THE COMMON SENSE RHETORICS OF ANTI-SCIENCE: TESTIMONIES FROM CREATIONISTS AND ANTI-ENVIRONMENTALISTS

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
May, 2005

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ACKNOWLEDGEMENTS

This project has demonstrated to me the truly collaborative nature of writing; I owe much gratitude to those who helped me create this dissertation. First, I thank Drs. Carol Moder and Margaret Ewing for their work on my committee and their helpful comments. Thanks to Dr. Melissa Ianetta for her insightful questions, which helped me to think more critically about my methods of analysis. I also owe thanks to Dr. Denise Tillery who assisted in the inception of my research questions. In addition, I'd like to thank her for her willingness to read drafts, answer questions, and give encouragement whenever I needed it. My early discussions with her about science and rhetoric provided the basis for the entire project. Thanks also go to Dr. Shelley Reid who provided last-minute moral support.

I owe special thanks to Dr. Richard Batteiger who valiantly stepped in as dissertation advisor more than halfway through the project. His close reading of my many drafts and his insightful commentary were indispensable to me. His encouragement and guidance have been invaluable throughout the entire process. His unwavering confidence in me pushed me to keep writing even when I wanted to quit.

I must also thank those friends who have spent more than two years listening to me talk about this project. Dr. Shelley Thomas has been an invaluable source of information. Thanks also go to Dr. Mischelle Anthony, Stacey Winters, and Julia Boyd

for their friendship and encouragement. My parents, Bill and Carol Hoverson, deserve special recognition for their understanding and emotional support.

Finally, I would like to thank my biggest supporter, Robert Seifert, who has been my closest friend and most reliable inspiration. Without him, I never would have finished. Thanks for putting up with me.

TABLE OF CONTENTS

Chapter 1: Introduction 1

Science and Anti-Science 4
Popular Science 11
The Anti-Intellectual Movement 17

Chapter 2: Methods 22

Text Selection 29

Chapter 3: The Creationist Debate 34

The Creationist Ideology 34
A History of Creationism 41

Chapter 4: A Neo-Aristotelian Analysis of Creationist Rhetoric 56

Invention and Stasis Theory 57
Arrangement 63
Style and the Critique of Mainstream Science 78

Chapter 5: Creationist Writing as Conversion Rhetoric 93

The Story of Creationists 94

Chapter 6: The Anti-Environmentalist Movement 117

The Anti-Global Warming Perspective on Environmentalism and Science 121
The Apocalyptic Environmentalist Tradition 128

Chapter 7: A Neo-Aristotelian Analysis of Anti-Environmental Writing 141

Invention and Stasis Theory 141
Arrangement 148
Style and the Critique of Mainstream Science 161

Chapter 8: Anti-environmental Writing as Conversion Rhetoric 170

The Story of Anti-Environmentalism 173

Chapter 9: Understanding the Fantasy-Types of Anti-Movements 191

Chapter 10: Conclusion 206

Works Cited 209

TABLE OF TABLES

Table 1 196

Chapter 1: Introduction

> *…Science's potential as an instrument for identifying the cultural constraints upon it cannot be fully realized until scientists give up the twin myths of objectivity and inexorable march toward truth. One must, indeed, locate the beam in one's own eye before interpreting correctly the pervasive motes in everybody else's (55).*
>
> Stephen Jay Gould, *The Mismeasure of Man*
>
> *It will be argued here that in fact only the scientific method (and only when correctly applied) can generate truth. Conversely, apart from the obvious, the only truth possible is by definition scientific.*
>
> Theo Theocharis, "What Is 'Episteme?' The Meaning of 'Science' and 'Truth'"
>
> *Science arouses a soaring sense of wonder. But so does pseudoscience. Sparse and poor popularizations of science abandon ecological niches that pseudoscience promptly fills. If it were understood that claims to knowledge require adequate evidence before they can be accepted, there would be no room for pseudoscience (6).*
>
> Carl Sagan, *The Demon Haunted World*

I first became interested in the interplay between science and rhetoric while attending a university biochemistry department picnic as a guest. Nervous about my ability to communicate intelligently with a group of people who could freely and enthusiastically chit-chat about metabolic pathways, I sought out a seat with the least intimidating of the bunch: a friendly gentleman with a white beard and checkered suit. His stuffy suit was comically out of place as he perched at the end of a rusting metal picnic bench eating a burned hot dog. After making small-talk about my training in rhetoric, he promptly informed me, "I've never known much about persuasion and argument. I just work in my lab and then write up my results. Just the facts." He shrugged happily, convinced that we weren't even on the same plane of existence. "But

surely you must believe that argument exists in the field of science?" I asked. "Oh, sure," he told me, "Carl Sagan, Stephen Jay Gould—the guys who publish books for nonscientists—they make some interesting arguments. But they still present facts," he hastily added. He continued on, "Then you have the creationists—*they* use rhetoric. That's not science." He shook his head disgustedly and continued eating his hot dog, content that he'd definitively demarcated the lines that separate science and rhetoric.

It was clear to me that he had established a hierarchy: mainstream science—specifically, lab science—is at the top because those scientists present facts. Popular science, if written by trained scientists, comes next because it simplifies complicated facts that scientists discover and present. Wrong-headed science, like creationism, doesn't even make the hierarchy—it languishes away in the world of rhetoric. The suggestion is that rhetoric is useful when one wants to convince others of false information.

The incident left me with questions about how other mainstream scientists—university professors and other professional scientists—perceive their work and their writing. The amiable man I spoke with has a PhD in chemistry from Harvard, has worked in his field for over thirty years, and has an impressive list of reputable publications to his name, yet he sees himself as merely a reporter of facts. I suspect that many other scientists see themselves in the same light: observers of phenomenon who use language to analyze and describe data, but certainly not as skillful rhetoricians who follow a very specific and rigid rhetorical tradition as they write.

Questions about how scientists view their writing led me to consider how popular science writers—those who write for lay audiences—see themselves. As reporters?

Purveyors of truth? Or as rhetoricians? My quest to understand the relationship between popular and mainstream science led me to the works of popular writers who are often called anti-science writers (Holton 147)—writers who call themselves scientists (and who often are formally trained as such) and claim to *do* science, but who are not accepted by the scientific community. These anti-science writers also vehemently claim they are not rhetoricians. Yet after reading these anti-science works, it was apparent to me that they do not fit within the realm of mainstream science at all. They are, in fact, quite different from popular science too. Anti-science works are not *just* translating science for general readers, as Sagan and Gould do, even though anti-science writers celebrate an epistemology of science that upholds the idea of the scientist as a reporter of truth. Like mainstream scientists, anti-science writers insist that science is observation, but they lament the inability of mainstream scientists to communicate useful facts and statistics to lay readers. Oddly enough, I discovered that the anti-science writers are not anti-science at all. While they certainly present a different view than mainstream scientists—one that is more often than not factually incorrect—they still claim to uphold the same epistemology that my friend at the picnic delineated for me.

The following dissertation is an attempt to understand the role of popular anti-science writing in our current culture. Of course, many writers have already written about the rhetorical nature of popular science,[1] but this dissertation examines the popular science movements that mainstream scientists often reject—in some cases because they are scientifically wrong, and in other cases because scientists want to distance themselves from the movement itself. More specifically, I am interested in examining the roles that

[1] See, for example, Jeanne Fahnestock's 1986 article "Accommodating Science," which looks at the rhetorical character of popular science. Gerald Holton's book, *Science and Anti-Science*, is also a useful exploration of science outside of the mainstream.

popular anti-science writers ascribe to themselves. In what roles do these writers see themselves? What duties do they believe the popular science writer must fulfill? How do anti-science writers distinguish their work from the rhetorics of science or popular science? Most important, what are the rhetorics of anti-science movements?

Understanding the rhetoric of anti-science movements can help illuminate the contentious debate between those who maintain that traditional science is the only appropriate epistemology and those who maintain that anti-science provides a more open and democratic route to understanding and making sense of the natural world. The relative success and endurance of anti-science rhetoric suggests that it requires the same level of rhetorical inquiry as the rhetoric of science. Rhetorical analyses of anti-science communication provides a window into how such groups view themselves and the world around them.

Science and Anti-Science

If one looks at the most contentious issues in our society today—abortion, gun control, capital punishment, the war in Iraq—one sees the polarizing effects each argument creates and there seems little hope for finding middle-ground. Abortion protesters, for example, likely will not lay down their picket signs or even accept the possible validity of the pro-choice camp. Likewise, staunch pro-choicers are unlikely to see the possible validity of the pro-life position. But one thing most people have in common, regardless of their opinion on the issue, is a general respect for science, though their interpretations and uses of it may differ vastly. Nevertheless, if a debate can be waged on scientific grounds, debaters will do so. If "science"—that vast, amorphous, almost-divine force—can definitively prove that life begins at conception, for example,

the pro-life camp has a compelling argument, assuming they can convince pro-choicers that their data is good science. The argument, of course, rages on about the definition of life, but creating a definition endorsed by science (or *seemingly* endorsed by science) gives an argument ground on which to stand.

Science holds a tremendous amount of authority in our society. The mere invocation of a supposed scientific truth can often end a debate; after all, it is difficult to argue with "facts." But not all scientific claims are factual. Pseudoscience, or fringe science, a popular and widespread phenomenon, includes work by people who claim to be doing mainstream science, but whose work is generally not accepted by academic, peer-reviewed publications. Specifically, Gerald Holton defines pseudoscience as something that passes itself off as mainstream science and "does so in the service of political ambition" (147). Pseudoscience "claims to use some of the tools and concepts of science, but scientists in the mainstream academic and scholarly world find that the supporters of these pseudosciences do not follow the accepted rules of evidence and other critical standards" (Friedman 191). Holton suggests that pseudoscience is more aptly called "anti-science" because it represents a "counter-vision" in opposition to mainstream science (145). Anti-science is a protest against the limited scope of mainstream science and the people who create its boundaries. The popularity of anti-science is, in fact, "one symptom of a long-standing struggle over the legitimacy of the authority of conventional science, as well as of the concept of modernity within which science claims to be embedded" (Holton 144). Holton argues that understanding anti-science movements can help us to understand how particular counter-visions move from harmless critiques of

mainstream science to large political movements dangerous to society[2] (Holton 145-47). According to him, anti-science works to erode the ontological and epistemological claims of mainstream science (152).

One such anti-movement is creationism, which often seeks to bind religion and science together. Rhetorician Elizabeth Ervin, for instance, examines how creationism flourishes in Wilmington, North Carolina. She suggests that mainstream science occupies a space of plenary authority; citizens, particularly lay people, begin to doubt the plenary authority of science when that scientific authority clashes with their personal and cultural values. They then look for an equally convincing authority. That authority is often religion. Charles Alan Taylor, however, argues in his article, "Of Audience, Expertise, and Authority," that creationism, though clearly a pseudoscience, is not just about religion; rather, he suggests creationism is an argument for a new epistemological view of science that considers the religious implications of scientific debates (283). But not all pseudoscientific movements seek to link religion and science. Some movements uphold particular secular values, such as technological and economic progress and conservative politics.

The term anti-environmentalist describes those who oppose almost all government-mandated environmental policy. Anti-environmentalists do not necessarily oppose the environment *per se*, as the term would seem to imply; rather, they oppose

[2] Holton distinguishes among certain types of science. For example, he argues that "pathological science" occurs when people believe they are doing mainstream science. In contrast, pseudoscience also passes itself off as mainstream science, but it does so specifically to advance a political platform (147). He marks anti-science in contrast to "blatant silliness and superstition" (146). Belief in the power of pyramids, for example, represents a superstitious belief. He contrasts that to "scientism," or the importation of science into nonscientific fields. He suggests that pseudoscience, or anti-science, is the most dangerous because it claims to offer scientific proof to bolster a political agenda. Holton argues that anti-science, which grows out of a disaffection with mainstream science, "can turn into a rage that links up with far more sinister movements" (148).

policy intended to preserve or conserve the environment unless it is immediately economically beneficial. It is difficult, of course, to define *all* anti-environmentalists this way. Certainly some anti-environmentalists would agree with environmentalists on particular issues, depending upon individual beliefs and values. However, when I refer to anti-environmentalism, I refer to radical anti-environmentalists who actively oppose the environmental movement and usually mainstream environmental science. I define anti-global warming supporters as those who not only oppose policies designed to combat global warming, but who actively oppose and dispute the science which supports the existence of global warming. I chose to analyze anti-global warming rhetoric in this dissertation because it is the most vocal and widespread anti-environmental movement right now. Anti-environmentalists, particularly the movements of radical groups, purport that their claims are based in mainstream science. One such radical group is the John Birch Society. Environmental rhetoricians Carl Brown and Stuart Herndl argue that while the rhetoric of the John Birch Society may seem irrational to academics and environmentalists, we should see it as part of a "contested cultural exchange, a contest not only about the nature of the world, but also about the identity and place of those involved in the debate" (215).

In this dissertation, I examine these two popular social movements—creationism and the anti-global warming movement.[3] They represent American cultural movements that simultaneously critique and borrow authority from mainstream science. While the goals of the two movements are ostensibly quite different, both speak for groups of

[3] I define anti-global warming supporters as those who not only oppose policies designed to combat global warming, but who actively oppose and dispute the science which supports the existence of global warming.

people who reject mainstream scientific explanations for particular phenomena. Both movements have far-reaching effects. According to a 2004 Gallup report,

> Only about a third of Americans believe that Charles Darwin's theory of evolution is a scientific theory that has been well supported by the evidence, while just as many say that it is just one of many theories and has not been supported by the evidence. The rest say they don't know enough to say. Forty-five percent of Americans also believe that God created human beings pretty much in their present form about 10,000 years ago. A third of Americans are biblical literalists who believe that the Bible is the actual word of God and is to be taken literally, word for word.[4] (Newport)

What is it that causes many Americans to reject a theory that has garnered almost unanimous acceptance among professional scientists? What is so controversial about this particular issue? The majority of antievolutionists, or creationists, suggest that their resistance stems from the lack of evidence for the existence of a specific type of evolution, macroevolution.[5] Because they claim they cannot see abundant evidence for evolution in the fossil record, they argue that evolution is not a valid explanation for the origin and development of life.

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[4] In a 1982 Gallup poll, 47% of Americans said they accepted the concept of human evolution (Eve and Harrold 31).

[5] Many evolutionists fail to recognize that almost all creationists accept microevolution, or the notion that humans and other living organisms have adapted over time within their species. A few creationists, though certainly not the most vocal groups, also agree that macroevolution has occurred. Macroevolution is the theory that living organisms within species have evolved from other organisms within another species. All creationists, however, reject the idea that life was spontaneously created without intelligent design and direction. The poll cited above does not indicate how those polled define evolution; although, given the confusion that exists between professionally-trained evolutionists and creationists, most Americans are probably confused about what exactly evolution is, even if they think they know. In this dissertation, when I refer to evolution, I am referring to macroevolution.

Anti-environmentalism may garner significantly less support than creationism, but many people still believe that global warming is not occurring, despite the scientific evidence for it.[6] One need only search the vast number of right-wing web sites devoted to anti-global warming claims. A concerned citizen, for example, wrote to Rush Limbaugh wondering what he could do to educate others about the global warming conspiracies: "What can I do as an Individual (sic) to educate people about these lies and to stop this movement? I believe that this is one of the greatest threat (sic) topolitical (sic) and economic freedom of recent times. I know that this is something that must be stopped." While it is difficult to find clear and reliable statistics that show public opinion about global warming, the presence of so many books, periodicals, and web sites devoted to anti-global warming indicates it is, at the very least, a position that enjoys passionate and devoted support.

Mainstream science writers tend to dismiss creationists and anti-environmentalists on the grounds that their scientific interpretations are simply wrong; however, because these are such pervasive and enduring movements, this dissertation seeks to determine the reasons behind the movements. In particular, I examine the arguments of popular creationist and radical anti-environmental writing in order to discern what rhetorical strategies they have in common. I argue that a rhetorical analysis of popular anti-science movements can lead to a better understanding of the nature of counter-visions, particularly those that counter mainstream science. Specifically, I attempt to answer the following questions:

[6] It is difficult to find recent data that shows how many Americans accept or reject global warming; however, a 1997 World Wildlife Federation poll shows that as many as two-thirds of Americans believe that global warming is a "serious threat" and believe that we should cut greenhouse gas emissions regardless of economic costs (Shapiro 35).

- What specific rhetorical techniques do these groups have in common?
- How do anti-science groups use the rhetorics of mainstream science?
- How does anti-science function rhetorically as popular science and as cultural narrative?
- How do anti-science movements appeal to anti-intellectualism?
- What makes these anti-science movements so enduring and why do supporters respond so passionately to them?

Isolating the rhetorical characteristics that set these marginalized groups apart can lead to a better understanding of them. Based on previous scholarship, it is obvious that simply "correcting" the use of false or inaccurate date does not change the position of the group. A more pressing concern for audiences outside the creationist or anti-environmentalist group is understanding them as cultural movements. In other words, academics and scientists who are not creationists or anti-environmentalists must begin to speak to marginalized groups and the cultural ideology they represent. What is particularly useful about examining and identifying the rhetorical natures of these two anti-movements is that they can reveal something about the true substantive nature of the debates as well as what is at stake in terms of policy adoption.

In the following sections, I briefly examine the nature and characteristics of popular science in order to define and contrast it to mainstream science. Both creationists and anti-environmentalists use the genre of popular science almost exclusively to deliver their messages to lay readers. In another section of this chapter, I turn to the cultural movement—anti-intellectualism—that emerges in both creationist and anti-environmental rhetorical. Because anti-intellectualism lends authority to anti-movement

writers, I discuss the resurgence of the anti-intellectual movement and the rhetorical characteristics of it.

Popular Science

Despite the intentions of creationists and anti-environmentalist to identify with mainstream science, their texts function more as popular science in terms of audience and purpose. Much like popular science writing, creationists and anti-environmentalists state that their goal is to educate lay readers who are not professionally trained in the sciences. Furthermore, creationist and anti-environmentalist writers openly claim that they want to discuss the social and cultural impact of evolution and environmentalism on our society, something that is outside the realm of mainstream science. Mainstream popular science writers, such as Stephen Jay Gould and Carl Sagan, also openly discuss how science affects society, but they only do so in their popular works. Their popular scientific accounts aimed at lay readers are interpretations, though not always exact, of their mainstream science. Louis Masur suggests that popular science, specifically the work of Gould, is an attempt to "translate internalist scientific developments into public questions of both philosophical and practical significance." Popular science works to "bridge the gap between laboratories, experimentation, and science, on the one side, and epistemology, narrative, and history on the other" (Masur 113-4). Ideally, the intention of popular science is to educate and inform lay readers, to provide accurate and compelling accounts of mainstream science, and to modify what lay readers accept and believe. Carl Sagan argues that mainstream scientists should popularize science in order to teach readers the methodologies of science, a skill that will allow them to distinguish between real science and pseudoscience. Sagan writes, "The method of science, as

stodgy and grumpy as it may seem, is far more important than the findings of science" (*The Demon-Haunted World* 22). For Sagan, popular accounts not only simplify complicated information, but they simplify and teach *how* scientists have come to know the information presented. Popular science is also a useful tool for teaching lay readers that science is an epistemological system rather than a belief system like religion. Michael Shermer's work, *Why People Believe Weird Things,* for example, hopes to teach readers this distinction. He writes, "If we can offer a natural explanation for apparently supernatural phenomena and make three or four simple points about science and critical thinking so that listeners can learn *how* to think instead of what to think, then I believe it is well worth the effort" (136).

Creationism and anti-environmentalism, however, function less to inform readers of any scientific facts or methods and more to convince them of the exigency of rejecting evolution and environmentalism—they, in essence, celebrate the anti-movement. Rhetorician Jeanne Fahnestock examines the rhetorical results of translating normal science for popular readers and concludes that the difference resides in a shift from forensic rhetoric in normal science to epideictic rhetoric in popular science. While the popular science writing in her study is not necessarily pseudoscience, it does present an inaccurate picture of mainstream scientific results. By making the results less tentative, through subtle changes in the discourse, popular science writers change the nature of the mainstream science results, which may have adverse effects on the deliberative rhetoric (or the issues of policy-making) that occurs as a result of popular science accounts. For example, Fahnestock analyzes two articles about carrion-eating bees; she finds that the subtle addition of the word "only" to a popular account changes the entire meaning of the

article. The popular account makes the results more certain and enhances the uniqueness of the bee's behavior. This instance represents the goal of "science accommodators:" to encourage readers to marvel at the singularity of an event (Fahnestock, "Accommodating Science" 25). Mainstream scientists, on the other hand, strive to link their writing with previous scientific work. "Science accommodators" must focus on the "wonder" and "application" of their subjects since "the public will be interested in these subjects only if they are significant, and there is simply no way to address the public with the significance of findings that are so carefully hedged that their reality seems questionable" (Fahnestock, "Accommodating Science" 25). For example, mainstream scientific reports on cholesterol will not definitely tell readers whether or not we should change our diet and to what extent. Popular science, however, will catch the attention of the reader by telling us how we should modify our diets, even if the scientific claim is carefully hedged.

The rhetorical shift from uncertainty to absolute knowledge may not be problematic if the subject is bees, but it can become a serious problem when accommodators write about health or social issues, such as in the case of a scientific report that suggests boys may be naturally better at math than girls (Fahnestock, "Accommodating Science" 27). By making the results sound more certain than they really are, accommodators present an inaccurate picture to lay readers who make important policy decisions. Popular science articles about math ability may influence teachers' perceptions of students and their natural abilities. Fahnestock's comparison of the rhetorical techniques used to "translate" original science to popular science shows

that there are clear rhetorical and substantive differences, though often seemingly small, between these types of science.

I will show throughout this dissertation that creationist and anti-environmentalist texts bear little rhetorical or substantive resemblance to mainstream science. Readers would not necessarily expect creationists and anti-environmentalists to present mainstream science since the writers themselves admit that they are doing popular science; however, many creationist and anti-environmentalist writers *claim* they are actively engaging in both mainstream science *and* popular science. For example, one of the most vocal supporters of creationism is the Institute for Creation Research (ICR), whose web site offers materials for educators, suggested reading for nonscientists, recent articles on creationism, and a graduate program curriculum. The ICR's graduate school and faculty claim to be devoted entirely to proving creationism on a scientific level. The creationist books I discuss in this dissertation are all written for nonexperts. Creationist writers are not necessarily trying to approximate mainstream science writing, but rather are translating it for uninitiated readers. Given this purpose, it is not surprising that creationist writing would look very different than mainstream science writing; however, the fact that creationists rely so heavily on the ethos of mainstream science to bolster the credibility of their works and that they claim to be translating mainstream science makes comparisons between creationism and mainstream scientific conventions useful, particularly as a means of illustrating the radical split between the rhetorical conventions of each.

Likewise, anti-environmentalist works are also usually doing cultural work through popular science. Their real purpose is to connect with lay readers who feel

excluded from the realm of mainstream science and from mainstream policy debate. We might view seemingly extremist and radical rhetoric as "part of a contested cultural exchange, a contest not only about the nature of the world, but also about the identity and place of those involved in the debate" (Brown and Herndl 214-215). Based on this notion of contested cultural exchanges, Brown and Herndl conclude that offering scientific arguments to dispute radical, fringe anti-environmentalist groups like the John Birch Society is futile. These scientific arguments simply do not affect the group's position. The group is doing cultural work—establishing an identity for a group of people who believe themselves to be disenfranchised. These works serve to assert an anti-intellectual position that contests the underpinnings of mainstream science which exclude a certain subset of people. The rhetorical function of the group's communication is not persuasion, but about creating an identity within the group (Burke 23).

Most creationists and anti-environmental writers indicate that they are accurately "translating" mainstream science for lay readers in order to talk about the social effects of teaching evolution in schools or the implications of adopting environmentalist attitudes and policies. One way of examining the actions of these cultural movements is to understand a group's *habitus,*[7] or their "dispositions to act in particular ways in particular settings" (Brown and Herndl 223). In the case of the John Birch Society, members feel as if they are "under siege" (Brown and Herndl 220); their use of scientific language indicates that they recognize the dominance of mainstream scientific language and knowledge while at the same time mark their *habitus* as marginal (Brown and Herndl 225). That is, members of the John Birch Society know they are marginal and powerless

[7] Brown and Herndl draw on Pierre Bourdieu's work, *Language and Symbolic Power,* as a means of analyzing the John Birch Society's publication "The Resilient Earth."

in the tradition of mainstream science; however, as a fringe group, they have the power to create and maintain a fringe *habitus*—a rhetoric of anti-science—that marks their cultural territory. Ultimately, the John Birch Society has no real scientific power, and, as Brown and Herndl point out, the group's rhetoric indicates that they are aware of their marginal cultural position. The Society can, however, use its texts to create a cultural identity that sets it apart from the mainstream science that alienates Society members. Brown and Herndl suggest that scientists and rhetoricians stop responding to the "science" that the Society claims to report and instead respond to their "social and political marginalization" (232). This means responding to the conditions that maintain their *habitus* as well as to the mainstream academic *habitus* (232). In other words, understanding an anti-movement, means far more than examining their facts and evidence; it means understanding their cultural position as well as their own view of their cultural position.

Anti-science rhetoric borrows popular science rhetoric as a means of conveying a particular groups' cultural perspectives, or *habitus*, and as a means of establishing a link—no matter how tenuous—between the group and mainstream science. While some mainstream science writers, like Sagan and Gould, argue that popular science is an excellent way of conveying the importance of science and scientific methods to lay readers, I will show that anti-science writers use popular science to convey the importance of a particular group's cultural perspective. As this dissertation will also show, anti-science writers have discovered the genre of popular science as a means of conveying their unique conception of science and what it means to their lives and the lives of readers; anti-science writers use popular science to express their loyalty to a

cultural *habitus*, one that is outside the sphere of mainstream science and popular works associated with it.

The Anti-Intellectual Movement

The creationist and anti-environmentalist worldviews stem from their common cultural frameworks. The current political climate of America tells us a great deal about the cultural environment that influences these groups. One need only turn on a 24-hour television news station to witness the great divides in America: democrats versus republicans; liberals versus conservatives; Christians versus non-Christians; and, most recently, war supporters versus war protesters. One of the most salient cultural divides, though, may be the one between intellectuals and anti-intellectuals. This cultural divide may form the basis of the other vast polarizations in American culture, including the polarizations between creationists and evolutionists, anti-environmentalists and environmentalists.

Historian Richard Hofstadter writes that the term anti-intellectualism emerged in the 1950s as a response to political conditions, particularly as a result of intellectuals becoming targets of McCarthyism. He defines anti-intellectualism as "resentment and suspicion of the life of the mind and of those who are considered to represent it" (3-7). Hofstadter provides a description of an intellectual: he is "a person of spurious intellectual pretensions" who is often a professor. He is "superficial," "over-emotional and feminine to reactions in any problem." He has "contempt for the experience of more sound and able men," and he is "immersed in a mixture of sentimentality and violent evangelism" (Hofstadter 9). Furthermore, Hofstadter suggests this brand of anti-intellectualism is rampant in right-wing political circles. This particular group of people

can be best characterized by their "categorical folkish dislike of the educated classes and of anything respectable, established, pedigreed, or cultivated[8]" (12).

Anti-intellectualism is certainly *not* dominant in American culture but it *is* pervasive. And what makes anti-intellectualism particularly troubling is its often ambivalent character. Anti-intellectuals often view intellect with a mix of "respect and awe" alongside "suspicion and sentiment." In fact the most vocal anti-intellectuals are often "deeply engaged with ideas" (Hofstadter 21). The spokespeople for anti-intellectual movements are often very competent speakers and thinkers. They may not be formally educated, but they are "marginal intellectuals, would-be intellectuals, unfrocked or embittered intellectuals, the literate leaders of the semi-literate, full of seriousness and high purpose about the causes that bring them to the attention of the world" (Hofstadter 21). These common men speak for the people. Literary critic Joseph Wood Krutch wrote in the 1950s that commonness had become a virtue; in fact, people praise politicians for "being nearly indistinguishable from the average man on the street" (8).

Hofstadter writes about anti-intellectualism in the early 1960s, but certainly anti-intellectualism is a prevalent social movement in our culture today. One need only survey articles about the 2000 election to understand the importance of anti-intellectualism in that election. Jonathan Chait, of the *New Republic*, for example, points out that many Americans identify with George W. Bush because he is not an intellectual; people perceive him as having "character," which translates to "lived experience" outside of the political arena. Todd Gitlin, in *The Chronicle of Higher Education*, points out the distinctions between voters in the 2000 election. He argues that there were "two nations"

[8] Obviously, the term anti-intellectualism carries with it a fundamental bias in that it makes assumptions about anyone outside of the academic sphere. I borrow Hofstadter's term in order to call up the perceived generalizations that both academics and nonacademics make about the other group.

in that election. "Bushland" consisted of the "rural, inland, heavily male, and white" voters. "Goreland" consisted of those "urban, coastal, heavily female, and immigrant" voters. Gore's intellectualism was characterized as "dismissive and overbearing," which voters perceived as deceitfulness. On the other hand, Bush's anti-intellectual stance became that of the "amiable common man," which translated into truthfulness. The 2000 election illustrated the stereotypical binary distinctions Americans often make between the formally educated and the common person. There is no doubt that in folk epistemology,[9] as well as in the 2000 election, the supposed common man is the victor. Anti-intellectuals often prominently participate in popular scientific debates because mainstream science is a field that necessarily excludes non-intellectuals—one generally cannot simply decide to be a biologist, for example, and expect to participate in scientific debates with any sort of credibility. Scientific discussions with an anti-intellectual tenor often take the form of popular science.

In the following chapters, I examine how creationism and anti-environmentalism use popular science to create cultural frameworks appealing to their readers. In Chapter 2, I discuss the methods I use to analyze creationist and anti-environmental works. In Chapters 3 through 8, I analyze six popular creationist books and six popular radical anti-environmental books using two methods of rhetorical analysis. First, I examine the works using traditional neo-Aristotelian methods of analysis to discuss the canons of rhetoric—arrangement, invention, and style[10]—and the classical genres of rhetoric—epideictic, deliberative, and forensic rhetoric. I use this analysis to discuss the context of

[9] Charles Alan Taylor uses the term "empiricist folk epistemology" ("Of Audience, Expertise, and Authority...," 278) to describe the type of arguments creationists lobby in favor of their position. Taylor argues that they rely on common sense logic or folk logic to support their arguments. I borrow the term "folk epistemology" to represent supposedly common sense reasoning.

[10] I do not discuss memory or delivery in this dissertation.

the rhetoric and the rhetors themselves. Second, I employ Ernest Bormann's fantasy-theme analysis as a means of discussing the role of the audience in these works. Identifying recurring rhetorical themes allows me to see how the movements define themselves and their readers. Based on these analyses, I conclude, in part, that these books indicate dissatisfaction with a mainstream scientific epistemology that seemingly dismisses common sense,[11] often the one tool for analysis available to the lay person outside of the academy or the profession. By advancing a new philosophy of science based on observation and common sense, these movements work to establish a new scientific credibility. At the same time, they attempt to dismantle the complicated epistemology of mainstream science that assumes indoctrination within the academic and professional culture. As a result, there exists a wide gulf between the cultures of mainstream science and anti-science supporters.

Anti-science movements are rhetorically similar to conversion rhetoric—that is, religious-themed rhetoric that seemingly attempts to convert uninitiated audiences. However, much like televangelism, these works are directed primarily at audiences who already accept the arguments of the movement. The works, then, serve not to relay facts and information or to elucidate methodology, but to solidify and rally audiences who are alienated by the academic culture that excludes them. Previous analyses of creationist and environmental popular works focus on how these writers are scientifically wrong.[12] Past rhetorical analyses of these two subjects have attempted to discern why these movements

[11] I define common sense in the Enlightenment tradition: sense perceptions are fundamentally reliable and trustworthy. Knowledge of the natural world comes from observation, and one need not be a trained expert to observe the world (Toumey 16).

[12] See, for example, Michael Shermer's *Why People Believe Weird Things*; Laurie Godfrey's edited volume *Scientists Confront Creationism*; Philip Kitcher's *Abusing Science: The Case against Creationism*; and Paul and Anne Ehrlich's *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens Our Future*.

resonate with the public *in spite of* their scientific inaccuracies. (I will briefly review some of these works in the next chapter.) Other scholars conclude that creationism and anti-environmentalism are large-scale social movements. I concur, but my work adds to the existing body of scholarship by comparing these movements to each other in order to establish an understanding of the related and also divergent rhetorics of anti-movements. I suggest that while these two movements are similar to each other in terms of audience, they diverge in their scope and purpose. I hope to show that their differing rhetorical schemes create new dramatic themes that require specific public and political responses. My focus here is on what their rhetorics tell us about these social movements, their definition of science, and the character of the people who espouse these movements. It is useful to compare these movements because they both represent popular—perhaps, the *most* popular—anti-movements. Understanding similarities and differences helps to determine how anti-movements function rhetorically, and that can lead to a better understanding of them. In Chapters 9 and 10, I interpret the rhetorics of these movements and suggest the best means for understanding these anti-movements, and possibly other movements fueled by the same sense of social, political and epistemological alienation.

Chapter 2: Methods

The goal of this dissertation is to begin building a rhetorical theory of scientific anti-movements in order to better understand the rhetorical nature and cultural basis of creationist and anti-environmental writing. As rhetorician Sonja Foss notes, the primary goal of any kind of rhetorical analysis is to say something about the general nature of symbolic processes that recur in different places and times in response to issues beyond those which particular artifacts address (6). My analysis of creationist and anti-environmentalist literature includes an exploration of: the relationship between the two and the contexts in which they operate; the reality that each constructs for its audiences; and the reality each movement creates for itself (Foss xi). Using neo-Aristotelian criticism, I describe the rhetorical features of a particular genre of creationist and anti-environmental writing— books written for lay readers. I then do a rhetorical analysis of the texts' messages using fantasy-theme analyses; my goal is to better understand the creationists and anti-environmentalists themselves and the counter-visions they are creating for their readers.

Neo-Aristotelian criticism represents the movement away from literary criticism. According to Herbert Wilchens, the first critic to apply ideas about literary criticism to oratorical texts (Gaonkar 292), rather than being concerned with the beauty and permanence of literature, rhetorical analysis focuses on the effect of rhetoric on a particular audience (Foss 71). Wilchens argues that any rhetorical analysis requires that we consider "the public character" of the rhetor, including what he is and what his

audience perceives him to be; the audience itself; and the rhetor's topics, motives, and proofs (70). Ethos is particularly important in creationist rhetoric because the rhetors themselves become part of the argument. That is, their personal morality—or the public presentation of their personal values—serves as both motive and proof of their arguments for creationism.

Aristotle defined rhetoric as "the faculty of observing in any given case the available means of persuasion" (*The Rhetorical Tradition,* 181), and he clearly separates rhetoric from dialectic, the process by which truth emerges. The goal, then, of neo-Aristotelian rhetoric is to discover how rhetors use persuasive tools to advance an argument when truth cannot be known. Foss provides a list of goals for a neo-Aristotelian critic: first, she must recreate the context in which the textual artifact occurred; second, she must analyze the artifact itself; and finally, she must consider the effect of the text on the audience in relation to the rhetorical options accessible to the rhetor (75). Neo-Aristotelian criticism includes the careful analysis of the "elements in the occasion that influenced the rhetoric in choice of subject and approach on the peculiar demands of the time and place of the rhetoric," as well as the consideration of "the historical antecedents of the rhetoric, and the social and cultural attitudes toward the topic of rhetoric" (Foss 75). I am not suggesting that we can necessarily know the moment an argument occurs, nor can we know the exact effect an argument has upon an audience; rather, I am suggesting that neo-Aristotelian analysis provides a framework for understanding how and why rhetors make rhetorical decisions based upon their perceptions of their audiences.

Contextual analysis, such as historical criticism, examines the rhetor's ideas as "an integral part of their times." (Brock, Scott, and Chesebro 27). The historical perspective requires critics to answer two key questions: first, how does a rhetor accommodate the audience? And, how does the rhetor use a particular occasion and historical context to his or her advantage (Brock, Scott, and Chesebro 27-9)? In other words, the critic examines *kairos*.[13] I will combine historical and neo-Aristotelian analyses in order to argue that contemporary creationist and anti-environmentalist writers are popular partially as a result of the current political climate.

My analyses, in Chapters 3-8, feature a combination of neo-Aristotelian and historical analyses. My focus is on the rhetors and how they solve a rhetorical problem within a particular situation, including the historical context in which the text occurs. I operate under the assumption that rhetorical concepts reflect and describe reality and that a critic can discuss these concepts in a reasonably discrete fashion; that is, the assumption is that critics can study various rhetorical concepts apart from one another in the process of analyzing the discourse (Brock, Scott, and Chesebro 28).

