeth and Frankenstein's friend Victor enter the lab only once: when Frankenstein reanimates the Monster. Even so, Frankenstein locks them inside the lab, confining them to his world. In this way, science and society remain apart. Science becomes a secretive affair, hidden behind watchtower walls and comprised of shadowy figures and strange machines.

When Frankenstein leaves his work behind and joins Elizabeth to marry her, society reenters the story. This holy consecration, unlike the abominable one performed earlier, concludes in front of the eyes of the community. A joyous celebration occurs when Frankenstein and Elizabeth wed because society deems such a union as both natural and normal.

Tragically, while interacting with people after his escape, the Monster kills (albeit accidentally) a small girl by drowning her. Poignantly, the filmmakers use a child as the victim. She represents the future of normal reproduction destroyed by the oncoming wave of abnormal offspring created within the walls of science.

The father of the girl discovers her body and carries it to the village celebrating the nuptials of the couple. Realizing what has caused the girl's death, the villagers rally around Frankenstein who will redeem himself by destroying his offspring. Society, represented by the villagers, has to destroy the Monster in order to restore the natural order. Frankenstein, who has reentered society earlier through his marriage, needs to destroy what he had created in order to restore normalcy to all of society. Not only does society shun the act of creation, but the creation itself. As long as it exists, society cannot function properly. This epitomizes Kass's initial contention that the creation of clones or artificial beings damages society.

When enjoining others to fear cloning because of its Frankenstein-like qualities, opponents of human cloning criticize science for allowing non-traditional reproductive technologies and non-traditional family units. The single parent, the homosexual couple, can now have genetically related offspring. The science of cloning not only has the potential to produce monsters; it also has the potential to undermine the social fabric of this country by allowing those who live alternative lifestyles to have the same opportunities and choices afforded to “normal” members of society. For opponents, this becomes much more dangerous than an army of clones: one can destroy flesh and blood. However, what clones represent, the decadent ideals their presence contributes to society may be far harder to get rid of and dismiss once the clones materially exist. Existence serves as a reminder of the failings of society in promoting and maintaining the traditional family.

The remainder of the chapter focuses on three films that depict artificial reproduction as a central plot point. An examination of the films reveals that they primarily analyze and explore definitions of the human by examining those who abuse their creations. These films, made twenty years apart, portray the corruption of scientists and industrialists, while depicting a more sympathetic view of the offspring they have created.

Historical Treatments: The Boys from Brazil

Franklin J. Schaffner’s 1978 movie *The Boys from Brazil* represents one of the earliest cinematic depictions of human cloning. Based upon the Ira Levin novel of the same name, the movie embodies many of the fears people have about the technology: in this case, the real-life individual Dr. Josef Mengele attempting to clone Hitler.

David Koehler, a self-styled Nazi hunter, uncovers a plot by Mengele to kill 94 men in a 2 1/2 year period, and tapes Mengele discussing the plan with his Nazi associates. Mengele

discovers Koehler and brutally murders him, but not before Koehler contacts Ezra Lieberman. Based on the historical figure Simon Wiesenthal, Lieberman has previously tracked down Adolf Eichmann and investigates Nazi sightings in South America. Lieberman looks into Koehler's claims to discover exactly what Mengele is trying to accomplish.

The audience gradually learn that Mengele seeks to clone Hitler in order to establish a fourth Reich; he produces 94 clones of Hitler in Paraguay, seeking not only to reproduce the genetic elements of the dictator but also the environmental elements. He does this by placing the boys in familial environments similar to the one Hitler experienced growing up, including the killing off the fathers of these boys at the very age Hitler lost his own father.

Lieberman, after interviewing families of the deceased, starts to see a pattern, mostly because of the striking similarities in appearance and demeanor amongst the male offspring of the murdered individuals. He discovers that people, all of the same age and with similar jobs, have adopted the babies.

Eventually Lieberman discovers the true nature of Mengele's plot, confronts him, and kills him with the help of attack dogs belonging to one of the clones. The movie ends with Lieberman refusing to give a list of the clones to a former colleague of Koehler, who wants to kill the clones. Lieberman rejects the notion of destroying the clones just because of their heritage. They have committed no crimes, and their destruction would be an act as evil as everything Lieberman has sought to stop.

The film contains a few noteworthy elements. The filmmakers combine both genetic material and similar environmental pressures to produce a clone of Hitler that will exhibit similar personality traits. This balance between nature and nurture demonstrates a certain understanding on the part of the filmmakers that genetics alone cannot dictate the personality of an individual.

The filmmakers also use science and scientific experiments in the narrative. When Lieberman tries to understand Mengele's objective, he visits a geneticist at a research institution. The geneticist dresses in a white lab coat, a garment often associated with working scientists. He explains the concept of cloning to Lieberman by showing him a film of early experiments with cloning in rabbits. In doing so, the filmmakers use actual footage to make the depiction as realistic as possible.

