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Prose and Polarization: Environmental Literature and the Challenges to Constructive Discourse

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CLAREMONT MCKENNA COLLEGE
PROSE AND POLARIZATION:
ENVIRONMENTAL LITERATURE AND THE CHALLENGES
TO CONSTRUCTIVE DISCOURSE

SUBMITTED TO

PROFESSOR WILLIAM ASCHER
AND
PROFESSOR NICHOLAS WARNER

AND

DEAN GREGORY HESS

BY

PAIGE COSTELLO

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Abstract

This work explores how authors employ literary modes to persuade readers towards one side or another of the environmental debate and whether the works promote constructive discourse on environmental issues. It uses two seminal works from each side of the environmental discourse, *Silent Spring* and *The Population Bomb* and *The Ultimate Resource* and *The Skeptical Environmentalist*, to analyze stylistic differences and similarities, to compare public reception, and to explain the increasing polarization of environmental discourse.

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Chapter One: Introduction

*Environmentalism starts with love of a place. A place you believe is special—
even if it is just a patch of dirt in your backyard. W.S. Merwin*

The Problem

The emergence of humanity as a biogeophysical force is widely acknowledged. It is treated by the scientific community as neither good nor bad. The Anthropocene makes one thing clear, however: we are the environment. Currently, we take environmental services for granted, at least until things go wrong. We rarely think about the bees pollinating our fields, the sun powering our food supply, and the water cycle which cleans, distributes, and replenishes free of charge. Should any environmental service falter, we would be astounded by the astronomical costs and immediacy of its effects on our daily lives.

The global dominance of *Homo sapiens* is a recent phenomenon. For nearly all of human existence, our collective footprint was small. Abundant with resources, the planet held the promise of frontiers and room for growth.

This completely changed in the last two centuries. Thanks to advances in public health, energy and agricultural technology, our population surged from 1 billion in 1800 to 7 billion today. In the past 50 years, the number of humans has more than doubled. During the same period, our consumption of resources grew to staggering new levels,

fueled by increasing prosperity. The worldwide consumption of food and freshwater tripled, and the use of fossil energy sources grew fourfold.

In just two hundred years humans became the dominant force on the planet. The *New York Times* confirms, “Our collective actions have transformed the physical, chemical and biological makeup of the world. Land, water and air have been fundamentally changed. Even our weather patterns are changing.”¹ Civilization has remade the planet, from its warming atmosphere to the bottom of an acidifying ocean, and there is no turning back. “The fate of the biosphere and our civilization are intertwined. We will thrive—or collapse—together.”²

Our battles, which pit environmental conservation against economic gains, have been polarizing. Sound judgment and healthy policy is essential for sustainable progress. We must clarify our norms to usher in a new ethic and collective purpose, one that recognizes us as stewards of human *and* planetary well-being.

With the plethora of environmental literature published since the release of Rachel Carson’s *Silent Spring*, it is useful to ask how effective this body of work has been in creating sensible concern for the environment and how environmental literature can be more effective as we continue to face trade-offs between environmental protection and economic growth, present and future benefits, convenience and wastefulness, local willingness to make sacrifices for a global problem, and stark policy polarization.

¹ Jonathan Foley, "The Age of Anthropocene: Should We Worry?" *Room for Debate. The New York Times*, May 23, 2011, accessed October 20, 2011, <http://www.nytimes.com/roomfordebate/2011/05/19/the-age-of-anthropocene-should-we-worry/learning-to-thrive-on-terra-humana>.

² Foley, "The Age of Anthropocene: Should We Worry?"

Although some people have been moved to be environmentally conscious, others have not. Why is this? One answer is polarization. Many people are concerned that the policy debate has become too black and white, with disrespect from each side towards the other, and an “in or out” mentality regarding concern for the environment. Can a balance be struck? Either within or outside of the rhetoric of the pro- and anti-environmental movements, we must convincingly express the trade-offs we face to generate a healthier policy debate. How can environmental literature reduce the stark polarization over environmental policies that has led to paralysis in developing sound approaches to the issues we confront?