In my discussion of creationist and anti-environmentalist rhetorics, I look at the canons of rhetoric separately; however, I recognize that each works in conjunction with the other. Furthermore, I recognize my own inherent bias as a researcher. The creationist debate is largely predicated on the belief that evolutionists and creationists do not understand each other. As a creationist outsider, my analysis inevitably reflects that

[13] Carolyn Miller argues there are two different definitions of *kairos*. The first indicates situational context, or what Lloyd Bitzer called exigence. This definition suggests that *kairos* is "a distinct point in time;" therefore, rhetors must seize the appropriate time in order to successfully reach audiences. The second definition suggests that every moment in time has a particular *kairos* or "a unique potential that a rhetor can grasp, and make something of" (Miller 312). For the purposes of this analysis, I will discuss *kairos* from both perspectives.

position. It is my intention, however, to use my analysis to understand the creationist ideology. Likewise, the anti-environmentalist debate is largely predicated on the belief that lay readers can easily understand global warming issues, but only with the help of an able scientist leading the way. As a nonscientist, my own ideas have obviously been impacted by the environmentalists and anti-environmentalists who have helped me to understand the issues of the debate. My analysis of their work is necessarily influenced by my own position as an outsider and a lay reader. By reading their work as a rhetorical critic, I attempt to understand the cultural underpinnings of the movements.

In addition to neo-Aristotelian and historical criticism, I use another method of analysis that allows me to specifically consider the motivations of creationist and anti-environmentalist writers. Fantasy-theme analysis, first proposed by Ernest Bormann, describes messages as rhetorical visions, or what Sonja Foss suggests is the construction of fantasy themes, defined as stories that account for the experiences of a group; these stories constitute the reality of the group participants (290-2). In examining creationist, and anti-environmentalist motivations from a fantasy-theme perspective, I can explore the crux of their arguments, which is much more complex than mainstream scientists suggest and extends far beyond the issue of science, moving into much more complicated cultural and rhetorical issues.

According to Bormann, assessing rhetorical visions as "composite dramas" allows rhetorical critics to classify and analyze recurring dramas as a means of better understanding the rhetors who produce the messages (177). Bormann argues that fantasy-themes are symbolic realities that a group of communicants share. He notes, "When group members respond emotionally to the dramatic situation they publicly

proclaim some commitment to an attitude" (211). To illustrate group fantasizing, Bormann borrows an example from Robert Bales' 1970 work, *Personality and Interpersonal Behavior*, where Bales first introduced the concept of group fantasizing. If someone in the group dramatizes a negative story about a political figure, other group members may positively respond by actively agreeing or adding more stories about the political figure. The group has then established a shared political attitude which they share and can later invoke as a sort of inside discourse. This response constitutes a fantasy chain that tests and legitimizes values and attitudes. If no one in the group responds to the initial story, then a political attitude has also been demonstrated: the group does not build and share a fantasy-theme. Bormann suggests that these kinds of dramatizations, and thus fantasy chains, spread to larger audiences where they "serve to sustain members' sense of community, to impel them strongly to action…, and to provide them with a social reality filled with heroes, villains, emotions, and attitudes" (211-213).

Fantasy-theme analysis operates under the assumption that the message is important, but that the sharing of the message is even more critical because audiences converge over common experiences. Thus, critics look for common settings, characters, and plots in order to determine fantasy types, or similar scenes, shared by a community. Once a community has accepted the fantasy type, rhetors no longer need to tell their audiences all of the details about the settings, characters, and plots of a particular situation. They simply give the basic story of the fantasy type (Foss 290-2).

In the following chapters, I examine the settings, characters, and plots of the stories creationists and anti-environmentalists tell in their works. I suggest that writers are working to legitimate a creationist and anti-environmentalist fantasy-type for general

readers; therefore, rhetors present recurring fantasy-themes based on the specific characteristics of the readers themselves. These characteristics include a general mistrust of science, technology, higher education and intellectualism, and a reverence for mainstream values fused with common sense intelligence. In addition to a mistrust of science, creationist and anti-environmentalist writers invoke a fantasy-theme that demonstrates a trivial model of science, as discussed in greater detail in Chapter 3. By privileging the accoutrements of science, rather than the actual philosophy of science, creationists and anti-environmentalists create a new genre that simultaneously invokes and critiques science.

In Chapter 3, I begin by exploring the background of the creationist debate and the existing scholarship that deals with their rhetorical strategies. In Chapter 4, I show how three of the five canons of rhetoric apply to the discourse of anti-science movements. Specifically, I analyze the arrangement, invention, and style of anti-science rhetorics.[14] In addition, I examine how anti-science rhetors use artistic proofs to find the available means of persuasion. My goal here is to illuminate how the rhetors' strategies anticipate the audience's needs, as well as how the artifact reflects the historical context within which it is situated. Once I establish the rhetors' means of persuasion, I use fantasy-theme analysis, in Chapter 5, to characterize the rhetors and their rhetorical visions. Based on these analyses, I begin a genre analysis in order to draw some conclusions about the unique genre of creationist writing.

Genre criticism operates under the assumption that "certain types of situations provoke similar needs and expectations among audiences and thus call for particular kinds of rhetoric" (Foss 111). Thus, a critic attempts to find commonalities within

[14] The canon of delivery can include information design; I will not include that in my analysis.

recurring situations. Things that appear to have similar organizing principles, substantive features, and stylistic feature can be part of the same genre. By using genre criticism, critics can see how "rhetoric is shaped by prior rhetoric" (112). Genre criticism, then, seems to be a natural counterpart to traditional criticism. Just as traditional criticism considers the historical context— time and place— of a text, genre criticism considers the influence of previous rhetorical texts. Foss also links genre criticism with neo-Aristotelian criticism; for example, Aristotle's divisions of rhetoric—deliberative, forensic, and epideictic—represent genres (Foss 112-3). My analysis includes a discussion of Aristotle's genres, as well as an analysis of how creationist texts fit within the particular genre of conversion rhetoric. I conclude that creationist rhetoric can be best categorized as conversion rhetoric—persuasive writing that serves to solidify a community while simultaneously reifying its beliefs and values. Conversion rhetoric is essentially epideictic rhetoric; it celebrates a particular community by denouncing competing ideals.

Conversion rhetoric is most often associated with religious movements, though most creationists adamantly maintain that their core argument is not religious in nature. Conversion rhetoric, however, can be more broadly defined to include political or cultural movements (of which religious movements are a part). Christopher Wright, in his article, "Preaching to the Converted: Conversation Language and the Constitution of the TV Evangelical Community," suggests that the rhetorics of conversion are primarily "goal-directed persuasive languages" (738). Dale Sullivan, in his analysis of New Testament rhetoric, suggests that conversion rhetorics specifically lead to belief rather than judgment or scientific knowledge. Religious proclamations, a type of rhetoric he finds in

the New Testament, is similar to Sophistic rhetoric. This type of rhetoric is not "epistemic nor doxastic, but rather alltheiac" (218). Rather than creating knowledge or repeating cultural knowledge, conversion rhetorics claim to represent truth. Much like these religious rhetorics, creationist writers seek not only to convert members, but to reaffirm the truth of their cultural values, as well as to create an epistemology that rivals the inaccessible one of mainstream science. In Chapter 6, I turn to the anti-environmentalist movement to examine its cultural importance. I again use neo-Aristotelian and fantasy-theme analyses in Chapters 7 and 8. Analyzing texts from both movements allows me to identify similar and different rhetorical strategies to appeal to largely the same audience.[15]

Text Selection

The rise in creationism has meant a corresponding rise in creationist literature, particularly in texts designed for young and/or uninitiated readers. The profusion of creationist writing suggests they have found an eager, willing, and responsive audience. The Institute for Creationist Research (ICR) web site provides a useful reading list for lay readers interested in understanding the creationist debate; in addition, the ICR provides a brief statement naming the intended audience of each book. They offer a range of books for young children to books for adults without scientific backgrounds. Not surprisingly, all of the books are for popular readers. Almost all of the listed books are by ICR members Duane Gish, Henry Morris, and Morris's son, John Morris. One notable exception is Phillip Johnson, a law professor at Berkeley and a self-taught creationist,

[15] Ehrlich and Ehrlich argue in *Betrayal of Science and Reason* that creation and anti-environmentalism are related in the sense that both "feature denial of facts and circumstances that don't fit religious or other traditional beliefs" (12). Later Ehrlich and Ehrlich cite Rush Limbaugh, who admits in his book, *The Way Things Ought to Be*, that his anti-environmental stance is rooted in his belief in creationism (199).

who writes prolifically about the creationist movement. Although Johnson is not a faculty member of the ICR, the organization whole-heartedly endorses his work.

Based on the ICR's listing of creationist works, I selected five texts geared toward high-school students and/or general lay audiences. These works include Henry Morris and Gary Parker's, *What is Creation Science?* (1982); Henry Morris's *The Long War against God: The History and Impact of the Creation/Evolution Conflict* (2000); and Duane Gish's *Evolution: The Challenge of the Fossil Record* (1985). Other texts for analysis include the major work critiquing teaching evolution in schools, Phillip Johnson's *Defeating Darwinism by Opening Minds* (1997). Finally, I selected one text advocated by the ICR, but not affiliated with a fundamentalist Christian organization. Lee Spetner, in *Not by Chance: Shattering the Modern Theory of Evolution* (1997), argues for creationism; however, Spetner does not belong to a fundamentalist Christian group.[16]

In selecting these books, I looked for discussions of creationism as science; the supposed lack of evidence for evolution; the impact of teaching creationism and/or evolution in public schools; and the philosophical and cultural reasons for promoting creationism outside of religious venues (and particularly inside science classrooms.) I did not include Morris's first textbook, *Scientific Creationism* (1974), which essentially launched the creationist book industry, because it has been largely revised into other works since then.[17] There are certainly many more creationist books in circulation, not to mention a number of periodical publications. The ICR, for example, publishes *The Good Science*, a newsletter for teenagers, as well as a frequently updated FAQ page on their web site. In addition, there are many web sites that promote creationism besides the ICR,

[16] Spetner is Jewish and his book is published by Judaica Press.
[17] *What is Creation Science?* (1982) by Henry Morris and Gary Parker, for example, is an updated version of *Scientific Creationism*.

though the ICR is probably the largest. In this analysis, however, I will focus on books. Because the ICR promotes particular books for use in public schools and in homes, as alternatives to mainstream science textbooks, I focus on how these books function rhetorically as a means of informing lay readers about the debate itself, as well as about the philosophy to which creationists subscribe.

Creationists present multiple genres besides books, including: web sites, magazine articles, novels, course materials, online discussion lists, children's books, and illustrated works. For this dissertation, I will focus solely on published books that are not anthologies or collections of writing. My decision to focus on books is partially random—I could easily have picked any of the genres I mentioned above; however, my decision to analyze books aimed at lay readers was at least partially motivated by the fact that readers of these books are likely more committed to truly understanding the substance of the arguments, particularly on a scientific level. I assume that readers who read the books are compelled by in-depth studies of creationism and are committed to learning about the scientific justification for the movement. Conversely, web sites and illustrated articles provide only a cursory overview of the movement at best.[18] The books I have chosen provide longer and more detailed discussions of creationism, including a great deal of quantitative data and scientific discussion. As I show in the following chapters, these books are intended for audiences who have the ability and desire to truly understand the roots of this debate.[19]

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[18] See the ICR website, for example. www.icr.org.

[19] I specifically selected books that included an author's note, in the preface, introduction, or on the book jacket, that stated the author's intention to write for lay readers. There are other popular creationist books that are more scientifically complicated. Michael Behe's book, *Darwin's Black Box*, for example, includes a complex argument for creation which is supported by Behe's allegation that there is biochemical proof for it. Behe's book, however, requires some knowledge of biochemistry and a working knowledge of the evolutionist argument. The books I selected assume that readers know little or nothing about evolution.

In Chapters 6-8, I examine eight popular anti-environmentalist works; all but one were published by or sponsored by political organizations. These works include: M. Mihkel Mathiesen's *Global Warming in a Politically Correct Climate: How Truth Became Controversial* (2001), published by Writers Club Press, a vanity press; Thomas Gale Moore's *Climate of Fear: Why We Shouldn't Worry about Global Warming* (1998), published by the Cato Institute;[20] S. Fred Singer's *Hot Talk, Cold Science: Global Warming's Unfinished Business* (1999), published by The Independent Institute;[21] Patrick J. Michaels' and Robert C. Balling Jr.'s work *The Satanic Gases: Clearing the Air about Global Warming* (2000), published by The Cato Institute; Ronald Bailey's *Ecoscam: The False Prophets of Ecological Apocalypse* (1993), published by St. Martin's Press and sponsored by the Cato Institute; Dixy Lee Ray's and Lou Guzzo's *Environmental Overkill: Whatever Happened to Common Sense?* (1993), published by Regnery Gateway;[22] Ray and Guzzo's earlier work, *Trashing the Planet: How Science Can Help Us Deal with Acid Rain, Depletion of the Ozone, and Nuclear Waste (Among Other Things)* (1990) also published by Regnery Press; and *Taken By Storm: The Trouble Science, Policy, and Politics of Global Warming* (2003) by Christopher Essex and McKitrick published by Key Porter Books.[23] All of these works focus primarily on denouncing the threat of global warming.

[20] The Cato Institute is a libertarian organization. According to their web site, they seek to promote "the mainstream American principles of limited government, individual liberty, free markets and peace."
[21] The Independent Institute claims to be a nonpartisan group devoted to exploring issues of public policy. According to their web site, they employ "rigorous standards without regard to any political or social biases." Most of their featured articles and publications, however, have a strongly libertarian bias.
[22] Regnery Press specializes in sponsoring ultra-conservative political works. One of their latest publications is Mona Charen's sharply critical right-wing polemic *Useful Idiots: How Liberals Got It Wrong in the Cold War and Still Blame America First.*
[23] Key Porter Books is a Canadian press that does not specialize in politically conservative titles. It was the only anti-global warming book by a mainstream press that I found.

There are surprisingly few books dealing exclusively with anti-global warming and even fewer which tackle the scientific and political aspects of the debate. I selected the preceding works because they are frequently cited on conservative web sites, such as the Heritage Foundation and the Cato Institute. In addition, the authors of these works represent the most vocal and prolific anti-environmentalist writers, and they are often cited by environmentalist writers as the leaders of the anti-environmentalist movement. Dixy Lee Ray and Thomas Gale Moore are often cited in various articles about global warming, and they are recognized by environmentalists and anti-environmentalists alike as the leading voices in the global warming debates. These books represent the most extensive and recent discussions of the issues.

Chapter 3: The Creationist Debate

Our world, our church, our schools, our society, need the truth of creation more than ever. We see the wrong thinking of evolution having produced devastating results in every realm. Our passion at the Institute for Creation Research is to see science return to its rightful God-glorifying position, and see creation recognized as a strength by the body of Christ; supporting Scripture, answering questions, satisfying doubts and removing road blocks to the Gospel. The Institute for Creation Research Graduate School exists to train students in scientific research and teaching skills, preparing effective warriors for the faith. We are delighted that you are considering honing your skills in creation thinking, and trust that God will lead you. We look forward to hearing from you.

John D. Morris, Ph.D., President
Institute for Creation Research

It's no coincidence that when the triumph of Darwinism was announced to the public officially in 1959, at the University of Chicago, at the 100th anniversary of Darwin's masterpiece, it led to a very drastic change in the moral foundation of our culture in the 1960s and thereafter. Some people applaud that change, and others deplore it, but whether you agree with the sexual revolution, for example, or wish it hadn't happened, the triumph of Darwinism in the culture, and the great propaganda that was put forward in its behalf, even by the government, had a big role in that moral change.

Bill Sherman
"Purpose Vs Chaos," *Tulsa World*, 10 Apr 2004

Over 2/3 of the American people believe that God created the world and ½ of them believe that it happened less than 10,000 years ago. These facts anger and frighten the evolutionist establishment.

Kansas State School Board

The Creationist Ideology

Raymond Eve and Francis Harrold, in one of the most definitive works on the sociology of the creationism movement, *The Creationist Movement in Modern America* (1991), divide creationists into three camps. Young Earth creationists uphold a literal

interpretation of Genesis. They argue that God created human life, basically as it is now, in six literal days (46). The Institute for Creation Research (ICR) best represents this camp. According to their web site, the ICR is a "Christ-focused creation ministry" dedicated to seeing "science return to its rightful God-glorifying position, and see creation recognized as a strength by the body of Christ; supporting Scripture, answering questions, satisfying doubts and removing road blocks to the Gospel."[24] To fulfill such a mission, the ICR offers its own graduate program to prepare students for scientific research and teaching, thus, according to John D. Morris, ICR President, "preparing effective warriors for the faith." The ICR graduate courses include mainstream biology, biochemistry, geology, and education courses; however, the curriculum serves a purpose outside of the realm of mainstream science. As the ICR web site notes, the goal of graduate education through the Institute is to "discover and transmit the truth about the universe by scientific research and study, to correlate and apply such scientific data within the supplemental integrating framework of Biblical creationism." The Young Earth creationist goal is to use mainstream science research to bolster the credibility of the Bible. Thus, the Young Earth position of ICR creationists means they cannot recognize any evidence that contradicts the Genesis account of creation.[25]

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[24] The ICR focus on science as a means of glorifying God is a return to the philosophy of the Scientific Revolution. Thomas Sprat, for example, writes in his *History of the Royal Society*, that the goal of science is not to upstage the creator, but to "*admire* him the more" (111). Likewise, Robert Boyle, in *A Free Inquiry into the Vulgarly Received Notion of Nature*, argues that studying nature is not injurious to the notion of God; rather, "every true Christian ought to be much concerned for truths, that have so powerful an influence on religion" (159). They suggest that the study of nature (science) can be used to illustrate the greatness of God.

[25] Young Earth creationists have never encountered any evidence that they believe contradicts God. Furthermore, when questionable evidence arises, they believe they must simply look harder for evidence of God. They incorporate evidence and arguments that are inconsistent with their beliefs into their creationist philosophy, making both sides consistent with each other. For example, Eve and Harrold note that creationist Duane Gish routinely interprets fossil date incorrectly in order to prove that Genesis corroborates science. Eve and Harrold point out that most creationist readers do not have the scientific background to adequately decide if Gish's fossil interpretation is valid.

Philosophically, then, Young Earth creationists of the ICR argue that the Christian bible corroborates the scientific theory of creation, and they search for all scientific evidence that will seemingly, in turn, corroborate the Bible, or at least will not openly clash with biblical theory. The ICR is vocally opposed to any forms of evolutionary "compromises;" that is, it opposes any suggestion that evolution may be a process *begun* by a supernatural power (such as the Christian god), but continued through natural processes.

Not all creationists, however, subscribe to a literal interpretation of scripture. The second group of creationists, Old-Earth Creationists, accept evidence for an ancient earth, and thus, accept *some* tenets of evolution (Eve and Harrold 46). These creationists are not willing to accept evidence for macroevolution, but they do believe that micro-evolutionary processes can serve as evidence that human life is the product of intelligent design. These creationists may or may not argue for the existence of the Christian god. Rather, they argue for the existence of some supernatural intelligent designer; hence, the name Intelligent Design (ID) theory. ID theorists, however, usually do not associate themselves with creationist movements, though the ICR does advertise texts by ID theorists in their literature and on their web site. Because ID theory says nothing about biblical treatments of creation, ID proponents tend to produce treatments of creation that are more scholarly, in the sense that they use the scientific method to guide their research and they remove all overt reference to religious ideology in their writing. The ID movement includes such neo-Darwinian critiques as Australian molecular biologist Michael Denton's *Evolution: A Theory in Crisis* and Lehigh University biochemist Michael Behe's 1998 *Darwin's Black Box*. Denton and Behe do not align themselves

with the creationist movement. As a supporter of ID theory, Behe stated in a personal interview with journalist Larry Witham that he's simply arguing for "design beyond nature's laws" (qtd. in Witham 27). In other words, ID theory offers no validation of any particular religious tradition. It still falls short of mainstream science, though, because ID theory argues for supernatural creation, an idea that is scientifically impossible to prove or disprove. Evolutionists generally consider ID theory to be just another brand of creationism. For example the position statement listed on the website for the National Association of Biology Teachers (NABT)[26] says: "The diversity of life on earth is the outcome of evolution: an unpredictable and natural process of temporal descent with genetic modification that is affected by natural selection, chance, historical contingencies and changing environments." According to this statement, both young earth and old earth creationism are technically outside of the scope of mainstream science because they both call for an explanation for origin outside of nature.

The third creationist camp represents a blending of the young Earth and old Earth theorists. Poetic creationists believe that Genesis is not a literal account of creation, but rather is simply a poetic, metaphoric account of God's work (Eve and Harrold 48). Free from the constraints of biblical literalism, poetic theorists can accept evolutionary compromises without turning to the amorphous and nonspecific supernatural power of ID theory. For example, physicist Lee Spetner, author of *Not By Chance!* represents the poetic camp. Spetner, who is not affiliated with the ICR, does not deny macroevolution; he simply opposes the notion that genetic mutation as an evolutionary mechanism could

[26] NABT has faced a number of debates with the ICR, parents, teachers, and students regarding the teaching of evolution in public schools. Presumably the NABT speaks for other organizations devoted to the promotion of mainstream science.

feasibly, and randomly, produce the effects of large-scale evolution. Unlike ID theorists, however, he attributes creation to God, rather than an unnamed supernatural force.

My focus in this analysis is primarily on the Young Earth creationists, the most vocal group and the most far removed from mainstream science, though they attempt to align themselves with science. The ICR, for example, devotes itself entirely to the pursuit of rejecting evolution, but also claims that the conflict between creationism and mainstream science is illusory. Because creationists believe that scientific evidence is consistent with the Genesis account of the origin of human life, their goal is to falsify evolution on scientific grounds and offer what they maintain is scientific proof for creation. Eve and Harrold stress that creationist movements are not determined to dismiss the institution of science, but rather want to redefine it based on their own vision (55-72). Ironically, despite the ICR's insistence that it is critiquing evolution on the grounds of mainstream science, it produces little or no research to support creation as a viable scientific explanation for life's origins. Although it does produce a number of articles claiming to be scientific literature, these articles appear almost exclusively in creationist publications because they do not fit within the boundaries of peer-reviewed journals. A brief perusal of the articles listed under the button "Research" on the ICR home page indicates that all of the listed papers have been presented at creationist conferences (usually sponsored by the ICR) or have been published in ICR-sponsored newsletters or magazines, but not published in a peer-reviewed journal. The articles provide little scientific information. For example, one article called, "Toward the Development of an Instrument," discusses "the fundamental issue of measurement of the construct worldview." The author examines ways to measure a "person's worldview as

related to the creation/evolution controversy." The authors argue that evolutionary scientists choose to accept evolution because of their worldview, not because of evidence for evolution. They also argue that "by rejecting the creationist view of God as Creator, they accept natural processes, time, and chance (evolution) as "god." The authors then go on to discuss various instruments available to measure people's worldviews. The article represents a sociological viewpoint of creationism, but it presents no scientific evidence for or against creationism itself. The article assumes that evolution is a worldview, not scientific concept. By moving the issue into the sociological realm, the authors can talk about it from a cultural standpoint rather than a scientific standpoint. In addition, the authors, Steve Deckard, EdD and Gregory M. Sobko, PhD list their academic titles as a means of associating themselves with the authority of the scientific academy—the same one they reject.

Another article, by Larry Vardiman, reminds readers that Isaac Newton, one of the greatest scientists of all times, was a devout Christian. Vardiman's purpose in the article is to "explore some of the current attitudes and implications to using the Bible as a source of information to 'do' science," to examine the "consequences of Christian scientists restricting themselves to non-Biblical sources of information," and to "take the Bible more seriously in formulating research questions and interpreting scientific data." Vardiman presents no clear discussion of how scientists actually "do" science, but rather continues with a personal narrative in which he discusses his conflicted friendship with mainstream scientist Carl Sagan and the Christian worldview of Los Alamos scientist, John Baumgardner, who Vardiman believes to be a laudable example of a creationist scientist. Vardiman himself has a PhD, but a brief search on the ICR web site reveals

that his PhD was granted by the ICR itself. Like other ICR writers, however, Vardiman uses his credentials to identify with mainstream science so that he can explain with authority his own departure from formally-trained evolutionists.

Both Vardiman's article and the one by Deckard and Sobko were presented at major creationist conferences, but were not published in peer-reviewed journals. Creationists also believe that they are kept out of mainstream journals because evolutionary scientists want to quash the creationist philosophy. Creationists believe that evolutionists will keep any supposed evidence for the existence of God covered at all costs. For example, creationist Phillip Johnson argues that the definition of mainstream science requires that scientists look for "strictly materialist explanations of every phenomenon, and they want to believe that such explanations always exist" (80). In other words, scientists simply do not know what to do if evidence points to a cause outside of materialist explanations.

The fact remains that creationist "researchers" rarely do research—in the mainstream sense—and this is especially ironic given that creationists openly claim to be actively doing mainstream science, not merely touting a religious or political agenda. Perhaps one of the most famous creationists, Duane Gish, famed for debating evolutionists in public arenas, does no research himself, according to Eve and Harrold; rather, he combs evolutionary writing looking for inconsistencies and inaccuracies in the evolutionary data. Unfortunately, Gish does not necessarily interpret the data correctly, but few readers have the background to know that. For example, at least one charge of intellectual dishonesty has been lodged against Gish. In the 1982 *Nova* debates televised on PBS networks, Gish claimed that while humans did bear resemblance to chimps in

some protein data, we more closely resemble frogs or chickens in other data. Gish, however, has not been able to produce any evidence to support this assertion; he claims it is the evolutionists' job to find the proof themselves. Leading evolutionists have not been able to find evidence to support Gish's assertion, yet Gish has refused to retract the statement (Eve and Harrold 79-83). The point here is not to lambaste Gish's character and make martyrs out of evolutionists, but to underscore the philosophical starting point of the creationist movement. Gish likely believes that he does not *hav*e to produce data for evolutionists because he maintains that the burden of proof lies with the evolutionists. Furthermore, because Gish, and other creationists do not do mainstream scientific work—empirical, testable, replicable research—it is obvious that they have a different conception of what science is or should be. Creationists generally believe that borrowing scientific terminology and the conventions of science constitutes *doing* science. I am not suggesting here that creationists are so obtuse that they do not understand what mainstream science is; the fact that many of the active ICR members and writers have PhDs from accredited universities in appropriate fields of study indicates that they must know a great deal about science itself. I am suggesting, however, that the creationist arguments maintained by the ICR represent an argument for a revised philosophy of science, specifically one that returns to earlier philosophies of the eighteenth and nineteenth centuries.

A History of Creationism

Creationism has its very early roots in the eighteenth-century philosophy of "Scottish Realism" formulated by Thomas Reid, and later by Dugald Stewart, though scientific creationism would not emerge until much later. According to anthropologist

Alice B. Kehoe, modern creationists have relied on Reid's philosophy in order to construct their argument against evolutionary science. Reid, dissatisfied with other philosophies of reason and knowledge, believed that true knowledge must come from a source outside of pure reasoning. Basing his methods on Francis Bacon's work, Reid suggested that reasoning must occur inductively—a system of basing conclusions on careful observations of the natural world. Thus, Reid argues, "We can accept God's miracles and promise of redemption as true because we can confirm the truth of other parts of the Bible through observation of the natural world" (qtd. in Kehoe 6). The idea that science can corroborate creationism, and thus Genesis, later became an important part of creationist philosophy. Contemporary creationists argue that if one part of the Bible can be corroborated by science, then other aspects of the Bible, and thus God, would be proven as well.

When Darwin's *On the Origin of Species* emerged in the nineteenth-century, many members of the scientific community had difficulty accepting Darwin's theory as a plausible one. For many people, scientist or not, Darwin's theory appeared to challenge the Genesis account of supernatural creation. Furthermore, the late nineteenth-century was a time of rapid and radical change in the intellectual climate as a whole:

> The Protestant churches were rocked by the publication of new theories in geology, biology, and critical biblical scholarship. In addition, the 'new' disciplines of psychology, sociology, and comparative religion were forcing a rigorous self-evaluation. Each of these changes within the intellectual community presented a unique series of challenges that set the

> stage for the approaching controversy [between scientific creationism and evolutionary theory]. (Waters 149)

Because of this changing intellectual environment and seemingly overwhelming challenges to Christian faith, many people (including scientists) broke off into two schools of thought. Liberal and modern Protestants incorporated the findings of these new sciences into their religious teachings. Fundamentalists groups, however, defended religious orthodoxy by claiming the inerrancy of the Bible.

Fundamentalist groups of the late nineteenth-century often pointed to Darwin as a challenger to theism. Such an accusation, however, is untrue. In fact, "Darwin, who considered himself a theist when he published *On the Origin of Species* in 1859, depended upon a sophisticated biological-geological science developed mainly by Christian scientists" (Wilson 3). Evolutionary theory emerged not as an attempt to discredit Christianity, but as an attempt to offer a scientific explanation for the presence of modified forms in the natural world. But admittedly, with evolution came a greater awareness of the ultimate question: is evolution compatible with the Christian God and with the Old Testament? Wilson notes that in 1932, C.L. Drawbridge administered a survey to Royal Society members, questioning members about aspects of science and religion. Drawbridge received 200 responses from the Society, and as Wilson argues, the responses provide an interesting picture of early twentieth-century thought regarding God and evolution. Drawbridge asked: "'Is it your opinion that belief in evolution is compatible with a Creator'" (qtd. in Wilson 16-17). Interestingly, the overwhelming response was yes, but not necessarily the Christian God. Wilson suggests this survey

represents a trend of scientists moving away from rudimentary Christianity to a more progressive view of Christianity (16-17).

The evolution controversy became well-known to nonscientists in America with the 1925 *Scopes v. Tennessee* trial. As a result, as Warren D. Dolphin points out, "The focus of the controversy shifted from abstract philosophical differences to the pragmatic issue of what should be taught in the public school science class" (19). Concerns about public school education would simmer rather quietly for almost fifty years. In the 1970s and 1980s creationism made its comeback, though in certain geographical areas of the United States, it never fell out of favor. But creationism returned to the attention of the general populace when former president Ronald Reagan seriously questioned evolution in his 1980 presidential campaign. In fact, according to another anthropologist, John R. Cole, Reagan was elected, in part, as a result of financial help from a number of antievolution special interest groups (13). Creationism appealed to large numbers of Americans because it seemed to offer observable facts, rather than esoteric theory. As Kehoe notes, "For a pragmatic American, scientific creationists' assertions that they know truth and can prove it with facts is seductive" (10).

Generally, philosophies of science fall under three strains of thought. The Protestant model encompasses common sense philosophy and Baconian empiricism as a method of corroborating scripture (Toumey 19). This is a problematic model, however, because it so clearly links science with religion, and thus can be easily dismissed by mainstream scientists. In direct opposition to this Protestant ideology is the European

Enlightenment model, which focuses on rationalism and naturalism,[27] philosophies accepted by mainstream science (Toumey 20). Creationists, however, critique this model because they believe the absence of religious ideology represents a religious ideology itself. Finally, the trivial model,[28] established as a result of the rift between Protestant and Enlightenment models, eradicated the conceptual links between tangible symbols of science—things like test tubes, labs, centrifuges—and the ideological substantive aspects of science. As a result, the trivial model allows nonscientists to borrow the symbols of science (Toumey 20), and thus borrow what Elizabeth Ervin calls "the plenary authority of science" (454). This plenary authority allows nonscientists to authoritatively discuss creationism in conjunction with certain subjects that are off-limits to mainstream scientists. In the case of creationists, they can talk about a creator, the Bible, and other religious ideologies while seeming to be scientists. The result is a "scientific sanctification" (Toumey 20), or the acceptance of seemingly scientific knowledge on the basis of appropriated scientific symbols. Creationism represents a full-scale adoption of the trivial model; creationists use scientific symbols and scientific philosophies (no matter how out-dated) to bolster authority and support for their largely political claims. By borrowing scientific symbols of authority, creationists have created a contemporary anti-science that has "fragmented the logical relation between the intellectual structure and the substantive content of science, on the one hand, and the common symbols of science on the other. The result is that those symbols are available for trivial and superficial appeals" (Toumey 142). Certainly, other movements have used similar

[27] Naturalism suggests that the universe is a machine devoid of any purpose and indifferent to the needs of humans. Naturalism assumes that everything can be explained by natural laws; therefore, it necessarily rejects supernatural or extranatural explanations.

[28] Anthropologist Christopher Toumey uses this phrase to indicate an ideology superficially based in science, but which contains no substantive scientific basis.

techniques. For example, diet ads that use scientific data to prove the effectiveness of the product borrow the authority of mainstream science through their use of scientific symbols and discourse types. What sets creationism apart is its infusion of conservative politics and fundamental religion into science.

Current creationist movements are rooted squarely in both the Protestant model and the trivial model; they are united in a fight to discredit Enlightenment philosophies of science. Contemporary creationists also borrow from the tradition of Scottish Realism,[29] and thereby dispense with the need for mainstream scientists to interpret evidence for lay readers. They believe the opacity of evolutionary theory is a result of mainstream scientists deliberately obscuring the truth that the lay reader can plainly see for herself. Second, creationists argue that because evolution is only a scientific theory, it cannot be as trustworthy as pure observation.[30] Finally, the core of creationism is the focus on empirical knowledge that corroborates the Genesis account of creation,[31] an ideology that clearly separates creationism from mainstream science.

In contemporary America, creationism speaks to people who have felt disenfranchised by one of the largest and most important institutions of American culture—science. Christopher Toumey calls creationism "a system of cultural meanings

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[29]Reid's common sense philosophy argued against the accepted notion that truth is difficult to perceive and only specialists can ascertain these truths. Reid's philosophy held that things worth understanding are not opaque; things are as they seem, so nonspecialists can trust their own senses (Toumey 16).

[30] Common sense philosophy, and creationism by extension, is grounded in Baconian empiricism, which begins with the premise that "truth is uncomplicated and self-evident" (Toumey 16). Baconianism applied to science means that theorizing is no longer necessary; rather, science consists merely of observation, collection, and classification of facts (Toumey 16).

[31] Creationism also has its roots in Princeton theology, which combined both common sense philosophy and Baconian empiricism to the exegesis of scripture. Anthropologist Christopher Toumey argues that the merging of these three epistemologies are "reducing tendencies" which function to diminish "knowledge to its most simple, obvious, tangible qualities" (17). The move toward a secular model of knowledge in the nineteenth century occurred not because colleges and universities consciously rejected biblical accounts of creation, but because the institutions were becoming more specialized—theologians were no longer teaching wide varieties of courses.

about both immorality and science that helps fundamentalist Christians make sense of the realities, anxieties, changes, and uncertainties of life in the United States" (6). The popularity of creationism, however, extends beyond fundamentalist Christians. Michael Shermer cites a 1991 Gallup poll which shows that 47% of Americans believe that God created humans basically in our present form. Only 9% believe in evolution. Shermer points out that 99% of scientists accept the view that only 9% of Americans believed (156). The fact that so many Americans reject evolution requires careful consideration of the creationist appeal.

The creationist ideology is more complicated than evolutionists often give it credit for being, and it is perhaps more complicated than evolutionists' representation of it. Not all creationists believe the same things, but all creationists lobby three major contentions about the origin of life: first, creationists believe the mechanisms for evolution—either natural selection and/or genetic mutation—are unsupported by evidence, and therefore, false. Second, creationists believe evidence exists that actually challenges the possibility of natural selection and/or genetic mutation acting as a mechanism of evolution. Finally, they argue that scientific evidence exists to support God as the creator of human life in basically our present form. These arguments supposedly stem from perceived lack of empirical evidence for evolution; however, creationist movements stem from a number of other political, social, and philosophical factors as well. They arise from fundamentalist religious traditions, grounded in a philosophy of science completely different from those philosophies that anchor mainstream academic science. These differing philosophical positions result in clashes that have ultimately created two distinct sides of the evolution/creation debate. On one

side there is the mainstream scientific establishment, which represents intellectualism and Enlightenment values. On the other side is the very vocal and visible creationist movement which claims to represent common sense, empiricism, and more important, the fundamentalist religious and moral values of the common person. Based on this creationist philosophy of science, creationists conclude that evolution just does not make logical sense, not only because they cannot directly observe animals or humans giving birth to distinctly other life forms, but because the concept of evolution seems to directly oppose the biblical creation story, which definitively states that God created Earth and all living things in six days.