This movie demonstrates a number of fears associated with cloning. The first, and most innocuous, is the fear of unfounded expectations levied on someone due to their heritage. In this case, the expectation placed on the boys in continuing Hitler's legacy. Second, this expectation, if made known to the children themselves, could be devastating. Growing up with the expectation to be a great scientist or athlete would be a hard enough burden. Growing up with the expectation that one will lead a people through destruction and authoritarianism becomes a whole other matter. Finally, people fear that scientists would clone an evil person such as Hitler for unsavory reasons. Opponents of cloning frequently provide the example of Hitler becoming immortal through the science of cloning as a reason to resist human cloning.

Like Frankenstein, Mengele keeps most of the science he conducts shielded from the eyes of society. A secretive affair, the cloning, birthing, and raising of the children take place without the knowledge or approval of society. Lieberman, in uncovering the plot, drags the secretive science to the light of day, to the examination of a society skeptical of his claims, but ultimately forced to confront them.

While the movie does get some things right, namely the fact that environmental factors play a large role in the development of an individual, it becomes too heavy-handed to leave the audience any room for sympathy towards the clones. Using sadistic historical figures such as

Mengele and Hitler, and depicting a scenario often cited by ethicists, assures that the sympathies of the audience will be on the side of Lieberman.

Blade Runner: Defining the Human

Ridley Scott's 1982 film *Blade Runner*—based on Philip K. Dick's 1968 novel *Do Androids Dream of Electric Sheep?*—offers the audience a more nuanced examination of the theme of how society defines humanity. In the year 2019, the Earth has become highly polluted, almost all natural animals have died, and most of Earth's population has left for space colonies, leaving the infirm, mutated, and underclass behind. Replicants, artificial humans constructed by corporations, live in the off-world colonies acting as soldiers, workers, and sex slaves, performing tasks too menial for humans. While physically similar to humans (but with increased strength and endurance), the replicants display stunted emotions. The scientists have made them without feelings and genetically programmed to die within a four-year span (to guard against the possibility of the development of self-awareness). Because of an earlier violent revolt, replicants live only in the outer colonies, banned from earth under the penalty of death. Like the Monster in *Frankenstein*, society deems the very existence of the replicants as undermining the “natural” order of life remaining on earth.

The story focuses on Rick Deckard, a police officer, known as a blade runner, sanctioned to “retire” replicants who have returned to Earth. The results of a Voight-Kampff test, which measures emotional and physical responses, especially breathing and pupil dilation, differentiate between humans and replicants. The current incarnation of replicants, the Nexus 6, possesses intelligence comparable to that of an average human being. However, replicants do not have emotions though some believe that the Nexus 6 line might be able to develop emotions such as empathy with time.

In his pursuit of a group of five replicants nearing the end of their “natural” life spans, Deckard starts to examine his own motivations and questions the biological and cultural divide between humans and replicants. Part of his inquisitiveness results from his meeting with Rachel, the niece of the owner of the Tyrell Corporation, one of the largest manufacturers of replicants. Rachel is a replicant, implanted with false memories from Tyrell’s real niece; thus, she does not know of her true origins. Because of her false memories, Rachel has almost developed true emotions. She fails the test, but only after Deckard administers more than twice the standard number of questions.

This inability to differentiate humans from more evolved replicants symbolizes the failure of humans to maintain control over technology (Galagher 170). Just as humans in *Blade Runner*’s alternate future have laid waste to their cities because of the use of nuclear weapons, humans now lose their ability to identify the replicants they built to serve them. The replicants’ revolt also demonstrates this fear: losing control of a creation and having it run amok, similar to what the Creature does in *Frankenstein*, or a revolt of the lower (artificial) classes against their masters.

In this case, the replicants have come to Earth in an effort to save their lives, which they know will soon end, and find their creator (Tyrell) to reverse the process that limits their lifespan. While they do find Tyrell, Tyrell cannot help them, explaining that their lifespan intertwines with their genetic makeup; there is no way to reverse the process without destroying the replicants. Frustrated, the leader of the replicants, Roy Batty, kills Tyrell by putting out his eyes.

When Rachel confronts Deckard, trying to prove her humanity to him, she offers a photo of herself as a child as proof of her human heritage. Deckard reveals his knowledge of events she

has told no one previously, proving her artificial origins. The news devastates Rachel and Deckard. We see him surrounded by photos of his past, and he begins to wonder about their authenticity. If technology can construct memories, then it can construct objects that serve as memory devices, such as photos. Blurring the clean division between natural and artificial life forces the characters, and the audience, to re-examine their own definitions of what it means to be human, and focus on similarities rather than differences.

Deckard, too, starts questioning what it means to be human. Is it the possession of memories? Awareness of the self? The line distinguishing replicants from humans becomes unclear for Deckard. This blurring of the human/non-human, natural/artificial boundaries established by reproductive technology raises another fear. If we cannot trust our memories or photos we have of ourselves, then how can we know who or what we truly are? However, this portrays the very point of Tyrell's work. As Tyrell says, his business creates replicants "more human than human."