Much hangs on whether environmental communications are effective. If the works are effective, they will push us to change our habits, clarify norms, compromise, and seek solutions that are truly sustainable, allowing us to fulfill our needs without compromising the ability of future generations to fulfill their needs. Failure to convey consistent truths about the state of our environment causes confusion; the extreme disparity of environmental conclusions incites anger on both sides of the movement, and mixing misinformation and assorted interpretations can lead to bad environmental policies. By pursuing bad policies, we may do irreversible damage to ourselves and our planet.

Does our society and policy elite believe that we are in the right place, balanced at the fulcrum of the tradeoffs we face? This is an alternative explanation for our policy paralysis, but it is not a helpful one. Perhaps it functioned before the discovery of global climate change, but we face new and changing environmental issues. Examples range from hydro-fracking to novel chemical compounds, which require constant evaluation

and addressing. The policy debate must react to new environmental threats. It is inconceivable to say that we rest at the fulcrum of the tradeoffs we face.

For healthy environmental discourse, alternative explanations of our present situation and reactions to global climate change must be included. A body of counter-environmental literature exists and is incorporated in this analysis for a thorough mapping of the environmental discourse today. Counter-literature plays a significant role because readership matters. The critical reception of both pro- and anti-environmental works creates lively, but largely counterproductive discussion of environmental issues.

The Approach

This work will take a holistic approach in examining pro- and anti-environmental literature for several reasons. The first is that both types of environmental communication are important and interrelated. Environmental literature and its counter-literature rub against each other in interesting ways; they are interactive and feed on the extremism of one another. One body can be decisively fanatical while the other is dangerously dismissive. This thesis examines two influential works from each category, identifying rhetorical trends, critical reception, and devices for their improvement.

By weaving together varied analytical approaches—from psychology to the study of rhetoric—a clearer picture arises of the primary methods used in environmental communications and their overall effectiveness in generating reasonable concern for the earth. Modern environmental literature uses many techniques to inspire concern for the environment. These range from spiritual appeals to exaggeration, to language that evokes fear, awe, and emotion, often imbuing readers with greater dedication to intergenerational

commitment. Exploring the roles and the impact of these approaches in environmental communications is essential.

Once we understand these works, how they generate concern, and the nature of that concern, we can extrapolate their effects and recommend the particular methods that best move readers towards sensible concern for the environment to improve understanding, behavior, and policymaking to preserve our planet and ourselves.

Chapter Two: Rachel Carson's *Silent Spring*

Published in 1962, first in *The New Yorker* and shortly afterward by Houghton Mifflin, Rachel Carson's *Silent Spring* has been compared with the Harriet Beecher Stowe's *Uncle Tom's Cabin* for its capacity to startle the American public with moral lessons and also with Darwin's *On the Origin of Species* for its challenge to dominant scientific practice.¹ Impressive in its scholarship, clarity, and passion, *Silent Spring* has never gone out of print and continues to provoke controversy. Carson described the toxic side effects of commonly used insecticides, and, to a lesser extent, herbicides, and fungicides, criticizing what she felt were indiscriminate, irresponsible and dangerous practices and policies that failed to take into account the ecological effects. She was deeply disturbed by the lack of research on how long synthetic chemicals might persist in the environment and how they might affect humans and nontargeted animals and insects.² *Silent Spring* challenged not only the irresponsible uses of chemicals, but the users as well. Carson explicitly criticized state and federal agricultural agencies, state agricultural universities, commercial food and agricultural interests, chemical manufacturers, and

¹ Linda Lear, "Bombshell in Beltsville: The USDA and the Challenge of *Silent Spring*," *Agricultural History* 66 (Spring 1992): 152; Paul Brooks, *The House of Life: Rachel Carson at Work* (Boston: Houghton Mifflin, 1972), 293; Michael B. Smith, "'Silence, Miss Carson!'" Science, Gender, and the Reception of "Silent Spring," *Feminist Studies* 27 (Autumn 2001): 733.