It seems ironic that creationists trust and revere science based in empiricism when they so ardently oppose evolution. Creationists have actually adopted a narrow and older definition of science, one that suits their goals. Therefore, the evolutionists' inability to put forth clear, persuasive, and *observable* evidence for macroevolution is one reason evolution is a hotly contested topic. Evolutionists themselves interpret the evidence for the mechanism of evolution in multiple ways—hence, the rift between Neo-Darwinian evolutionists and punctuated equilibriumists.[32] Creationists maintain that if evolutionists have no definitive answer regarding the mechanism of evolution, then perhaps nonexperts can assume that evolutionists are wrong altogether, or at least the possibility exists that they are wrong. I suggest that creationists object to evolution on epistemological grounds, but in addition, I argue that the creation/evolution controversy is a rhetorical issue. Both evolutionists and creationists want to believe that the other is merely using fancy words and arguments to unfairly persuade unsuspecting readers. Mainstream

[32] While both groups of theorists agree that the mechanism of evolution is natural selection acting on variation, they dispute *how* evolution actually occurs and the *rate* at which it occurs.

science, of course, is predicated on being unrhetorical,[33] so it is impossible for evolutionists to engage in the same type of rhetoric as creationism without a complete overhaul of mainstream scientific philosophy—a difficult or impossible task. Of course, the claim of being non-rhetorical is itself rhetorical. While creationism does not openly admit its rhetorical nature, any more than science does, creationist writers are free to discuss the political context of their debate as well as the implications of adopting particular educational policies because they believe that considering the implications of developing scientific theories is an integral part of the scientific epistemology. As a result, they are free to lobby critiques against evolutionist writers and the conventions of mainstream science. They can also rely on personal views outside of empirical research. It would be useful, then, to examine the way creationists talk about science. While previous rhetorical and cultural analyses focus on how evolutionists might publicly respond to creationists and to the general public,[34] I suggest that we must first better understand the rhetoric of creationism. Analyses of other scholars such as Charles Alan Taylor, Elizabeth Ervin, and Kary Smout are enlightening in terms of describing the general character of the creationist movement, but they offer few specific examples of where, how, and, most important, *why* the rhetoric of creationist functions successfully. Ultimately, I argue that the creationist philosophy is a legitimate (despite its frequent inaccuracies) critique of mainstream science because creationists argue for a common sense rhetoric, one that allows those who are not professional scientists or intellectuals

[33] Philip Kitcher, for example, in *Abusing Science: The Case against Creationism*, suggests that "creationists have constructed a glorious fake, which we can use to illustrate the differences between science and pseudoscience" (5). The means with which they have created this "glorious fake" is rhetoric, and the implication is that mainstream science does not engage in the same kind of language trickery.
[34] See, for example, Larry A. Witham's *Where Darwin Meets the Bible: Creationists and Evolutionists in America* (2002); Christopher P. Toumey's *God's Own Scientists: Creationists in a Secular World* (1994), and Kary Doyle Smout's *The Creation/Evolution Controversy: A Battle for Cultural Power* (1998).

access to science. By dismissing creationists—either by ignoring them or attacking them—evolutionists overlook this important critique of mainstream science. In a culture where scientists hold a tremendous amount of authority, asking for an accessible epistemology and rhetoric is not an outrageous request.

I am not suggesting that anyone should be able to call themselves scientists without proper training and knowledge, but I am suggesting that creationism is a part of an anti-intellectual movement that signals our culture's uneasiness with what may be an intellectual meritocracy. As rhetoricians, we can examine how creationists create and invoke rhetorical themes that indicate the aspects of mainstream science with which they are uneasy. Rather than dismantling the epistemology of mainstream science or creationism, evolutionists need to learn how to understand the philosophy of anti-movements. Understanding the three main ideologies behind creationism illuminates the rhetorics they use. First, creationist terminology represents a commitment to both the Protestant model of science and the trivial model. Creationists borrow scientific terminology and falsely believe that the use of scientific ideas alone corroborates their arguments and their religious ideals. Rhetorician Kary Smout studied the major documents of three major events in creationist history—the publication of Darwin's *Origin of Species*, the infamous 1925 Scopes trial, and the 1981 Arkansas trials which attempted to again oust evolution from public schools. His post-structural analysis of the texts reveals "terminological battles" over words such as "science," "theory," and "fact" These battles fuel the war between evolutionists and creationists, and the conflict cannot be resolved until each side recognizes how the opposite side defines these terms (3). Smout notes that both creationists and evolutionists incorrectly see language "as simply a

mirror for reality instead of a tool used to create and sustain various human communities" (xi). Second, creationists also want to advance an argument for Baconian science, or science that relies on sensory observation. Creationists believe only studying that which is observable can be called science. Consequently, their rhetorical strategies work to advance an older philosophy of mainstream science—one that only considers observable phenomenon. Whatever cannot be observed, cannot fall under the rubric of science. This Baconian science has its roots in the seventeenth century where scientists acquired knowledge solely through direct observation and experimentation, not through books and Greek and Latin philology as scientists prior to them did.

These seventeenth-century scientists also distrusted ornamental language, but they believed words, if chosen carefully, could be used with mathematical precision; they believed that there could be a one-to-one relationship between what they observed and the words they chose to express that observation. Imprecise language was simply unscientific. Merrill Whitburn argues, "Nothing was to exist between the mind and its true object; rhetorical devices were not to be an obstruction between observation and description" (351). Likewise, Halloran argues that as Thomas Sprat and his colleagues perceived it, rhetoric involved ornamentation only. Halloran writes, "Science was knowledge of things, and as such could have no use for an art of verbal cosmetics. A true scientist would not use words to please an audience, but merely to point his colleagues toward the things that were his real concern" (Halloran 80). Creationists believe that they are doing this kind of science: strict observation, unmediated by any outside influence, neutrally reported with mathematical precision.

Creationists manage to use people's doubt about contemporary science to bolster support for creationism while ironically adopting the philosophy of seventeenth-century science. In her 1999 article, "Academics and the Negotiation of Local Knowledge," Elizabeth Ervin explores the creation controversy in the town of Wilmington, North Carolina, home of the University of North Carolina at Wilmington. Ervin uses Wilmington as a case study of sorts to explore how and why creationism is most popular in small southern communities. Wilmington, Ervin explains, has been the site of a heated creation/evolution controversy, and she suggests the controversy is in response to two major conditions. First, the presence of local nonacademic residents and a sizeable population of alien newcomers usually associated with the university creates a situation of insiders and outsiders. Long-time residents tend to perceive the academics as intruders or as "decadent, self-important outsiders." Likewise, academics tend to view community residents as "provincial" (452). Second, modern creationists, particularly in primarily fundamentalist Christian states, like North Carolina, are concerned with the "plenary authority" of science, which Ervin defines as "the belief that the explanatory power of science is absolute and conveys an absolute moral imperative—a faith that depends on the domination of nature and the accumulation of empirical knowledge." When people begin to doubt the plenary authority of science, however, they begin to look for "equally persuasive ideological systems." In places like Wilmington, the most common plenary authority outside of science is fundamentalist religion (Ervin 454). Creationists create a sense of doubt about mainstream science and then substitute the authority of science with the authority of religion. What they create is a fused religious/scientific epistemology that borrows from both religious and scientific rhetorics. Creationism flourishes because

creationists have effectively adopted a new model of science more compatible with lay readers' expectations of science. Rhetorician Charles Alan Taylor's argument that "creationism endures not only *in spite* of the response from the mainstream scientific community, but also, in part, *because* of that response," ("Of Audience, Expertise, and Authority…" 278) underscores the rhetorical success of creationism in translating a philosophy of science for popular readers. Taylor analyzed creationist writing, including the book-length works and periodical publications of the ICR, as well as evolutionists' responses to these creationist works. The evolutionary commentary appeared in mainstream publications such as *Nature* and *Physics Today*. Taylor's analysis reveals that evolutionists misconstrue the philosophical foundation of creationism. Evolutionists believe that creationism is wholly a religious argument rather than a cultural response. Taylor maintains that the foundation of creationism is deeply entrenched in folk epistemology and a profound mistrust of detached technical knowledge (278). I would add that this mistrust of technical knowledge extends to a general mistrust of intellectualism. The scientists who argue for evolution represent very different cultural values than creationists hold. Opposing evolution is a way of opposing an entire value system that is inconsistent with creationism and the attending religious philosophy.

Taylor goes on to say that creationist arguments succeed with their intended audience because scientists sometimes shut off their end of the dialogue (and the ability to reach the public) by simply not producing accessible popular treatments of evolution.[35]

[35] In reality, there are many sources that present evolution in an easy-to-understand fashion. Michael Shermer's *Why People Believe Weird Things*, for example, deals in depth with evolution. Stephen Jay Gould's 1977 book, *Ever Since Darwin*, is also aimed at lay readers. I would amend Taylor's argument and suggest that evolutionists have not presented works that resonate with the very novice reader. Even though Shermer and Gould are relatively easy to read, they probably still require a certain level of knowledge to understand. Creationists have launched a writing campaign that includes picture books,

Taylor argues that not responding to creationists directly allows creationists to popularize a philosophy of science that does not square with mainstream science. Because mainstream science quickly dismisses creationism as simply bad science, rather than examining the epistemological system in which creationism is based, evolutionists forego the opportunity to submit creationist claims to rigorous testing (Taylor 285). Taylor suggests that evolutionists need to actively engage in debate with creationists, thus recognizing that technical expertise *is* rhetorical (290). Elizabeth Ervin suggests we modify our academic model of argument, so that instead of making "argumentative displays and presentations," we learn a different conception of argument that includes "anecdotal, personal, and cultural reflections" (290). This new model of argument would allow us (as academics) to understand where they (creationists) are coming from. Along these same lines, Kary Smout argues that the creation/evolution debate is not about science, but rather a battle for cultural power between a fundamentalist philosophy and a humanist philosophy (xi). In order to move away from this cultural battle, Smout advocates that academics begin to recognize "truth as distinct from either values or beliefs" and instead as a "function of shared values or beliefs[36]" (180). Likewise, Raymond Eve and Francis Harrold characterize creationism as a "value-oriented movement" where creationists challenge the basic values of the scientific and academic community (70). Smout also suggests that evolutionists stop trying to understand creationism rationally and instead tell stories that illustrate the scientific viewpoint. He

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books for teens, and adult books that explain creationism using very accessible rhetorical techniques, including illustrative analogies and simplified language.

[36] Of course, most academics hope that we already consider truth as a function of beliefs; however, many academics are dismissive of movements like creationism that seem ridiculous, wrong, or contrary to the academic's notion of common sense. The point Smout tries to make here is that academics are not necessarily free from the biases we identify in others.

recommends the 1989 novel by Fred Chappell, *Brighten the Corner Where You Are* (180). The fact that Smout recommends a novel indicates his recognition that evolutionists must use different genres (outside of academic texts) to reach new audiences. I suggest that in order to understand creationists and their rhetorics, we have to understand the creationist ideology as an anti-movement. This means understanding how it functions rhetorically in relationship to the scientific and cultural philosophies it opposes.

Chapter 4: A Neo-Aristotelian Analysis of Creationist Rhetoric

Aristotle argues that only scientific demonstration and dialectic can lead to knowledge; however, he suggests that rhetoric—if used properly and prudently—can convey truth to nonexperts. He maintains that if rhetoric leads audience to a false conclusion, it is the fault of the speaker. Aristotle writes, "Rhetoric is useful…because things that are true and things that are just have a natural tendency to prevail over their opposites, so that if the decisions of judges are not what they ought to be, the defeat must be due to the speakers themselves, and they must be blamed accordingly" (*The Rhetorical Tradition* 152). Based on this philosophy, Aristotle defines rhetoric as the "faculty of observing in any given case the available means of persuasion" (*The Rhetorical Tradition* 153).

Classical rhetoric divides persuasive language into five distinct stages: invention, arrangement, style, memory and delivery. The rhetor's job is to use each stage effectively by employing a full range of persuasive appeals—ethos, pathos, and logos. (Bizzell and Herzberg 4). Rhetors must use these appeals in such a way that the audience will find the message persuasive. Aristotle argues that ethos concerns, "the personal character of the speaker." Pathos deals with "putting the audience into a certain frame of mind," and logos focuses on "the proof, or apparent proof, provided by the words of the speech itself" (*The Rhetorical Tradition* 153). In the following sections, I examine how creationist writers move through three of the stages of rhetoric applicable to written work—invention, arrangement, and style. Specifically, I look for how they find the

available means of persuasion and how they use the rhetorical appeals to persuade readers.

Invention and Stasis Theory

The process of invention includes "the search for persuasive ways to present information and formulate arguments" (Bizzell and Herzberg 3). In this stage of writing, rhetors decide how to persuasively to present arguments (Bizzell and Herzberg 4). The process of invention also includes establishing stasis, or the point at which disagreement occurs. "Stases present a way of determining the central question in a controversy; thus, stases determine where a case stands, and the case develops or proceeds from the point of disagreement" (Covino and Jolliffe 86). An analysis of creationist invention processes reveals one of the most significant aspects of creationist writing: the creationists begin their arguments from very different starting points than evolutionists, revealing their different conceptions about the actual crux of the debate.

Rhetorician Alan Gross notes that the invention of science writing is usually considered fundamentally non-rhetorical (Gross 6-7). That is, science writers often believe that they are simply identifying facts, or truths. Some science writers believe it is their goal to clearly *interpret* empirical data while rhetoricians work to *influence* audiences; in interpreting scientific data, however, scientists actually use rhetoric to "influence one another about interpretations of the empirical domain" (Harris, "Rhetoric of Science" 284). That is to say that no scientist simply reports empirical data; instead, interpretation of the data is a significant rhetorical step in the process of doing science. In order to participate in science, a scientist must present her findings and convince others of the validity of her claims. That activity falls under the domain of rhetoric,

though it may not seem rhetorical to those who do it (Gross 7). In fact, the ontology of science writing requires that it *masquerade* as non-rhetorical: "Through style its prose creates our sense that science is describing a reality independent of its linguistic formulations" (Gross 17). Many scientists, though, argue that science is *inherently* non-rhetorical. Albert Einstein, for example, wrote to the Italian minister of state in 1938 protesting the minister's plans to obligate intelligentsia of Italy to pledge loyalty to fascism. Einstein writes, "The pursuit of scientific truth, detached from the practical interests of everyday life, ought to be treated as sacred by every government, and is in the highest interests of all that honest servants of truth should be left in place"[37] (qtd. in Taylor, *Defining Science* 3). Science, however, as a discipline works to demarcate itself from other discourse communities through rhetoric, and it does this, in part, by claiming to be purely empirical, rather than a set of arguments constructed by the scientists themselves (Taylor, *Defining Science* 5-7).

The process of rhetorical invention, or the act(s) of deciding what to say and how to say it, requires that scientists focus on a particular aspect of the problem and minimize or ignore another (Gross 8). The set of focusing questions that scientists ask represents stasis theory, one of the most important parts of the invention process. Stasis theory may help explain points of departure in types of science writing. The stases, generally used in courtroom situations, function as a list of questions that allow us to "orient ourselves in situations that call for a persuasive response" (Gross 7). Analysis of the movement through the stases provides a method of accounting for how scientific issues develop in

[37] In many ways, it is hard not to side with Einstein given his goal of combating the misuse of science by corrupt governments. As creationists will point out, there are benefits to bringing science into the realm of the social. For one, it can make the scientific community responsible for their theories and the implications of them. Einstein understood this. He joined with other scholars and scientists, including philosopher Bertrand Russell, to ban the development of nuclear weapons (Sagan, *Broca's Brain* 36).

public venues (Fahnestock, *Rhetorical Figures in Science* 31). Both mainstream and popular science can be rhetorically demarcated by examining their movements through the stases: mainstream science begins with the first stasis, the conjectural stage. In this stage, scientists ask whether a thing exists or whether an event occurred. Popular science, however, bypasses the first stasis, assuming, that it has been adequately answered (Fahnestock, *Rhetorical Figures in Science* 32-3). Readers of popular science generally have no idea that science accommodators begin at a different rhetorical place than mainstream scientists do. These differences in stases "can lead—in fact, have led—to radically different conceptions of science" (Gross 9). The examination of how different types of science writing travel through the stases, particularly when political groups use scientific or technical information, is useful for understanding the effects of science writing (Fahnestock, *Rhetorical Figures in Science* 33). For instance, examining the rhetorical departure from mainstream science writing to popular science writing can lead to a better understanding of the motivations of both. Recall Fahnestock's example of the carrion-eating bee. Popular scientists made the results of the study more certain in order to enhance the uniqueness and singularity of the event. The mainstream scientific account, however, was much more tentative because traditional science writers are more concerned about fitting their findings within the tradition of mainstream science (Fahnestock, "Accommodating Science" 25).

I argue that in terms of stasis theory, creationist writing, like other popular science, begins at a different stasis than evolutionist writing. But unlike the popular science Fahnestock describes, creationist writing almost always begins at the earlier first stasis question: was an act committed? According to Gross, this translates into scientific

terms as: *what actually exists* (8)? Evolutionists begin their discussions at the second stasis question because the theory is so well-established in mainstream science that there is not need to ask if evolution exists. The second stasis question assumes that if something exists, *what is its character* (Gross 8)? Hence, evolutionist writing revolves around questions of the mechanism of evolution, not whether or not the process of evolution actually occurs. Evolutionists assume that readers already know the same things they do and already agree.

An analysis of creationist texts, as I show later in this chapter, reveals their interpretation of what the important questions of the debate are. Duane Gish, author of *Evolution: The Challenge of the Fossil Record*, begins his work with a clear and accurate statement of the evolutionist position. It is: "The theory that all living things have arisen by a materialistic evolutionary process from a dead, inanimate world" (11). Gish, however, argues that fossil evidence for this theory does not exist; therefore, evolution is a philosophy or a worldview, not a science. Because he believes good evidence exists that supports creationism, it can be accurately labeled as a science itself (12). In terms of stasis, Gish begins at the first question: is there clear empirical evidence that evolution has occurred? Gish claims that scientists, on the other hand, have already accepted evolution as a fact, and this is illustrated by textbooks which present it as such (Gish 11).

When creationists do address the second stasis (if evolution exists, what is its character?), the place where mainstream science has already begun, they perceive this question differently than mainstream scientists. While mainstream scientists discuss how the mechanisms (natural selection and genetic mutation) of evolution work, creationists discuss the moral implications of evolution. Lee Spetner, in *Not by Chance: Shattering*

the Modern Theory of Evolution, for example, worries that evolution requires a belief in randomness, which in turn "has led to atheism and to the belief that we human beings are not more than a cosmic accident" (viii). In the most dire discussion of evolution's effect on human morality, Henry Morris, author of *The Long War Against God: The History and Impact of the Creation/Evolution Conflict*, argues that all of society's ills are a direct result of the system of attitudes, values, and beliefs associated with evolution: "I am now convinced that all significant problems of society are the children of an ignorant or indifferent attitude toward creationism" (10). Morris goes on to say, "Pornography, adultery, divorce, homosexuality, premarital sex, the destruction of the nuclear family—all are weeds that have grown from Satan's big lie about the universe" (10). Satan's big lie is, of course, evolution, and Morris holds it responsible for everything from the Holocaust to television violence. Certainly, it might be difficult to take Morris's claims seriously, particularly in any kind of scientific discussion; however, such discussions of morality occur in some form in all creationist works. Obviously, these questions of morality fall outside the province of mainstream science, but creationists believe it is a valid and necessary discussion. The focus on the implications of believing in evolution represents their interpretation of what the second stasis question is asking. Creationists believe that we must discuss all aspects of evolution's character, including its potential social implications, which is beyond the scope of evolutionists.

Some creationists, however, bypass all of the initial stasis questions and move to what Gross calls the final stasis: whether or not a court has jurisdiction, translated into scientific terms as whether or not something qualifies as a scientific theory (8). Arguing about jurisdiction, or whether evolution constitutes a scientific theory, allows creationists

to bypass any discussion of evidence for creationism. Rather than arguing against the scientific validity of evolution, creationists claim that the character of creationism is the same as evolution; therefore, each is on equal footing. For example, Dean H. Kenyon, in the introduction to Morris and Parker's work, *What is Creation Science?*, defines evolution as the assumption that the universe is self-contained and all complex systems within the universe can be "explained solely by time, chance, and continuing natural processes, innate in the very structure of matter and energy" (xii). Kenyon suggests that there is no observable proof for this position, that it is simply an assumption.

Kenyon argues that creationism operates under a set of opposite assumptions: the universe is not self-contained, and the creation of it occurred as a result of supernatural or extra-natural processes (xii). These definitions allow Kenyon to define evolution as a model predicated on atheism and creationism a model predicated on theism. Kenyon then claims, "Theism and atheism are mutually exclusive philosophies and are therefore in the same category. It is not more nonreligious for a view to be atheistic than to be theistic" (xii). Kenyon does not argue that evolution is necessarily unscientific; rather, he argues that if creationism is labeled unscientific, then evolution is equally unscientific. He can then reverse the argument: if evolution is science, then creationism is also science. Similarly, Phillip Johnson, in *Defeating Darwinism by Opening Minds*, urges readers to understand the philosophical biases of mainstream science. Because science is empirical, naturalistic, and materialistic, it cannot seek explanations outside of nature. As result, according to Johnson, mainstream scientists bring with their interpretations an inherent bias since they can never consider any evidence for supernatural creation (21).

Arrangement

Once a rhetor devises arguments through the use of invention, she must decide how to effectively order these arguments. That is the task of arrangement (Bizzell and Herzberg 5). Aristotle argues that persuasive speech must contain two parts.

> You must state your case, and you must prove it. You cannot either state your case and omit to prove it, or prove it without having first stated it; since any proof must be a proof of something, and the only use of a preliminary statement is the proof that follows it. Of these two parts the first part is called the Statement of the case, the second part the Argument, just as we distinguish between Enunciation and Demonstration. (Aristotle)

Aristotle argues that logical appeals go into the body of the argument, while appeals to pathos and ethos should appear in the introduction and conclusion (Bizzell and Herzberg 5). Both evolutionists and creationists focus on all three of these appeals, but the specific arrangement of creationist works is a sharp departure from mainstream science and popular science arrangements. As I will show in this section, creationists spend a considerable amount of time in forewords, introductions, and prefaces—sometimes using all three—establishing personal authority. Once they establish their own credibility within mainstream science, usually by emphasizing their advanced degrees from reputable universities, they then reject the evolutionist position. Early in their works, creationists convince readers that seeing the flaws in evolution is not as difficult as they may have thought—it is just a matter of reading creationist books and trusting the authors. This particular arrangement primes readers for embracing the creationist ideology in two ways. First, the scientific authority of the writers (or at least the semblance of science authority) persuades readers to immediately trust creationist

writers, and their subsequent argument against evolution also appears credible. Second, creationist writers emphasize their own common sense. While being part of mainstream science, they also claim to be in touch with the ideas of the common person. The creationist introductory material works to simultaneously convince readers that creationist writers are authoritative mainstream science voices, while at the same time convincing readers that the proceeding arguments require no special skills—other than common sense—to understand. In the following section, I first briefly examine the arrangement of mainstream science to show how a typical evolutionist writer establishes authority and presents an argument. I then look at the arrangement of creationism specifically to show how the introductions make the body arguments appear more credible.

Mainstream science writers establish authority in a much more subtle manner than creationist writers largely because mainstream science writing is firmly grounded in organizational conventions that require writers to begin with a discussion of previous research rather than their own personal qualifications. Furthermore, while creationists often begin their conclusions in the very first lines of their introductions, mainstream science writers must save their discussion of the research results for the last section of the paper (though they will make reference to their argument in the abstract or the first section of the paper.)

Creationist writer Henry Morris states in the first paragraph of the foreword to Duane Gish's book, *Evolution: The Challenge of the Fossil Record*, "This book constitutes one of the most devastating critiques of the evolutionary philosophy one could find. It goes right to the stronghold of the supposed scientific evidence for evolution and

demolishes its central bastion" (7). Morris tells readers that Gish *does* demolish evolution before Gish even shows any evidence for his position. In contrast, mainstream science uses the introduction of a work to ground their work within the entire body of mainstream science writing. A typical mainstream evolutionary paper illustrates this convention. Joseph Thornton's article on the evolution of steroid receptors in vertebrates appeared in the May 2001 issue of *Proceedings of the National Academy of Sciences*. The first sentence of the article grounds his research in previous evolutionary research. He writes, "According to neodarwinian theory of evolution, novel functions arise as the phenotypic outcome of natural selection acting on random mutations" (5671). Thornton follows a brief review of previous work in evolution with his own research question: "In the absence of a ligand, what function does a new receptor serve? And without a receptor, what selection pressures guide the evolution of a new ligand" (5671)? Throughout the paper, Thornton presents plausible answers for these questions based upon his research. In no place does he question the conventions of mainstream science, nor does organize his claims around his personal authority, which would be inappropriate for a peer-reviewed article. Bazerman notes in his analysis of Watson and Crick's landmark 1953 article, "Molecular Structure of Nucleic Acids," that the authors can bypass in-depth discussions of previous work on molecular structures because "the chemical and biological literatures are codified and embedded in the language, problematics, and accepted modes of argumentation" (*Shaping Written Knowledge* 46). Rhetorician Charles Bazerman argues that less codified subject areas require more in-depth literature reviews. He chooses an unsettled area of inquiry—sociology of science—to demonstrate this marked difference.

The sociology of science article that Bazerman analyzes carefully "reconstruct[s] the literature to establish a framework for discussion." The unnamed author of the article "attempts codification because codification is not a fact going into the essay" (Bazerman, *Shaping Written Knowledge* 46). According to Bazerman, these differences in codification arise from differences in audience expectations (*Shaping Written Knowledge*, 46); however, I suggest that audience's expectations stem from the authority of both the author *and* the genre. Bazerman notes that Watson and Crick's audience accept their method of analysis, the criteria they use for judgment, and their suggestions for application. As a result, "The authors do not urge, but rather leave the audience to judge and act according to the dictates of science." Conversely, the sociology author must actively help his audience see his line of reasoning and urge them to accept his conclusions (Bazerman, *Shaping Written Knowledge* 46). I would add that the sociology author creates credibility for his claims through his extensive literature review and his argumentative strategies, establishing authority for both himself (as a writer and scholar) and the genre in which he writes. Watson and Crick, on the other hand, already have a good deal of credibility because they are biochemists, a mainstream science field that garners a certain amount of respect. Bazerman notes the marked differences in authorial presence between Watson and Crick and the sociology writer. Watson and Crick take a proud and seemingly humble tone in their work, even though their claims are open to scrutiny; however, these claims are based in empirical data. That means that their discovery has "the potential ring of natural truth and nearly universal professional acceptance" (Bazerman, *Shaping Written Knowledge* 47). The sociology of science

author, on the other hand, makes a qualitative argument, so he must rely totally on the force of his own argument, and possibly his own authority.

Similar issues exist between mainstream evolutionary biology and the work of creationists. Creationist writings rarely include literature reviews because, in many ways, the creationist genre is already well-codified. Of course science is also well-codified, but readers expect a literature review, or a context, in order to ground the author's claim within the scientific paradigm. Creationists, however, dispense with literature reviews because each piece of writing is independent of everything but itself and its audience's beliefs. Because creationism is almost always associated with fundamentalist religion (a recognized authority for many lay readers); the authors need not invoke previous religious writing. But because readers may not associate creationism with science, creationist writers must invoke their personal authority as both morally upright people *and* traditionally-educated scientists.

In terms of the body of an argument, mainstream science writers follow a specific and rigid line of argumentation that requires the presentation of methodologies and results before writers draw any conclusion. Even well-codified, empirical arguments, like the one presented by Watson and Crick, must carefully demonstrate evidence to support any of their claims. Only after they have presented this evidence can they begin to draw conclusions. In contrast, creationist writers begin with their conclusions and promise to present their evidence later in the book. It is interesting to note, however, that many creationist works do *not* present the evidence they claim they will offer. Lee Spetner, in *Not by Chance: Shattering the Modern Theory of Evolution,* for example, notes in his preface that he will use information theory to explain why spontaneous

mutation cannot give rise to macroevolution, but Spetner only mentions Claude Shannon, originator of information theory, in only one paragraph—as a passing reference to Shannon's work developing the theory. Spetner never discusses how information theory works, nor does he apply it to genetic mutation. Lay readers may not question Spetner's methodologies or the conclusions he draws based on this methodology. The most important part of Spetner's work is his conclusion, prominently placed in his preface: information theory shows that "random variation cannot lead to large evolutionary changes" (vii). Spetner makes the claim as if it were definitive despite the fact that he does not explain how he has reached this conclusion.

Creationist Duane Gish takes a similar approach in the first chapter of his book. He definitively argues that evolution does not fit within the scope of science. He cites George Gaylord Simpson's definition of a scientific theory from a 1964 *Science* article: "It is inherent in any definition of science that statements that cannot be checked by observation are not really about anything…or at the very least, they are not science" (qtd. in Gish 12). Gish uses this definition, which privileges scientific knowledge, to argue that evolution cannot be qualified as science. He also indicates that his argument will include demonstrable proof that evolution is not scientific, but the body of his argument does not contain observable proof against evolution or for creation. He does, however, include a number of cursory reasons why evolution is not science. For example, he illustrates using the following two equations:

FROG $\xrightarrow{\text{t=instantaneous}}$ PRINCE = NURSERY RHYME

FROG $\xrightarrow{\text{t=300 million years}}$ PRINCE = SCIENCE (Gish 15).

He does not offer an explanation for this equation, which is followed by a critique of evolution on the grounds that it cannot be falsified. The equation, however, is supposed to demonstrate that evolution is simply a fairy tale that scientists ask lay readers to accept blindly; the only discernible difference between a fanciful fairy tale and evolution is evidently time. His definitive thesis—that evolution is not science—primes readers at the beginning of his work to accept this equation as proof of his claim, regardless of whether or not it really proves his assertion. These examples illustrate that creationist writing more closely resembles the arrangement of popular science, not mainstream science.[38]

Creationist writers attempt to make evolution sound too tenuous to be true; in contract to evolutionists, creationists present a much more definitive argument. Recall that the most notable feature of popular science writing is that writers present their claims as more certain than the mainstream science it allegedly represents (Fahnestock, *Rhetorical Figures in Science* 22). This is because popular science writers are under no specific obligation to provide rigorous evidence for their claims, much like creationist writers Spetner and Gish are under no obligation to prove the statements they make in their introductions and thesis chapters. Recall also Fahnestock's argument that popular science writers focus on "wonder" and "application," rather than evidence (*Rhetorical Figures in Science* 25). In the case of creationism, readers are interested in discovering the wonders of the world and themselves, and they are concerned about how they should teach their children about these wonders. Fahnestock argues that popular readers are not

[38] Some creationists vocally state that they want to write popular science. Spetner, for example, states, "I decided the book for me to write should be for the layman." And later he writes, "In citing the literature, I have preferred to cite articles accessible to the layman" (x). My point is to show how the arrangement of creationist books works to establish credibility and authority for the movement.

interested in hedged claims; rather, they want to read unequivocal claims about issues that potentially affect them. Therefore, creationist writers focus in their introductions on the certainty of the claims they intend to make, as if they had already proven their claims. For example, Morris's emphatic statement in the introduction to Gish's book that the fossil evidence does not support evolution—"The fossils say no!" (Gish 7)—precludes discussion of any of the numerous other sources (including articles in academic journals) that *do* argue for the existence of fossil evidence. The fact that creationists make these claims in the very beginnings of their works makes it easy for readers to forego truly weighing the evidence; the organization invites readers to ignore the evidence.

I should reiterate here that popular science writers who are considered reputable by mainstream standards also present their arguments definitively in the beginnings of the works and include evidence in proceeding chapters. See, for example, the work of Stephen Jay Gould, one of the most prolific popular science writers of all time. For instance, he begins his book *The Mismeasure of Man* with a discussion of his work as a popular essayist. He also includes a discussion of mainstream science and what that encompasses. Finally, he lays out his purpose: debunking the myth of the popular work, *The Bell Curve*. Likewise, popular works about evolution follow similar formats. John A. Moore's easy-to-understand book, *From Genesis to Genetics*, begins with an introduction to the long-standing tension between science and religion. Moore follows this with a statement indicating that his purpose is to inform parents, educators, and concerned citizens about the problematic creationist argument. Moore states in his introduction that creationists base their arguments on "faith." He argues that creationists begin with an answer and then attempt to find evidence to support it (6). Ironically, this

is the same critique creationist popular writers lobby against evolutionists! And, like creationists, Moore states this thesis at the beginning of his work, but he uses the body of his work to argue that lay people cannot adequately understand evolution. He argues that lay readers should usually only accept scientific hypotheses of experts and trust that they are true. Like creationist popular writing, neither of these works follows a mainstream format of introduction, methods, results, and discussion, even though the writers are mainstream scientists. I am not arguing that creationist writers should uphold standards of mainstream science writing, since that is not the genre within which creationist writers intend to write, but by using the genre of popular science, creationists hope to convince readers that they are reading definitive, unequivocal science, not anti-science.

Creationist writers attempt to convince their readers that they are reading mainstream science by establishing their own credibility within science Creationist writers use authority-building strategies in the very beginning of creationist books setting up a paradox that continues throughout their works: they borrow mainstream scientific credibility in order to reject the tenets of mainstream science. They establish a common sense or trivial philosophy of science. Presenting information about personal credibility focuses readers on the charisma of the writer, not on the theories from which creationism and evolution emerge. Creationist writers establish authority by doing two key things. First, they acquire training within mainstream academic institutions. Then, they reject or critique that training in their works, and assert their superiority to evolutionary scientists. The fact that they begin their works by establishing these two key pieces of information focuses their argument on themselves and their own dissatisfaction with mainstream science and science institutions. All five of the works I analyze begin with a preface or

foreword that states first the exigency of the book, and then establishes the credibility of the author, specifically his scientific credentials within the mainstream scientific establishment. For example, in the foreword to Morris and Parker's *What is Creation Science?*, Dean Kenyon assures readers that this book is timely because we have entered a "critical, perhaps, even climactic stage" in the evolution-creation debate. What is more, mainstream scientists "are beginning to take creationists' scientific challenge seriously for the first time," though Kenyon offers no evidence of this. Kenyon reminds readers that skeptics' view of creationism as "religion in disguise" indicates "a degree of closemindedness quite alien of true scientific inquiry" (i). Kenyon indicates the central argument of all creationist works: mainstream science is not free from bias if it cannot listen to those who have contrary opinions. Furthermore, Kenyon reminds us that the time is ripe for a creationist crusade because mainstream scientists are sufficiently scared that creationism presents a viable threat to the insulated and well-protected ivory tower of mainstream science. It seems that Kenyon is arguing against ivory tower intellectualism which he believes ignores the input of people outside of the academy. The fact that this sentiment occurs in the preface is significant because it establishes the tone of the entire book: it argues for a democratic science in which everyone can participate. This argument appeals to anti-intellectual readers who distrust the academy.

Kenyon's statement in the foreword is followed by photographs and brief biographies of the authors, Morris and Parker, which establish their own credentials within mainstream academia. As I noted earlier, Morris, founder of the ICR, has a PhD in hydraulic engineering from the University of Minnesota, and Parker has an EdD in biology from Ball State. Parker also later served for twelve years on the ICR faculty and

considers himself a creationist biologist. The statement of purpose, followed by a list of impressive credentials, allows Morris and Parker to borrow from the "plenary authority of science" (Ervin 454) while simultaneously critiquing it. In essence, Kenyon's statement claims that science is somehow scared of creationism and therefore prejudiced against it; the authors' own involvement in mainstream science reminds readers that they understand mainstream science and are therefore equipped and qualified to critique it. Moreover, it signifies that the authors are justified in critiquing science.

Other authors use similar techniques to present comparable arguments about their knowledge of mainstream science. Creationist Lee Spetner begins with a page-long biography telling readers that he has a PhD in physics from MIT. In case readers miss the biography page, the cover names the author as *Dr*. Lee Spetner, cueing readers that Spetner is a professionally-trained academic. Following Spetner's presentation of his credentials, he writes a preface explaining the need for another creationist book. He writes, "Conventional wisdom holds that life arose spontaneously" and this position is untenable because it lacks sufficient evidence (vii). Spetner also substitutes the words "conventional wisdom" for "science," which allows him to emphasize that he does not fall for conventional wisdom, or folk knowledge. What is unusual about Spetner's argument is that he critiques folk wisdom, the type of knowledge anti-intellectuals revere, and champions science in its place. Spetner, however, clarifies that biologists are relying on received knowledge: it [evolution] is "the nearly universal belief among biologists" (vii). Thus, Spetner claims that evolution is simply a "belief"—not a testable theory—that mainstream biologists hold on to because they are unaware that it is untrue or unwilling to *believe* it is untrue. Biologists and, by extension, lay readers who read their

works or take their classes, subscribe to this false "conventional wisdom." The implication is that just because a scientist is professionally-trained does not mean he has critically considered the evidence. Lay readers, then, can be more astute than scientists. Historian Richard Hofstadter notes that anti-intellectualism is based on the notion that "the plain sense of the common man, especially if tested by success in some demanding line of practical work, is an altogether adequate substitute for, if not actually superior to, formal knowledge and expertise acquired in school" (19). In the case of creationism, the practical task is reading popular creationist books that supposedly require the reader to submit evolutionist claims to demanding critical analysis. Spetner suggests that after this activity, even the common person will be superior to an intellectual.

Creationist writing suggests that the common sense lay reader unlike academics, do not have to rely on received knowledge; they can use common sense to evaluate the arguments that people like Spetner lay out. Once lay readers read Spetner's book, they may know *more* than mainstream scientists! One no longer needs to be a scientist to engage in the creation debate. Spetner includes a first-person narrative that underscores this point. He tells readers that when he first encountered evolution after receiving his PhD, he "found it hard to believe," not only because it clashed with his religious views, but because it went against his "intuition about how the information in living organisms could have developed" (ix). After critically examining the evidence for evolution and publishing papers on the issue,[39] Spetner claims to "know more about evolution than do

[39] While Spetner has published in mainstream science journals such as *Science*, none of his articles deal with creationism per se. Rather, his articles primarily focus on aspects of the mechanism of evolution, an issue about which mainstream scientists debate. Other articles have appeared in communications journal. For example, his 1968 article, "Information Transmission in Evolution," appeared in *IEEE Transactions on Information Theory*. This particular article attempts to use information theory as a means of explaining evolving life forms. Stating that he has published articles critiquing evolution is slightly misleading, particularly for general readers.

most biologists who have not specialized in it" (ix). The point of Spetner's narrative serves to reiterate two major points: first, his initial intuitive doubts about evolution, despite his lack of knowledge about evolution, turned out to be right; he could not be fooled by "conventional wisdom." Second, it is obvious that one need not be an expert to understand and evaluate the evidence against evolution.