The final distinction between the two groups, humans and replicants, dissolves at the climax of the film when Batty saves Deckard from falling off a building, preserving his life. The gesture becomes especially poignant because it occurs moments before Batty dies because of his preprogrammed lifespan. Batty has exhibited empathy towards another living creature, becoming more human than those who pursued him do.

Like the Creature from *Frankenstein*, Batty has sought his maker, and in doing so, has come to realize the value of life. However, unlike Shelley's creation, Batty has this realization before he dies, saving the life of the man bent on his destruction:

Because the film focuses so intensely on Batty's figurative reaching out for life, his literal and inexplicable reaching out to save Deckard becomes highly

symbolized gesture that transforms this monster into the truly tragic romantic figure that Shelley's Monster never becomes. (Abbott 348)

While Dick wrote his novel in response to the Vietnam War and the killing of civilians in that conflict, it, and the film based upon it, remain poignant even today. What becomes more important in determining the worth of an individual: their method of creation or the way they act? *Blade Runner* questions our notions of humanity by making the replicants of the film appear life like, while at the same time bringing into question the real nature of life. What provides a basis for one class to enslave the other if only their physical construction differs? Once replicants gain the ability to empathize then they deserve equal treatment: not as slaves, but as individuals. The society that manufactures and enslaves these naïve creatures becomes guilty of heinous crimes, more problematic than the crimes committed by replicants trying to escape their forced captivity.

GATTACA: Genetic Essentialism and Undue Expectations

Instead of depicting a world with replicants, a world where manipulation of humans has become the norm provides the scenario for Andrew Niccol's 1997 film *GATTACA*. In the not so distant future, humans have nearly perfected genetic engineering, allowing couples to select desirable traits for their offspring, rather than leaving the process to chance. This process creates "natural" children, the old process of reproduction now labeled unnatural. Society has labeled these individuals conceived without the benefit of genetic engineering "faith births" or de-generants. Though officially illegal, genoism, discrimination against individuals based on their genetic make-up, exists, in both hiring practices and daily life. Relegated to menial labor, faith births register with the state and endure random interrogation and detention when crimes occur.

Society assumes that only a de-gene-erant could be morally or genetically faulty enough to break the law.

In the society of *GATTACA*, genes predicate the life of all children regardless of their method of birth. Genetic tests indicate mental, physical, and emotional deficiencies, often limiting the choices afforded to children as they grow. The analysis of DNA charts everything about a person including their probable cause of death. Invariably, this knowledge “seems to dampen human initiative, while living up to one’s technologically determined potential can also be daunting” (George 179). The society in *GATTACA* embraces genetic determinism and eugenics taken to an extreme.

GATTACA exemplifies the fear that discrimination based upon difference in reproductive process will become a problem. Echoing the eugenics movement in this and other countries in the early twentieth century, the world of *GATTACA* relies on advanced technology rather than selective breeding to create better offspring. The film, however, reverses our current state of affairs by making those created through this alternative technology the ones society rewards and values rather than those conceived through traditional methods. Members of this society have divided into two classes, with the genetically inferior subject to harassment, prejudice, and regulation.

The film introduces the audience to one of these faith babies, Vincent Freeman, who dreams of becoming a flight engineer for the corporation Gattaca, and eventually going to Titan, the 14th moon of Saturn. At birth, Vincent’s parents received the news that he had a 99% chance of dying young due to an abnormal heart. His parents have treated Vincent like an invalid, though he does not exhibit any physical limitations. Not wishing to tempt fate twice, Vincent’s

parents create his brother Anton “naturally.” He becomes Vincent’s physical, but not necessarily his intellectual, superior.

Unable to find work, and not appreciated by his parents as much as his sibling, Vincent strikes out on his own. Frustrated by his inability to get a non-menial job (he works as a janitor at Gattaca), Vincent decides to buy the identity of a genetically ideal individual, Jerome Eugene Morrow.

Because of the nature of this society, genetic profiles have become the most precious commodity. A highly touted swimmer Morrow became disillusioned with his life after finishing second in a championship meet. A cripple, Morrow cannot walk because of an accident—presumably due to a failed suicide attempt—and lacks any spark to live. Utilizing Jerome’s bodily fluids and clippings (hair, blood, urine, etc.), Vincent takes on the name and identity of Jerome (while Jerome now only uses his middle name, Eugene) and gains employment at Gattaca, this time as an engineer rather than a janitor. Though the two do not look alike, “Vincent becomes a conceptual clone of Eugene by assuming his identity through the use of his DNA” (Clarke 105). In a society that places so much faith in technology, people trust readouts of DNA rather than believe in their senses. Technology has provided humans with the ability to achieve near-perfection. At the same time, they have become myopic because they trust the results provided by technology without question, believing machines infallible. They fail to use their senses because they believe totally in the technological applications found within society. Like *Blade Runner*, *GATTACA* reminds the audience that what one “sees” does not necessarily mirror the truth.