² Joseph Edward Steiguer, *The Origins of Modern Environmental Thought* (Tucson: University of Arizona Press, 2006), 30.

professional entomologists.³ The reaction to this challenge was swift and severe and, as one source stated, “where the shot hit, the feathers fly.”⁴ Though Carson’s message that the natural environment was being poisoned by chemicals was not new—some scientists had spoken of the threat—she was the first to give it a widespread audience by deliberately making the argument clear and accessible while adhering to high research standards. The world took serious notice when the message was delivered by as talented an author and researcher as Rachel Carson. “In *Silent Spring*, Rachel Carson put before the public the chilling possibilities of a neo-Malthusian catastrophe where humanity’s demand for greater agricultural productivity would contribute to its own undoing.”⁵

Though Carson tried to convince other scholars to write a book on the subject of chemical use and environmental degradation, she ended up taking on the massive issue herself. Fortunately, Carson’s professional and educational background prepared her for such an ambitious undertaking. Carson originally studied English at Johns Hopkins University but later switched her major to biology, contributing articles to the university’s newspaper and literary supplement all the while. During that time, Carson feared that she had abandoned her dream of a literary career, only later realizing that she had discovered what she wanted to write about. Paul Brooks, author of one of many Carson biographies, writes, “The merging of these two powerful currents—the

³ Steiguer, *The Origins of Modern Environmental Thought*, 33.

⁴ Brooks, *The House of Life*, 296; Steiguer, *The Origins of Modern Environmental Thought*, 34.

⁵ Steiguer, *The Origins of Modern Environmental Thought*, 28-29.

imagination and insight of a creative writer with a scientist's passion for fact—goes far to explain the blend of beauty and authority that was to make her books unique.”⁶

Carson continued her graduate studies at Johns Hopkins in zoology and genetics, receiving a master's degree in marine zoology in 1932. After financial hardship and the loss of her father, Carson was forced to drop out of her PhD. Program and began work as a government biologist at the U.S. Bureau of Fisheries (renamed in 1940 the U.S. Fish and Wildlife Service), a position won by outscoring all other candidates on the civil service exam. At this point in 1936, she became the second woman to be hired by the Bureau of Fisheries for a full-time, professional position.⁷ Additionally, Carson had impressive literary credentials with three best-selling books to her credit.⁸ “These three books, *Under the Sea-Wind* (1941), *The Sea Around Us* (1950), and *The Edge of the Sea* (1955) established Carson as one of America's most admired and respected science writers long before she became embroiled in the pesticide controversy with the publication of *Silent Spring*.”⁹

A great deal of what made *Silent Spring* enduring and successful lies in what Carson chose to make explicit. This selectivity is evident in her first chapter “A Fable for Tomorrow,” a frightening and deeply moving parable:

⁶ Brooks, *The House of Life*, 18.

⁷ Linda Lear, *Rachel Carson: Witness for Nature* (New York: H. Holt, 1997), 79-82.

⁸ Steiguer, *The Origins of Modern Environmental Thought*, 29.

⁹ Lisa H. Sideris and Kathleen Dean Moore, *Rachel Carson: Legacy and Challenge* (Albany, NY: State University of New York Press, 2008), 1.