This focus on the author's authority, coupled with doubts about the authority of mainstream science, is prevalent in other books as well with even greater emphasis on the supposed errors of mainstream scientific thinking. In a preface to Duane Gish's book, Henry Morris boldly claims in the first paragraph that Gish once and for all sets the record straight about evolution: "This book constitutes one of the most devastating critiques of the evolutionary philosophy one could find. It goes right to the stronghold of the supposed scientific evidence for evolution and demolishes its central bastion." Morris continues by explaining that one need ask only one question about evolution, and that is, "Does the record of past ages, now preserved in the form of fossils, show that changes have occurred?" The answer to the question, he tells us, is, "The fossils say no" (7)!

Morris's statement, however, overlooks important considerations about fossil evidence. Laurie Godfrey, in "Creationism and Gaps in the Fossil Record," attempts to show where creationists have erred in their critiques of the fossil record. Godfrey points out that creationists commonly argue that no transitional forms between the shark and the whale exist. What creationists are misinterpreting, according to Godfrey and other evolutionists, is that transitional forms "display increasingly derived sets of traits that form the *successive links*" (203-204). In other words, the fossil record will not reveal a

distinctly shark-like whale; instead, fossils will indicate derived sets of certain characteristics not necessarily indicative of a distinct shark-to-whale transition. In addition, Godfrey argues that Gish overlooks the major paleontological works that do corroborate the existence of transitional fossils. Creationist writers implicitly remind readers of the creationist conception of science: if it looks ridiculous, it probably is. If something is counter-intuitive, it is probably wrong. While these aphorisms are often false, they appeal to readers who believe that common sense can solve any problem. Morris's emphatic statement that the fossil record does not support evolution is a key component in the creationist movement. Critiques of the fossil record remind readers that creationists are basing their arguments on evidence (or lack of it) rather than beliefs.

Most scientists believe that one must be trained to understand and interpret fossil data. Darwin himself lamented scientists' inability to ever fully reconstruct the fossil record because such a great deal of the record has not been adequately preserved. In the *Origin*, he uses an analogy of books to illustrate the problem of the fossil record: it is "as a history of the world imperfectly kept, and written in a changing dialect." Like a set of books missing volumes and pages, the fossil record too is an imperfect record (310). Thus, scientists must work to fit the pieces of the puzzle together when, in fact, some of the pieces are missing. Furthermore, Morris's insistence that any reader, regardless of her training, will see for herself that the fossil record does not support evolution is inconsistent with mainstream scientists' views of geological interpretation. Darwin, for example, in his discussion of the lapse of time necessary for the occurrence of natural selection, tells readers it does not suffice to merely read Charles Lyell's influential *Principles of Geology* or other treatises by different scientists. In order "to mark how

each author attempts to give an adequate idea of the duration of each formation or even each stratum [, a] man must for years examine for himself great piles of superimposed strata…before he can hope to comprehend anything of the lapse of time, the monuments of which we see around us" (282). While Darwin does not talk specifically of the actual analysis of the fossil record, he points out the degree of study that goes into understanding the geological records. In the tradition of common sense philosophy, however, creationists like Morris rely on the argument that anybody can easily and accurately interpret the fossil record. He notes in the preface to Gish's text that the book itself exists to help lay readers understand the record. Fortunately, Morris reminds us, we have a trained leader that we can help us use our common sense. He follows with an encomium to Gish: He "is a careful scientist of impeccable academic credentials" (7). We are in good hands, Morris tells us. We must reject the words of the mainstream scientist who "*believes* in evolution in spite of the massive witness of the fossil record *against* it," yet we must place our trust in Gish *because* he is also a mainstreamly-trained scientist.

Phillip Johnson, in *Defeating Darwinism by Opening Minds*, raises similar doubts about mainstream scientists, depicting evolution- doubters as shrewd thinkers, skeptical of the outlandish claims of scientists. Furthermore, Johnson's depiction of scientists as arrogant and out-of-touch with lay readers allows him to build up his own credibility as a writer in touch with lay readers. Johnson says, "The people suspect that what is being presented to them as 'scientific fact' consists largely of an ideology that goes far beyond the scientific evidence. That is why they are so resistant to it" (11). Johnson claims that evolutionists just do not get this. Johnson cites a conversation he had with a Berkeley

colleague, a scientist, who wondered why people "won't believe what the evolutionary scientists tell them science has discovered?" The colleague hypothesized that people just do not understand the theory. But according to Johnson, people *do* understand the theory, sometimes even better than scientists themselves (10). In Johnson's opinion, people oppose evolution because they intuitively understand that it lacks evidence, though he offers no proof of this claim. Citing the story with his colleague allows Johnson to establish himself first as a member of the reputable Berkeley faculty, but it also illustrates Johnson as the mediator who easily moves between the clueless scientists and the common sense public.

This method of arrangement—setting up a contrast between the allegedly faith-driven mainstream science and the truth-seeking lay reader—paves the way for creationist writers to present their conclusions. Readers are confident in their own abilities and suspicious of what the mainstream science establishment wants them to believe. Creationist readers are also suspicious of evolution because they believe that evolutionists use rhetoric rather than common sense. Once creationist writers have established these sentiments, they are ready to present their arguments.

Style and the Critique of Mainstream Science

One of the most interesting aspects of creationist writing is the way in which writers use rhetorical techniques to create a unique style that affirms the scientific veracity of creationism while simultaneously critiquing the genre of mainstream science. Because creationist writers claim to be participating in mainstream science, even though they write books geared for lay readers, an important starting point for a stylistic analysis is a brief examination of how mainstream science uses rhetoric. Alan Gross's analysis of

taxonomic language in a prototypical mainstream science article demonstrates how scientists use rhetoric (and appear as if they have not). Gross's point is to show how something as seemingly empirical as taxonomy is entirely rhetorical. The classification of a new species, for example, hinges entirely on the authors' rhetorical strategies, which includes a glut of description and multiple descriptive features that highlight key similarities and differences of the new species. In analyzing this use of rhetoric, Gross proves that "the objectivity of evolutionary taxonomy depends as much on rhetoric as it does on rationality" (53). Mainstream scientific texts use rhetorical strategies to "close down alternative possibilities and, through rhetoric, to indicate that the one finally chosen is the obvious and logical one" (Kelley 134). Species, for example, "are not natural kinds in the technical objectivist sense, namely, classical categories defined by essential properties." Biological species are "not defined with respect to intrinsic properties, but only with relation to other groups" (Lakoff 187-88). Taxonomy is a set of rhetorical strategies designed to illustrate order and classification; the rhetorical nature of the exercise slowly becomes invisible as we begin to believe the categories represent the natural order of things. Likewise, science texts are not reports of empirical data, but a set of narratives that serve a persuasive function: "to make themselves believable, to pass off whatever degree of fictionality they may have as truth" (Kelley 134). When the scientific community validates a scientist's interpretation of a set of data, "the claims take on the appearance of irrefutable truths stated with objective authority transcending the urging of an author" (Bazerman, "How Natural Philosophers…" 14). These claims are also subject to replication.

The key rhetorical feature of mainstream science, then, is the overarching presence of rationality, which confirms the supposed factual nature of science. It appears that scientists are not making arguments, but are instead presenting observable facts. In the same way, creationism also claims to be empirical. Morris and Parker, for example, claim their purpose is to promote open-minded analysis of the evidence. Their hope is that readers will "draw the most logical inference from the weight of the evidence" and "follow 'truth' wherever it may lead, regardless of personal preference and preconceptions" (18). Lee Spetner tells readers to be suspicious of mainstream scientist's rhetorical tricks, though he offers no specific examples. "Verbal arguments," he tells us, "should always be suspect." Furthermore, "Clever debaters have long shown they can make even the weakest case look strong" (75). While Spetner recognizes the rhetorical nature of mainstream science, he fails to acknowledge the rhetorical nature of arguments in favor of creationism.

While creationists claim that they use simplistic language to help lay readers' comprehension, the cultivation of a nontechnical style primarily buttresses their philosophy of common sense observational science. Furthermore, the lack of technical terms reminds readers that one need not spend years in college studying biology to participate in a debate about facts any person can see for herself. Nowhere are these ideas more evident than when creationists begin to describe the evolutionist position. Morris and Parker, for example, tell readers that the crux of the evolutionist debate is that "frogs turn into princes" (75). While macroevolutionists do suggest that species have historically evolved both within their own kind as well as from other distinct species, the idea that any serious scientist claims that frogs have turned into princes is absurd. This

rhetorical technique is a *reductio*, a way of reducing the evolutionist argument to the absurd as a means of disproving it. The technique works because it appeals to creationist readers' common sense. While readers probably do not take the statement literally, it does serve to reduce and exaggerate the evolutionist claim so that readers see it as contrary to common sense. Furthermore, by implicitly referencing a popular fairy tale convention (where frogs can freely turn into princes), Morris and Parker manage to underscore what they believe to be the fanciful, and ultimately, unscientific quality of evolution. In keeping with common sense, creationists maintain that frogs and people were quite obviously "separately created from the same kinds of molecular 'building blocks,'" but they are clearly not the same species (Morris and Parker 76). Morris and Parker ultimately make evolution look irrational by using the language of a simple fairy tale to characterize evolution.

Creationists use other rhetorical strategies to make evolution look like the crazy ramblings of obsessed scientists. Duane Gish, for example, refers throughout his whole book to evolutionists as "anti-creationists," as if evolution is the counter-vision or anti-science. In addition, he refers to his own work as scientific, factual, and truthful, while calling evolutionist work "evolutionary stories" (247), meant to suggest the fictitious nature of evolution. By referring to evolutionists as "anti-creationists," creationist writers set up a simple dualism that readers will probably like and find comfortable.

The most common rhetorical undermining of evolution, however, occurs when creationists trace the history of evolutionary theory. Creationists carefully move the subject from evolution to Darwin and then use derogatory descriptions to launch an ad hominem attack on Darwin in order to discredit evolution. Creationist Duane Gish refers

to Darwin as "the great high priest of evolution" (247), suggesting that Darwin is a religious leader in his own right and evolutionists blindly follow him as if he were a god. In the most damning discussion of Darwin, Morris devotes an entire section of his book to describing Darwin's personal and professional shortcomings. Not only was Darwin an "apostate divinity student" (10), he was a "pampered time-waster in college" and "chronically ill most of his life with an uncertain malaise." Furthermore, his contributions to science were "mundane," "not original," and he "consistently failed to give credit to his predecessors" (152). This is damning if one knows little about Darwin, and Morris counts on readers' lack of knowledge. In reality, Darwin implicitly hesitates to apply natural selection to humans by conspicuously *not* referring to man at all for most of *On the Origin of Species*. Only in the last chapter does Darwin make a tentative (and optimistic) move toward linking natural selection and man:

> In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history. (488)

Despite Darwin's hesitance to apply natural selection to man, he agreed to write *The Descent of Man* because he admitted that to apply natural selection to plants and animals but *not* to man would be ridiculous. Darwin illustrates this view in an 1859 letter to Charles Lyell, in which he compares natural selection to theories in physics; both require the existence of something (i.e. natural selection or the power of attraction) without an explanation. But he stresses that he rejects as unnecessary "any subsequent addition of 'new powers and attributes and forces;' or of any 'principle of improvement,' except in

so far as every character which is naturally selected or preserved is in some way an advantage or improvement, otherwise it would not have been selected."

Darwin believed strongly, however, that natural selection should not be misused to discriminate against certain people. He addresses, in Chapter V of *The Descent of Man*, the notion of civilization "blunting," or interfering with, natural selection. Darwin claims that while civilization does blunt natural selection in some respects, natural selection still has *some* effect in a civilized society. For example, criminals are executed or imprisoned, the insane are institutionalized, and those who participate in excessive and unhealthy behaviors will have a decreased life-expectancy. But Darwin stresses that we should *not* attempt to moderate "civilizing effects" even if they do blunt natural selection and even if that leads to degeneracy. Darwin stresses the importance of cultivating a civilized society. He writes, "If we were to intentionally neglect the weak and helpless, it could only be for a contingent benefit, with a certain and great present evil" (*Descent* 168-69). Clearly, Darwin does not advocate using natural selection of humans as a means to promote eugenics or other "uncivilized" actions, as others were doing.

Despite Darwin's intentions, Henry Morris reminds readers that Darwin's "racism" throughout *The Descent of Man* led (albeit with some outside help) to World War I and II (Morris 67)! Morris's critique of Darwin links the misuse of Darwinian principles to Social Darwinian theories, but it is basically vitriolic and irrelevant to any discussion of evolution itself. For example, Morris links the theory of evolution to the rise of placentophagia, which he defines as a practice among certain "New Age people" of eating the placentas of newborns. Morris writes, "Cannibalism and placentophagia are among the most bizarre and extreme products of evolutionism, though not the most

important and deadly—not yet at least" (143). While Darwin's theory of natural selection *did* lead some people toward Social Darwinism, as Ruse notes, the "various doctrines [of Social Darwinism] owed as much to Herbert Spencer as to Charles Darwin, if not more, and particularly in America Spencer was praised equally by academics and by barons of industry like Andrew Carnegie" (264). Even after he wrote the *Descent of Man*, Darwin did often "explicitly disavow social Darwinian views" (Ruse 264). Of course, I should note that Darwin did also occasionally subscribe to certain tenets of Social Darwinism. For example, Michael Ruse cites a portion of *Descent* where Darwin feared vaccination would preserve the unfit (Ruse 264). Morris's argument, however, suggests that scientists do not care about the moral repercussions of their theories. Creationists *do* have valid concerns about the past and potential misuses of evolution, but just because concepts of evolution have been misapplied does not mean that we can or should deny them altogether, nor can we place all of the blame upon scientists. I do, however, want to emphasize that, to some extent, the creationist fear of evolution is grounded in history; evolution *has* been misused in the past. Lay readers unfamiliar with the important distinctions scientists and academics make between Darwinian evolution and Social Darwinism could easily dismiss evolution on these grounds. Additionally, the repetitive critique of Darwin's character, and thus his credibility, helps to discredit the mainstream scientific establishment and to classify evolution as a politically-motivated pseudoscience.[40]

As creationists attempt to distance themselves from mainstream science, they also align themselves with science by arguing that rhetorical tools have no place in science, a claim they have in common with mainstream scientists. The idea is based in a long

[40] The phrase "survival of the fittest" has, for example, been often misapplied ever since Darwin.

history dividing science from other inquiries and elevating it above anything that looks even remotely rhetorical. For example, science has always claimed to separate itself from metaphor, perhaps the quintessential rhetorical tool. Despite this belief, science and rhetoric have always been closely linked. A useful starting place is Victorian biology—the beginning of evolutionary theory—where the lines between professional/mainstream science and popular science were rather blurry. Notable science writers like Charles Lyell, Thomas Huxley, Robert Chambers, and Charles Darwin, for example, wrote about evolution in works that were read by other naturalists, but the texts were also read by educated lay readers.

Science, as I have noted earlier in this chapter, has historically had an unstable relationship with rhetoric--metaphor in particular--since the beginning of natural philosophy. The Royal Society, according to Soyland (1994), openly asserted, "*Nullius in Verba*"—translated as "nothing by the mere authority of words" (13). And certainly scientists were not to assert anything on the authority of metaphor because the Royal Society unequivocally stated that metaphor overshadowed the truth. Thomas Sprat, in *The History of the Royal Society*, condemns metaphor as a rhetorical device that serves only to obscure the truth. In fact, Sprat calls for writers of scientific texts to "reject all the amplifications, digressions, and swellings of style: to return back to the primitive purity, and shortness, when men deliver'd so many *things*, almost in an equal number of *words*." Sprat argued that discourse should take on a "Mathematical plainness" (113). Sprat's theory of language implied a one-to-one relationship between thoughts and words; for every idea, there supposedly exists one word to represent the concept. Based on this theory, rhetorical devices, like metaphor, become ornaments of style rather than

legitimate means of using language to explore and explain concepts. The Royal Society's condemnation of metaphor as a disposable stylistic device established a negative image of metaphor that few seventeenth- and eighteenth-century science writers dared to openly challenge. Of course, Mistichelli, in "Style and Truth: Reflections on the Language of Science," reminds us that the Royal Society's attempt to free the truth from the chains of rhetoric was noble in theory. But pre-Royal Society science relied heavily on descriptions of occult qualities, rather than on qualities obtained by experimental methods. The war on rhetoric was an effort to free nature from common superstitions—religious and otherwise.

Modern scientists have posed little threat to the prevailing attitude toward rhetoric within mainstream science. In fact, using metaphor, in some cases, indicated a scientist was less knowledgeable of his (and in some cases *her*) field and certainly indicated an ignorance or defiance of scientific convention. Science writing, according to scientists themselves, ought to be plain and clear; it ought to *feature* the facts rather than hide behind abstractions of style. Linguist Colin Murray Turbayne suggests that early scientists who used metaphor attempted to "place metaphysical disguises upon the faces of process and procedure." The problem with this, according to Turbayne, is such that "after the disguise or mask has been worked for a considerable time it tends to blend with the face, and it becomes extremely difficult to 'see through it'" (4). Metaphor, according to Turbayne, is a veil behind which the truth hides, and the implicit danger is that people will eventually be unable to find the truth behind the metaphors.

Mistrust of rhetorical devices, however, implicitly creates a paradox regarding scientific 'truth.' According to Mistichelli, scientists *have* historically avoided stylistic

devices like metaphor for fear that they would obscure the truth. The paradox is that scientists also argue that style *cannot* obscure the truth because natural truth exists independently of the scientists. This paradox suggests some scientists' implicit recognition that, first, metaphor is more than a stylistic device, and second, that metaphor is capable of altering conceptions of science. Linguist D.E. Leary argues that metaphor is an invaluable method for scientists to relate new information to other scientists and lay readers. Leary suggests that metaphor can be used to describe ideas, objects, actions, or feelings that have similarities with familiar concepts. This ability to make connections between and among disparate topics gives humans the power to compare and comprehend a variety of new and unfamiliar ideas. The ability to reference new phenomena with established reference points is an essential aspect of science. For Leary, metaphor is not a grammatical device or rhetorical ornamentation—metaphor is the vehicle for learning what was formerly incomprehensible. Based on Leary's conception of metaphor, all scientific knowledge is rooted in metaphor, since at some point, all scientific knowledge was once unknown.

Not all theorists, however, agree with Leary's assertion of scientific metaphors as basically statements of similarity between one unfamiliar concept and one familiar concept. Martin and Harré suggest that a comparison theory of metaphor is lacking in terms of explaining how metaphor works in science. A theory that merely asserts a comparison or similarity between two disparate things implies that what scientists say metaphorically *could* be stated literally. Martin and Harré argue that scientific metaphors usually involve instances where at least one concept cannot be stated in literal terms. Furthermore, they note that "we need metaphor because in some cases it is the only way

to say what we mean since the existing semantic fields of the current terminology referentially related to the subject in questions are inadequate to our own thought" (95). In this manner, metaphors supply, perhaps create, a term where one did not exist before; metaphor is a "catachresis" (101). The result of catachresis is an understanding of formerly un-understandable concepts. Similarly, linguist D.W. Allbritton argues that a cognitive function of metaphor is to provide "a framework for understanding a new domain or restructuring the understanding of a familiar domain" (36). Metaphor, then, serves for sorting and understanding novel concepts.

Linguist Colin Turbayne, however, asserts that metaphor is "sort-crossing" (11). Such a situation results when a metaphor seems to appropriately describe a novel scientific concept or situation, previously unknown to anyone, but is actually inappropriate. This inappropriateness arises from using a sign in a sense different from the normal (or literal) usage. This conception of metaphor directly opposes the idea that metaphor is the best, and only, way to explain novel scientific concepts. It also presupposes knowledge of what is literal and what is not.

Turbayne ultimately argues that metaphor actually confuses readers of science rather than contributing to their understanding of it. He suggests that to "undress"[41] a metaphor is to in fact show that metaphors are actually confusions. Turbayne speculates that metaphor becomes a hindrance to scientific communication when readers mistake metaphor for literality—a process he calls "sort-trespassing" (22). For example, sort-trespassing occurs when a person interprets the metaphor, 'Man is a wolf,' to mean that man *is* a wolf (literal), rather than merely *pretending* that man is a wolf (metaphorical).

[41] Turbayne, perhaps, alludes to Sprat's reference, in The History of the Royal Society, to the process of removing metaphor in scientific texts in order to ascertain the "naked Innocence of vertue" (111).

Turbayne explains that such a confusion happens in science when readers are unaware of when literal interpretation or metaphorical interpretation is appropriate. The process of inappropriately interpreting metaphorical statements occurs in three main stages of metaphor, according to Turbayne. First, we recognize the metaphorical usage is inappropriate because "it gives the thing a name that belongs to something else" (24). Our first reaction is to try to interpret the statement literally. Turbayne uses the examples of a child calling a camel a dog and a scientist calling the body a machine. Both involve statements which are not true, in Turbayne's opinion, so we seek an alternative meaning. The second step involves accepting metaphorical statements as appropriate. According to Turbayne, metaphor has "its moment of triumph" and "we accept the metaphor by acquiescing in make-believe" (24). In this stage, children *pretend* that dogs are camels and we *pretend* that human bodies really are machines. Finally, metaphor reaches the stage where it is accepted as "commonplace" (25). At this stage, children actually *believe* that dogs are camels and humans *believe* that human bodies are machines. The danger of metaphor in scientific discourse is that "what had before been models are now taken for the things modeled" (26). Metaphor changes what we believe to be true. Turbayne implicitly recognizes the power of metaphor, but assumes that its power to change our perceptions of science produces undesirable, even dangerous, results.

The use of analogies, a type of metaphor, constitutes the bulk of creationist writing and characterizes its style. All creationist books that I read use analogies as a means of simplifying complex scientific information.[42] Despite the insistence of

[42] The use of analogy as an explanatory technique has a history in evolutionary biology. Darwin's comparison of artificial selection with natural selection is an extended analogy that operates throughout the *Origin of Species*. It is not surprising that analogy remains an explanatory device for popular science writers, including creationism.

mainstream science that metaphor does not have a place in science writing, creationists freely use analogies to reaffirm their familiarity and facility with mainstream science and to introduce readers to complex concepts. The analogies, though, often misrepresent mainstream scientific philosophy. Morris and Parker, for example, use a simple analogy to illustrate the impossibility of spontaneous creation of human life. Suppose you are walking along a creek, they tell readers, lazily kicking pebbles as you stroll. If you see a stone that looks strikingly like a cowboy boot, you know that it was not designed that way. Your common sense tells you that the stone has been weathered and eroded and, in the process, happens to look a lot like a cowboy boot. But if you see an arrowhead lying on the ground as you walk, you know that it is a human creation. "You have just done what many people dismiss as impossible. In comparing the pebble and the arrowhead, you were easily able to recognize evidence of creation" (2). Just as Carl Sagan listens for signals from space because he knows he can tell the difference between waves produced by chance and those produced intentionally, they argue that nonscientists can easily distinguish the randomness associated with simple cowboy boot-shaped stones and the awesome complexity of human life (Morris and Parker 2). In other words, the analogy tells us that all we need to recognize the evidence of creation is logic and observation, or "the ordinary tools of science" (Morris and Parker 2). Morris and Parker use the analogy to simplify evolution while simultaneously reaffirming the creationist philosophy of science: observation and common sense are the cornerstones to any scientific inquiry. Lee Spetner uses a similar analogy throughout his work. He likens computer programs to human development: "Cells change and develop according to a program that's part of the information built into each one" (26). Using a computer analogy has specific metaphoric

mappings that emphasize a creator—somebody obviously has to write a computer program since software simply cannot magically come into existence. Spetner supplements this controlling computer metaphor with factory metaphors. "The information in a cell plays a role much like that played by information in a factory. The production file in a factory contains a set of instructions that tell what each worker has to do at each stage. The production file is information carried by printed symbols; the developmental instructions in the cell are information carried by molecular symbols" (27). Again, the comparison here lies between the person who wrote the set of instructions in the factory file and the creator who allegedly wrote the instructions for living cells. This part of the analogy, however, is implicit.

These analogies falsely assume that complexity necessarily proves the existence of a creator. It is true that in the case of an arrowhead, a computer program, or a file of instructions, we can safely assume someone designed those things. We can also assume that any modification in these things must mean that a creator has either modified them himself or herself, or in the case of a computer program, that he or she has written the modifications into the program. The point is that arrowheads, computer software, and files do not change without intervention from their creators. Creationists use these analogies because they suggest the same thing is true for living beings—changes cannot occur without the intervention of the creator. Furthermore, if we can all agree that someone must create arrowheads, computer programs, and files, then the creationists assume we all must agree that something as amazingly complex as a human—certainly more complex than an arrowhead—must also have a creator. The analogy seems to make sense, but evolutionists argue that living organisms have the capacity to change (evolve)

over long periods of time without intervention by a creator, unlike inanimate objects. Thus, evolutionists argue that references to inanimate objects, which cannot evolve, are foolish and should not be extended to organic materials. But this reasoning from analogy is useful for creationists because it reaffirms the trivial model of science. It suggests that anyone, regardless of his or her training, can refute evolution. These accessible analogies work to create an overall style of creationist works that underscore their philosophy of science grounded in everyday epistemology. Folk knowledge and intuition, manifested through stylistic techniques, become indispensable ways of knowing versus the scientific method that guides the work of evolutionists.

Chapter 5: Creationist Writing as Conversion Rhetoric

While a neo-Aristotelian analysis offers an interesting view of creationist rhetoric, it does not offer a complete picture as to why it is so seductive to its believers. In order to understand why and how the rhetoric works, I employ a system of rhetorical analysis to understand the stories creationists tell about themselves and their beliefs. In the following chapter, I suggest that creationist writing constitutes conversion rhetoric, or what Dale Sullivan calls proclamation (317). Sullivan argues that "proclamation is a kairotic rhetoric" that leads to belief (*pistis*), not to judgment (*krisis*) or scientific knowledge (*episteme*)." He concludes that conversion rhetoric is more Sophistic than Platonic or Aristotelian because of its quest to bring audiences to believe in the nonrational versus the rational (217). Creationist rhetoric also subtly attempts to bring readers to *pistis*—or the nonrational, even though it openly claims to lead readers to the rational.

This emotional conversion rhetoric is intended to help readers understand the creationist quest, which is not *just* about being scientifically correct nor is it *just* about validating Christianity. The creationist movement is based on its members' concern for what happens *as a result of* scientific inquiry. That is, creationists are concerned about the impact of teaching people—children in particular—evolutionary theory because of its atheistic worldview and detached technical nature. This concern for the impact of a scientific theory may be partially warranted. I am not suggesting that we should ignore scientific rigor to benefit a particular agenda, but I am suggesting that perhaps

creationists are justified in discussing the ramifications of scientific theories. After all, we often discuss the theoretical and practical ramifications of other scientific issues including genetic modifications, nuclear power, stem-cell research, in-vitro fertilization, and a host of other scientific topics. The creationist focus on *how* the teaching of evolution impacts people is a significant part of their cultural and political perspective. They view themselves as victims of scientists' unwillingness to recognize, or even discuss, the effects of teaching evolution. Creationists then see themselves as protectors of a conservative Christian worldview under attack by science.

In this chapter, I look at how creationists attempt to show people that mainstream science is problematic because it refuses to consider the impact of its theories. Because mainstream scientists reject the argument that the impact of evolution requires careful consideration, creationists believe they are victims of mainstream science, and by extension, atheism. By tapping into people's disdain for the intellectualism that seemingly excludes them, creationists use evangelical conversion narratives to solidify their fantasy type. Because these conversion stories are written primarily for those who are already converted, the rhetoric of the stories provides an insight into how creationist writers view their readers.

The Story of Creationists

Like other religious/political rhetorics, creationism seeks to enact social change—to modify how we think about and teach the existing conception of mainstream science. In this sense, creationist rhetorics are similar to rhetorics of religious extremism, described by Amitav Ghosh in his article on extremist groups embroiled in ethnic strife. Ghosh suggests that these extremist groups use, among other techniques, false,

misinterpreted, or decontextualized statistics to enhance the threat of the opposing side. For example, a particular group may argue that another ethnic group's birthrate is too large and therefore threatens existing social and political structures. Creationists use similar techniques when they claim that atheism (a belief system they believe to be synonymous with evolution) is threatening to take over university campuses, and thus pollute the minds of America's young people.

Creationists suggest that evolutionists simply hate creationism (and creationists) because they abhor the belief system it represents. Morris and Parker cite an example of an evolutionist who absolutely refused to accept the creationist viewpoint, in spite of alleged evidence for it. They point to the mainstream evolutionary scientist, Marcel Shutzenberger, who presented a paper at a 1976 evolution conference. When an audience member responded to the paper by saying that life *must* be a result of special creation, the transcripts indicate that Shutzenberg said simply, "No!" Morris and Parker, however, sarcastically comment, "Anything but creation; it wasn't even fair (in spite of the evidence?) to bring up the word" (65). The implication here is that evolutionists refuse to accept legitimate arguments from creationists. Of course, Morris and Parker never consider that perhaps the evidence did *not* point to creation, and Shutzenberger was simply contradicting a false conclusion by an audience member. The problem here, at least in part, is the mixing of differing epistemologies and discourses that are fundamentally incompatible. Neither side accepts the authority of the other: creationists approach the argument from a theistic perspective, while evolutionists approach the argument from the perspective of the scientific method.

The fact remains that creationists often see themselves as victims of a majority conspiracy, a hallmark of religious extremism (Ghosh). Henry Morris, in *The Long War against God*, argues, "The denial of God—rejecting the reality of supernatural creation and the Creator's sovereign rule of the world—has always been the root cause of every human problem" (15). Evolutionists, scientists, and atheists, then, have caused all of the world's evils that creationists must shoulder! Morris and Parker remind readers, "It is not easy to be a creationist scientist in a humanistic society, but commitment to *true* science demands it for many of us" (156). In their view, despite overwhelming evidence for creation, dogged evolutionists (who are committed atheists and humanists) continue to persist with their cause and thus persecute truthful creationists. They argue that evolutionists "*believe* in the evolution of man for philosophical or 'religious' reasons, not because of logical inference from the fossil record" (Morris and Parker 116). Morris and Parker suggest then that evolutionists are upholding religious beliefs rather than focusing on fact.

It may seem odd that creationism attracts so many followers given the reality that fundamentalist Christianity represents a fairly small subset of the population. In 1995, for example, 39% of Americans claimed to be born-again Christians (Cox 62), the religious sub-set which most actively supports creationism. Pat Robert's Christian Coalition, however, a large and influential group committed to creationism, among other issues, had an estimated 1.7 million members in 1995 (Cox 60), and now, in 2004, estimates their membership at around two million members (Christian Coalition of America). One reason creationism is so successful is that it taps into a popular anti-intellectual sentiment and eschews knowledge that requires formal and secular training. It

is actually not uncommon for extremist religious beliefs to extend to people who have no religious affiliations. Consider a story about a group of middle-class Hindu doctors who wanted to destroy all of the mosques in India even though they were not part of an extremist group, nor did they hold any particular religious beliefs of their own. In this case, "Religion, race, ethnicity, and language have no real content at all," but the significance of these things resides in the "lines of distinctions they provide" (Ghosh). Much like these religious extremist movements, creationists draw lines to make distinctions among groups of people, specifically the academic and common person, which breaks down to the immoral and godless versus the moral and the Christian (or theist). The creationist movement, then, is certainly not as simple as evolutionists might believe: as I will show in this chapter, the rhetoric reveals it is not simply a movement of people who are ignorant of or misunderstand mainstream science. Creationism is an organized social movement that seeks to distinguish the social, political, and religious backgrounds of its members from the social, political, and religious backgrounds of its opposition. Creationism is a critique of mainstream scientific epistemology and the climate of today's academic institutions. It is a form of religious extremism, and like other forms of extremism, it "represents a generalized, nebulous consciousness of dissent, an inarticulate, perhaps inexpressible critique of the political and moral economy of today's world" (Ghosh).

While creationist movements are similar to large-scale religious extremist movements, they are more closely aligned rhetorically with evangelical conversion rhetorics often used by televangelists. Christopher Wright, in his exploration of the rhetoric of televangelists, argues that religious conversion rhetorics consist of "goal-

directed persuasive languages" (738), and televangelists ostensibly use this language to convert nonbelievers; however, Wright points out the inherent paradox of televangelists' goal—demographics indicate that most viewers of these programs are already converted (736)!

One goal that Wright does not mention is that of raising significant amounts of money, and certainly the Institute for Creation Research (ICR) has a monetary agenda as well, at least to keep its organization viable. What is interesting, however, is that televangelists could feasibly still raise money without "pretending" to convert the already-converted. Wright's argument is that televangelists use the conversion angle as a means of establishing an in-group—a community of like-minded individuals who share the same values. In other words, televangelists want to make money, but using the conversion angle allows them to reaffirm an identity and it allows their audience to do the same.

Likewise, creationism carries with it a similar mission. Creationists, particularly those affiliated with the ICR, write to audiences who are probably already fundamentalist Christians. While these readers may not have rejected mainstream science, they are probably already suspicious of the ideals that mainstream science upholds. Wright argues that televangelists continue to use conversion rhetoric because it preserves an "inclusive moral community" (753). Televangelism is "a gathering of the born-again from which non-members are excluded thus enabling the constitution of the saved as a community" (756). Conversion rhetoric works not actually to convert, but to define, structure, and solidify a community of like-minded individuals through the guise of spreading

knowledge to outsiders. Conversion rhetoric is epideictic, and it celebrates the anti-intellectual man.[43]

Obvious similarities exist between the conversion rhetorics of televangelists and creationists. Wright notes that televangelists use language to "present their audience with a set of recommended roles and relationships which, if enacted, would generate in practice a structure, the moral community, whose current existence is necessarily assumed in the same rhetoric" (739). Likewise, creationists use specific narratives to demonstrate the roles of both creationists and evolutionists. The most common rhetorical strategy of creationist writers is the use of narratives in order to illustrate the creationist philosophy of science. Lee Spetner, for example, begins each chapter of his book with a short anecdote presumably intended to introduce the topic of the chapter; however, the anecdotes implicitly reiterate common sense philosophy and the creationist view of science as Baconian. Spetner begins his chapter on Neo-Darwinian theory with a personal narrative about his cousin Dorothy who tells her great-grandchildren stories that she heard from her own grandmother when she was a child, including stories of Napolean's invasion of Russia. Spetner's point is that we know stories from several generations back, often hundreds of years in the past. But evolutionary scientists, Spetner tells us, actually claim that "our great,…great grandfather was an ape-like creature, covered with thick hair instead of clothing. Further back, they say, our ancestor was some kind of insect-eating mammal. Still further back in our family tree our ancestors were fish" (49). Of course this is an oversimplification of evolutionary processes,

[43] It is significant that I use the word "man" rather than "people." Women presumably read creationist writing; after all, many of the books are specifically directed at parents. To my knowledge, however, there are no creationist books written by women, nor are there any women faculty or board members in the ICR. The act of creating creationist knowledge is very much a man's enterprise.

particularly because Spetner uses ellipses to obscure the degree of removal from apes and fish to our great grandparents, but this lead-in allows Spetner to then question: "Was my great,…,great grandmother really a fish" (50)? This may seem a ridiculous question, but it is Spetner's intention that lay readers will balk at believing any story that requires them to find pictures of ancestral fish in the family photo album or envision a world unlike the one presented in Genesis. Spetner devotes the remaining portion of the chapter to describing neo-Darwinism. The narrative illustrates the theory by implying that Darwinism is foolish and counter to our common sense.

Creationist anecdotes also underscore the gulf between nonacademic lay readers and academic mainstream scientists. Phillip Johnson begins his book with a letter written by a young, and presumably naïve, evolutionist named Emilio. Emilio was a student at a European university who posted a message on an Internet forum, in which he claimed that there was no reason why people could not be both theists and evolutionists. Johnson uses Emilio's message to argue that there is no compromise between creationists and evolutionists, thereby setting up a binary: one must be either an evolutionist or a Christian, but not both. If forced to choose between science and theism (which the ICR suggests is synonymous with morality and truth), what person would choose science except one who is immoral and dishonest?

Emilio suggests that the real crux of the creation/evolution debate is the fact that science and religion are two separate realms that need not necessarily affect each other, but Johnson objects wholeheartedly to Emilio's philosophy of both theism and science because Emilio's version suggests that religion is absent of reason and therefore shifts plenary authority to science. Johnson uses an analogy to illustrate his argument: an artist

might see the Grand Canyon as beautifully sublime while a scientist may see it as a big gaping hole. Both are true statements, so the difference between artist and scientist is a "superficial contradiction," neither actually obscures the truth (18). But according to Johnson, people want to believe that the same type of negligible contradiction holds true for the creation/evolution debate. They may believe their faith in God cannot be tempered by scientific reason, even if it means accepting the tenets of evolution, but Johnson objects to linking science and reason because he believes we must then necessarily link theism with irrationality. He argues that the separation of faith and reason is a sophisticated argument that "thrives in the obscurity provided by big words and lengthy academic books" (18). Johnson's implicit argument emerges: mainstream science (and thus evolution) excludes nonacademics. Evolutionists do not speak the language of the common man. Furthermore, evolutionists ignore common sense and intuition, the only tools available to nonacademics, in favor of complicated philosophies that only the educated can understand.