While employed at Gattaca, Vincent (as Jerome) takes up romantically with Irene Cassini, a fellow space-traveling aspirant. Though conceived in the laboratory, Cassini has a

secret. Something went wrong during her development, and she, like Freeman, has a weak heart. Like Morrow, Cassini cannot live up to the expectations placed upon her by a society that values genes above all else:

In *Gattaca*, society has become a collective Dr. Frankenstein. It achieves this by genetically manipulating fetuses to produce ‘perfect’ specimens of humanity. And, as we see, the experiment fails because the perfect specimens are imperfect in subtle, undetected ways. Ultimately, they are stymied by the curtailing of their natural impulses and crippled by the paternalistic expectations imposed upon them. (Kakmi 90)

While those around him remain grounded, Vincent fulfills his desire to go to space. Vincent’s drive to go beyond his seeming physical limitations contrasts with the “natural” born characters’ inability to fulfill the expectations placed upon them because of their “superior” genetic heritage. Spirit can overcome perceived genetic limitations.

Trust in humans rather than in technology remains the key to improving the race because superior genes do not necessitate superior morality. The filmmakers depict the use of technology in improving the species as unproblematic:

Unlike most bioethics texts that discuss gene therapy, however, *GATTACA* maintains that many of the problems associated with the new eugenics, such as genetic discrimination, genetic prophecy, and the homogenization of society, are not due to the technology itself. Rather, *GATTACA* proposes that these problems will only arise if the belief that individuals are no more than the sum of their genes becomes a matter of consensus: a black box. (Kirby 211-12)

There is nothing wrong with seeking to improve the physical characteristics of individuals as long as we seek to improve the emotional ones as well. Genetically engineered humans might be physically superior but they suffer from the same emotional weaknesses that their predecessors did, including discrimination. Enhancement needs to be as much about the spirit as about the body.

A Counter-Narrative of Science Fiction for the Cloning Debate

My exploration of these cultural artifacts reveals themes common to both the novels and films. These themes offer a different explanation of the works' meanings for the audience than interpretations provided by the media and ethicists debating human cloning technology.

Thematic Elements in the Novels

While *Frankenstein* depicts the effects of a monster in society, and *Brave New World* depicts society as monstrous, they contain some striking similarities in plot and character that go beyond the works' depiction of the rapid change in technological innovation. One significant parallel in the two works is the role language plays. Unlike the better known portrayal of the Creature on screen, the Creature in Shelley's novel appears quite articulate, even more shocking to those that encounter him given his appearance:

From his first words, he [the Creature] shows himself to be a supreme rhetorician of his own situation, one who controls the antithesis and oxymorons that express the pathos of his existence.... When we learn of the Monster's self-education we understand the sources of his eloquence, and of the conception of a just order of things that animates his plea to his creator. (Brooks 206-07)

The Creature's eloquence raises him above the role of just a savage brute. He remains aware of his actions and commits them with good reason. Because of Victor's denial of his request for a mate, he continues his murderous actions.

Huxley uses language as a key element throughout his work. However, in the world of the future, language has taken on less rather than more significance:

Doing away with literature has severely affected the use of language. Other than insipid popular music... there are no models to guide usage and no means available to expand vocabulary or experiment with structure. Human languages and other cultural differences have been severely reduced by the World State, since stability requires mutual understanding between different peoples. (Sisk 123)

The ironically named Savage enters this world and maintains a true love and understanding of language due to his familiarity with literary works. Like the Creature, his eloquence cannot get help him attain what he wants: a comfortable and accepted place within society.

The rhetorical power of these two individuals, the Creature and the Savage, represents just one of the traits the two share. Abandoned by their fathers and self-taught through literature of an earlier age, the two display an incredible naiveté when it comes to human nature of their respective societies. They become "the other" because of their methods of creation and create disturbances for their societies: the Creature through murder, and the Savage through his ideas. They both seek escape from a society that cannot accept their nature: the Creature by running to the Arctic and the Savage through suicide.

The two architects of the scientific world of the two novels, Victor and Mond, also display similarities. Both become aware of the consequences of their actions but ignore these

consequences at the expense of others. Victor stays quiet about what he has done, even remaining silent when it can save the life of an innocent woman accused of murder. Ultimately, his silence indirectly leads to the death of his wife Elizabeth. Mond, the Controller of the World State, understands what has been lost in a culture void of art and love. He makes the laws, laws that he can break with impunity, but does not allow others this benefit. In order to keep the world ordered and have everything in its proper place, Mond sacrifices individual freedom.

The function that both Victor and Mond play in their respective texts gives us an insight into the authors' primary concerns. In both novels, the authors criticize the reckless manner in which scientists use technology. Both works illustrate the themes of numerous stories that critically comment on scientists and their motivations for discovery.

Themes Evident in the Films

While the films attribute different meanings and degrees to the function of science in society, they depict common themes about the role of technology in society.

Culture defines humanity as much as biology: The members of society impart or withhold the moniker "human" on individuals, whether created through cloning, genetic engineering, or traditional methods. In turn, individuals retain this designation based upon their actions, not their origins. Frankenstein becomes a valued member of society after he destroys his offspring. Lieberman resists identify the clones of Hitler because they have committed no crimes unlike their progenitor. Batty redeems himself by showing empathy towards Deckard by saving his life. Vincent succeeds through determination and a strong work ethic rather than his genetic heritage. Retaining one's humanity involves making choices that demonstrate the characteristics of humanity as defined by society.