There once was a town in the heart of America where all life seemed in harmony with its surroundings. The town lay in the midst of a checkerboard of prosperous farms...where in autumn white clouds of bloom drifted above the green fields...Then a strange blight crept over the area and everything began to change...There was a strange stillness...a white granular powder...had fallen like snow upon the roofs and the lawns, the fields and streams. No witchcraft, no enemy action has silenced...this stricken world. The people had done it themselves.¹⁰

She concludes the chapter saying that the town does not yet exist, but that it easily could exist and that communities have already suffered each of the tragedies described though not all together. Carson's decision to begin her treatise with a "fable" shows that she was aware of the delicate balance to be struck when writing didactically on such a heavy subject. By leading the book with an ambiguous, but widely applicable tale, Carson reveals not only her conviction that every person in every town has a right to know about the dangers of pesticides, but also her ability to employ literary techniques like allegory to make an argument with serious political and scientific implications. By selecting the fable form, Carson shows her cleverness and concern as an author. She concludes the chapter with a call to continue reading: "What has already silenced the voices of spring in countless towns in America? This book is an attempt to explain."¹¹

Her second chapter—the focus of much controversy—defines the problem as Carson sees it, presenting her philosophical reasons for writing the book and making

¹⁰ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962), 1-3.

¹¹ Rachel Carson, *Silent Spring*, 3.

explicit that she does not argue for a complete ban of pesticides. One statement in this chapter is particularly memorable: “We have subjected enormous numbers of people to contact with these poisons, without their consent and often without their knowledge. If the Bill of Rights contains no guarantee that a citizen shall be secure against lethal poisons distributed either by private individuals or by public officials, it is surely only because our forefathers...could conceive of no such problem.”¹² In the end, she quotes French biologist and philosopher, Jean Rostand: “The obligation to endure gives us the right to know.”¹³

The third chapter, “Elixirs of Death,” outlines the properties of various insecticides, explaining how chemicals like DDT are not discriminating, harming all organisms in the same way that they harm or kill their intended victims. “Surface Waters and Underground Seas” next describes the continuity of the earth’s aquatic system of rivers and oceans and thus the role of the system in the spread of pollution. She continues this vein with the concept of the interconnectedness of natural systems in her fifth chapter, “Realms of the Soil.” Here, Carson shows off her talent as a nature writer, detailing the creation and life of soil, dependent on both dead and living organisms. Again we see the emphasis on ecosystems in “Earth’s Green Mantle,” which refers to vegetation as “part of a web of life in which there are intimate and essential relations

¹² Carson, *Silent Spring*, 12-13.

¹³ Carson, *Silent Spring*, 13.

between plants and the earth, between plants and other plants, between plants and animals.”¹⁴

In her seventh chapter, “Needless Havoc,” Carson shows that many “eradication” campaigns (such as that of the Japanese beetle) are wholly unsuccessful anyway, causing massive ecological destruction yet failing to get rid of the pests and in some cases causing conditions to be more favorable to the pests. In the chapter she tells a story to suggest that the wholesale application of pesticides raises “not only scientific but moral” questions.¹⁵ Joseph Steiguer, author of *The Origins of Modern Environmental Thought*, retells the tale aptly, capturing the essence of Carson’s concern:

The incident involved a decision by the Illinois Agriculture Department to aerially spray dieldrin, a compound fifty times more lethal than DDT, in order to eradicate Japanese beetles. Between 1954 and 1961, 131,000 acres were sprayed around the town of Sheldon with some incredibly destructive side effects. The dieldrin virtually annihilated ground squirrels, fox squirrels, pheasants, robins, meadowlarks, and starlings; killed muskrats, rabbits, and cats; and sickened cattle. Many of the animals experienced particularly violent deaths; “the dead ground squirrels...exhibited a characteristic attitude in death...the head and neck were outstretched and the mouth often contained dirt suggesting the dying

¹⁴ Carson, *Silent Spring*, 64.