Johnson returns to young misguided Emilio and his belief that theists can also be evolutionists to stress the dilemma of the nonacademic in the academic world. It seems Emilio's fate is sealed: he is trying to concede to both his upbringing and what he is being taught at a university full of agnostic professors, and his only choices are to either become an agnostic "like most of the other students" or compromise (as he does in his Internet post) (20). But Johnson has already explained that a compromise is not tenable. Poor Emilio, then, must become an agnostic. Johnson has a better idea, which he explains in his next chapter aptly titled, "Do You Have a Better Idea" (20)? The better idea is creationism, and the narrative of Emilio allowed Johnson to present it as the

answer for anyone who resides outside of academia, and by extension, mainstream science.

In some ways, Johnson may be right—science *is* linked with rationality, which often means that pursuits outside of science are linked with *ir*rationality. Carl Sagan, for example, advances this argument, though perhaps unwittingly. He writes in his best-selling work, *The Demon-Haunted World*, "…every time we exercise self-criticism, every time we test our ideas against the outside world, we are doing science. When we are self-indulgent and uncritical, when we confuse hopes and facts, we slide into pseudoscience and superstition" (27). In other words, if we are not doing science, we are self-indulgent and uncritical; it also suggests that science is rational thinking and whatever is not science is superstition or irrational. This may sometimes be the case, but surely not all nonscientific activity is irrational, self-indulgent, and uncritical. Sagan's claim, though, represents our basic cultural beliefs about science, so Johnson's fear is not without warrant. However, the fact that creationists want to label their work as rational, critical, and thus, scientific, is the matter to which evolutionists object.

The point of contention here seems to be how creationists and evolutionists define rationality. For evolutionists, as Sagan illustrates, rationality means the absence of overt emotion or our ability to keep our own personal beliefs and superstitions from clouding a scientific issue. For creationists, rationality means recognizing the creation/evolution controversy as a battle between good and evil rather than simply a scientific dispute. For example, Henry Morris writes in *The Long War against God*,

> …the modern creationist-evolution conflict is more than a mere scientific controversy, or even a battle between science and religion, as evolutionists

> pretend. It is nothing less than a new and critical phase in the age long conflict between the only two basic world views. One is centered in the Creator of the world and his redemptive works on behalf of that lost world; the other is centered in the creatures of that world, not only man and his self-oriented goals, but also in the devil himself, who is ultimately behind all rebellion against God. (199)

Morris later suggests that both creationists and evolutionists use logic in formulating their viewpoints. For Morris, creationists logically believe that science should uphold the notion of a Christian god while evolutionists naturally work against God. Morris writes, "Abortion, infanticide, and euthanasia are logical behaviors for those who have so easily disposed of the image of God in the eternal soul of man. The concept of a resurrected body and eternal life is also a casualty of this evil philosophy" (10). Morris suggests that creationists follow the opposite logic: by glorifying God through science, creationists make morally upright decisions in other arenas.

Creationists believe that science and God must logically serve as evidence for each other. As Johnson notes when he discusses Emilio's plight, creationists believe there can be no compromise between creation and evolution. Gish, for example, states in his book *Evolution: The Challenge of the Fossil Record* that the Bible is definitely not a collection of "parables or poetry;" rather, the Bible presents "the broad outlines of creationism in the form of simple historical facts" (23). For creationists, the Bible offers evidence for creation. Creationism, in turn, supports the claims of the Bible. Evolutionist Michael Shermer establishes a three-level taxonomy of scientific belief in order to show the contrast between the standards of rationality of creationists and evolutionists.

Shermer first outlines the "same-worlds model," which maintains that science and religion deal with exactly the same issues. In other words, science and religion are interchangeable. In contrast, the "separate-worlds model" allows science and religion to conflict with each other because of the belief that they operate independently of each other (138). This is the model Emilio suggests. Many evolutionists, including Charles Darwin and Stephen Jay Gould, also uphold this ideology. Finally, Shermer outlines the "conflicting-worlds model" which maintains that only science or religion can be right. Adherents to this philosophy believe that reconciliation between science and religion is impossible. Shermer suggests that this position is usually represented by atheists and creationists (138). My reading of creationist work, however, shows that creationists are aware that the same-worlds model is untenable in scientific discussions. They are aware that science and religion are supposed to operate independently of each other, so they attempt to discredit evolution by arguing that it is *also* religious in nature. Gish argues: "The reason most scientists accept evolution has nothing to do, primarily, with the evidence. The reason that most scientists accept the theory of evolution is that most scientists are unbelievers, and unbelieving, materialistic men are forced to accept a materialistic, naturalistic explanation for the origin of all living things" (*Evolution* 21). Gish later reiterates that "evolutionary theory is no less religious nor more scientific than creation" (*Evolution* 25). Phillip Johnson argues that evolutionists simply refuse to accept the evidence of a creator. He writes,

> The intellectual elite in America believe that God is dead. In consequence they think that reason starts with the assumption that nature is all there is and that a mindless evolutionary process absolutely *must* be our true

> creator. The common people aren't so sure of that, and some of them are very sure that God is alive. (22)

Gish argues that creationism is supported by evidence in the Bible. He states that Genesis chronicles creationism in a "grand but concise fashion" (*Evolution* 23). Creationists attempt to move away from the conflicting-worlds model by showing that science and religion are providing logical evidence for one conclusion: special creation. For creationists, this is the only logical conclusion.

The creationist focus on their conception of logic and rationality culminates in anecdotes that appear throughout all of their books. The anecdotes end with a rational common man (never a woman) outwitting the educated—but not intelligent, moral, rational, or open-minded—scientist. In a particularly entertaining fictional narrative, Spetner analogizes an aspect of the creation/evolution debate, randomness, using archetypal characters and settings grounded in American folk culture. The story revolves around a group of men playing poker at a tavern in Abilene, Texas. Chuck is a "tall," "weather-beaten" cowboy with a Stetson hat, a blue bandana, and brown boots. Chuck is a "taciturn" man who does not make "idle conversation," though he is "fair and honest," "even tempered, and does not "anger easily." Furthermore, he is a "natural-born poker player" because "no emotion ever showed." As one might guess, Chuck's nemesis is a city slicker named Bert, a babbling New York City salesman. After describing the characters in detail, Spetner explains that cowboy Chuck finds himself with a straight flush to the jack. Chuck raises the bets up to $10,000 that he does not have ("his credit is good"), but Chuck is flabbergasted when it turns out that city slicker Bert has a straight flush to the king.

The story culminates when Chuck pulls out his gun and shoots Bert through the forehead. When Chuck's pals ask why he would do such a thing, Chuck says (complete with the authentic dialectic), "Ah, reckon the odds against both us gettin' a straight flush are more'n a billion t'one. If sump'm happens against odds like that…it…ain't…luck!" Of course, Spetner softens Chuck's rash actions by having Chuck remind his pals, "An honest man'll sooner get struck by lightnin' than get shot by me" (Spetner 85-7). The import of this narrative is obvious: if the odds are against an occurrence, it probably has not occurred. Furthermore, Spetner uses this story to illustrate the sagacity of Chuck, the stereotypical image of most creationists, and his response to the city slicker's (and mainstream scientists') implicit request to believe something that extends beyond his common sense and his previous experiences. Spetner seems to endorse Chuck's behavior since he never discusses the consequences of such rash actions.

Likewise, Spetner calls on his lay readers to question what evolutionists are asking them to believe against all odds. In this case, Spetner wants readers to doubt the chances that random variation could produce the large-scale changes needed for macroevolution. When Spetner later asks, "Were the poker hands just luck? Or did Bert stack the deck (88)?, he is really asking, "Have evolutionists stacked the deck?" The story indicates that men who are fair-minded, honest, and sensible (though prone to violent rages), like Chuck, are suspicious of arrogant, deceitful, and sophisticated men like Bert. In the end, Chuck figures out that Bert must be cheating, a fact which mitigates his rash (and horrifying) decision to shoot Bert through the forehead. The implication here, though Spetner does not elaborate on it, is that creationists can be sure of themselves and they must act on that knowledge. Of course, Spetner is surely not

suggesting that creationists murder evolutionists, but he is suggesting that creationists speak out, like Chuck, when they know an evolutionist (a smart-talking city slicker) is pulling one over on them. Evolutionists, according to Spetner, want readers to go against their intuition (even when it is obvious the deck is stacked). He writes,

> The average person finds it hard to believe that complexity and sophistication of such higher order was developed by having natural selection organize random events. Evolutionists try to teach them that they alter their thinking to be able to accept such an incredible conclusion. As we have seen, and as we shall see further, the average person's intuition is correct and the neo-Darwinists have gone awry in their sophistry. (113)

Not only does Spetner accuse mainstream science of asking people to believe the unbelievable, he notes that evolutionists are sophists. According to him, evolutionists are convincing only because they use rhetoric, while creationists, presumably, rely on facts. This point is ironic when one considers the colorful story Spetner includes at the beginning of the chapter to illustrate his argument![44]

I should point out that Spetner's story contains some unwanted implications. For example, Spetner never mentions the possibility that Chuck might be the one cheating, and by extension, that creationists might be less than honest with their arguments. Because Spetner tells us that Chuck is a good-hearted country boy, readers expect him to be good and honest. But Chuck's rash behavior seems to counter his goodness and honesty, even if Bert did stack the deck. The implication here might be that creationists

[44] Popular science writing does the very same thing, however. Recall Phillip Kitcher's assertion that creationism is simply a "glorious fake"(5), achieved completely through rhetoric.

are bullies, prepared to use their own sophistry to advance their political agenda. Chuck, for example, has no evidence that Bert stacked the deck; he simply *knows* that Bert must be cheating. The analogy suggests that creationists do not have evidence to support their claims, but simply *know* that evolution must be false. I suspect Spetner, however, did not intend for readers to question Chuck's (or creationists') behavior.

Chuck and Bert's characters represent the divisions that creationists identify between the creation and evolutionist camps. Chuck and Bert respectively represent the west and the east, rural and urban. Chuck is wise, just, and honest. Bert is foolish, unjust, dishonest, and presumably deceptive. Chuck is a common man who relies on his common sense. While Bert is a businessman and not an intellectual, he represents the intellectual who eschews intuition and instead relies on whatever he is told by experts. Chuck and Bert represent the divide that other creationist writers also identify. Recall Phillip Johnson's statement that the "intellectual elite in America" reject God, but "the common people aren't so sure of that" (22). Morris and Parker, in *What Is Creation Science?*, argue that most Americans are creationists, but the media is "completely out of touch with the American people" (267). They suggest that the media over-represents intellectuals, who are predominantly liberal, and overlook the common person who accepts the intuitive creationist argument. Chuck and Bert's characters illustrate the creationist view of both themselves and evolutionists. Chuck prevails because he has the truth behind him and he is sage enough to recognize that truth. Morris and Parker illustrate the same point with a story about a simple farmer who recognizes the truth of creation. Morris and Parker point out that some evolutionists will say that a farmer who

selectively breeds animals is "practicing evolution."[45] They quote a common farmer who quips, "Mister, when I cross pigs, I get pigs. I don't get dogs and cats and horses." Morris and Parker comment, "If the point is that obvious, then other people ought to see it. And they do" (72).

In addition to illustrating the divide between scientists and lay readers, as well the divide between academics and nonacademics, creationist writers use other familiar narratives to show themselves as righteous victims of an evil plot by mainstream scientists to quash the truth. For instance, Phillip Johnson casts the creation/evolution drama as a Cinderella story; although, Johnson says it is evolutionists who believe they are like Cinderella "ruled by cruel religious oppressors called Christians, similar to the wicked stepmother and stepsisters in 'Cinderella' who tried to prevent people from thinking and from marrying their true love" (30). A drama like *Inherit the Wind* is "a smear" intended to make Christians look bad, and these are the images evolutionists draw on for their perceptions of creationists (31). Not surprisingly, however, creationists do the same thing with the goal of depicting themselves as the down-trodden Cinderella character. One such depiction is Johnson's story of Denver teen, Danny Phillips, who openly opposed a *Nova* program shown in his public school that claimed life began as a single-celled organism. Johnson depicts Danny as an open-minded and critical thinker who valiantly fought the menacing school board (Johnson 34). Even though Danny eventually lost in court, the program was removed from the curriculum and Danny's fight against the close-minded academics of mainstream science illustrates the creationist

[45] Morris and Parker offer no evidence for this claim. Most mainstream evolutionists would argue that selective breeding is most definitely *not* evolution; however, Morris and Parker may be referring to the opening chapters of Darwin's Origin where he uses selective breeding to illustrate some principles of evolution.

stance that evolution is simply dogma. This is especially apparent when Johnson describes a public debate that occurred between young Danny Phillips and the president of the National Academy of Sciences, Bruce Alberts. Danny presented his arguments against evolution, and Alberts recommended to Danny *The Beak of the Finch*, a recent evolutionary book by Jonathan Weiner that describes some cases of microevolution in finches on the Galapagos Islands. As Johnson notes, Alberts' suggestion was just plain stupid given that almost all creationists (including Danny) believe in evolution. After all, "The evolution-creation controversy is not about minor variations but about how things like birds came into existence in the first place" (Johnson 52). Once again, evolutionists play the role of the overbearing, arrogant, and dogmatic stepmother, while Danny gets to be Cinderella, the beacon of truth in an evil world.

The message of creationist works is important, but even more critical is how creationists share this message. In terms of Bormann's fantasy-theme criticism, the reality of the creationist message is grounded in their narratives. The popular creationist books with easy-to-understand explanations; stereotypical images; and binary distinctions between academics and nonacademics, scientists and nonscientists, and Christians and non-Christians allow creationists to converge over common experience. The images of Chuck and Bert, for example, do not merely provide an illustration to explain the unlikelihood of random mutation leading to evolutionary change; rather, these images provide a fantasy-theme for a certain group of people to use as a set of assumptions about themselves and their opposition. Much like the conversion rhetorics of televangelists, creationists use these stories to define and structure their group experience, not necessarily to convert nonbelievers to that particular position. The recurring themes

present in the creationist narratives and analogies serve as fantasy types, and these stock scenarios repeatedly appear throughout creationist literature. Evolutionists, who are outside of the community, are likely unaware of the fantasy type. Recall that one of the tenets of fantasy-themes is that once a scenario repeatedly appears in a theme, rhetors no longer need to tell the audience specific details about particular characters or settings (Foss 292). In the case of the creationist works I have discussed, the fantasy type is a scenario involving creationists as morally responsible theists dedicated to finding truth through common sense philosophies. Without knowledge of the rhetorical vision of creationists, anyone outside of the creationist community potentially overlooks the real vision (and purpose) of the creationist movement. Foss argues that rhetorical visions "are integrated by the sharing of a dramatizing message that contains a master analogy. This analogy pulls together the various elements of the vision into a more or less elegant and meaningful whole" (293). The master analogy for creationists is based on the archetypal images that Spetner uses to illustrate Chuck and Bert. Without specific knowledge of the creationist rhetorical vision, one lacks knowledge of the motivation and the goals of the creationist movement.

Prior discussions of creationist literature place it squarely in the category of pseudoscience or religious rhetoric. I suggest, however, that it uniquely combines both scientific authority and Christian dogma, but what sets it apart from other religious rhetorics is the use of science, which allows writers to argue that their work is entirely epistemic. Creation writers claim to be leading readers to truth and emphatically denying that belief has anything to do with creationist philosophy, and by extension, denying any link to Sophistic rhetoric. In other words, creationists present their philosophies as

grounded in facts. Morris and Parker offer an example of such rational weighing of the facts in their work. They cite a mainstream evolutionary scientist, Colin Patterson, who decided to review all of the fossil data from a creationist perspective. Patterson scrutinized the data with the mindset that creationists produce hypotheses and draw inferences that can be understood from an evolutionary perspective without necessarily agreeing or disagreeing with creationists. Based on his assessment, Patterson was supposedly able to understand how and why creationists draw their conclusions. Morris and Parker cite this activity as "a superb example of healthy scientific skepticism" (26). The point they make here is that creationists draw their claims from hard facts (truths) just like mainstream science because evolutionists, like Patterson, can see the facts of creationism if they just put aside their own biases.

What is particularly ironic about this creationist argument is that their work is clearly and unabashedly predicated on belief in Christianity (or at the very least, some sort of theistic ideology). Recall that the ICR clearly notes their mission is to corroborate the Genesis account of creation. Likewise, Gish argues, "The Bible does indeed reveal that there is a living God who has created us and who controls our destiny" (23). Morris and Parker suggest that "the marvelous development of the human embryo should make everyone a creationist" (28). For them, marveling at the complexity of human life is akin to proof of design by the Christian God. The creationist insistence upon the reliability of observation and common sense reaffirms their philosophy while simultaneously solidifying their community.

Creationists seem to be claiming that observation is an unmediated experience, unlike the sort of observation that mainstream scientists do which is necessarily impacted

by mainstream scientific epistemology. Some researchers suggest that the influx of technology into our culture has created an environment where people can no longer experience anything unmediated. Increasingly, almost everything we know comes from the television, the radio, the Internet, and as a result, we receive our information through the filter of the medium. Television critic Jerry Mander suggests that the result of these mediated experiences is that "human beings no longer trust personal observation, even the self-evident, until it is confirmed by scientific or technological institutions" (54). Advanced technology has created a world where nothing is true unless a scientist claims it is true. As Mander notes, "The people who define the moon are now the scientists, astronomers and geologists who tell us which interactions with the world are possible and which are not, ridiculing any evidence to the contrary (59). While Mander's specific argument is about the negative effects of television on society, his comments are relevant to the creationist movement and philosophy. Creationism represents a backlash of a certain subset of people who believe (or want to believe) that their experiences and observations are unmediated and, as a result, accurate. Recall the farmer that Morris and Parker invoke. He sees with his own eyes that breeding pigs produces more pigs, not horses or cats (72). Just like Phillip Johnson's Danny Phillips, the dissenting high school student who argued against the possibility that life arose from a single-celled organism (34). Johnson suggests that Danny saw with his own eyes that life is too complicated to have arisen from a simple organism. The farmer and Danny both have much in common with Chuck who observed the evidence before him and discerned that Bert could not have a straight flush to the king, just as creationists believe, based on observation, that the likelihood of evolution occurring is remote. Regardless of whether these assertions are

right or wrong, these creationists rely on what they believe is good common sense, unmediated by the dogma of evolution.

Evolutionism requires a fair amount of scientific knowledge beyond mere observation and common sense; it is mediated by mainstream philosophies of science. Scientists, for example, must rely on the evidence of fossil records. They must be able to intelligently observe, analyze, and interpret their records and then draw conclusions about evolution. Usually, this requires a certain amount of scientific training. Creationism, on the other hand, allows proponents to believe that their viewpoints need no validation—one must only observe to be a creationist. Good old country folks, like Chuck, do not require validation from an intellectual movement that they neither like nor respect. While Chuck claims to use some version of statistics to reach his conclusion, it is certainly far-removed from any academic knowledge; his conclusions are based on his life experiences. People who share Chuck's social and economic class likely have no access to mainstream science; even if they wanted to become a part of that community, they probably do not have the educational background to participate in it, so common sense philosophies allow certain people to participate in an activity from which they would ordinarily be prohibited.

While creationists want to believe that common sense is unmediated, it is actually mediated by the culture of creationism and many other cultural factors. While the farmer is right to believe that pigs do not breed cats, he is misunderstanding the evolutionist debate. Evolutionists are not suggesting that pigs have ever turned into cats through breeding. Likewise Danny Phillips' contention that life is too complicated to emerge from a single-celled organism may seem to be common sense, but an evolutionist would

find his argument preposterous. Scientific sensibilities, based on data from fossil records, indicate that Danny's argument is not sensible at all. Finally, Chuck's insistence that Bert could not possibly have a straight flush to the king because it is statistically unlikely may seem to be common sense when playing cards. However, evolution is not a card game.

The popularity of creationism that has endured for many years makes it unlikely that the movement will fade into oblivion. Even the concerted efforts by mainstream scientists to spread the "facts" of evolution will not quash the creationist movement. The creationist movement is a rhetorical movement that succeeds because it reaffirms what its audience already knows and believes. Like the conversion rhetorics of televangelists, creationist rhetorics are not really intended to convert nonbelievers; they solidify a community of like-minded individuals. As Wright notes, most conversions on evangelical programs occur in people who are already marginal members of the community. Only rarely do conversions occur in people who were totally outside of the community. In these cases, an unhappy and immoral person turns on the television in the middle of the night to find an evangelical program, or s/he happens to walk into a room where the program is airing—the conversion is accidental, though the converted presumably have a certain degree of psychological readiness. Despite the fact that conversions rarely occur in nonbelievers, televangelism continues to use conversion rhetoric because it "symbolically separates the faithful community from the unsaved viewer while, though acknowledging the existence of the unsaved, it identifies the community's boundaries" (753-5). Likewise, creationism continues to urge readers to weigh evidence for creation and evolution before they make their conversion. However,

the actual function of creationist rhetoric is the same as that of televangelists: to continue and affirm a community grounded in a specific philosophy. For creationists, this philosophy celebrates the character of creationists themselves and promotes an anti-science vision of a marginalized group.

Chapter 6: The Anti-Environmentalist Movement

> *The global warming hypothesis has failed every relevant experimental test. It lives on only in the dreams of anti-technologists and population reduction advocates.*
>
> Oregon Institute of Science and Medicine Petition Project
> Anti-Global Warming Petition

A central aspect of global warming, or the increased temperature of the earth's surface, is what scientists call the greenhouse effect. The greenhouse effect means that much of the sun's energy that reaches the earth is absorbed by land masses and oceans; however, the presence of water vapor and other heat-trapping gases, such as carbon dioxide and nitrous oxide, convert some of the solar energy into heat and water vapor is retained or reflected back to the surface of the earth. The presence of heat-trapping gases actually makes the earth habitable by creating what Williams describes as a "blanket of warm air around the earth" (6). Without the greenhouse effect, we would be in an Ice Age (Williams 6). Anti-environmentalist scientist, Dixy Lee Ray points out that were it not for the greenhouse effect, we would not be able to inhabit the earth because it would more closely resemble the uninhabitable moon (*Trashing* 32). The greenhouse effect becomes a problem, however, when the presence of too much heat-trapping gas leads to

the earth's temperature rising at a significant rate. Environmentalists worry that the human production of carbon dioxide will hasten global warming and cause adverse effects. Michael Oppenheimer and Robert Boyle go so far as to argue in *Dead Heat: The Race against the Greenhouse Effect* that the over-production of greenhouse gases will lead to the eventual destruction of humanity. They urge government to act quickly in order to slow the level of carbon dioxide emissions (1-5). Oppenheimer and Boyle argue that the average global temperature in 2025 could be three degrees warmer (2), but they also point out that climate projections could be "20% higher or 50% lower than that (6). Robert Watson, Chief Scientist at the World Bank and member of the Intergovernmental Panel on Climate Control (IPCC) predicts that the earth's temperatures will rise 2.5 to 10.4 degrees between 1990 and 2100 (19). The consequences of such temperature increases, if they were to occur, would be devastating for the earth and for humans. The Natural Resources Defense Council (NRDC) suggest on its website that higher temperatures will bring "drought, disease, floods, [and] lost ecosystems." The NRDC maintains that "global warming's effects have already begun." In a 2001 IPCC report on climate change, a panel of scientists argues that global warming, and other environmentally degrading processes such as pollution, will have deleterious consequences for most humans. The IPCC write on their web site,

> We have reached the point that the cumulative interaction of several factors related to human activities (e.g., land-use changes and emissions of GHGs, ozone-depleting substances, and local air pollutants) increases the risk of causing or aggravating potentially irreversible events, such as loss

> of species, forests, human settlements, glaciers, or heritage sites near coastlines and, in the long term, altered oceanic circulation regimes.

Those scenarios have generated significant controversy, including the anti-environmentalist argument that scientists lack evidence to make such broad claims about the adverse effects of global warming. Those who disagree with global warming scenarios make one of three arguments against those who worry about the effects of global warming. First, a few anti-environmentalists argue that global warming is not occurring at all. M. Mihkel Mathiesen, author of *Global Warming in a Politically Correct Climate*, which I analyze in the following chapters, argues, "The greenhouse hypothesis has been decisively proven wrong time and time again"[46] (107). Second, other anti-global warming writers agree that global warming is occurring, but they argue that the effects of global warming are not harmful. For instance, Fred Singer, author of *Hot Talk, Cold Science*, argues, "Even if a moderate warming were to materialize, its consequences would be largely benign" (2). Finally, other anti-global warming writers argue that global warming exists and it may be harmful, but they maintain that humans have not significantly *caused* global warming; therefore, they question the logic of expensive government regulations designed to curb certain types of emissions. Dixy Lee Ray maintains, "The amount of CO_2 released into the atmosphere […] is divided about evenly between natural and man-made sources" (*Trashing* 32-33). Patrick Michaels and Robert Balling agree in their work, *Satanic Gases*; they write, "For the record, we too believe that there is a human influence on the climate. But, to put it simply, the effect is just not all that bad" (21).

[46] Mathiesen offers no evidence for this statement.

Generally speaking, anti-global warming writers are critiquing two groups of writers in their works. They criticize mainstream science writers who rely on computer-generated models for global warming data. Climatologists, including those who make up the IPCC, rely on computer-generated models to make predictions about warming patterns. The Environmental Protection Agency (EPA), however, points out that computer models are all that climatologists have to make predictions about climate patterns. On their website, the EPA writes,

> Virtually all published estimates of how the climate could change in the United States are the results of computer models of the atmosphere known as 'general circulation models.' These complicated models are able to simulate many features of the climate, but they are still not accurate enough to provide reliable forecasts of how the climate may change; and the several models often yield contradictory results. For the time being, however, these models are about all we have to say how the climate may change in particular areas. Given the unreliability of these models, researchers trying to understand the future impacts of climate change generally analyze different scenarios from several different climate models. The hope is that, by using a wide variety of different climate models, one's analysis can include the entire range of scientific uncertainty. ("Climate Models")

The anti-environmentalist criticism regarding computer-generated models represents their scientific epistemology that one should only gather data through direct observation.

Computer models, regardless of how accurate, are merely speculative. Therefore, anti-environmentalists dismiss the models as unscientific.

Anti-environmentalists also criticize popular science writers for making political and personal arguments about global warming. This criticism represents their view that popular science is dangerous because it is primarily political, yet masquerades as science. It is an ironic criticism because these anti-environmental writers are producing popular science writing for lay readers which advances their particular political viewpoint. As I will show in the following chapters, anti-global warming writers claim seek to *re*-politicize the issue, while claiming to de-politicize it. Their view of the global warming debate is less about the science surrounding it and more about the politics and cultural perspectives that they believe global warming represents. In the following sections, I first look at the anti-environmentalist perspective on both science and environmentalism; both of these perspectives are central tenets of the anti-global warming debate. I then examine the history of the apocalyptic environmentalist movement, to which anti-global warming writers are responding both implicitly and explicitly.

The Anti-Global Warming Perspective on Environmentalism and Science

Rhetoricians M. Jimmie Killingsworth and Jacqueline Palmer note that there exist three attitudes toward the environment: the view of nature as an object; the view of nature as a resource, and the view of nature as a spiritual presence (*Ecospeak* 11). In relation to the latter, Killingsworth and Palmer argue,

> The view of nature as spirit places human beings on a par with the rest of nature, extending ethical action to all beings of the earth. The characteristic actions prompted by this attitude—beyond prayer,

> meditation, and bearing witness—involve an active resistance to the other perspectives that violate that identity of human beings and nature. (*Ecospeak* 13)

On one level, anti-environmentalism is a response to deep ecology (preservation), which suggests that humans and nature have the same intrinsic value. Anti-environmentalists often view the entire environmentalist movement, regardless of its actual agenda, as an attempt to elevate nature to the level of humans. In some cases, anti-environmentalists believe that environmentalists seek to place nature *above* human needs, regardless of the cost. Anti-environmentalists maintain numerous websites that paint environmentalists in broad brush-strokes; these websites suggest that all environmentalists are nature mystics who do not care about the needs of people. For example, the site, *Right Wing News*, includes a page written by John Hawkins devoted to "Environmentalist Wacko Quotes." The page features such quotes such as the one from John Shuttleworth, a British singer: "the only real good technology is no technology at all. Technology is taxation without representation, imposed by our elitist species (man) upon the rest of the natural world." The page also includes a number of quotes from the radical environmental group, Earth First!. For example, John Davis, editor of the Earth First! Journal, says, "Human beings, as a species, have no more value than slugs." Conflating radical environmentalists, such as Earth First! with environmental scientists, or even environmentally-conscious citizens, is simply not an accurate representation of each group's philosophies. Anti-environmentalism, however, is predicated on the earnest belief that all environmentalists are misanthropes.[47]

[47] This is an issue that I explore further in the following chapters.

In order to bolster their argument, anti-environmentalists frequently use science to establish and maintain their authority and credibility,[48] though mainstream scientists often dispute the accuracy of the anti-environmentalist use of science. Paul and Anne Ehrlich, for instance, define anti-environmentalism as "a twisting of the findings of empirical science" (*Betrayal* 12). As an "anti-science," it is designed "to bolster a predetermined worldview and to support a political agenda" (*Betrayal* 11-12). The Ehrlichs also link anti-environmentalism to creationism: both "feature a denial of facts and circumstances that don't fit religious or other traditional beliefs" (*Betrayal* 12). Anti-environmentalism, however, is a complex and far-reaching movement of people who are dissatisfied with environmental attitudes among international scientists and politicians who support environmental protection legislation. Anti-environmentalists are frustrated with a scientific establishment which, in the eyes of the anti-environmentalist, ignores any data that suggests global warming is not a serious threat to humans. And many of these anti-environmentalists are mainstream scientists themselves. Patrick Michaels, environmental scientist at the University of Virginia, and Robert Balling, climatologist, argue, "One era's paradigm is often a future era's laughingstock, but the holders of the current paradigm [global warming] cannot seem to recognize that fairly high probability" (31). Sallie Baliunas, an astrophysicist at the Harvard Smithsonian Center, writes in an article posted on the Marshall Institute web page, that global warming is insignificant. She writes,

> The scientific history drawn from nature and man's observations over the last millennium suggests that a strong trend of human-induced warming

[48] As I will discuss in the following chapter, anti-environmentalists borrow authority from mainstream science, but they also reject it on the grounds that scientists are too environmentally-conscious. In other words, anti-environmentalists critique scientists who they believe view nature has intrinsic value.

> does not exist. The scientific facts indicate that costly policies to combat global warming are unlikely to mitigate any of climate's ever-present natural risks, but they could reduce society's economic ability to cope with them.

Scientists who make anti-global warming claims often have links to political organizations. There are currently approximately ten think tanks actively working against the mainstream environmental movement. The most notable groups include the Political Economy Research Center, the Competitive Enterprise Institute, and the Heritage Foundation. All three organizations are right-wing political think tanks who argue against environmentalism in most forms. When the Heritage Foundation published their 1990 *Policy Review*—an outline for their vision for the next decade—they stated their desire to end the environmental movement on the premise that environmentalists are Luddites. One of the authors of the *Review* happened to be Pat Robertson, who is tied to right-wing politics and fundamental religion. I am not suggesting that we dismiss these think tanks on the basis of their political roots. Certainly, environmentalists have political ties as well that affect their policy decisions. What I am suggesting is that the anti-global warming movement, much like the creationist movement, is culturally and rhetorically tied to other politically-charged issues. In that respect, anti-global warming and creationism have much in common. While creationism links fundamental Christianity with science, anti-global warming advocates conflate environmentalism with other hot-button issues. For example, the conservative think tanks that I mentioned earlier often conflate environmental policy with gun control and animal rights. They argue that environmentalists want to enact environmental legislation as a means of

tightening restrictions or eliminating firearms and to enact more protection for animals. Presenting platforms on varying issues may attract people to the anti-global warming cause who are normally single-issue voters.

Despite the attention that many scientists, politicians, and citizens pay to anti-global warming, other mainstream scientists definitively argue that global warming *is* occurring and that it *is* a notable threat to the well-being of humans and our environment; in fact, there is very little debate in the mainstream scientific community about the actual existence of global warming.[49] Scientist Stephen H. Schneider notes that, "The greenhouse effect, despite all the controversy that surrounds the term, is actually one of the most well-established theories in atmospheric science" (774). James Hansen, who is the director of NASA's Goddard Institute of Space Studies, believes the earth is dangerously warming as a result of the greenhouse effect, a testimony he made before a Senate committee hearing in 1988 (Green 8). In a 1999 *Audubon Magazine* article by Robert Boyle, Hansen recalls what he said at the hearing:

> First, that the world was getting warmer on decadal time scales, which I said could be stated with 99 percent confidence. Second, that with a high degree of confidence I believed there was a causal relationship with an increased greenhouse effect. And third, that in our climate model there was a tendency for an increase in the frequency and the severity of heat waves and droughts with global warming. (Boyle)

Finally, Hansen argued, "It's time to stop waffling so much and say that the greenhouse effect is here and affecting our climate now" (Boyle). As I write, a *Reuters* news report

[49] The debate in the mainstream scientific community centers around how much effect humans have on global warming and what the long-term effects may be.

has just been released stating, "Warmer temperatures in North America since 1950 were likely caused in part by human activities." The study was commissioned by the current Bush administration which has consistently maintained that there is no scientific evidence for human-induced global warming (Doggett). Ehrlich and Ehrlich note that *most* of the people who actively deny global warming (or minimize its effects) are not mainstream scientists. Those who are part of the scientific community often have paid side jobs as consultants to major industries or are actively involved in conservative or libertarian political groups. For example, Patrick Michaels is a climatologist at the University of Virginia, but he is also a senior fellow for the libertarian organization the Cato Institute. He is also a consultant for a coal and energy company. Likewise, Fred Singer, who has a PhD in physics from Princeton University, consults for various oil companies (Ehrlich and Ehrlich 37).

The anti-global warming movement actively opposes any sort of government regulation to curb its effects, despite the evidence for global warming. Rhetoricians Carl Herndl and Stuart Brown suggest that unsuccessful environmental policy-making often stems from a "failure to construct an acceptable authority from which to promulgate decisions" (11). Although they were not necessarily talking exclusively about anti-environmentalism, finding an acceptable authority is certainly a main priority for anti-environmental movements. For example, while creationists rely on the morality and value-system of Christianity as their ultimate authority,[50] anti-environmentalists put forth an ideology that they claim requires a complete *absence* of moral values or religious

[50] Recall that creationists believe that science *must* corroborate biblical teaching.

ideology.[51] In fact, anti-environmentalists' primary criticism of environmentalists (including mainstream scientists like Paul and Anne Ehrlich) is that they emphasize the the intrinsic value of the environment in addition to, or at the expense of, scientific principles. That is, anti-environmentalists critique environmentalism on the basis that there is no place in science for the consideration of intrinsic values or moral responsibility in scientific discussions. Environmental scientists, however, including contemporary scientists like the Ehrlichs and pioneering environmentalists like Rachel Carson, argue that we must consider the value of the environment, outside of economic values, in order to make effective and appropriate policy decisions.

While most mainstream environmental scientists reject the idea that mainstream science writing can or should be emotional or make value-laden claims, many argue that environmental scientists do have the responsibility to explain to popular readers the implications of environmental science in order for the public to make informed political decisions. That is not to say that people like the Ehrlichs eschew scientific credibility or advocate the publication of false data; rather, they believe scientists must simply explain how to apply data by producing popular science writing that emphasizes the important results of mainstream science.

Early environmentalist literature, such as the Paul Ehrlich's work, *The Population Bomb*, and Rachel Carson's *Silent Spring*, include scenarios intended to help readers see the detrimental effects of ignoring environmental issues. An important starting place is to examine the rhetorics of these early environmental texts because they established the tone for environmental literature. Because they were written by mainstream scientists, anti-

[51] While anti-environmentalists may not rely on religious ideologies, they do clearly attempt to advance particular values. Most notably, they argue for technological and economic progress regardless of ecological cost.

environmentalists often critique these works in an attempt to discredit all scientific environmental popular works. When anti-environmentalists critique mainstream environmental scientists for being unscientific, they usually mean that they find them too rhetorical and too focused on the value of nature. They are critiquing the tradition of trained scientists who wrote popular science intended to motivate lay readers into changing their views and actions toward the environment. In the following section, I provide a brief discussion of that apocalyptic environmental tradition, pioneered by trained mainstream scientists.