Technological developments profoundly shape society: The creation of individuals through cloning or genetic engineering does more than just lead to new offspring. It alters the way society conceives of reproduction, the creation of life, and defines the natural. In *Blade Runner*, replicants must perform jobs once considered undesirable or dangerous by members of society. As the replicants develop qualities that are more human, the society must justify their continued segregation by develop better methods of differentiating them from humans. In *GATTACA*, genetic engineering creates superior individuals. However, the technology also creates a rigidly, hierarchal society where personal motivation no longer matters, only your genetic heritage and the expectations you must fulfill. Once developed, technology cannot be “undiscovered” and removed from the culture’s awareness.

Society becomes morally responsible for the consequences of technology: Reciprocally, even as technology shapes society, members of society remains accountable for the effects of technology. Scientists cannot ignore the repercussions of a technology, dismissing the effects as someone else’s problem. Frankenstein ignores his creation after imparting the spark of life by abandoning him to society and causing him anguish. The world of *Blade Runner* abuses replicants by treating them as slaves forced to perform undesirable jobs. Moreover, society shuns and disregards natural births in *GATTACA*, treating them with contempt rather than respect. Just as they worry about how their new offspring will act towards them, members of society must appreciate the way they will react to their discoveries.

These stories ask the audience “could our society come to grips with a creation such as this, and the culture that produced it, regardless of the creation’s nature?” The answer seems to be a resounding no, akin to the no Kass delivers to his audience. For Kass, the creation of a clone

inspires repugnant and becomes an abhorrent act. For these filmmakers, society's treatment of the creations reflects the repugnance of the creators.

This chapter examined depictions of reproductive technologies in science fiction books and films as a way of understanding both the mythic qualities of the texts and the arguments of the films. Read in their historical context, *Frankenstein* and *Brave New World* deal with the loss of humanity through the auspices of technology. In *Frankenstein*, Victor exhibited moral failure, not because he created the Creature, but because he abandoned his responsibilities for his creation. While we identify with the society portrayed in the book, we also identify with the Creature, an orphan of early-modern society who must educate himself and rise above his "humble beginnings."

In *Brave New World*, the situation reverses, with John the Savage taking on the role of the Creature. Also self-taught, John mirrors the horror we feel for the society he has been introduced into. As Shelley did in *Frankenstein* through the depiction of Victor's actions, Huxley condemns all members of society not for their use of technology but for their worship of it in place of all other human endeavors. In doing so, the members of the World State have all abandoned their responsibility as parents because of the revulsion they feel for natural conception.

The films share many of these themes. While *The Boys from Brazil* stands somewhere between the two meta-narratives of the Clone as Monster and Society as Monstrous, *Blade Runner* and *GATTACA* clearly situate themselves in the latter category. The two films depict the effects of an over-reliance on technology and the subsequent marginalization of those who fall into socially constructed categories of the undesirable. The films demonstrate that advances in

technology do not predicate increased wisdom or require superior morality on the part of the creator.

When Kass and the media invoke these texts through metaphor, they offer a version of the story without an exploration of the themes. Debates over technology must include concepts of morality, but not morality derived from a reductionist interpretation of literature. I have provided a more nuanced view of the stories, which in turn provides a more nuanced discussion of the ethical aspects of the stories.

Chapter 6: Lessons from Dolly

I began my investigation of this topic five years ago with a single question: why do people dislike or even fear cloning so much? Over the subsequent years, my research revealed that the only experience many people had with the concept of cloning came from their exposure to scenarios contained within science fiction books and films. However, this exposure did not fully explain why the national ethics bodies and the U.S. Congress felt it necessary to ban human cloning. Only upon further examination did I learn that opponents of human cloning incorporated these fictional accounts of cloning into an ethical framework they used when debating the technology.

This dissertation has presented a case study examining the effects of popular culture on a debate over a new application of technology. While the cloning of a sheep through a new scientific technique became newsworthy, the likely possibility of cloning a human captured the headlines and imagination of individuals. Long relegated to the realm of science fiction, the cloning of human beings became a significant media story in the late 1990s.

The field of science and technology studies has both theorized and demonstrated through analysis the role non-technical factors play in technology acceptance. A deeper examination of the non-existent technology of human cloning further demonstrates how these factors become part of, and ultimately frame, the ensuing debate about what the acceptance of a technology says about our culture. Because cloning deals with issues of personhood and the body, issues that go to the very core of our identities, the debate about it proved replete with many stakeholders seeking to have their voices heard.