¹⁵ Carson, *Silent Spring*, 99; Steiguer, *The Origins of Modern Environmental Thought*, 31.

animal had been biting the ground.”¹⁶ The chapter closes with the bitter question, “By acquiescing in an act that can cause such suffering to a living creature, who among us is not diminished as a human being?”¹⁷

Carson’s eighth chapter, “And No Birds Sing,” was, not coincidentally, an allusion to John Keat’s poem “La Belle Dame Sans Merci” and the inspiration for the title of the book. The next few chapters follow what Murphy considers essentially the same format, “presenting one aspect of the problem, providing explanations and illustrative incidents, and concluding with exhortations to acknowledge the problem and demand solutions.”¹⁸ In “Rivers of Death,” Carson’s chapter on fish life, she concludes that the threat to fish “by the chemicals entering our waters can no longer be doubted.” Carson wonders, “When will the public become sufficiently aware of the facts to demand...action?”¹⁹

Perhaps her most provocative chapter, however, deals with the human dimensions of the problem. “Beyond the Dreams of the Borgias,” contains some of Carson’s most confrontational material, giving the media an image of the infamous Borgias who feigned hospitality as they poisoned their guests that would recur in its coverage.²⁰ She suggests

¹⁶ Carson, *Silent Spring*, 99-100.

¹⁷ Carson, *Silent Spring*, 100; Steiguer, *The Origins of Modern Environmental Thought*, 31-32.

¹⁸ Priscilla Coit Murphy, *What a Book Can Do: The Publication and Reception of Silent Spring* (Amherst: University of Massachusetts Press, 2005), 7.

¹⁹ Carson, *Silent Spring*, 152.

²⁰ Murphy, *What a Book Can Do*, 7.

that “age of poisons” was created “to make money.”²¹ The chapter relates the hazards of crop dusting and the aerial spraying of gypsy moths and Japanese beetles. Additionally, Carson challenges the Food and Drug Administration (FDA) about the contamination of consumer food, arguing that government protection of consumers is limited.

The following three chapters are the most technical, describing the physiological and cellular effects of the ingestion of pesticides. “One in Every Four” addresses cancer specifically (citing among others, studies concerning the consequences of arsenic used by tobacco growers). The final three chapters, titled “Nature Fights Back,” “The Rumbblings of an Avalanche,” and “The Other Road” argue that indiscriminate pesticide use ruins nature’s usually powerful ability to keep undesirable insects in check.²² In her final chapter, Carson discusses “the other road”—the selective and prudent use of safer chemicals coupled with other, less threatening technologies such as biological control and insect sterilization.²³

Silent Spring is in essence a call to action in which Carson asks the public to consider the threat of pesticide misuse and make conscious choices about the state of the environment rather than acquiescing unknowingly to a world of environmental degradation and imbalance by taking what first appears to be the easier path. She writes, “The public must decide whether it wishes to continue on the present road, and it can do

²¹ Carson, *Silent Spring*, 174.

²² Steiguer, *The Origins of Modern Environmental Thought*, 33.

²³ Steiguer, *The Origins of Modern Environmental Thought*, 33; Carson, *Silent Spring*, 277-297.

so only when in full possession of the facts.”²⁴ Carson concludes her book with a stern warning:

“The “control of nature” is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth.”²⁵

Carson as an Author and Advocate for the Lay Reader as Citizen

Rachel Carson did not set out to be an “environmental writer” in the modern sense, that is, with the purpose of mobilizing readers for a particular ecological cause. *Silent Spring* with its explicit targeting of pesticides and warnings against their indiscriminate use was in many ways a departure from the genre of writing Carson knew and loved best. Carson was first and foremost a nature writer, seeing herself as a “reporter and interpreter of the natural world.”²⁶ Her extraordinary gift for nature writing enabled Carson to evoke in rich detail the permeability of boundaries, “the tastes and sounds, the pains and pleasures, of the world as experienced by nonhuman forms of

²⁴ Carson, *Silent Spring*, 13.

²⁵ Carson, *Silent Spring*, 297.