The Apocalyptic Environmentalist Tradition

Rachel Carson's *Silent Spring* (1962) is unequivocally one of the most important and enduring examples of popular environmental literature. *Silent Spring*, with its impassioned presentation of an environment at risk, alerted concerned readers of the need to save the environment from destruction by chemicals. *Silent Spring* was followed, six years later, by Paul Ehrlich's *The Population Bomb* (1968). Ehrlich's thesis is that unchecked population growth could ultimately lead to total ecological destruction. Ehrlich argues that overpopulation leads to mass starvation, increased usage of dangerous pesticides as a means of multiplying food supplies, and even nuclear war. Critics charged both Carson and Ehrlich with using scare tactics to get readers to accept their version of impending environmental doom (Killingsworth and Palmer, "Millenial Ecology" 31). Anti-environmentalist writer Ronald Bailey argues that *Silent Spring*, *The Population Bomb*, and Donella Meadows' *The Limits to Growth* "profoundly disheartened" readers because they "painted the near future—our future—in hopeless bleak terms" by presenting unnecessarily apocalyptic predictions" (xi). Apocalyptic doom, however, was

successful in rallying public support for environmental causes. *Silent Spring* eventually led to an investigation, which in turn eventually led to the banning of DDT in 1972 and the organization of the Environmental Protection Agency (Waddell 2).

Though perhaps less influential in terms of public policy, *The Population Bomb* (1968) was overwhelmingly popular with general readers. Sales eventually reached over three million copies, which made it one of the best-selling environmental books of all time (Killingsworth and Palmer, "Millenial Ecology" 32). Of course the problem with apocalyptic environmental writing is evident: predictions that do not come true make the predictor lose credibility. In Ehrlich's case, one such prediction included the doomsday prophesy that "a *minimum* of ten million people, most of them children, will starve to death during each year of the 1970s, but this a mere handful compared to the numbers that will be starving before the end of the century" (3). Bailey argues that Ehrlich's predictions are wildly inaccurate and based on little else but his own conjecture; Bailey claims that Ehrlich does nothing more than "scare the hell out of his readers as a way to get them to adopt his coercive population control policies" (43). While Carson's and Ehrlich's predictions of ecological doom may not have been scientifically accurate, their "hysterical" environmental warnings called attention to environmental issues that the public had overlooked. Killingsworth and Palmer maintain, "If the fervor of environmentalism seems irrational, that is because, in the view of the environmentalists, an ostensibly rational public discourse has neglected the signs of trouble for so long that only a cry of pain can break the public habit of inattention" ("Discourse" 3). Furthermore, Killingsworth and Palmer point out that one of the keys to Carson's success is her apocalyptic rhetoric, which they argue rises "out of disgust and a sense of

powerlessness, which simultaneously refuses to be constrained any longer" ("Discourse" 11).

Both Carson and Ehrlich urge readers to take action and responsibility for existing and impending environmental disasters and both writers indict humans for their careless mistreatment of the environment. While both writers do present a potential apocalyptic future, they maintain that changes in actions, attitudes, and policy can reverse the downward spiral of the environment. To facilitate public involvement in environmental issues, Carson and Ehrlich present their calls for action using "fictions" as a means to interest and move readers. Rachel Carson presents "A Fable for Tomorrow," depicting a harmonious and beautiful town that had been destroyed by irresponsible chemical use. Plants, wildlife, and humans have all been affected by these dangerous chemicals, which she refers to as an "evil spell" (2). Carson is quick to reassure readers that the town in her fable does not actually exist, but reminds readers that every disaster depicted in the fable (including dying birds and children) has happened somewhere already (1-3). By using a fable based on truth to begin her argument, Carson establishes that there is a lesson or a moral to be learned from her fable. Though the fictional town may be lost already, informed and active citizens can stop these disasters from happening in their own towns.

In addition to the fable, *Silent Spring* is an interwoven fabric of science and "fictions." For almost every scientific description Carson gives, she follows with an illustrative example based on actual events, but "stylized" or "fictionalized" for her purposes. For example, Carson explains the properties, structure, and effects of endrin, a chlorinated hydrocarbon related to dieldrin but five times as poisonous because of its

differing molecular structure, and considerably more harmful than DDT. Carson illustrates this information with the "true" story of an American family in Venezuela who had their cockroach-infested house sprayed with a pesticide containing endrin. Shortly after the spraying, the family dog died as a result of the spray. The baby suffered convulsions, lost consciousness, and ultimately suffered long-term, irreversible physical and mental damage as a result of the spray (Carson 26-27).

This illustration is purportedly a true story used to gain reader's interest and to alarm them; however, rhetorician Randy Harris reveals that Carson modifies portions of the story. Though she never misrepresents the actual events, she uses specific rhetorical tactics to fulfill her own ends. For instance, Carson takes her information about the Venezuelan family from the brief "Poisoning by Endrin" by Harold Jacobinzer and Harry W. Raybin, published in the *New York State Journal of Medicine*. The writers of the brief took their information from Dr. Edmund N. Joiner III, Chief of Pediatrics at Roosevelt Hospital in New York. Dr. Joiner purportedly received his information from the attending hospital staff. Harris speculates that some of their information probably also came from Venezuela. Carson takes this third or fourth-hand account and makes some small, but important, changes in her version. According to Harris, the original brief refers to the victim as a "child," "infant," or "patient." Carson, however, consistently refers to him as the "baby." Authors of the brief refer to the incident as an "exposure" to endrin; Carson calls it "fateful contact." Authors of the brief indicate that the child did show some improvement over the course of time, though they admit it was minimal improvement; Carson concludes that there is no hope for the child's recovery (Harris 132-34). What is significant about these changes is that while Carson bases her examples

on facts, she changes them to make them more frightening, touching, or to have irreversible consequences, as we see in the case of the baby. Though she is not necessarily writing fictional stories in the same way Ehrlich does, she uses "fictions" (part truth/part rhetorical tinkering) to create a sense of urgency and alarm for her readers.

Throughout *Silent Spring*, Carson refers to "we," "us," and "our" environment. For example, in "The Obligation to Endure," Carson's describes "*our* distorted sense of proportion," what "*we* have done" to our environment, why "*we* have done it," and that "*we* are told" we need to use pesticides (emphasis added, 8-9). Carson's inclusive language stresses the shared responsibility for the environment of all humans, but also the capability of humans to work as a community to stop the damage that is already being done. The emphasis is on working together to tap into the combined ingenuity of humans to find solutions to save our environment.

Despite Carson's view of humans and nature as part of one interwoven community, she does concede the need to wage war on some aspects of nature, though she believes that can be done using natural agents. In illustrating the fine balance of nature, Carson clarifies that the natural behaviors of certain predators keep other insects at bay. For example, dragonflies keep mosquito populations in check. Lacewings prey upon aphids. She illustrates that certain insects are enemies, such as mosquitoes and aphids, while other insects work in our favor. According to Carson, pesticide use has dangerously altered these relationships, which are beneficial to humans. "We have turned our artillery against our friends. The terrible danger is that we have grossly underestimated their value in keeping at bay a dark tide of enemies that, without their help, can overrun us"

(Carson 251). Carson concedes the need or desire of humans to be free from certain pests, but she also uses the helpful dragonfly and lacewing as tools to illustrate a community working together. Nature and humans are inseparable and they must work together to fight the imbalance and disruption pesticide use creates. Through these kinds of examples, Carson constantly emphasizes the need for community cooperation.

Some critics maintain, however, that Carson's rhetoric is agonistic (Killingsworth and Palmer, *Ecospeak* 210) and actually creates rifts among groups of people. Killingsworth and Palmer argue,

> The agonistic rhetoric of the exposé, of which *Silent Spring* is a fine example, must ever rest on the assignment of praise and blame in an effort to influence decisions about public ends and means. It fosters controversy and divides perspectives, often attempting to arrange disparate interests into a clearly demarcated pair of opposed parties—environmentalist and developmentalist, for example—thus mobilizing citizens for a quick decision one way or the other, as is required in moments of crisis. (*Ecospeak* 76)

Though Carson does conceivably divide citizens and the chemical industry, for example, through her narratives, she continually does so in such a way that the chemical company becomes an entity in and of itself, rather than a group of any specific citizens. She consistently distances the chemical industry from the people within it in order to create a nameless, faceless enemy that humans, as a community, must fight. By de-emphasizing the people who make up the chemical industry, she creates a "thing" that exists apart from the people who are part of the industry. That way the enemy becomes a nebulous

and separate entity, The Chemical Industry. By doing this, Carson can demonize the industry itself without demonizing the citizens, who can still join with the community to make a difference. This technique is evident in the ways Carson sets up her stories about the misuse of pesticides. She often refers to those who administer chemicals as inanimate objects. For example, when describing a pesticide flyover in Detroit where massive amounts of pesticides settled in yards, eaves, and on people, Carson refers to the people spraying the pesticides as "planes"—as in, "The planes went about their work" (90). Carson does not acknowledge the people flying the planes. When Carson does refer to individual people as chemical sprayers, she refers to them in a generalized manner: "insect controllers" (13), "the man with the spray gun," "the authoritarian" who makes the decisions (127), or "the practitioner of chemical control" (297). In addition, Carson's depiction of the chemical industry is not always entirely negative. For example, she concedes that chemical companies recognize the need for education against the misuse of chemicals and recommend more education for people who use them (180).

Paul Ehrlich takes a slightly different approach by presenting three fictional scenarios mid-way through his book designed to illustrate potential problems facing citizens if population issues are not addressed. Ehrlich stresses that these scenarios are "just possibilities, not predictions" (49). Much like Carson's fable, Ehrlich's scenarios serve to warn readers of impending disaster if they do not take action. One scenario is a short fictional piece about the effects of a future vastly overpopulated world. Characters in the story face food rationing; pesticide poisoning as a result of increased chemical use to yield more food for the starving masses; race riots as a result of the limited food sources; and even nuclear war as a result of the United States government ignoring

international sanctions against the use of dangerous chemicals. The characters ultimately must face the problems of their world and recognize that the origin of their problems came from overpopulation and apathy about it.

Ehrlich's short science fiction story about environmental apocalypse is interesting in part because of his depictions of the characters. Though, Ehrlich continually reminds readers that he is merely presenting a story, not making predictions, we can get an idea of the type of environmental reform Ehrlich calls for by looking at his scenarios. In this apocalyptic story, set in the U.S. in 1983, President Burrell is a bumbling and environmentally ignorant president who approves the use of a dangerous chlorinated hydrocarbon in order to increase food production. Because of massive overpopulation, citizens of the U.S. have been put on food rations and many are starving to death. The President's conscientious scientific advisor, George Gilsinger, resigns because of his moral misgivings regarding the approval of a chemical known to cause harmful effects to humans and to the environment. After resigning, Gilsinger decides to accept a position at the University of Kansas, rather than returning to Cal Tech and the unbearable smog of Pasadena.

In the second section of the story, Ehrlich describes Jane Gilsinger, George's wife, as a typical housewife in charge of feeding and caring for the Gilsinger children. While George meets with the President, Jane rejoices over the low-mercury cod she chances upon at the grocery store. When she finds out George has resigned from his Washington position, she worries about returning to Pasadena, where she had to carry a purse full of quarters to buy breaths of fresh air from the clean air machines. She is thrilled when she discovers George has accepted the position in Kansas; though, George

does not tell her that the improved air quality will be offset by the harmful effects of the chlorinated hydrocarbons that the President has just approved in order to gain votes in the Wheat Belt. Within the story of the Gilsingers, Ehrlich tells a secondary story about Margaret Andrews, a widow who is a victim of racism. After her husband is killed in riots, spurred by overpopulation and a waning food supply, Margaret must travel from the Midwest to her mother's house in Alabama. She hopes to grow food for her family in the only soil left in the U.S. still capable of producing crops. Along the way, Margaret encounters difficulties obtaining ration cards and is bullied by white police. When she finally arrives in Alabama, she runs to her mother crying and her mother reassures her she is safe at home. Within this story, Ehrlich attempts to depict social and race relations that stem from food shortages caused by overpopulation. In Margaret's case, she is denied food because of her skin color, and she must leave her home and go back to the south in order to survive. She has no means of taking action to change her situation, other than leaving her Midwestern home.

After presenting these scenarios, Ehrlich makes a call for public action, which consists of a list of what individuals can do to stop overpopulation. He includes a list of "target" audiences so that readers can tailor their arguments to particular people. If one encounters a childless couple, for instance, he should congratulate them and praise them for their restraint "even if you suspect that target is sterile" (169). This tactic, though rude and a bit unusual, is considerably less combative than Ehrlich's other suggestions, where Ehrlich advocates pitting one group against another. For example, Ehrlich instructs the childless to encourage those with large families to quit having children. Ehrlich suggests conscientious environmentalists should "emphasize that the need for

family limitation was not obvious before," but one should also point out that people "surely would not behave that way today" (169). In addition, Protestants should urge Catholics to lobby the Pope to loosen Church restrictions on birth control; liberals should reveal to conservatives how much tax money is spent on welfare in our overpopulated world. In essence, Ehrlich argues that people must confront each other and tell each other how to live in an environmentally responsible manner. Though this may be a noble and worthy cause for which to lobby, Ehrlich fails to examine the problems underlying environmental issues. Surely, praising the childless and condemning those with large families will do little to reverse environmental oppression, but will do much to create communities of dissent. Rather than indicting *all* humans for the damage we have inflicted upon ourselves, thus spurring community action, Ehrlich attempts to hold only *some* people responsible for the environmental issues at stake. In terms of grassroots struggle, Ehrlich's practical suggestions for convincing others of a population problem do attempt to include average citizens. In that respect, Ehrlich is calling for the same grass-roots action as Carson, but Ehrlich's suggestions serve only to create distance between groups. These suggestions do not create community in the way Carson does, nor do they promote a common goal or even a common enemy. Instead, each group looks to another to blame or indict, yet ultimately none of these people can really accomplish anything since Ehrlich seems to believe that population control must come from governmental regulation.

Despite the 'disclaimers' that both Carson and Ehrlich issue with their fictions, critics have suggested that these stories are unnecessarily apocalyptic, alarmist, and irresponsible, particularly because they come from scientists. The use of fictions,

however, captivated the interest of a large audience. Both works were phenomenal best sellers. The interest *Silent Spring* garnered even helped to institute the ban on DDT.

Rhetorician Ralph H. Lutts suggests that *Silent Spring* captivated audiences in part because the time was right for it. Because people had been overshadowed by the presence of impending nuclear war, they were ready to accept apocalyptic warnings. Lutts traces film and media presentations of nuclear war prior to the publication of *Silent Spring* in order to establish that people were finally beginning to understand 'invisible' threats. These popular media representations prepared people for Carson's pesticide warnings. Lutts writes, "People understood that fallout can circle the globe and that this invisible poison, which they were unable to detect with their own senses, could threaten lives in the future" (29). Similarly, the publication of *The Population Bomb* in 1968, six years after *Silent Spring*, came at a time when environmental issues, sparked by visions and fears of nuclear war, were still fresh in people's minds. Using fictions to present these environmental exigencies simply fit into what people were used to seeing and hearing in popular films depicting the occurrence or imminence of nuclear war, so it makes sense that both authors would make use of fictions as a means of making their arguments. Using fictions is also an attempt to free both Carson and Ehrlich from the constraints of scientific writing. As Christine Oravec notes, a first-person narrator often "disqualifies the content of writing as being truly 'factual' or 'objective,' as in most scientific genres." On the other hand, Oravec argues, "the lack of an explicitly authorial presence hides or subsumes personal responsibility for the facts and how they are manipulated rhetorically" (57). Carson's strategy is an objectification of her fiction and a personalization of her facts. In other words, Oravec claims that by conspicuously

removing the narrator from the overtly fictional element of the book, the fable in the first chapter, Carson universalizes the mythic truths of the fables—this town is *any* town, this could be *your* town. Furthermore, by personalizing the "facts" (providing details for the real people experiencing real environmental problems), Oravec argues that Carson actually takes responsibility for the "factuality" of these stories (57). Conversely, Ehrlich uses "scenarios" as a means of distancing himself from the situation. The presence of a fictional narrator in the first scenario, newspaper writers in the second scenario, and an historian in the third scenario keep Ehrlich from having to take responsibility for the accuracy or inaccuracy of the events in his scenarios.

In both works, Carson and Ehrlich are attempting to illustrate what might happen to our world if we do not examine how we are treating it. Killingsworth and Palmer claim that apocalyptic narratives, like *Silent Spring* and *The Population Bomb*, are "shock tactics" that are designed to "win the hearts and minds of the general public at crucial historical periods in which the need is perceived to extend and broaden commitments to the environmental movement." ("Millennial" 22). Using fictions, then, serves as a practical means of stirring up interest and encouraging commitment to environmental issues. Killingsworth and Palmer stress the importance of recognizing science fictions, like *Silent Spring* or *The Population Bomb*, as "myths", not as "lies, mistakes, or superstitions that scientific enlightenment is committed to destroy." Rather they see fictions as "collective narratives reaching beyond the boundaries of any specialized body of knowledge and touching the heart of society's emotional, spiritual, and intellectual consciousness" ("*Silent Spring*…" 176). The problem, then, is not that these science writers are using fiction to spur citizen action—the scientific accuracy or strict

"truthfulness" of these texts is irrelevant. But how these writers envision environmental action does indicate Carson and Ehrlich's visions about what environmental activism should look like. For both writers, environmental activism means community involvement; everyone must join together to solve the environmental crisis or risk destroying our earth. Both writers, despite their different tactics, advocate governmental regulation in addition to community activism. This sort of regulation is exactly what anti-global warming writers oppose. Furthermore, they oppose Carson and Ehrlich's scenarios that illustrate people who do not properly value nature. The anti-global warming movement is largely a response to these seminal environmental calls for action.

Chapter 7: A Neo-Aristotelian Analysis of Anti-Environmental Writing

> *The common sense comes in considering that farmers are not dumb; they will adapt to changes - as they always do. They will plant the right crops, select the best seeds, and choose the appropriate varieties to take advantage of longer growing seasons, warmer nights, and of course the higher levels of carbon dioxide that make plants and trees grow faster.*
>
> Fred Singer, "Global Warming Whining," *Washington Times*
> April 16, 1999

> *And wealthy ideologues have joined with the most cynical and irresponsible companies in the oil, coal and mining industries to contribute large sums of money to finance pseudo-scientific front groups that specialize in sowing confusion in the public's mind about global warming. They issue one misleading "report" after another, pretending that there is significant disagreement in the legitimate scientific community in areas where there is actually a broad-based consensus.*
>
> Al Gore, "Global Warming and the Environment"
> Speech delivered at the Beacon Theater, New York, New York
> January 15, 2004

Invention and Stasis Theory

In the following section, I do an analysis of the invention methods of anti-environmental works in order to show that their stasis questions are vastly different from those they claim environmentalists are asking, and that these different stasis points result in very different conceptions of the global warming debate. An analysis of texts using stasis theory, as I discussed in Chapter 4, can reveal the starting points of arguments or the focusing questions (Gross 8) that scientists ask themselves as they begin the invention

process. Recall that in the case of creationism, writers begin at the first stasis,[52] asking if something actually exists, while evolutionists generally begin at the second stasis, asking what is the character of an existing phenomenon? Like creationists, anti-environmental writers generally begin at the first stasis: is global warming actually occurring? Most agree that the earth is warming, and they all agree that the greenhouse effect does exist. However, my analysis reveals that anti-environmental writers believe that the real starting point should not be asking whether or not global warming is occurring; rather, they argue for starting with a modified first stasis question: does global warming exist *as a result of human activity*? According to anti-environmentalists, global warming *only* matters if it is result of human activity. After all, if global warming is a result of natural climatological patterns, anti-global warming writers argue that it will not be curbed by the sorts of policies advocated by environmentalists that enforce changes in human behavior.

Anti-environmental writers begin their works by quickly answering the question: does global warming exist? Ray and Guzzo first rhetorically question if the planet Earth is threatened by environmental issues. They lament that answering a truthful "no" to that question makes one "an apologist for industry" or leads to being "accused of favoring pollution" (*Trashing* 3). Ray and Guzzo, however, do agree that the greenhouse effect exists and global warming does occur.[53] Mathiesen also plainly states the universal agreement that global warming exists: "The *truth* is that hardly anyone denies that the globe is warming…" (xxii). Michaels and Balling definitively report, "One thing

[52] Most notably, this includes Philip Johnson, Duane Gish, Henry Morris, and Lee Spetner, among others.
[53] As I mentioned in the previous chapter, the greenhouse effect is not a point of contention for any of the important voices in the global warming debate. Most writers, on either side, understand and agree that were it not for the greenhouse effect, Earth would not be able to sustain human life (Lee and Guzzo, *Trashing* 32). Without the presence of heat-trapping gases, Earth's average temperature would be approximately -2 as opposed to 59 degrees Fahrenheit (Green 10).

concerning global warming about which there is no debate is the notion that human activity has augmented the earth's natural greenhouse effect" (30), though they claim that human contributions are not significant. Moore hedges a bit, but he does concede that global warming is likely to occur, if it is not already (4).

Only one of the writers denies the existence of global warming at all. Fred Singer begins his preface with his thesis:

> The purpose of this book is to demonstrate that the evidence is neither settled, nor compelling, nor even convincing. On the contrary, scientists continue to discover new mechanisms for climate change and to put forth new theories to try to account for the fact that global temperature is not rising, even though greenhouse theory says it should. (ix)

He later states that "no significant global warming has been observed in the last half-century, and none at all in the last two decades" (x). Singer's stance is something of anomaly given that his colleagues generally agree that global warming is occurring, to at least some degree.

Anti-environmentalist writers believe that we must be able to answer that first stasis question before we can talk about the nature of global warming. If global warming is natural, which they later argue, then we need not worry about it. Mathiesen argues that natural global warming is not a problem because we can certainly easily handle nature. "We forget that nature has caused far more violent changes in the past than those predicted by the alarmists" (65). He suggests that we have managed far greater natural disasters than those predicted by environmentalists; therefore, we can solve the problem of global warming with relative ease. Dixy Lee Ray and Lou Guzzo maintain that carbon

dioxide ($C0_2$) is produced by both natural and man-made sources. In fact, they argue that each produces about the same amount.[54] The point here is that they claim only fifty percent of global warming is a result of humans, which means that even if we curbed our production of CO_2, we would still be left with a certain amount of naturally-produced $C0_2$ (*Trashing* 32-33). Lee and Guzzo argue that warming and cooling periods are a natural part of the earth's climatological patterns (*Trashing* 34). Implicitly, they answer this first stasis question—how much do humans contribute to global warming—with a resounding, "Not significantly." Their argument that political programs, such as the Kyoto Protocol, are ineffective for dealing with natural climate patterns, reiterates their answer to that stasis question.

Some of the writers, including Mihkel Mathiesen in *Global Warming in a Politically Correct Climate: How Truth Became Controversial* (2004) and Christopher Essex and Ross McKitrick in *Taken By Storm: The Troubled Science, Policy and Politics of Global Warming* (2002), include a corollary first-stasis question. After firmly illustrating that humans do not notably increase global warming, they ask: how did the "false doctrine" of global warming come to "thoroughly enthrall all parties concerned with this subject—the press, governments, non-governmental organizations, scientific and educational organizations, and corporations" (Essex and McKitrick 18)? Mathiesen argues that people are willing to accept global warming—even if it is supported by patently false data—because they get their information from the media. The media, he laments, do not understand science, so they resort to using political correctness as their guide (xxiv).

[54] Lee and Guzzo provide no source for this assertion. Presumably, this is their estimation.

Essex and McKitrick also argue that the media, and as a result, lay people, do not understand science. They write that "many sophisticated and influential people today have a level of scientific and mathematical knowledge that would not compare to that of a monk from the Middle Ages (23). As a result, lay people hear about science issues that they have no hope of understanding. "As often as not, such gaps in knowledge are filled in with fears and insecurities. Without real knowledge, people act on those fears and make poor choices that leave us worse off" (Essex and McKitrick 24). In other words, when people cannot understand science, they become fearful. They accept the impending doom of global warming because they are frightened. Much like Elizabeth Ervin's argument that creationists accept religion as a replacement "plenary authority (454)," so-called global warming alarmists make fear their plenary authority. According to Essex and McKitrick, people do not consider the observable facts of global warming; instead, they simply respond to their fears.

After discussing why people are willing to believe that global warming is an impending disaster caused by human activity, anti-environmentalist writers turn to the second stasis where they address the question: what is the character of global warming? They argue that it is difficult to talk about this issue because many environmental scientists willfully overlook important evidence that does not support global warming. Michaels and Balling, for example, make a complicated argument to this end that uses Thomas Kuhn's argument about paradigm shifts.[55] Michaels and Balling interpret Kuhn as arguing that when opposing data threatens accepted paradigms, people will tend to ignore reality. Michaels and Balling then apply this argument to global warming:

[55] Michaels and Balling reference Thomas Kuhn's famous 1962 work *The Structure of Scientific Revolutions.*

"'normal science' in the greenhouse issue is the notion that computerized climate models are producing a largely realistic picture of the atmosphere warmed by carbon dioxide…and that warming will be rapid and disastrous. In the longest run, though, Kuhn is predicting that something will eventually be found to be gravely wrong with the current paradigm[56]…" (10). What Michaels and Balling attempt to do here, with Kuhn's help, is show that environmental scientists have overlooked grave evidence that goes against the likelihood of rapid global warming.

Ray and Guzzo attempt to demarcate types of scientists—who they call theorists and realists—in order to show that realists are starting from the correct scientific standpoint. They argue that theorists "develop intellectual models of how nature is believed to work and then, using very highly sophisticated (and expensive) supercomputers, they make computer simulations from which conclusions and predictions are derived." Realists, on the other hand, collect and measure data. "They believe that natural phenomenon can best be understood by gathering evidence from nature itself. They believe in studying what actually happens in the natural world." So what is Ray's position? She writes, "My obvious bias is toward direct evidence and measurement" (*Environmental* 30-31). Ray and Guzzo go on to argue that only direct observation qualifies as acceptable evidence. Theorizing—using computer simulations—is not acceptable science, according to them. In terms of stasis, Ray and Guzzo suggest that not only should scientists ask about the causes and effects of global warming, they must answer the question from a realistic perspective, not a theoretical one. Mathiesen concurs and makes a similar demarcation between science and politics. "The role of

[56] The wording here may suggest that Kuhn is actually discussing global warming. In reality, he speaks generally of various shifting paradigms in the sciences—he does not mention global warming.

science is to objectively test every hypothesis without prejudice. Observation is the ultimate judge of whether something is so or not….Such ruthless objectivity clashes with the muddled thinking, selective observation and subjective reaction of political correctness" (77). Mathiesen argues that we must rely on observation—the realistic perspective—in order to answer questions about global warming.

Only two anti-environmentalist writers argue that the existence of global warming will provide positive consequences. While other writers address the second stasis questions by arguing that damages will be minimal or that we can adapt with the use of technology, both Fred Singer and Thomas Moore argue that the presence of global warming will only serve to make our planet more habitable. Singer points out that "human activities, especially agriculture, have always thrived during warm periods and faltered during cold periods." He maintains that warmer periods have always been beneficial to humans, and argues that people multiply more and live longer and healthier lives during warm periods (Singer 4-17). Singer and Moore's position is somewhat anomalous here—they are the only writers who focus solely on the effects of global warming as beneficial. The other writers agree that global warming is negative, but they argue that the harmful effects are minimal. Most notably, the other writers argue that the character of global warming is basically irrelevant because technology can fix any problem it might pose. Anti-environmentalists critique the environmentalists for beginning at the second stasis question—what is the character of global warming—without first discerning a clear answer to the first stasis question: does global warming exist specifically as a result of human activity. In rhetorical terms, the anti-environmentalists critique environmentalists for using deliberative rhetoric, which they

then use to influence governmental policy. Anti-environmental writers attempt to remain in the province of epideictic rhetoric, or what Gross characterizes as the celebration of methods (Gross 11). More specifically, anti-environmentalists celebrate the neutrality of science, its supposedly complete separation from political matters, and its ability to save us from any impending doom.

The emphasis on multiple first-stasis questions indicates that anti-environmentalists dispute the way in which environmentalists envision the global warming debate. The anti-environmental insistence upon asking questions that probe not only the causes of global warming, but the reasons that people embrace global warming alarmism suggests that they approach the issue from a largely different perspective than do environmental writers. According to anti-environmental writers, the environmentalists have simplified the stasis questions, and in doing so, overlooked important aspects of the debate, and limited the ability of each side to talk to each other. Mathiesen, for example, writes, "The calamity promoters adopted the myopic view so typical of the great environmental issues, the one which holds mankind solely responsible for real or imagined changes in conditions in the environment while ignoring even the possibility of variations in natural factors which create and maintain them" (39). The fact that Mathiesen calls environmentalists "myopic" indicates his belief that environmentalists are overlooking important aspects of the global warming debate.

Arrangement

In this section, I show how anti-environmentalists use their organizational structures to build ethos and develop a rapport with readers. The writers complete these tasks in the opening sections of their books in order to cast suspicion on mainstream

science. Building authority and rapport primes readers for rejecting the arguments of mainstream science; they are then free to reject biased science and embrace the alleged value-free science of anti-environmentalists. Writers attempt to assert their own political leanings under the guise of neutrality. The rest of the book becomes palatable and believable as the writers establish their ethos as neutral scientists who supposedly simply present the truth.

Much like other works of popular science, anti-global writers follow a particular organizational structure intended to bolster the credibility of the writers, and thus, the claims of the writers. As readers might expect, the works do not follow the standard organizational structure of mainstream science. While all of the works mention other global warming research, there are no discernible literature review sections. Furthermore, none of these works includes a section on methodologies or the results of any kind of study. Like creationist books, these books use forewords, prefaces, and introductions (written by the authors themselves or another writer) to establish the personal credibility of the author and his or her membership within the mainstream science community. Later they use those credentials to denounce environmentalists as pseudoscientists. Finally, they argue that anti-environmentalism is more closely aligned with mainstream science than environmentalism is. They argue that environmentalism is an entirely political movement based solely on personal and/or political agendas.

All of the writers begin by enthusiastically establishing their own credentials or by having guest writers extol their scientific credibility for them. For example, Fred Singer, author of *Hot Talk, Cold Science: Global Warming's Unfinished Business*, is "an atmospheric and space physicist" with "unassailable scientific credentials" (vii), though

his specific scientific background is unclear. The author of the introduction, Frederick Seitz, whose own credentials are also unclear, assures us, "Professor Fred Singer has never been one to lean on conventional wisdom" (vii). In other words, Singer will not be swayed by folk wisdom—he relies only on the facts. Dixy Lee Ray and Lou Guzzo begin one of their works, *Environmental Overkill*, with an encomium to other mainstream scientists. They acknowledge a Dr. Beckmann and a Dr. Teller who "have demonstrated their passionate devotion to truth in science and their unshakable belief in its remarkable power to improve the lot of human beings" (*Environmental Overkill*, vi). Ray and Guzzo do not explain who Dr. Beckmann or who Dr. Teller are, leaving readers to guess.[57] Ray and Guzzo attempt to align themselves with respected members of the scientific community, even though they never reveal who Beckmann and Teller are. All we need to know, however, is that they are devoted truth-seekers.

Ray and Guzzo use the dedication in another of their works, *Trashing the Planet*, in order to make common citizens feel as knowledgeable and capable as a mainstream scientist. They dedicate the work to "those sensible citizens who may wonder or worry what all the environmental fuss is about but whose access to facts is limited to the hyperbole of the popular media or to the technical papers that are replete with qualifications and footnotes and are seldom written in common language" (vi). At the same time, they critique scientists who cannot and will not speak to lay readers. They dedicate their work to all "those honorable men and women of science and engineering … who work to better the conditions for human life on this planet" (vi). Ray and Guzzo

[57] Presumably, Ray and Guzzo are referencing Dr. Edward Teller, a senior research fellow at the Hoover Institution from 1975 until his death in 2003. Teller was also a member of the General Advisory Committee of the U.S. Atomic Energy Commission from 1956 to 1958 and chairman of the first Nuclear Reaction Safeguard Committee ("Edward Teller").

claim that they successfully belong to both groups: "We have tried to be true to [scientists] while serving [the public]" (vi). They see themselves as respectable mainstream scientists, but they also see themselves as servants or stewards of the lay reader.

Other writers claim similar commitment to mainstream science, but ironically reveal their own political biases. Patrick J. Michaels and Robert C. Balling Jr., authors of *The Satanic Gases: Clearing the Air about Global Warming*, brag that they do not buy the hype surrounding global warming *because of* their extensive scientific backgrounds. Michaels is a professor of environmental science at the University of Virginia and Balling is the director of the Laboratory of Climatology at Arizona State. While they agree that the Earth is growing warmer, they maintain that the warmer temperatures will hardly be catastrophic. The reason for the global warming hysteria, they argue, is that politicians use the issue to gain votes. Al Gore, for example, blamed "every weather tragedy he could find—and the United States normally is replete with them—on global warming" (xii). Michaels and Balling argue that Gore's interest in global warming is borne not out of an scientific interest, but as a means of convincing voters that the fate of the world depends upon his election. They carefully pitch themselves as the opposite of Gore: they argue they are lacking in self-interest and motivated solely by the desire to deliver the truth. Ironically, one need only turn back to the first page of the introduction to see that Michaels is a Senior fellow at the libertarian Cato Institute, a possible marker of his own political affiliation given the Cato Institute's commitment to the anti-global warming position. Once again, it is important to note that I am not criticizing Michaels for identifying with a particular political group. My point is that it is hypocritical to call

Gore biased because of his political associations when Michaels' project is published by a political organization that has already taken a position on the global warming issue and only publishes material that advances its own political viewpoint. The Cato Institute likely would not publish Michaels if he were to take a contrary position on global warming because they have already clearly stated their view on the issue. To suggest that he is somehow neutral is entirely disingenuous, yet convincing for many readers. Unlike Gore, who is very clearly associated with the Democratic party, Michaels' relationship to the Cato Institute is only clear if one pays close attention to the publisher of his book.

Ray and Guzzo also claim neutrality, but they implicitly align themselves with the right-wing conservative movement. Rush Limbaugh provides an enthusiastic endorsement on the book jacket:

> A way must be found to get this book into the hands of as many Americans as possible. The myths promulgated by militant environmentalists are now accepted as fact by far too many who actually rob them of their economic and political freedom. Dixy Lee Ray challenges the environmental prophets of doom and gloom with penetrating, searing truth. *Environmental Overkill* is a bright light that exposes the fraud and deceit being perpetuated against an unknowing public. (qtd. in Ray and Guzzo, *Environmental Overkill*)

The hearty endorsement from Limbaugh serves as a link between the writers and the conservative community for whom they write. Ironically, Ray and Guzzo claim their book is an attempt to sort out the scientific facts from the political biases of environmental scientists. Using Limbaugh on the dust jacket is a not-so-subtle way of

establishing a political affiliation without having to claim a direct relationship to conservative audiences.

After establishing their own ethos, anti-global warming writers work to separate themselves from environmental scientists. Casting doubt on mainstream science is a difficult job that writers have to handle delicately. After all, as I have mentioned earlier, science is a well-respected institution in our culture. Paradoxically, Americans are also growing suspicious of mainstream science because people often see scientists as exclusionary, power-hungry, and capricious—people often think that science changes daily depending on the whims of the scientists and their own personal, economic, and political goals. Anti-environmentalist writers use the common person's doubts about science to establish their own credibility. For example, Mathiesen, in *Global Warming in a Politically Correct Climate*, begins his work with an epigraph, which he took from Alan Bloom's *The Closing of the American Mind*: "Jonathan Swift says that scientists in power and with power don't give a damn about mankind as a whole. The whole conspiracy is like any other. The potential tyrant speaks in the name of the common good but is seeking a private good" (qtd. in Mathiesen vii). The quotation seems to suggest that scientists are involved in a conspiracy, and that while mainstream scientists claim to be seeking the common good, they are often seeking private goals, though they are unclear about what those private goals might be. While the quotation may have been taken out of context, both by Bloom and Mathiesen,[58] it underscores the anti-environmentalist belief that scientists obscure truth for their own purposes. Therefore, scientists cannot be trusted.

[58] Bloom does not reference the Jonathan Swift work from which he took the quotation, nor does Mathiesen ever refer to Bloom's purpose in *The Closing of the American Mind*.