In analyzing the cloning debate, I have presented a narrative of the events that shaped some of the public discourse used in the debate. I began by looking at cloning policy with a

critique of the methods employed by two ethics commissions that held meetings and produced recommendations to the president on the technology of human cloning. While similarities existed between the two sets of deliberations, the differences signal a realization of how public perceptions of cloning changed and the means bringing about those changes. The NBAC, in proposing a moratorium on the funding of human cloning, focused on the place of the clone in society. In speaking for the non-existent clone, the commissioners exhibited genetic determinism, placing an undo emphasis on the role the gene plays in forming the individual psyche. Concerns about autonomy, individual expression, and an undetermined future for the clone marked the clonal body as a copy, and placed too much emphasis on the genetic makeup of individuals.

In contrast, the PCBE recommended a complete ban on reproductive cloning. In reaching this consensus, the commission considered numerous non-technical factors in their assessment. The unusual choice in including literature signaled recognition of the importance of literature in reaching conclusions about technology and in shaping subsequent ideas about technology. This recognition reflected the way the topic of cloning the media and those debating the topic used science fiction as a frame. While journalists and ethicists writing in the media made allusions to *Brave New World* and *Frankenstein*, often in metaphorical ways, the PCBE spoke of the importance of literature in an overt manner. The books and films that had once been cultural tropes became policy topics written about in background papers and discussed in governmental reports. In using these cultural tropes, the commission members reduced these stories to pithy statements about the harms of technology. In doing so, the members ignored the larger themes present in the works.

The editorials Leon Kass, the Chair of PCBE, wrote about cloning also underwent a shift in emphasis. Initially, Kass grounded his argumentation in cultural norms and values, reflected in his description “cloning is repugnant.” Kass’s concerns over cloning stemmed from not only the production of clones and their effect on society, but also from the potential loss of identity and personal autonomy we have as individuals. Kass believed that our current societal values, which had declined steadily in the preceding decades, enabled those who wanted human cloning to articulate their beliefs.

In his second editorial, Kass focused less on the clone in society, and more on the direction of our society. Framing his argument with Huxley’s *Brave New World*, Kass took a technological deterministic view towards developments in science. In calling on his audience for support in banning cloning, Kass posited that only by stopping cloning could we stop its subsequent negative repercussions.

In both his arguments, Kass relied heavily upon culturally conceived definitions of natural and acceptable when it comes to the traditional family. In essence, Kass’s argument focused on “how to conventionalize and contain diversity and (the proliferation of) difference(s)” (Hartouni 119). While cloning would not create identical individuals, allowing cloning as a reproductive choice would acknowledge the difference in beliefs individuals held on concepts such as family and parenting.

The media played an active role in associating mammalian and human cloning, using both ethical and science fiction frames in its coverage of Dolly’s birth. Acting as gatekeepers, the media drove the discussion of cloning in a specific direction. Instead of reporting on the facts of the cloning of a sheep, the media focused on the inevitability of the cloning of a human. In doing so, they also focused on the effects cloning would have on society. They based these

prognostications not on the society of the day but on the societies portrayed in science fiction texts and films. In this way, they grounded their writing and made the concept of cloning accessible to the public. Drawing upon the mythical power of themes in *Frankenstein* and *Brave New World*, cloning became an eventual certainty in journalists' descriptions of the technology. By drawing upon the cultural conceptions of cloning derived from these works, the media reified the image of cloning technology as highly problematic.

I have employed the term “cultural accommodation” in referring to this practice by journalists and science writers in drawing upon preconceived notions about science and technology in explaining scientific concepts to the public. In the case of human cloning, those mostly negative preconceived notions developed over decades of exposure to science fiction films and books that conceived of the subject of alternative reproduction. Average individuals might not understand the complexities of somatic cell nuclear transfer, the process used to create Dolly, but they had an affinity with the possibility of cloning humans through previous exposure to films such as *The Boys from Brazil*.

I examined the actual texts invoked by the media as a means of producing a counter-narrative to the one put forth by Kass. The genre of science fiction utilizes alien civilizations and futuristic societies to discuss the problems of contemporary society. By placing characters in otherworldly situations, the author freely analyzes society without the repercussions of censorship or retribution. Science fiction authors do not portray inevitable futures but possible ones. They do not predict what the future holds but set a mirror before society to demonstrate a possible future for that culture.

In opening the “black box” of science fiction works invoked by the media, ethicists, theologians and politicians, at first one finds a certain sense of revulsion or dread in the stories.

The consequences of actions similar to the cloning of humans appear disastrous to the audience. Science fiction works that deal with body manipulation in general, and cloning in particular, often appear dark and foreboding. Society either shuns or destroys individuals who play god or go beyond the bounds of ordinary science. Works that portray a society transformed by this sort of technology depict the society as highly negative, the antithesis of the audience's perceptions of the real world.

However, individuals can read these science fiction works as more than just literal indictments of science or the products of science. Often, the stories criticize the culture that creates this science or technology, not for producing it but for not regulating it. Both *Frankenstein* and *Brave New World* depict this type of scenario. Frankenstein's abandonment of the Creature and the World State's wholehearted adoption of mass production represent instances of society ignoring or disregarding the subsequent effects of technological development.

In many cases, the scientist's choice in creating an offspring or the transformation of society does not represent the primary concern of the author. They merely serve as a medium the author uses in getting a message across to the audience. In reducing the works of science fiction to a simple idea about the dangers of technology, the media and Kass diminished the stories' value, misrepresenting the spirit of the work and the message the author conveyed in their stories.