²⁶ Rachel Carson, “Design for Nature Writing,” Acceptance Speech for the John Burroughs Medal, Apr. 7, 1952, cited in Linda Lear, ed., *Lost Woods: The Discovered Writing of Rachel Carson* (Boston: Beacon Press, 1998), 94.

life.”²⁷ What remained constant across all her works, however, was a clear appreciation for ecosystems and the interconnectedness of our ecological lives. Phrased differently by Murphy, “The underlying logic of her argument follows from the concept of natural interrelatedness of all living things and the need to sustain relationships in a dynamic balance.”²⁸ *Silent Spring* made the idea that nature requires balance both vivid and acceptable, when previously the conceit—“the balance of nature”—carried connotations of irrational sentimentality and was derisively applied to nature lovers.²⁹

According to the edited volume *Rachel Carson: Legacy and Challenge*, Carson identified and attempted to bridge what she saw as dangerous gaps in communications between specialists and everyone else.³⁰ She worried about the fragmentation and compartmentalization of knowledge, particularly the gaps between experts and average citizens, but also among specialists from different disciplines. The editors of the volume conclude that Carson cleverly drew on a discourse of citizens’ rights and government and corporate responsibility that still resonates strongly with American ideals and sensibilities.³¹ This is best illustrated by the last paragraph of Chapter 2, “The Obligation to Endure”:

There is still a very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of

²⁷ Sideris and Moore, *Legacy and Challenge*, 2.

²⁸ Murphy, *What a Book Can Do*, 8.

²⁹ Murphy, *What a Book Can Do*, 8.

³⁰ Sideris and Moore, *Legacy and Challenge*, 1.

³¹ Sideris and Moore, *Legacy and Challenge*, 1.

or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. When the public protests, confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizing pills of half truth. We urgently need an end to these false assurances, to the sugar coating of unpalatable facts. It is the public that is being asked to assume the risks that the insect controllers calculate.³²

Carson powerfully and pithily conveys the inequality of the assumption of risk between citizens and corporations. She criticizes experts' failure to collaborate with one another and to perceive environmental issues holistically.

Carson's recent biographer, Linda Lear, notes that Carson used the occasion of accepting the National Book Award for Nonfiction in 1952 to make known her concern with the trend toward the "artificial separation of science and literature as exclusive methods of investigating the world."³³ For Carson, "the aim of science is to discover and illuminate the truth," which was for her the objective of all literature. Carson's conclusion that "there can be no separate literature of science" was both unusual at that

³² Carson, *Silent Spring*, 13.

³³ Dianne Newell, "Silent Spring's Success Stems from its Mix of Science and Storytelling," ed., *The Environment in Rachel Carson's Silent Spring* (Farmington Hills, MI: Greenhaven Press, 2012), 59.

time and considered by Dianne Newell to be a harbinger of the feminist debates about science to come.³⁴

While Carson frequently discussed (both in her books and public statements) the dangers of what she perceived as the artificial separation of literature and science, as well as the communications gap between experts and laypeople, it was not until her acceptance speech for the John Burroughs medal that she proposed an imperative: nature writers must write for a broader audience. “I am convinced,” she said, “that we have been far too ready to assume that these people are indifferent to the world we know to be full of wonder. If they are indifferent it is only because they have not been properly introduced to it—and perhaps that is in some measure our fault. I feel,” she continued, “that we have too often written only for each other. We have assumed that what we had to say would only interest other naturalists. We have too often seemed to consider ourselves the last representatives of a dying tradition, writing for steadily dwindling audiences.”³⁵

Carson was intensely hopeful about the lay reader. She believed that interest and wonder in the natural world could be cultivated. This is confirmed by her posthumously published book, “The Sense of Wonder” in which Carson paired her keen observations with nature photographs to help children discover nature and to help adults rediscover nature with a childlike sense of wonder. She encourages people to ask themselves, “What

³⁴ Newell, *Science and Storytelling*, 59.