Environmental scientists cannot be trusted, according to anti-global warming writers, primarily because they have "religious" biases.[59] Specifically, anti-global warming writers want readers to associate a particular value system with environmentalism; in this case, they argue that interest is "political correctness." Mathiesen, and the author of the Foreword, Zbigniew Jaworowski, whose title includes an MD, a PhD, and a D.Sci, definitively state that political correctness has become an impediment to progress of any sort—and most anti-environmentalists believe progress is always positive. Anti-environmentalist writers use the term political correctness quite frequently, though few actually define what they mean by the term. They generally use it to associate science, intellectualism, environmentalism, and liberalism as a religion of sorts for liberals—again, a code for secular humanism. In the introduction to *Global Warming in a Politically Correct Climate*, Mathiesen characterizes political correctness as "a need to veil uncomfortable truths, to oversimplify and to favor subjective reason over objective reason in a process where the distinction between true and false is increasingly replaced by one between what is taught to be good or bad" (xix). It rules people through "mediocre thought" and relies on "half truths" and "manipulation." It offers "relief from recognizing unpleasant facts and independent thought" (xx). Mathiesen, however, offers no specific examples of how political correctness, or environmentalism, has negatively affected people. Mathiesen continues his assault upon the nebulous concept of political correctness, lamenting the fact that the PC hysteria affects everything from science to our public schools. He seems to believe that public schools should be on a mission to teach truth—which includes science—to hungry young

[59] Anti-environmentalists seem to be suggesting that political correctness is a code word for secular humanism, which they argue is a religious bias.

minds, but political correctness, the amorphous enemy that he cannot quite define, works to obscure this truth in an effort to make school children feel good about themselves. He tells us, "Political correctness pervades society on all levels" (xxv). Kids are being sent home from school for not being PC and it is all part of a "circus of absurdity typical of a shortage of reason" (xxvi). He suggests that political correctness obscures "fundamental truths" and results in "laudatory epithets bestowed on the young who cannot know what they have not been taught" (xix). Again, he offers no specific examples to support his argument. Matheisen believes that global warming awareness is nothing more than political correctness gone awry, yet his angry attack on public schools has little to do with environmentalism. He calls the global warming awareness movement a "circus" (xxiv) and an "adventure" (xxiv); he suggests that environmentalists worship on "the altar of political correctness" (xxiv). His real argument, however, seems to be that a cultural movement is masquerading as science.[60]

Mathiesen reiterates the role of the scientist in simply relaying truth to a trusting audience and suggests that environmentalists champion this political correctness under the guise of neutral science. Jaworowski, the writer of the introduction, also obviously wants to link political correctness with religion in order to highlight the supposed hypocrisy of science. By doing this in the introduction, he attempts to convince readers that mainstream science is not absolutely neutral and value-free; scientists simply choose the values to which they will adhere. In this case, Jaworowski implies that the "religion" of science is political correctness. He argues that the environmental movement has "given rise to a belief that man is creating a looming natural catastrophe by pursuing

[60] This sentiment is the same one that certain mainstream scientists express; in fact, evolutionists critique creationists because they discuss personal values as opposed to simply discussing the scientific data.

economic growth and generally improved well being for mankind" (xviii). Environmentalists' singled-minded pursuit to halt progress, Jaworowski argues, is a result of science sullied by values and beliefs of the scientists themselves. He suggests, "Science eroded the influence of the church and now, to our bafflement, science is undermined by a political correctness syndrome, the roots of which are less obvious. In its many manifestations it can easily be mistaken for a conspiracy against reason" (xviii). Jaworowski seems to argue that science has historically refused any involvement with religion, and, in fact has wholeheartedly fought against the introduction of any religion into science.[61] However, he suggests that contemporary science is controlled by its own new religion: political correctness—an illustration of the hypocrisy of science.

Jaworowski and Mathiesen make a clever conceptual connection in their introductions. They define mainstream science as truth, free from any sort of bias, particularly a religious bias. Then, when they suggest that global warming is part of the political correctness movement, they can argue that any scientist who suggests global warming is a serious scientific issue must be a biased hysteric with a political/religious agenda. Rejecting political correctness, as anti-environmentalists claim to do, means that one is not motivated by an agenda—one is a truth-seeker. Obviously, the logic here is flawed, but anti-environmentalists do tap into an accepted epistemology of science—one that holds science as synonymous to fact, and more important, to truth. They suggest that anti-global warming writers (and readers) are fact-gatherers; they are common-sense-users who are not ruled by religion. Anti-global warming activists do not need the seemingly complicated mainstream epistemology of science that seems to run counter to common sense. Anti-global warming supporters can use their own personal authority to

[61] This is likely a reference to the creationist debate.

observe and draw conclusions about the environment. Thus, they privilege themselves over other observers.

Because of this argument that global warming is motivated by a pseudo-religious agenda of political correctness, anti-global warming writers criticize and dismiss any scientist (or reader) who accepts the veracity of global warming. Furthermore they suggest that scientists (or readers) would accept global warming only if they had a vested political interest. For example, Frederick Seitz, in the introduction to Fred Singer's book, predicts that some readers will quickly dismiss Singer's anti-global warming position in order to hastily "establish international agreements and poorly conceived policies and regulations" (vii). These are the scientists, according to Seitz, who use global warming to advance a political agenda. Singer, on the other hand, wants to understand "the mechanisms that cause climate change—in response to natural or manmade forces—and, perhaps more important, to secure a place for science outside the realm of selfish bureaucracy or the reach of irrational environmentalism" (viii).

Other writers also seek to align themselves with what Mathiesen classifies as the "relentlessly objective reason" (xxvi) of science while underscoring the unscientific nature of environmentalism. Michaels and Balling argue that global warming is an "interesting scientific problem being played out as political drama" (1). They urge us to "remove the melodrama" from our discussions of this scientific issue (5). Singer concurs that the global warming movement is an attempt to "mitigate climate 'disasters' that exist only on computer printouts and in the feverish imagination of professional environmental zealots" (ix). All of the anti-global warming writers worry that our government has made

choices based upon its own agenda versus the hard facts of science. Instead, anti-global warming writers urge us to consider the observable evidence that is before us.

Finally, after fleshing out the differences between "real" science and politically-motivated science, anti-global warming writers use the introductions to assert their own political agendas. Ironically, they urge readers to dismiss the threat of global warming and rest assured that the world will continue as it always has before. The introductions serve as a tranquilizer for anxiety-ridden readers—there is nothing to worry about and the introductions foreshadow reassurances from our expert writers. Ronald Bailey, in *Ecoscam: The False Prophets of Ecological Apocalypse*, provides a positive outlook for the future when he asks us to remember that human history proves that humans always prevail. "Life and progress will always be a struggle and humanity will never lack for new challenges, but as the last fifty years of solid achievement show, there is nothing out there that we cannot handle" (Bailey xii). Ray and Guzzo have faith that all problems "are amenable to solution when we use the knowledge that science can provide" (*Environmental* ix). Mathiesen argues that prior generations had the wherewithal to combat any problem through objective reason; he then goes on to say that reliance on God, as opposed to individuals, will somehow allow us to return to a "reliance on reason and objectivity" (xvii). He goes on to say that environmental "hysteria" is the result of too many people "choosing to follow a path of least resistance in the absence of a compelling, commonly shared reason to do otherwise" (xviii-xix). His antidote is a combination of science and the rejection of relativism. After all, it is the erosion of ideal standards that diminishes "true individual freedom which is only fully possible in an ideal world where truth reigns and the distinction of good from evil guides every action"

(xviii). He concludes by arguing that "false prophets abound in an age when reason is dimmed and guidance is offered by a code of political correctness" (Mathiesen xviii). Even though Mathiesen's impassioned statements have little to do with the issue of global warming, he urges readers to focus on science—truth and reason—because it will solve all of our problems. This is, on the surface, epideictic rhetoric—a loving tribute to science as the ultimate truth. Beneath the surface, however, it seeks to undermine mainstream science and instead champion the individual who rejects global warming. The unusual epideictic nature of these books is evident as writers celebrate an idealized version of science. The writers want readers to accept their scientific epistemologies immediately upon reading the introductory material. Once they have established their authority within this idealized mainstream scientific community, they are ready to present their claims. Their evidence is of little importance at this point because of the work their organization has already done for them.

The organization reveals that these works are clearly not mainstream scientific accounts because they do not include the requisite parts, including a literature review, methods, results, and discussion; however, none of these writers claims to be producing mainstream science. Their arrangement indicates that they are doing popular science, where the introductions serve to introduce a thesis. Popular science *begins* with a premise and promises evidence later, which may or may not be presented. Ray and Guzzo, for example, tell readers: "This book was written because I believe too many people are losing touch with common sense" (*Trashing*, ix). Ronald Bailey states his thesis that we have lost faith in human progress and ingenuity (2). Other writers, such as

Singer, Mathiesen, and Michaels and Balling, argue that environmentalism is too political and therefore unscientific.

As popular science, these works simplify and present arguments to lay readers in the same way that mainstream scientists communicate with lay readers through popular science. Anti-global warming writers are claiming to be neutral scientists who simply want to relay facts. The fact of the matter is that they are also presenting political agendas, sometimes in subtle ways, in very much the same way Rachel Carson and Paul Ehrlich tied their scientific and political arguments together. Anti-environmentalist agendas are every bit as political as the environmental agendas they critique. Ronald Bailey, for example, argues, "With the advent of apocalyptic environmentalism and the rejection of science and technology, it now seems Western Civilization may join the Ghost Dance" (4-5). He goes on to say, "Radical environmentalists are now the earth's vanguard class who will lead the struggle to bury capitalism and Western materialism" (6). Bailey's somewhat disingenuous criticism of environmentalism reveals one of the major values of the anti-global warming movement: economic progress. Ray and Guzzo also reveal their political bias when they discuss Representative John Dingell as "a liberal Democrat usually in favor of intrusive big government" (*Environmental* 145). Ray and Guzzo also say that one of the goals of the environmental movement, presumably supported by the big-government Democrats, is "preventing Third World countries from building modern refrigeration systems" (*Environmental* 45). Their argument paints environmentalists as supporters of a totalitarian-like government that wishes to prevent starving Third World residents from having food. This argument at once associates anti-global warming supporters with the Republican Party, generally associated with the

desire for less government. At the same time, it suggests that it is the environmentalist who heartlessly does not care about helping the poor. This subtly answers the criticism that Republicans do not care about helping the poor.

Style and the Critique of Mainstream Science

Much like creationists, anti-environmental writers use stylistic techniques to simultaneously affirm the scientific veracity of their work while critiquing the style of mainstream science. In Chapter 4, I discussed how creationists uphold a model of science that privileges observation and common sense. At the same time, they critique evolutionary science, which they contend is based upon speculative or theoretical models. Likewise, anti-environmental writers also privilege observational science, and they critique any climate science based upon data from simulated computer models, a common means of analysis for climatologists. Specifically, they critique the popular science writers who theorize or make predictions based upon computer-generated evidence. As I will show in this section, anti-environmentalists use specific descriptive language, metaphors, and analogies to create an image of a unified anti-environmental front committed to observational science intended for lay readers. This style works to depict environmentalists as sophistic rhetors while portraying anti-environmentalists as purveyors of truth. Their end goal is to depict scientists, who believe that global warming requires some sort of action, as political zealots who misuse science to achieve a personal agenda. In contrast, anti-environmentalists use stylistic techniques to, ironically, present themselves as rhetoric-free truth-seekers.

This mindset is evident in the specific language anti-enviro nmentalists use to describe global warming. Mathiesen, for example, calls the global warming debate a big

"circus" (xxiv); an "adventure" (xxvi); and an "alter" upon which environmentalist worship (xxi). Michaels and Balling refer to global warming as a "political drama" (1); a "melodrama" complete with "theatrics" (5); and a set of "storylines" (73). The use of stage metaphors suggests that global warming is simply a theatrical performance rather than a pressing global problem backed by scientific evidence. Mathiesen refers to anyone who is concerned about global warming, especially scientists, as actors in the drama (5), and he uses an extended stage metaphor to depict scientists as players who present a fictional show for unsuspecting audience members who do not understand it is merely a drama (3). Moore alludes to Greek tragedy, referring to global warming sympathizers as "doomsayers" and "Cassandras" (4, 102). The reference to Cassandra suggests that environmentalists believe they are accurately foretelling the end of the world, yet they feel that people foolishly dismiss their predictions.

Both Moore and Bailey directly refer to those scientists concerned about global warming as "prophets," suggesting that their concern about global warming is based in religious beliefs, not scientific ones. Bailey argues that anti-environmentalists attempt to "convert consumers and sinners to the new ecological faith" (86). The anti-environmentalist faction smartly picks up on historic divide between science and religion. By suggesting that concern for the environment is a religious belief, they make the argument that any scientist who suggests we should be concerned about the effects of global warming is simply using science to mask his/her religious beliefs.[62]

Essex and McKitrick also criticize scientists for using metaphors like "the greenhouse effect," which they believe does not accurately describe the character of

[62] There is a strong religious undercurrent in nineteenth-century nature writing; anti-environmentalists may be conflating more contemporary environmental science writing with the nature writing of people like John Muir or Ralph Waldo Emerson.

global warming. They actually speak directly to scientists, telling them that ineffectual and inaccurate metaphors have confused lay readers since the very beginning of the global warming debate. They ask, "Why didn't you scientists get to the point from the beginning? The point of reaching out to explain was to show the public that scientific thinking matters. What we get instead is the opposite conclusion, because simple metaphors seem to dispense with all the scientific fuss" (25). Essex and McKitrick maintain that these facile metaphors—of which they do not provide any specific examples outside of the term greenhouse effect—help to establish "Official Science" or the "Doctrine." They maintain that anything "contrary to the Doctrine has become virtually unpublishable" (25). They argue that metaphor, or rhetoric, creates this Doctrine, which then becomes an unassailable paradigm. The suggestion here is that style serves to create an environmental exigency—one that Essex and McKitrick argue is merely a rhetorical creation.

In addition to the metaphoric allusions to drama, tragedy, and religion, anti-environmental writers, particularly Ray and Guzzo who I discuss below, use a glut of observational evidence to prove that anything beyond the act of observation is simply political, not scientific. This observational evidence is an attempt to highlight the evidence as the only true scientific evidence. They do this in much the same way creationists present a glut of rationality to make it appear as if creationism *must* be science. Both creationists and anti-environmentalists use "overdescription" to create a "rhetorical presence" (Gross 53). Ray and Guzzo's insistence that any person can observe that winters are cold, sometimes record-breaking cold, underscores their idea that understanding global warming is not difficult—anyone with an ounce of common sense

can discern that global warming is not a serious threat.[63] The problem with this argument, according to some scientists, is that anomalous cold temperatures do not necessarily mean that global warming is not occurring. According to the National Climactic Data Center (NCDC), the world's largest archive of climate data, average temperatures have increased by approximately .4 degrees Fahrenheit in the past twenty-fives years; however, they note that temperatures have not increased uniformly. Some geographical areas have experienced colder-than-normal temperatures during certain periods, but that does not negate the average temperature rise across the entire globe.

Anti-environmentalist writers also focus on the *lack* of observational evidence for global warming. Ray and Guzzo remind readers that "no scientific issue can be resolved by strongly held belief—however eminent the authority….Opinion polls are useless: *only evidence counts*. Facts, measured and described and independently verified, constitute the only basis for drawing conclusions in science" (*Environmental* 14). The anti-environmental writers emphasize that science is purely factual, a premise that they believe everyone accepts. Singer also discusses the issue of observation and argues that when discrepancies occur between satellite observation and computer simulations, we must trust the observation (1). But he overlooks the fact that computer simulations enable scientists to predict future climate trends. That is part of climatology. Scientists of the International Panel on Climate Change, for example, generate and study computer simulations as part of their job and it is an accepted method of science.[64]

The use of hyperbole allows anti-environmentalist writers to emphasize their view that the environmental argument is ridiculous, and they rightly assume that readers will

[63] Recall Ray and Guzzo's outrage at the people who forgot the bitterly cold winters of 1982 and 1978 when NASA publicly announced, in 1988, that the globe is warming (*Trashing* 31).
[64] I could not find any numbers verifying the accuracy of computer-generated climate simulations.

equate ridiculous with unscientific. The anti-environmental statements are so over-the-top that the educated and professional writers likely do not believe that what they write is literal; their use of hyperbole is a stylistic technique for emphasis. Nowhere is this hyperbole more evident than when anti-environmentalists discuss the pioneering scientists of environmentalism, Paul Ehrlich and Rachel Carson. Ray and Guzzo, for instance, inform readers that Ehrlich's position on global warming is not credible given his stance on population issues. They sum up Ehrlich's beliefs in a ridiculous list of social polices that they suggest Ehrlich endorses. According to Ehrlich, they claim, "We must go back to the spinning wheel, returning to a beatific state of endless drudge labor, six days a week, and exhaustion on Sunday" (*Environmental* 77). They claim Ehrlich does not want anyone taking vacations because he wants to end the use of fossil fuels. They say Ehrlich does not want rich people to have children because "the rich are the cause of most of the world's ills" (*Environmental* 78). Furthermore, Ray and Guzzo claim that Ehrlich believes you can only be "good parents by having 1.5 children" (*Environmental* 78). Obviously, the reference to 1.5, an impossible number of children, suggests that Ehrlich is so driven by statistics that he overlooks common sense. To further emphasize what they believe to be Ehrlich's radical views, Ray and Guzzo quote Ralph de Toledano, the conservative reporter who critiqued Paul Ehrlich's work in the June 11, 1990 article in the right-wing publication, *National Review*; de Toledano characterizes Ehrlich and other environmentalists as heartless, self-absorbed misanthropes. "They want a society in which the elite have organic strawberries and cream, and the rest of the people thank them each day for saving the tsetse fly and the precious mosquito" (qtd. in Ray and Guzzo, *Environmental* 78).

Anti-environmentalists' discussions of Ehrlich's arguments in *The Population Bomb* and his other environmental works are wildly inaccurate, completely exaggerated, or just plain distorted. Their hyperbolic treatment of Ehrlich's works does reflect his passionate belief in environmental conservation and his insistence on recognizing the intrinsic value of nature, yet lay readers likely read these discussions and dismiss Ehrlich, and other environmentalists, as crazy radicals. Bailey, for example, argues that environmentalists, like Ehrlich and Carson, are really proposing Marxism (18). The suggestion, of course, is that environmentalists are Un-American. Ray and Guzzo purposely use language that emphasizes American values and democratic ideals. They rail against environmentalists who ask us to relinquish our "independence" and our "liberty" (*Environmental* 12). They further undermine the environmental movement by misrepresenting the credentials of prominent environmentalists. Ray and Guzzo lament the existence of the Union of Concerned Citizens and Physicians for Social Responsibility because, according to them, the members are not dedicated, truth-seeking scientists. They report that Helen Caldicott, a prominent member, is *merely* a pediatrician and not an environmental expert. Paul Ehrlich, they write, is a lowly "butterfly specialist" (*Trashing* 12). They overlook Ehrlich's impressive list of environmental science credentials and suggest that Ehrlich *just* studies butterflies.

In addition to critiquing the scientific leaders of the environmentalist movement, anti-environmentalists choose environmental figureheads who may poorly represent the movement in order to conflate all environmental ideologies. For example, they hold up Ted Turner as an obtuse, anti-American environmentalist who allegedly says that Americans are all "pigs" and "losers" who need to return to a lifestyle of the "indigenous

people" as a means of preserving the planet. Ray and Guzzo sagely comment: "Surely no one listens to and accepts this drivel (*Environmental* 80). Since they do not provide a source for Ted Turner's alleged position on environmentalism, it is difficult to know whether Lee and Guzzo's summary of his argument is correct. Furthermore, they include this discussion of Ted Turner in the same section as their critique of Paul Ehrlich. They make no reference to the fact that Ted Turner is not a scientist and Paul Ehrlich is. Instead, they conflate the two figures, exaggerate their environmental claims, and then rhetorically question who would buy the garbage Turner and Ehrlich peddle? The implied answer is anyone who is stupid or lacking in common sense. Linking scientists and media moguls also works to support their claim that environmental science is tainted by politics, and any environmentalist, however lacking in scientific credentials, represents the entire movement.

Ray and Guzzo go on to argue that environmentalists also taint agencies, like the Environmental Protection Agency (EPA), with their ridiculous environmental agendas. Once again, they use hyperbole to summarize the EPA's suggestions for protecting the environment. They write,

> The EPA has begun to suggest that taking a hot shower *migh*t be carcinogenic, since the elevated water temperature *might* stimulate formation of chloroform from chlorine. There are no cases of asphyxiation or of cancer and certainly no cancer fatalities that can be traced to showering, but one can imagine a series of 'what ifs' and come up with a statistical model to predict…anything. (*Environmental* 147)

Ray and Guzzo emphasize the tentative nature of the EPA research in order to make the point that there is a multitude of 'what ifs' in any situation. Their characterization of the EPA research implies, however, that something as simple as taking a shower is now a health risk. Ray and Guzzo then argue that common sense shows that nobody has yet observed cancer, or any other health risk, directly related to hot showers.

A quick search of EPA reports reveals that Ray and Guzzo's characterization of the EPA research is inaccurate and exaggerated. According to *Science Daily*, researchers at the University of Texas in Austin studied chlorinated water and ground water tainted by gasoline from leaking tanks. *Science Daily* writes, "The U.S. Environmental Protection Agency is currently using the research to assess public exposures to chemicals, and subsequent health risks, once thought to enter the human body primarily through ingestion" ("Showers and Dishwashers"). The researchers are not suggesting that people stop taking hot showers, as Lee and Guzzo imply. They do suggest that more research is needed to study the effects of indoor air pollution. Until scientists better understand how indoor air pollution affects humans, the EPA suggests that people shower in well-ventilated areas with fans running or bathroom doors open. Lee and Guzzo's brief summation of the EPA studies is misleading and hyperbolic in its suggestion that the EPA wants to ban showering.

The crux of Ray and Guzzo's argument is that environmentalists want people to completely change their lifestyles as a result of the environmentalist political agenda. Other writers use hyperbolic statements to underscore the claim that environmentalists believe that absolutely everything causes environmental damage. Moore asks, "Does a Saturday afternoon barbeque, driving to church on Sunday or enjoying a heaping plate of

risotto contribute to the destruction of civilization, the ecology, and human life (1)? These are activities that most Americans do, but without citing any sources or referencing any particular claim, Moore argues that "many of our distinguished leaders, illustrious periodicals, and eminent scientists profess so" (1). The underlying argument here is that while common sense shows us that going to church on Sunday or having some risotto could not possibly affect the environment, yet politically-driven scientists want us to believe these activities are now dangerous and we need to stop doing them. Anti-environmentalists hope that lay readers will conclude that they need only use common sense to determine that the anti-environmental agenda is politically-driven and not supported by science. This focus on common sense goes back to the anti-intellectual believe that "inborn, intuitive, folkish wisdom" is superior to—and more honest than—the "cultivated, oversophisticated, and self-interested knowledge of the literati and the well-to-do" (Hofstadter 154). Anti-environmentalists continue to draw these lines between readers (the common man) and the scientists (intellectuals).

Chapter 8: Anti-environmental Writing as Conversion Rhetoric

Much like the televangelist—or the creationist—who urges readers to come forward and bear testimony about their conversion experience, anti-environmentalists recognize that readers have been led astray and require guidance in order to know "the truth" about global warming. But they also have faith that readers have already embraced the anti-environmentalist conception of science as a truth-seeking quest and a panacea for the world's ills. This conception of science is so deeply rooted in culture that almost every lay reader would naturally bring that ideology—that faith—to their reading. Like the audiences of televangelists who already embrace the shared tradition of Christianity, readers of the anti-environmentalist works bring their faith in science to their reading. As Wright notes, the televangelist uses conversion prayers and testimonies at the end of religious programming in order to "symbolically [separate] the faithful community from the unsaved viewer while, through acknowledging the existence of the unsaved, it identifies the community's boundaries" (753-4). Anti-environmentalist works, then, are testimonies to a particular conception of science. The use of conversion rhetoric works to continue and affirm a shared tradition for an audience of believers in science as the only way to find truth. Ironically, anti-environmentalist writers spend a significant amount of energy disparaging scientists, as I illustrated in Chapter 7. However, recall their argument that scientists who are concerned about global warming are driven by political goals. Specifically, recall Mathiesen's claim that global warming scientists are hindered by their "political correctness syndrome" (xviii). In addition, Ray and Guzzo argue that

global warming scientists and environmentalists want to "reduce progress and economic growth in the industrialized world" (*Environmental* 4). Anti-environmentalists argue that they are doing "true" science that is not motivated by a political aim. Anti-environmental works use conversion narratives to solidify a community of believers while identifying and isolating the unsaved—those who do not understand or agree with their conception of science.

Recall my earlier argument that the creationist movement is overtly motivated by religious convictions. Creationists tend to focus on the importance of understanding and accepting creationism because accepting evolution, in their eyes, means accepting the creation of human life with no deity. They worry about the moral repercussions of a world in which our account of creation is impersonal, random, and vastly different from the Genesis account of creation. But, as I discussed in Chapters 3 through 5, creationists understand that science can explain phenomena only by gathering evidence and proposing theories based on that evidence. Religion can play no role in this process. Intelligent Design theorists have begun to tell a new story that, in their view, adheres to the rules of science. They focus on testable evidence that they believe proves their assertions. As I discussed in Chapter 5, creationists, like scientists, also weave a narrative that reveals their underlying values and ideologies as a unified group of like-minded individuals. Their stories reveal their conservative religions values, their distrust for professional academics, and their belief that the lay person can easily see for himself or herself the truth about creation. I noted that creationists position themselves as victims or martyrs as they fight against the dogged evolutionists who have their own story—one that

creationists believe privileges academia and eschews sensory or common sense knowledge.

Anti-environmentalists characterize scientists in some of the same way that creationists do. They argue that environmental scientists rely on computer models and simulations to prove the existence of increased global warming, but anti-environmentalists insist that we need only use our common sense, our experiences, and our observations to conclude that global warming is not a serious threat. Like creationists, they respect mainstream science and attempt to fit within the confines of that ideology. Their accounts reveal their insistence that sensory observation can tell us anything we need to know about climate change. At the same time, these accounts present an ideology outside the scope of mainstream science.

Anti-environmentalists also tell stories, but they are very unlike those of creationists. First of all, anti-environmentalists do not make an overtly religious argument. In fact, they reiterate over and over again that religion has no place in science. They use that idea to criticize environmentalists who, they argue, are "worshipping" nature and are, therefore, mixing science and religion. But anti-environmentalists do tell narratives that reveal their own values as a group. The accounts they present illustrate their reverence for technology in the same way that creationists reveal their reverence for a creating deity. Within these accounts, anti-environmentalists present themselves (and their readers) as the victims or martyrs of environmentalists, particular scientists, who they depict as self-promoting misanthropes. These narratives serve as conversion rhetorics, or "goal-directed persuasive language" (Wright 738). I noted in Chapter 5 that televangelists use these rhetorics to "present their audience with a set of recommended

roles and relationships which, if enacted, would generate in practice a structure, the moral community, whose current existence is necessarily assumed in the same rhetoric" (Wright 739). Like televangelists, anti-environmentalist writers are generally "preaching" to an already-converted audience, at least in some respects. Anti-environmentalists believe that if readers believe that global warming is a serious issue, then it is only because they have been misled by the media. Essex and McKitrick, for example, attribute the success of global warming campaigns to the "rhetoric weapons" of environmental scientists (10). These authors argue that they are "tired of seeing science twisted into a prop for political ideology;" therefore, their book is an attempt to lead naïve readers to the right conclusions free from the "authoritarian grandstanding" of environmental scientists who choose not to do the "slow work of research, debate, and persuasion" (10). This statement represents the general consensus among anti-environmental writers: people have been misled by disingenuous scientists with radical environmental political agendas.

The Story of Anti-Environmentalism

My neo-Aristotelian analysis, in the previous chapter, showed the rhetorical techniques that anti-environmentalists use, such as a specific manner of arrangement that highlights the authority of the authors, an invention strategy that recasts the questions that environmentalists ask about global warming, and an emphasis on analogies and metaphors that attempt to show environmentalism as ridiculous. Using fantasy-theme analysis, I analyze the anti-environmentalist narratives in order to better understand the character of the rhetors and the audience.

Anti-environmentalism seeks to enact social change. Ideally, they want readers to eschew environmentalism, and completely dismiss what environmentalists tell them

about global warming. In particular, they want readers to dismiss the idea that global warming is an imminent threat. Ultimately, anti-environmentalist writers want to convince readers that they can relax, live their lives without fear, and trust that science (and, more important, technology) will obliterate any possible harmful effects of global warming. Anti-environmentalists repeatedly reassure readers that the world is a better, safer place than ever before and that science and technology can only make it even safer and better.

Their narratives build on three significant threads: first, anti-environmentalist writers create heroes, common people who use their common sense and physical senses to observe the world around them. They use this data, or evidence, to draw conclusions about their environment. They are reasonable and unemotional. And they are victims of the villains. The second narrative thread is the creation of these villains: scientists who are politically motivated, overly reliant on their emotions, and completely lacking in common sense. According to anti-environmentalists, these scientists are removed from the real world and overly idealistic. They romantically envision the good old days when global warming did not exist, and these villains seek to halt all progress in order to return to the good old days. Finally, the narratives culminate with the moral of the story: science and technology will save us all. The moral of the story is that the heroes will prevail, even though it is unclear how it will happen, and the villains will look like a bunch of idiots. All of the arguments that anti-environmentalist writers make lead up to that assertion. In this section, I will examine how anti-environmentalist writers establish these threads.

Like any good story teller who is in tune with his or her audience, anti-environmentalist writers create heroes with whom readers can identify. More important, the writers suggest that the heroes and their readers are the same people. That common person is wise, observant, and intuitive. She or he has a finely-tuned malarkey-meter which allows him or her to see the obvious flaws in the global warming debates. Writers describe the readers as the kind of in-touch people who are able to actively and perceptively use their common sense to analyze the world around them. The writers encourage readers to use this folk wisdom to analyze the global warming controversy. For instance, Ray and Guzzo tell readers that they understand why "thoughtful people" raise the question, "'Who should we believe?'" in the global warming debate (*Environmental* 29). Ray and Guzzo advise, "Look for evidence, not for arguments; discount any unsupported assertions, even if they come from an eminent authority, and then make up your own mind based on what facts you can assemble and on your own common sense" (*Environmental* 29). Anti-environmentalists work to convince readers that they are wise; therefore, they should be able to clearly determine fact from fiction. Furthermore, they ask readers to sort out the "argument," or the rhetoric, and instead rely on the "evidence," or the real science. They imply that real science cannot possibly be rhetorical.

Mathiesen advises readers not only to rely on their judgment, but also to be skeptical of academics who, he argues, only want to further their own careers. "Academia has become increasingly resistant to truth as political correctness rules the stream of grants" (Mathiesen 69). Mathiesen suggests that only lay readers can be objective because they do not have a political agenda. In addition, he argues that many people,

scientists included, rely on information because it came from a respected authority. Mathiesen tacitly compares observant readers to respected historical figures to show the importance of doubting authority. Galileo, he reminds readers, would have been wrong if he had listened to his denouncers. One of his observations—that the sun had spots—was a "politically incorrect assertion in the seventeenth century" (82). Mathiesen draws this parallel between Galileo and skeptical readers who doubt the authenticity of global warming in order to show that they all stand up to established authority, rely on their own observations, and trust their common sense. Mathiesen laments the fact that responsible readers, like Galileo, will suffer as a result of scientists' hubris, the way Galileo suffered as a result of the Catholic Church. The ban on CFCs, for example, ultimately affects the public, but "the public will simply have to grin and bear it. Political correctness allows it all in the name of simplification, majority rule in science, subjective judgment and exclusion of truth and objectivity" (51). In other words, conscientious readers will suffer at the hands of the untrustworthy academic who follows the rules of political correctness, even if there is evidence to the contrary. Michaels and Balling agree, as they remind readers that mainstream scientists are "quite good at theory and logic but oftentimes do not like to be disturbed by data and reality"[65] (46). The implicit message here is that lay readers understand science better than even professionally-trained scientists do. The authors also seem to be calling on a negative stereotype of academics in general, which is

[65] They make this comment in reference to scientists who argued that El Niño, a phenomenon that caused disturbances in the ocean atmosphere, was a manifestation of global warming. The scientists to whom they refer make up the majority of the IPCC. Michaels and Balling point out that the seventy members of the committee are "bona fide climatologists," but they also point out that only ten of these scientists deny the harmful effects of global warming (17). Michaels and Balling believe that ten global warming doubters represents an impressive percentage of dissenters and presumably believe the other sixty people are scientists who prefer not to be "disturbed by data or reality" (46).

the idea that academics are so far removed from the "real world" that they are unable to understand reality.

Rhetorician Elizabeth Ervin points out that academics often do not see themselves "as members of the public into which they occasionally 'venture.'" Ervin argues that this rift between academics and nonacademics gives rise to the question, do academics want to engage in any sort of public debate or do they want to "own and dispense knowledge in a public forum?" She warns that this particular attitude will result in a "pseudodebate in which participants retreat into discursive entrenchment." Ervin's depiction of evolutionists mirrors the image that anti-environmentalists have of scientists who cannot or will not engage with nonacademics, even though common people may be better able to understand the issues. For example, in *Trashing the Planet*, Ray and Guzzo emphasize that any Joe Blow ought to be able to discern whether or not global warming is occurring; however, they sympathize with readers who have been led astray by dishonest scientists and media spokespeople who want them to believe that global warming analysis requires academic training. They cite the case of NASA spokesman, James Hansen, who, in 1988, announced that rising temperatures served as evidence of global warming. Ray and Guzzo marvel at the people who had already forgotten the unseasonably cold winters of 1982 and 1978 when 200 people supposedly died as a result of freezing temperatures. Likewise, when *Time* announced that its 1988 "man of the year" was none other than the "overheated Earth," people seemingly forgot that Alaska had just experienced its coldest winter in history (31). The implication here is that only a simpleton, or those who have been misled, would believe the environmental hype surrounding global warming. Astute people who are even the slightest bit aware of their

surroundings—like readers of anti-environmentalist books—would easily see that global warming is a fiction.

As in any good story, determined heroes require equally determined and evil enemies. Heroes must be able to battle for the ultimate good and obliterate the ultimate evil—or at least discredit the enemy's story. In this case, the beneficent cause is the quest to create a ubiquitous feeling of calm and safety among everyday citizens. The evil environmentalist crusade is calculated to create feelings of alarm and overwhelming panic among citizens in order to advance a selfish and largely destructive political cause.

Anti-environmentalist writers depict their enemies in a hierarchy of blame. Politicians and politically-minded scientists are at the top of the hierarchy. Anti-environmentalists suggest these two groups feed off of each other. Politicians use bad science to support their causes; scientists use politicians to gain grant money and prestige for their work. Popularized science and the media are directly below politicians and scientists in the hierarchy. Media report the bad science, which they get from scientists. At the bottom of the hierarchy are common citizens. While anti-environmentalist writers blame those citizens who fail to use their common sense, they also excuse lay people who cannot help but be confused by the bad information they receive from respected authorities. They suggest that citizens are victims or pawns in a giant political chess game. It is up to anti-environmentalist writers to save them from the disingenuous claims of science and to help readers use their common sense to sort out the issues of global warming.

Politicians are natural enemies because they most clearly have a personal agenda, according to anti-environmentalist writers. Writers claim that everything an

environmentally-minded politician says or does is a result of his disingenuous plan to enact environmental policy. No politician is a bigger or more formidable foe than former Vice President and 2000 presidential candidate, Al Gore. Michaels and Balling critique the Clinton/Gore administration for blaming the massive and devastating 1997 flood across the Red River Valley on global warming. "Gore's history of exaggeration—climactic and otherwise—is long and deep and repetitive" (8). Gore's tendency to talk about global warming in terms of good and evil, according to Michaels and Balling, is "bombast and exaggeration." It has "become a Gore pattern that now imperils his political future" (8). This statement is ironic since Michaels and Balling, and other anti-environmentalist writers, also depict global warming in terms of good and evil. Their real problem with Gore's supposed bombast is that fact that people believe him. Michaels and Balling cite an Idaho poll conducted by Republican Senator Larry Craig. The poll indicated that fully 73% of polled constituents believed global warming is a "real problem requiring real action" (9). They argue that Gore is a villain because he is using his authority to lead responsible citizens astray with his exaggerations about climate change.

The point Michaels and Balling want to make is that readers should listen to them, and ignore the lying villains who bully citizens and upstanding scientists into supporting global warming alarmism. Just like Galileo's denouncers, who threatened him with death, Gore wielded an iron-hand in the Senate where he "hauled paradigm-smashers" in front of his "science round tables" and proceeded to "discredit" them if they did not yield to his viewpoint (Michaels and Balling 10). The message here is that the only way global warming alarmists can win the support of government, science, and citizens is to brandish

authority and threaten doubting dissenters. In addition, the use of the word "bombast" suggests that Gore relies on rhetoric instead of on facts. It underscores the anti-environmentalist belief that rhetoric and scientific evidence cannot operate at the same time. Michaels and Balling suggest that using rhetoric is tantamount to lying—or at least seriously embellishing the facts.

Anti-environmentalists suggest that scientific villains work in tandem with political villains. Anti-environmentalists identify these villains as those scientists who allegedly use their authority to bully unsuspecting citizens into believing that global warming and other environmental issues are serious threats. Most often anti-environmentalist writers indict the most noted environmental scientists, like Rachel Carson and Paul Ehrlich, who have supposedly led the way toward radical environmentalism. Bailey argues that Carson and Ehrlich really propose a form of Marxism (12). Mathiesen argues that Carson's work, which led toward the banning of the chemical DDT, cost numerous lives, though he does not talk about how or cite any sources for this claim (xxi). Later, Mathiesen says that the DDT ban is responsible for at least five million deaths from malaria every year[66] (11). He argues that Carson's work is a campaign that pits birds against people (12). The birds win, he claims, as a result of Carson's lyrical and emotional treatise on [her own] highly personal and speculative projections of the consequences of widespread use of pesticides." This strategy appeals to unsuspecting readers who "knew as little about the actual facts of the matter as the author apparently did—or less[67] (Mathiesen 11). The "victory" for the birds means "a

[66] According to the Environmental Protection Agency (EPA) web site, DDT was banned *only* in the United States on January 1, 1973 ("DDT Ban Takes Effect").