Texts such as *Frankenstein* and *Brave New World* have taken on a significant role in our culture, but not necessarily through people's reading of them:

Most people have not read *Brave New World*, but that doesn't matter. The scores of references to *Brave New World* aren't about the book; they are about the trope connected to the book. *Brave New World* is a stand alone reference, image, and

warning about dehumanization, totalitarianism, and technology-wrought misery—epitomized and made possible by the technology of cloning. There is no comparable book that praises cloning as a liberating technology. *Brave New World* stands alone, framing the issue as a dichotomy between vaguely helpful medicine and Fordist nightmares of enslaved and manufactured citizens. (Hopkins 11)

Frankenstein and *Brave New World* no longer function simply as stories. Instead, they have become modern myths for our society. As our culture adopts new technologies, we look to these modern myths of science fiction as an explanation of how we should confront and live with technologies that affect our lives. In the case of cloning, a technology that could change the nature of human creation, texts such as Shelley and Huxley's provide warnings for us. When humanity relies too much on technology as a guide for society, this creates the possibility of society foundering. However, if we keep technology in check and use it rather than let it use us, then the culture may benefit and retain its moral values.

Science fiction films also portray the vision of alternative reproduction. My analysis indicates that such portrayals place the onus of responsibility for any wrongdoing on the scientists and society that misuse technology, treating humans as objects. Films such as *Blade Runner* and *GATTACA* force a reevaluation of the way we define humanity, and an assessment of the underlying beliefs that go into creating those definitions. By emphasizing the similarities between humans and their non-human counterparts, these films move beyond black and white depictions of the effects of technology.

Opponents of cloning used these films and books as metaphors for the destructive nature of cloning. By stating "cloning is a Frankenstein-like scenario" or "cloning creates a Brave New

World,” opponents of cloning used the titles of science fiction works as a coded, shorthand way of indicating the dangers of modern science and technology.

Recent Developments

Researchers in Scotland euthanized Dolly on February 14, 2003 at the age of six. Dolly, who had been suffering from arthritis for a year, developed an incurable lung tumor. A post-mortem revealed no other abnormalities (Giles and Knight 776). Some scientists have hypothesized that Dolly’s demise relates to her advanced genetic age: her original cell came from a six-year-old ewe, making Dolly genetically 12 years old when she died. Scientists believe that they need to examine the premature ageing in clones in more depth.

To date, the United States Congress has failed to pass any legislation in both houses banning reproductive cloning. The Democrats taking control of both houses of Congress decreases the likelihood of any comprehensive ban passing in the near future. In response to this policy gap, 15 states have enacted laws banning reproductive cloning as of April 2006, modeling their language on proposed federal bans (“State Human Cloning Laws”). Additionally, six of these states (Arkansas, Indiana, Iowa, Michigan, North Dakota, and South Dakota) have also banned therapeutic cloning.

The PCBE’s use of fictional material as a basis for discussion has continued. In publishing a collection of fictional works used in deliberations about other ethical topics, the PCBE said, “These works can be invaluable companions as we search for a richer understanding and deeper appreciation of our humanity, necessary for facing the new challenges of our biotechnological age” (“Being Human”). The recent incorporation of narrative in the field of bioethics also reflects this move towards using literature in understanding dilemmas in medicine (Klein).

Tracing recent fictional accounts of cloning, comparative literature professor Kerstin Bergman argues that recent depictions of clones in books and movies have been, on the whole, growing more positive, though depictions of scientists have remained negative: “Two strong trends dominate the fictional depiction of human clones post-Dolly. First, clones are now portrayed as complete individuals who are fundamentally good and innocent.... A second, subtler trend is that clones are often extremely close.” Bergman believes that if this tendency persists, then “the exposure to positive images may very well accustom us to the idea of human cloning, help us think of human clones as human beings—and, eventually, for better or for worse, open the doors to reproductive cloning of humans.”

Bergman’s thesis echoes one put forth by Leon Kass in his editorial “The Wisdom of Repugnance.” Kass maintains that though declining moral values have proven most significant in creating an atmosphere for discussions about cloning, fictional portrayals of clones have softened us up and made us more accepting of the idea (17). However, such a perspective undermines his use of *Frankenstein* and *Brave New World* in arguing *against* human cloning. In making this statement, Kass may be arguing that positive and negative accounts of cloning belong in entirely separate categories of meaning. In essence, positive accounts romanticize or oversimplify discussion of technology while negative accounts portray the harsh realities associated with those technologies.

Further Inquiry

An approach such as the one I used in this dissertation lends itself well to an examination of the discourse on therapeutic cloning. Individuals often conflate discussions of this technology with the debate over reproductive cloning, sometimes as a rhetorical strategy and sometimes through lack of understanding of the differences between the two. Unlike reproductive cloning,

which very few people defend, therapeutic cloning maintains the support of an increasing number of individuals. The debate over therapeutic cloning has focused on the moral status of the embryo and the determination of the beginning of life. These subjects echo many of the same issues discussed in debates over abortion.