[67] But Carson has impressive scientific credentials. She earned a Master's degree in zoology from Johns Hopkins University, and, among other things, was the chief editor for U.S. Fish and Wildlife Service

loss for reason and humanity." Mathiesen argues, "Five million lives lost per year counted for less than the unfounded claim that DDT poses a threat to birds." Many people die, but environmentalists "feel good about having saved the birds which did not need saving" (Mathiesen 15). The villains here are environmental scientists who allegedly value nature more than they value human life. Writers hope that common sense will dictate to readers that human life is *always* more important than nature, and Carson sounds just plain silly for believing that the health and safety of birds is more important than the five million people dead from malaria.[68]

Bailey further suggests that Carson, Ehrlich, and their followers are "neo-Luddites" or "modern anti-technology zealots" (12). Like other "millenarian cults," these environmentalists foresee an apocalyptic future. Bailey argues that environmentalists predict a final battle between good and evil; good will lose unless everyone converts to environmentalism. Bailey says the problem is that these environmental scientists have spawned light green environmentalists[69] who are motivated by apocalyptic stories. The Smiths, for instance, might recycle and claim to prefer cardboard to Styrofoam, but that is just "an echo of a radical agenda set by millenarians in the 'dark green' environmentalist movement" (Bailey 16). In other words, Bailey believes that people like the Smiths are being brainwashed by dark greens with political agendas.

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publications. Despite her credentials, anti-environmentalist writers often suggest that she has no idea what she is talking about when she talks about the environment and that she lacks experience and scientific knowledge.

[68]It may seem hard not to side against Carson if one believes her crusade is really about saving the birds. The fact of the matter is that Carson was concerned about the effects on humans; the dying birds represented a sign of impending danger. In addition, her research suggested that DDT was harmful to humans. The story of the Venezuelan baby who suffered from DDT exposure represents one such piece of evidence.

[69] Bailey suggests that while light greens are concerned about environmental issues, they will do minimal work to practice it. His suggestion is that they do things like recycle because it is relatively easy to do and everyone else is doing it.

The indictment of environmental science leads to the next level of villains in this situation—popular science fueled by the lazy and imprecise media. Ray and Guzzo take this approach in order to justify to their readers why they might fall prey to the environmental argument. Readers are, in fact, victims because they haven't had the opportunity to hear the truth or they are confused about what is actually truth. For example, Ray and Guzzo describe how popular science changes the facts of a situation in order to make environmental disasters appear more imminent. They cite a news article from their local Tacoma newspaper, *The Morning News Tribune,* with a bold headline: "EPA PLANS TO PROBE SIMPSON MILL FOR DIOXIN." Ray and Guzzo criticize the article because the reporter assumes that dioxin is dangerous and announces this assumption to impressionable readers. Ray and Guzzo question why we don't first decide what concentrations of dioxin are *actually* dangerous to humans before we condemn its use (*Trashing* 4). They argue for a return to a second stasis question; that is, they want to know more about the character of dioxin before making claims about it. The media, however, moves to the fourth and final stasis: what action should occur?

Ray and Guzzo then move on to critique the way the media presents the study's findings. The article explains that nine flounder caught within one hundred yards of the mill's outfall contained 1.5 parts per trillion of dioxin. The reporter explains that this amounts to about one drop in twenty-five million gallons. Furthermore, the article indicates that the flounders' internal organs were blended together and the sample was taken from the combined parts. The reporter fails to mention that 1.5 parts per trillion of dioxin is a rather small concentration. Furthermore, that amount is spread out among the nine fish, including their internal organs and skin, which people would not normally eat

anyway. They argue that the study is incredibly misleading, yet it has prompted the study of other pulp mills, presumably at great expense (*Trashing* 5). They also cite other cases where the media has blown environmental risk out of proportion. They mention the 1992 *Time* cover story which announced that the ozone layer was disappearing. Ray and Guzzo argue that the article is "typical of the sort of 'scientific' information available to the public," full of "emotional hype, exaggeration, half-truths, and unsupported dogma that is more propaganda than reporting" (*Environmental* 28).

Ray and Guzzo use these stories to illustrate the media as an enemy; they also imply that scientists are to blame for not correcting and clarifying these misleading stories. According to anti-environmentalists, the scientists choose not to correct this information because they know that alarmism sells more newspapers and funds more research studies. Ray and Guzzo worriedly ask, "Who speaks for science? Or put another way: on whom does the press rely to speak for science" (*Trashing* 5)? Essex and McKitrick indict the media for using "hackneyed metaphors, hardened clichés and tortured truisms," and once the media gets hold of these truisms, they are next to impossible to correct (35). Citizens do not have the "personal knowledge to doubt what they are told" and "science and academia are so cloistered that many scientists from other specialties also lack this knowledge." The media sets the agenda for science (Essex and McKitrick 35-6).

Furthermore, Ray and Guzzo blame school systems for environmental misinformation because teachers do not have time to check the information media presents. They also blame the EPA for validating environmental claims by lobbying and supporting environmental laws and regulations. Ray and Guzzo also blame the EPA for

the Challenger disaster because the EPA insisted on an asbestos ban, which meant that the substance used to seal the malfunctioning O-Rings did not have the "insulating fire-retardant powers of asbestos." They conclude that the media is an ultra-liberal organization which supports abortion, homosexuality, and adultery, so it is not surprising, to Ray and Guzzo anyway, that they also support environmentalism (*Environmental* 178-181). Conflating pro-choice and gay rights platforms with environmentalism illustrates the anti-environmentalist viewpoint—the environmental movement is primarily distasteful because of its politics.

Ray and Guzzo's primary critique is that popular science is agonistic. They claim that the media, and scientists who inform them, report science it as if it were a great debate. While that is fine for other disciplines or genres, Ray and Guzzo maintain that scientists should be above argument, even though science is predicated on negotiating plausible explanations for particular phenomena. It is worth quoting Ray and Guzzo's view at length to show their contempt for the mixing of rhetoric and science.

> Lawyers might inspire their flocks, and political talk shows might be enlivened by the cut and thrust of debate. But science is about the sober weighing of evidence. To the scientific mind, argument seems to have replaced reason in our public discourse—as if important questions of science or technology could be resolved by which scientific celebrities have the most charisma and appeal. But science isn't a popularity poll, and sincere and impassioned rhetoric won't change reality. Only evidence counts. (*Environmental* 29)

This passage accomplishes a number of goals for the anti-environmentalist agenda. First, it clearly separates those who use rhetoric—lawyers, ministers, and politicians—from those who use reason, which is defined as evidence, fact, and truth. Those who use reason are the true scientists and consequently, anti-environmentalists. Mathiesen concurs and argues that environmental scientists describe everyone who does not agree with them as "pseudoscientists or fringe scientists." They create environmental debates that take on "emotional fervor normally alien to science." Fervent environmental debates might be common to law, politics, or industry, but not to the truth-seeking occupation of science; the only victim, or "passive player," is the common—readers of this book (Mathiesen 6-8). Those citizens or scientists who soberly weigh the facts are the ones who care about discovering the truth of the global warming debate. The use of the word "sober" (Ray and Guzzo, *Environmental* 29) seems to correspond with unemotional or dispassionate or apolitical behaviors. According to anti-environmental writers, rhetoric and emotion are wound up together as the great foe of truth.

Not surprisingly, the anti-environmentalist's enemy is also the environmentalist who misuses and misunderstands the information from science and media. Anti-environmentalists vividly characterize environmentalists as people who hate industry. They are people who want money, prestige, and power "at the public's expense without any accountability for the individual contributions" (Mathiesen 5). These are people who want to redistribute wealth from unsuspecting citizens to "the actors in the drama" (Mathiesen 5)—presumably the media, disingenuous scientists, and politicians. Bailey argues that environmentalists want to close off debate (53) and precipitate "worldwide religious conversion to the gospel of environmentalism;" they want to "convert consumes

and sinners to the new ecological faith" (86). His use of religious terms underscores the allegedly unscientific nature of environmentalism. Bailey also argues that the environmental movement is a cover for a massive political coup. According to him, environmentalists always believe that the problem is "industrial capitalism" and their answer is always "international socialism" (80). Bailey's critique is probably a contemporary way of suggesting that environmentalists are, in fact, communists.

Ray and Guzzo helpfully describe in detail the specific demographics of environmentalists. They are mostly white, middle class, and college-educated. They are elitists, but they hide behind the cover of a "vocal do-good mentality." They can be coercive and violent, but, most egregiously, they view nature as a sacred religion and technology as a sacrilege. Ray and Guzzo conclude the environmental movement is usually sincere, but "sophomoric" and overly "emotional" (*Trashing* 165). Essex and McKitrick suggest that trying to dialogue with environmentalists "is like trying to reason with a herd of wildebeest. Understanding doesn't advance as the herd grazes on" (35). This characterization may be somewhat warranted. Radical, biocentric organizations like Earth First!, sometimes resort to sabotaging property and other illegal activity (Cooper 237-8). But anti-environmentalist writers make these generalizations without delineating between radical cultural responses to global warming and the more reasoned stance of most mainstream scientists. Their critiques of environmentalist emotional rhetoric divert the readers' attention away from the anti-environmentalist rhetorical ploys; however, once the anti-environmentalists have established a clear enemy (and victims of that enemy), they can introduce the solution, or the moral, to the story. In this narrative, the savior is technological progress. First, anti-environmentalists argue that global warming

is not a significant threat, but they quickly add that if it were to become a viable threat (and they highly doubt it will), science and technology would quickly and easily eradicate the problem, though they offer no explanations as to how technology will fix the problem. Then they reassure readers that history is our best guide: we have always faced natural calamities and we have survived and prospered because of science and technology.

Most anti-environmentalist writers spend a significant portion of their time writing encomiums to technology, and they argue that one need only examine our past—before we had such wonderful technology—to see how much life has improved. Thomas Moore points out, for instance, that weather variations would have been far more disastrous for early man than it would be for us because we posses the knowledge and the money to adapt (27). The evidence is direct and observable, anti-environmental writers tell us. Surely, readers must see how comfortable our lives are in comparison to our ancestors, and surely that must convince us that we can overcome global warming. Other anti-environmentalist writers suggest that environmentalists fear technology and therefore want us to return to a "pre-industrial society" (Mathiesen 104). Ray and Guzzo characterize environmentalists as a facile group of misanthropes who are "anti-development, anti-progress, anti-technology, anti-business, anti-established institutions, and, above all, anti-capitalism." Environmentalists seek "development of a society totally devoid of industry and technology" (*Trashing* 163).

Anti-environmentalists marvel at the environmentalists' seeming inability to understand how much our lives have improved as a result of technology. Chapter Two of Ray and Guzzo's *Trashing the Planet* is called sarcastically "The Good Old Days." It

includes a long description of life in the early 1920s, when Ray was growing up. She informs readers that there were no vacuums, freezers, synthetic fibers, TVs, or other electronics. There were very few cars or electric lights. The truly dramatic difference, however, was in food production and medicine (15-16). After a lengthy discussion about the ailments from which people used to suffer, Ray explains that it is science and technology that allow us to live the relatively easy and healthy lives that most of us now enjoy. This entire story is for the purpose of convincing readers that science and technology will continue to improve our lives. One need only compare the lifestyle of a person from the 1920s and the lifestyle of a person in the twenty-first century: simple observation and reasoning should tell us—Ray and Guzzo hope—that we are far better off now than we ever have been before. But oddly enough, some people still shy away from technology. Essex and McKitrick marvel at the extraordinary fact that "even sophisticated and educated people of our heavily scientific age are so skittish about technical details that they have to be provided in the form of children's picture books" (309). Anti-environmentalist writers seek to show readers the beauty and benefits of technology in the hopes that readers will learn to trust in its power.

In addition to extolling the virtues of man-made technology, Ray and Guzzo scoff at environmentalists who believe that we, mere individuals, can have any sort of impact on something as vast and important as the environment. Despite our grand human accomplishments, humans are not particularly important, according to Ray and Guzzo. "The fact is that weather will be what it is and that man's influence, if any, is trivial and relatively local" (*Trashing* 162). Finally, anti-environmentalist writers assure readers that global warming has always been occurring; therefore, history suggests that we can easily

conquer our environment (Singer 29) (Moore 23) (Michaels and Balling 11) (Bailey 46) (Ray and Guzzo, *Environmentalism* 36)—the environment that we are supposedly too insignificant to affect! Anti-environmentalists urge readers to rely on observation (Singer 36) and to wait for more research before we draw any conclusions or enact any sort of social policy (Singer 49) (Michaels and Balling 5). Essex and McKitrick sum it up best with a descriptive passage about the amazing and beautiful common history linking us to our distant ancestors. They write,

> Your grandparents, and the generations before them, saw exactly the same stars in the same places after similar stormy summer days during the centuries past. All the generations, back to the beginning, stood under the same sublime heavens and wondered what the future would hold for themselves and generations to come. They wondered about us… It's our turn to wonder about the future and the generations to come. There are great perils and wonders facing humanity. This is not new. Humanity has always faced them…No need to be afraid. We will learn. That is our redemption. (310-11)

Anti-environmental books all tell the same basic story, which serves to communicate the reality of the movement. In terms of character themes, anti-environmentalists create identities for the readers that are in juxtaposition to environmentalists. Based on the rhetoric, they describe readers who are (or who want to be): conservative (politically and socially), cautious, capitalist, logical, truth-seeking, and reverent toward science and technology. These readers are wise and experienced. They maintain a Platonic view of rhetoric and believe, in the case of environmentalists,

rhetoric is used to make the best thing look worse. Furthermore, the writers of the books wholeheartedly endorse the mainstream model of science that believes science is always free from rhetoric and emotion. For that reason, they condemn popular science *because* it uses emotion and rhetoric. Their condemnation of the popular media underlies the motive of anti-environmentalist movement: to get people to stop talking about global warming. Or at least to get them to stop talking about global warming as a serious threat to humans.

In terms of plot, anti-environmentalists see global warming as a battle site: they believe that the heroes (themselves, readers, and technology) must fight the villains (scientists, the media, and unreasonable citizens). Their agonistic depiction of the environmental debate is aggressive and unlikely to convert environmentalists; writers are likely aware of this fact. Their fantasy-theme—the anti-environmentalist reality—is to cement the image of readers as reasonable and concerned citizens who do not need to worry themselves over unthreatening issues like global warming. The fantasy-theme works to create the image of readers as warriors fighting for the cause. In this case, the cause is rather simple: people need do nothing except sit back and allow technology to take care of them. The stock scenario appears again and again: global warming is not a threat because there is no observable evidence to support it. Anyone who says differently has a political agenda. Reasonable citizens must persevere…by marveling at the stupidity of environmentalists and bowing at the foot of technology.

Chapter 9: Understanding the Fantasy-Types of Anti-Movements

Analysis of creationism and anti-environmentalism reveal interesting differences and similarities between the rhetorical strategies of the movements. Both have similar goals: to register a resounding and unified voice of opposition against mainstream science. Both groups see themselves as crusaders for truth, fighting against the political biases of mainstream scientists.

In the case of creationism, they see evolutionary scientists as dogmatic secularists and atheists who have a vested personal interest in keeping the supposed truth of creationism hidden from innocent, yet discerning, lay readers. Neo-Aristotelian criticism reveals *how* creationists go about spreading their message, yet that tells us little about the reasons behind the movement and does not fully explain the far-reaching support that creationism garners. However, identifying fantasy-themes reveals the character of the group, which in turn illuminates the mission of the creationist movement. That mission, in part, includes the desire to solidify and preserve a group identity and ideology of science that challenges mainstream science. The main ideology running through the creationist works is that readers should only rely on common sense; therefore, lay readers are not at a disadvantage. Presumably, they have as much, and usually more, common sense than mainstream scientists.

In terms of group identity, creationists work to define for their readers the image of a typical creationist: he or she (though usually he) is moral, Christian, politically conservative, working class, suspicious of academia, and, most of all, reliant on common

sense as his primary guiding force.

The fantasy-theme for the evolutionist identity is just as important in defining a creationist. The evolutionist enemy is everything a creationist is not. He or she is: amoral, atheist, politically liberal, unconcerned for the welfare of humankind, white-collar, a member of academia, and, most of all, lacking in common sense and overly reliant on academic doctrine.[70]

While creationists claim to be creating these fantasy-themes to convert readers to creationism, they ultimately use the fantasy-themes to convince readers that they are already part of the group; therefore, they must be willing to take part in the mission to fight evolutionary dogma. It is a battle between good and evil, and readers must be willing to fight for good. The fantasy-theme champions the little guy, the common person, the reader, who fights backs against the bullies.

Creationist writing has been successful and continues to be successful because it creates a viable and empowering fantasy-theme for readers, which mobilizes them into action. Creationists urge readers to actively oppose evolution: they should put pressure on school boards to require teachers and textbooks to give creationism equal time, or at least put a disclaimer on evolution indicating it represents only one narrow viewpoint. Writers urge readers to lobby their state legislators to be sure that schools give creationism equal time. Creationist writers encourage readers to vocally oppose evolution so media register their voice of dissent. The creationist movement is largely successful because creationist readers are vocally spreading the creationist agenda. Even when they

[70] Creationists suggest that members of academe will uphold whatever ideology their peers endorse since their tenure, publication acceptance, and ability to get grants is dependent upon their willingness to uphold the accepted values of the institution. Creationists suggest that evolution is indoctrinated to the point that scientists cannot suggest any alternatives to the theory without seriously hurting their careers.

are not successful in enacting curriculum changes, they are very actively and effectively spreading the group fantasy-type: they provide an identity for those people who desire to *be* the characteristics that creationism claims for its own. In other words, politically conservative Christians who care about their children and want safe schools and a kinder world in which they can live, embody the same values as creationists. The logic suggests that if a person embodies all of the characteristics of creationism, then one *must* be a creationist. Furthermore, creationists tell readers that if they doubt their membership in the creationist group, then they need only consult their common sense because they maintain that the creationist story just makes more sense. Being part of the group also means fighting the evil evolutionist enemy. The creationist war becomes an ideological war fought behind the cloak of science. Anyone who disagrees with the creationist viewpoint must then embody the characteristics they have set aside to define the enemy.

Anti-environmentalists also work to create a group identity. They are generally politically conservative and usually Christian. They love America and stand for democracy. They believe that technology and science have made our world a better place and will continue to do so. They trust that history is a good predictor of the future. They believe that nature is a religion, and, therefore, has no place in scientific discussions. They argue that mainstream scientists and other popularizers should not talk about environmental issues in the media or other popular genres because it only alarms people and makes them believe that environmentalist ideologies are based on scientific fact. Above all else, anti-environmentalists believe in common sense as their primary guiding force. If it does not feel warmer, then global warming is not happening, at least to any significant degree.

Much like creationists, anti-environmentalists define their enemy in order to solidify their own identity. In this case, their enemies include environmentalists and mainstream scientists who say that global warming is a significant issue and a cause for concern. Anti-environmentalists say that these people are politically liberal and dislike American democracy; in fact, they are probably Marxists or socialists. According to anti-environmentalists, environmentalists refuse to recognize the achievement of science and technology. Instead, they romanticize the dirty, nasty past where disease was rampant and life was harsh and short. The enemy does not trust history as a predictor of the future: they are alarmists who are always looking for the harbinger of the apocalypse. They worship nature and therefore confuse science with religion. Anti-environmentalists believe that environmentalists want scientists to discuss environmental issues in popular genres, like the media, in order to brainwash the public. Above all, environmentalists, according to the anti-environmentalists, lack common sense and rely far too heavily on unproven conjecture in order to advance a political ideology.

A neo-Aristotelian analysis reveals how anti-environmentalists use rhetorical techniques to deliver a message that is convincing to many readers, that global warming is just not a serious and pressing issue. The popularity of this sentiment is interesting given the general mainstream scientific consensus that it is an important concern.[71] Fantasy-theme analysis, however, reveals interesting insight into the ideologies that motivate anti-environmentalist writers. While anti-environmentalism claims to want to "convert" readers, they actually provide a purpose or agenda for readers who already believe they possess the characteristics of an anti-environmentalist. Readers need not

[71] Again, I am not suggesting that all scientists are in consensus about the nature and extent of global warming, yet most climate scientists believe that global warming is an issue worthy of study and discussion.

care about global warming to any extent, but if they identity with the fantasy-theme, then they have an automatic position on the issue. If they are good conservative Americans who believe technology has improved our lives, then they are by definition anti-environmentalist. Furthermore, anti-environmentalists urge them to look around and see that global warming is not a serious threat to their everyday lives.

The primary goal of anti-environmentalism is to encourage readers not to do anything at all. Championing technology and science as a savior means that ordinary readers need do nothing except refuse to participate in any environmental cause. While they must distrust politicians and scientists with an environmental agenda, they *can* trust that the real, truth-seeking, unrhetorical scientists will take care of any potential problems. In doing so, anti-environmentalism attempts to create a sense of calm among people. They urge readers to have faith in science and to abstain from any environmental movement since anti-environmentalists believe almost all environmental movements are part of a liberal agenda.

Fantasy-theme analysis is most helpful in revealing the significant differences and similarities between the two movements. The table on the following page (Table 1) illustrates those comparisons.

Table 1

	Creationism	**Anti-Environmentalism**
View of mainstream science	Neutral; data-driven; truth-seeking	Neutral; data-driven; truth-seeking
View of Popular Science	Simplified version of science for lay readers	Distorted and alarmist version of science for lay readers
Role of Scientists	Interpret results; communicate with public; show relevance of data in our lives	Transmit facts; discover truth; allow data to speak for itself
Role of Readers	Use common sense	Use common sense
Motive of movement	Mobilize readers	De-mobilize readers

Both groups believe that scientists "discover" facts and actively deny the rhetorical nature of science. They both agree that while other fields and disciplines are rhetorical, science is supposed to be free from argument, politics, and personal biases. Both creationists and anti-environmentalists lament the fact that many contemporary scientists are not truth-seekers, and instead have succumbed to the desire to advance their own personal agendas. Both groups have faith that true scientists are still out there (working on their side, of course) fighting against the Doctrine (Essex and McKitrick 18) and dogma of politically-driven science.

Creationists and anti-environmentalists also envision similar audiences. They trust that readers respect the institution of science and believe that it can aid in discovering existing facts or truths. Creationists and anti-environmentalists assume their readers are not experts, but instead are interested in how science affects their lives. These readers likely have little scientific training, which is, of course, why they are reading the books.

The writers also envision their readers as anti-intellectuals, or perhaps more accurately, people suspicious of academia. They often see intellectuals as people who prefer to talk theory as opposed to discussing the practical implications of the theory. Anti-intellectualism maintains that common sense is at least equivalent—if not superior—to genius, or intellect (Hofstadter 255). Anti-environmentalists believe that intellectuals do not rely on observation, but instead focus on conjecture, computer-simulations, or patterns. Readers of these books do not trust anyone who appears to be lacking in common sense. In both the creationist and anti-environmentalist works, writers urge readers to use that common sense to sort through the arguments. The writers believe that by using common sense, readers will naturally reach the right conclusions, which means agreeing with creationism and anti-environmentalism.

While these movements have similar views of science and the readers of their works, they use that information for two very different purposes. Creationists describe science as a truth-seeking operation in order to convince readers that they *must* mobilize. They need to use the facts or the truth of science to show the rest of the world that the Earth must have had a creator (and most creationists hope that readers will naturally assume that the creator is God.) Creationists believe that the facts of science—free from political bias—can be used as evidence of a religious belief. The goal of readers should be to mobilize as a unified group and use science to champion their religions and political causes.

In sharp contrast, anti-environmentalists use the identical definition of science—a truth-seeking pursuit—to urge readers to *demobilize*. Their argument is that the trustworthy and respectable institution of science will save us all. That is, *if* we ever need

to be saved. Trusting in science as the ultimate pursuit of truth means that most of us can sit back and relax—we need not worry about anything.

If we want to understand the rhetorical success of anti-movements, or at least these particular anti-movements, we need to account for the ways that creationists use rhetorical strategies to mobilize readers while anti-environmentalist writers use similar strategies to de-mobilize their readers. Rhetorical analysis of creationist and anti-environmentalist narratives and cultural perspectives shed light on how they inspire readers. Recall Phillip Johnson's story of young Danny Phillips, the Denver teen who courageously opposed a *Nova* program shown in his school that claimed life begins as a single-celled organism (34). Johnson holds Danny up as a virtuous hero because he publicly fought the creationist position. Likewise, Morris and Parker urge readers to read evolutionary works and then publicly share their critique of them (xv). Morris urges readers to change the school systems so that evolution is no longer the favored perspective. According to him, creationists are "subjected to gross discrimination and sometimes even dismissal if they are outspoken about their beliefs" (320). Morris wants readers to change the American public education system by actively speaking out against the evolutionist oppressors. Table 1 shows that the creationist argument that the role of popular science is to simplify science and report it to lay readers. They view it as a tool the can use to their advantage.

Anti-environmentalists, on the other hand, critique popular science because they argue that it distorts science. Furthermore, they argue that the selection and composition of popular science depends largely on the political ideologies of the producer and the marketing needs of the media rather than on scientific fact. Ray and Guzzo most vocally

denounce popular science for spreading environmental hysteria, but other writers also argue that popular science oversimplifies a complex debate for the purpose of rallying people to participate in an environmental campaign.

Creationists argue that popular science works because it moves readers to action. Once they can understand the creationist debate, they can participate in a campaign for textbook disclaimers, for example, or rally for other creationist causes. Anti-environmentalists, however, suggest that popular science moves readers to action under false or misleading pretenses. That is, the simplification of the debate urges readers to action when no action is necessary. By denouncing popular science, they hope to persuade readers to de-mobilize, to dismiss popular science as political alarmism.

Both movements also take different positions on the role of scientists, as we saw in Table 1. Both groups see scientists as people who must gather facts and present them in an orderly and coherent fashion. Since both groups believe that facts are almost always directly observable, they do not believe that science should use any rhetorical strategy in presenting the facts. To do so would mean that scientists were trying to twist the readers' view of the facts in some way. People with common sense, however, will easily understand the observable facts. Both groups admit, however, that science can be complicated and difficult to understand for lay readers. Sometimes readers will need clarification, but most of the time they will be able to understand the basic facts. For example, lay readers will easily see that parts of a watch do not come together to make a watch without an artisan. Likewise, the same readers can stick their head out the window and quickly discover that the weather is not markedly different than the year before.

Where these groups diverge is in their beliefs about what scientists *need* to communicate to the public. Creationists argue that science must tell the public the relevance of the data to show how it will affect our lives. Morris, for example, implores readers to recognize that accepting evolution leads to immoral behavior including abortion, infanticide, and euthanasia (10). Regardless of whether or not this statement is true, readers will presumably believe it is true and they will take action to prevent the spread of these evil things. Evolutionists, however, argue that it does not matter what story you like better. If evolution is the fact, or at least the best and most comprehensive theory, then we must accept it. Like evolutionists, anti-environmentalists argue that discussions about value have no place in science or popular science. They criticize environmental scientists for their green agendas. Anti-environmentalists believe that people need to make up their own minds—scientists should merely present readers the truth, which they will have to process it for themselves.

Some mainstream scientists, however, also argue that they have a responsibility to explain how scientific findings will impact the public. Paul Ehrlich, for instance, argues that scientists must "learn to play the media game" if they want lay readers to understand environmental science. Part of one's scientific career, he maintains, should be to actively educate the public (*Betrayal* 200-204). He even offers a list of tips for scientists doing sound-bites. These tips include rhetorical advice for scientists. For example, he urges scientists to avoid the typical arrangement of mainstream written science (the model that includes introduction, methods, results, and discussion). Results must come first if the

public is going to pay attention to the information. He warns scientists about using scenarios, which will be construed as predictions instead of fictions[72] (*Betrayal* 204-8). Furthermore, Ehrlich agrees with Ray and Guzzo that it is journalists who primarily report and interpret science for the public, and he argues that they have just as large an obligation to accurately report it as scientists do (*Betrayal* 199). He suggests that the term science popularizer must lose its negative connotation. Popular science should not be equated with bad science or pseudoscience; in fact, he argues that it should be peer-reviewed according to the same process as mainstream science (*Betrayal* 207-8).

Encouraging mainstream scientists to participate in popular science is exactly what anti-environmentalists argue scientists should *not* do. Or at least, they oppose popular science writing that does not advance an anti-environmentalist agenda. The idea of scientists popularizing science is also somewhat at odds with the evolutionist agenda. Certainly many mainstream scientists have successfully published popular works on evolution, most notably Stephen Jay Gould. He argued that it was imperative for evolutionists and creationists to dialogue because the general public fasley believes that science will never accept any evidence that supports religion, even if evidence exists to discredit evolution (Witham 4). Gould attempts to show the public how science really works, that they are not denying evidence that supports religion, but that mainstream scientists do not accept untestable or irreplicable evidence. Evolutionists do not necessarily deny God as creator, but they argue that there is no true scientific evidence for such a claim.

[72] Ehrlich's *The Population Bomb* included a number of scenarios. Ehrlich intended these stories to be fictions that would warn people about our perilous future; however, most readers read them as predictions. When the events did not actually happen, Ehrlich's critics accused him of being unreliable. Furthermore, they pointed out that mainstream scientists should not be making predictions (especially false ones). Critics used that argument to discredit Ehrlich as a scientist.

Some evolutionists, however, still refuse to participate in the creationism debate, at least using the genre of popular science. David Raup, a leading evolutionist, recalls a time when it was unacceptable for scientists to engage in any sort of public debate. After all, scientists are supposed to be neutral and detached (Witham 73). To engage in debate suggests an emotional attachment. Certainly, things are changing and the proliferation of popular evolutionist books suggest that evolutionists understand the importance of communicating to the public.

None of these evolutionists, however, have specifically called attention to the need for rhetorical training. Ehrlich's instruction in *Betrayal of Science and Reason* clearly advocates scientists learning, understanding, and applying specific rhetorical appeals in popular works. He argues that this is the only way that the public will understand environmental issues. Creationists, like Ehrlich and other environmentalists, understand that popular science is an excellent forum for telling readers how science will impact their daily lives, not only because it can convey science, but because it can convey something about the importance of the issue at hand. In other words, if people do not understand the importance of environmental issues, it is because they have not heard a convincing story or narrative that tells them *why* they should care. For example, Killingsworth and Palmer suggest that tracts like Rachel Carson's *Silent Spring* can be called science fictions. It is not a "substitute for science," but it is "a response to science that contributes to the development of myths." They advocate treating myths not as the "cultural equivalent to of lies, mistakes, or superstitions," but as "collective narratives" that extend beyond the borders of science and touch our "emotional, spiritual, and intellectual consciousness" ("*Silent Spring*" 176). They argue that *Silent Spring* is an

effective environmental call to action because it has a "narrative thrust" (176) that convinces readers of the importance of environmental consciousness. Killingsworth and Palmer do not argue for the importance of making science matter to readers, which is exactly why anti-environmentalists critique the environmental movement. In rhetorical terms, there is no established fantasy-type that solidifies the evolutionist group identity. At least not in the way that anti-environmentalists and creationists have established one. Ehrlich's call for rhetorical awareness represents the environmentalists' recognition that a fantasy-type is imperative to any scientific/cultural movement.

Creationists are incredibly adept at making science matter to readers, and thus developing an important fantasy-theme. Many attempt to convince lay readers that evolutionism can be equated with immorality. For example, Arelton C. Murray, supposedly a former fossil preparator at the Washington D.C. Smithsonian Institute, is a creationist spokesperson who goes by the moniker Mr. Fossil. He speaks at church-sponsored groups chronicling his conversion from evolution to Christianity (Toumey 1-3). Clearly, evolution and Christianity are not opposites, but Murray presents them as such. He tells the story of his conversion to creationism one night at a Christian revival. He had originally attended in order to mock the preacher. In the midst of the revival, he realized Jesus Christ was his savior. Before his conversion, he drank alcohol and smoked cigars. And he believed in evolution. After turning to Christ, he became a teetotaler and a creationist. His boss at the Smithsonian gave him an ultimatum: give up his lectures or lose his job. He chose to leave his job (Toumey 1-3). Mr. Fossil's story represents the narrative thrust of the creationist story: it is important to reject evolution because it has a negative impact on our lives. It ushers in immorality, according to creationists.

Evolutionists have tried to explain to lay audiences that evolution is a scientific belief, not a philosophical, moral, or religious position, but the fact of the matter is that creationists provide a better story in terms of illustrating the importance of accepting creationism for a particular audience. I am not suggesting that evolutionists should present false information to readers, but I am suggesting that they must provide a better story for readers. That is, they must tell readers why understanding evolution is relevant to their lives.

Many scientists still rely on the authority of science to present scientific claims, rather than providing a solid fantasy-theme. Evolutionist John Moore, for instance, points out that science has helped cure and prevent diseases, helped launch rockets to the moon, and made accurate predictions about the solar system (95). While that is impressive, it tells the creationist audience very little about *how* evolutionary theory is valuable to them. Moore goes on to say that we accept scientists' word about many things in nature because we believe that "those who devote their lives to the study of a subject are more likely than others to have reliable information" (199). Moore seems to suggest that evolutionary theory is a better story because evolutionists are experts. This argument falls apart when creationists begin to list their expertise, oftentimes in mainstream science. It becomes easy for creationists to mobilize lay readers because readers believe they are being led by experts who have clearly shown them that believing in creationism has a more positive impact on their lives than believing in evolution.

I should note that some evolutionary scientists strongly urge citizens to vocally oppose creationist lobbies. For instance, the University of Oklahoma hosts a listserv administered by Victor Hutchinson, Professor Emeritus in the zoology department,

provides frequent updates on creationist activity in Oklahoma and across the country. Hutchinson frequently distributes information to subscribers about upcoming creationist rallies or debates and he keeps readers apprised of legislative activity surrounding creationism and textbook disclaimers. The reminders often come in brief emails attached to local and national news articles. Popular evolutionary books, however, frequently do not contain narratives that urge readers to action. They do not create a group identity the way creationist books do. These books often focus on proving creationists wrong. In other words, evolutionists *become* the anti-science. They write popular works because they are battling convincing rhetorics of creationism. They exist *because* they have an opposition. They do not focus on showing readers how understanding evolution impacts their daily lives, nor do they mobilize readers in the way environmentalists, like Rachel Carson and Paul Ehrlich, have.

Chapter 10: Conclusion

To put this dissertation in the scope of existing rhetorical theory, particularly those theories that deal with scientific and technical writing, anti-movements become significant or widespread when they can use narrative fused with science to define the members of the movement and convince readers that they are part of the group. Furthermore, the success[73] of anti-movements depends largely on the ability of the authors to tell readers how the philosophy of the movement fits within their daily life.

Evolutionists lament the increasing number of Americans who reject the theory of evolution. I suggest that their approach to popular science limits their ability to attract, maintain, and motivate readers. The primary argument of anti-environmentalists against environmental popular science is that it moves people to action. DDT is banned. People begin to recycle. People question how their own activities lead to global warming. Anti-environmental writers are working against an environmental writing movement grounded in the awareness that narrative woven into popular science works precisely because it motivates readers to action.

As evolutionists question how to fight the seemingly rising number of people who embrace creationism, popular science writers must begin to focus on their own rhetorical strategies. To understand how to respond to an anti-movement, we have to understand its motive for existing. We can best understand the meaning of a text when we can project

[73] I define success as the ability to attract readers who will carry out the goals the books advocate.

the effects it will have upon our actions. In other words, we read in order to act (Killingsworth and Gilbertson 6). Creationists and anti-environmentalists both use signs—in these cases, narratives—to cue readers when they recognize particular signs—anti-intellectualism or common sense or Christian morality—to react according to how the narrative instructions them to act.

Both movements view popular science writing as positivistic because mainstream science has insisted that science is truth. Creationists and anti-environmentalists view science writing as the subduing of language so that it "accurately and directly transmits reality" (Miller 610). They see science writing as an efficient way to coerce a mind to reality. This is the "windowpane theory of language" that supposes language can give a clear view of reality (Miller 612). This unrhetorical view of science writing is inaccurate since manipulating the structure of text in order to make it appear neutral and objective is a rhetorical move itself. A discourse community then deems that those assertions are objective and therefore worthwhile (Sanders 55). The consensus of the discourse community decides if something constitutes science; therefore, it is, in fact, a rhetorical enterprise.

Both evolutionist and anti-environmental writing represent this positivistic, windowpane theory of science writing. Anti-environmentalists dismiss popular science writing because it is not objective, and they argue that their anti-movement exists only to keep unsuspecting readers from believing that popular science is a clear window instead of an obstructed view. Nevertheless, they are willing to exploit popular science to deliver their message. Their use of popular science as a platform to critique it allows them to present their fantasy-type that formidably competes with the environmentalist fantasy-

type. Likewise, the creationists' willingness to use the genre of popular science to present their narratives makes them a significant foe to evolutionary theory. If evolutionists hope to present a viable competing view, they must reject that positivistic view of science.

Paul Ehrlich presents valuable advice to environmental scientists in *Betrayal of Science and Reason* when he recommends specific rhetorical strategies for competing with anti-environmental movements. Like Ehrlich, I recommend that evolutionists use narrative, in the tradition of the early environmentalist pioneers who used popular science to create identity among readers and spur them to action.

Ultimately, mainstream scientists must take better advantage of the opportunities popular science writing affords. In terms of rhetoric, they must understand the cultural underpinnings of an anti-movement before they can form a counter rhetoric that is believable, palatable, and responsive to the millions of lay readers who want to participate in scientific debate.

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