In a broader sense, further examination of the influence of cultural concepts and artifacts on non-existent technologies or technologies never accepted by society may provide valuable insights for policymakers and those studying them. In effect, I have created a framework that I can apply to other debates about science and technology in the policy sphere. The language people use in conceptualizing such technologies in the media will play a considerable role in the subsequent framing of the technology in public debates. This necessitates analysis of these debates from their inception so a complete understanding of the definitions, and any changes to those definitions, becomes clearer.²⁶

In writing about the impact of reproductive technologies, feminist scholar Valerie Hartouni (echoing Foucault) states, “social technologies already do much of the work at the same deep level and with the same effect that is feared this new reproductive technology, cloning, will do and have” (119). Understanding this phenomenon will generate productive discussion and analysis about the role technology has in society, and conversely, the role society has in creating technology.

²⁶ Studies such as Fahnestock’s analysis of accommodation in science writing underscore the need for the better training of journalists writing about complex topics. My forthcoming chapter on teaching audience in the professional writing classroom details my technique of immersing students in discourse communities. This immersion provides them with better insights into the relationship of audience to text.

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 M.S. Technical Communication. Rensselaer Polytechnic Institute. 1997.
 M.A. English (Rhetoric and Composition). University of Arizona. 1993.
 B.A. Biology and Creative Writing. University of Arizona. 1991.

Professional Experience

Assistant Professor. Writing and Rhetoric Studies. James Madison University. Teach "Critical Reading and Writing" and "Technology and Writing." Fall 2007 – date.
 Lecturer. Department of English. University of North Carolina Wilmington. Taught the courses "Introduction to Technical Writing," "Theory and Practice of Editing," "Writing for Business," and "Writing about Science." Fall 2006 – Summer 2007.
 Instructor. Writing Program. James Madison University. Taught face-to-face and online sections of "Critical Reading and Writing" and "Technology and Writing." Also taught "The Rhetoric of Scientific Discourse," "Visual Rhetoric," and "Medical Writing." Fall 2004 – Summer 2006.
 Adjunct Instructor. Department of English. Virginia Commonwealth University. Taught the courses "Writing and Rhetoric Workshop I," "Writing and Rhetoric Workshop II" and the writing-intensive course "Writing in the Workplace." Fall 2003 – Summer 2004.
 Adjunct Instructor. Department of History. Virginia Polytechnic Institute. Taught face-to-face and online sections of "History of the Modern World." Spring 2003 – Summer 2003.
 Graduate Teaching Assistant. Program in Science and Technology Studies. Virginia Polytechnic Institute. Assisted in the courses "Introduction to American Government and Politics," "Introduction to Comparative Government and Politics," "The U.S. Policy Process," and "Introduction to Humanities, Science, and Technology." Fall 1999 – Fall 2002.

Publications

"Reconsidering the Lay-Expert Audience Divide." *Handbook of Research on Virtual Workplaces and the New Nature of Business Practices*. Eds. Kirk St. Amant and Pavel Zemliansky. Hershey, PA: IGI Global, forthcoming.
 Review of Lords of the Harvest: Biotech, Big Money, and the Future of Food by Daniel Charles. *Journal of the History of Biology* 36 (2003): 411-13.
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Review of *The Triple Helix: Gene, Organism and Environment* by Richard Lewontin. *Journal of the History of Biology* 33 (2000): 611-12.

Conference Presentations

Conference on College Composition and Communication. "Online Instruction: Creating Student E-Identity in an Academic Environment." Paper presented at the Convention. New York. March 2007.

Society for Literature, Science, and the Arts. "Hideous Progeny: Alternative (Re)production in Science Fiction Films." New York. November 2006.

Choices and Challenges Forum. "Cloning in the Popular Imagination-The Science Fiction Film." Virginia Tech. October 2004.

Mephistos 2002. "Incommensurable Ideals: Family and Science in Frankenstein." VA Tech. March 2002.

Humanities and Technology Association. "Regulating Reproductive Technologies: Foucault, Cloning and NBAC." University of Virginia. October 2000.

NY State Speech Communication Association. "AIDS Education: Now or Never." Albany, NY. March 1996.

16th Annual Conference on Discourse Analysis. "Journalism 'Stories': The Ironic Implications of a Narrative of Science." Temple University. April 1995.

Awards and Grants

Madison Teaching Fellow – Teaching and Technology Group. James Madison University. 2005 – 2006.

Center for Instructional Technology Online Course Development Grant. James Madison University. 2005.

Excellence in Technical Communication Award. Society for Technical Communication. 1997.

Service Activities

Chair of the Writing Program Technology Committee. Fall 2005 – Spring 2006.

Member of the Writing Program Curriculum Committee. Fall 2005 – Spring 2006.

Member of the Writing Program Write On! Committee. Fall 2004 – Spring 2005.

Member of the Writing Program Portfolio Assessment Committee. Summers 2004 and 2005.