³⁵ Carson, “Design for Nature Writing,” in Lear, *Lost Woods*, 94; Lear, *Witness for Nature*, 221.

if I had never seen this before? What if I knew I would never see it again?”³⁶ Carson’s philosophy and authorial task are unmistakable: “If facts are the seeds that later produce knowledge and wisdom, then the emotion and the impressions of the senses are the fertile soil in which the seeds must grow.”³⁷ This belief led her to write the book, convinced that “The years of early childhood are the time to prepare the soil.”³⁸ Her optimism about the human sense of wonder was confirmed by the volume of letters she received after the publication of *The Sea Around Us*. In her acceptance speech for the Burroughs Medal, “Design for Nature Writing,” Carson marked herself as an advocate for the lay reader as citizen. She remarked, “The letters that have come to me in the past nine months have taught me never again to underestimate the capacity of the general public to absorb the facts of science.” She continues, “If these letters mean anything it is this: that there is an immense and unsatisfied thirst for understanding of the world about us, and every drop of information, every bit of fact that serves to free the reader’s mind to roam the great spaces of the universe, is seized upon with almost pathetic eagerness.”³⁹

Carson acted upon this realization when she undertook *Silent Spring*. This is particularly evident in her treatment of research citations. Unprecedented in any of her previous works (or, for that matter, other popular nature books of the time), Carson elected to append fifty-five pages of bibliography and source material to the end of her text. This decision is prominent, entailing a page to itself at the beginning of the work. It

³⁶ Rachel Carson, *The Sense of Wonder* (New York: Harper & Row, 1965), 68-69.

³⁷ Carson, *The Sense of Wonder*, 56.

³⁸ Carson, *The Sense of Wonder*, 56.

³⁹ Carson, “Design for Nature Writing,” in Lear, *Lost Woods*, 96.

reads: “Author’s Note: I have not wished to burden the text with footnotes but I realize that many of my readers will wish to pursue some of the subjects discussed. I have therefore included a list of my principal sources of information, arranged by chapter and page, in an appendix which will be found at the back of the book. R.C.” This choice shows that Rachel Carson anticipated the diversity of her audience, knowing that most lay readers would be averse to a text laden with footnotes while other experts and opponents would attend carefully to her research. As noted by Priscilla Murphy, author of *What a Book Can Do: The Publication and Reception of Silent Spring*, the presence and placement of this reference material played a pivotal role in criticism and defense of the book.⁴⁰

Language

The language of *Silent Spring* is both a source of praise and criticism for Rachel Carson. Nevertheless, both sides of the debate agree that Carson’s artful communication style enhanced the persuasiveness of both the scientific argument and its philosophical underpinnings. Carson’s broad use of metaphor and careful rhetorical presentation function together, beguiling the reader into assimilating information that is both intellectually difficult to understand and emotionally difficult to accept.⁴¹ Her literary skill allows her to present complex scientific information with clarity and grace.

⁴⁰ Murphy, *What a Book Can Do*, 9.

⁴¹ Carol B. Gartner, “When Science Writing Becomes Literary Art,” ed. Craig Waddell, *And No Birds Sing: Rhetorical Analyses of Rachel Carson’s Silent Spring* (Carbondale and Edwardsville: Southern Illinois University Press, 2000), 105.

Rhetoric

Craig Waddell, editor of *And No Birds Sing: Rhetorical Analyses of Rachel Carson's Silent Spring*, writes, “Although Aristotle argued that rhetoric concerns itself with ‘the things about which we make decisions, and into which therefore we inquire’ and although *Silent Spring* provides a striking example of such discourse—rhetoricians have thus far made few attempts to analyze or explain *Silent Spring*’s phenomenal impact on the public deliberation about the environment.”⁴²

Carson demonstrates her mastery of the rhetorical principle of audience analysis through pragmatic appeals to human self-interest interwoven with her calls for a more altruistic concern for preservation of the natural world.⁴³ She pushes her readers gradually toward the more difficult concept that preserving the greater environment is implicit in preserving ourselves. Carson’s awareness of her audience was due in large part to her belief that a knowledgeable public could bring about immediate changes in government policy and industry practice. She shaped her strategies in *Silent Spring* to reach the general public and mobilize what she knew could be formidable.

Harold Lasswell’s triple-appeal principle, an extension of Freud’s theory of the id, the ego, and the superego, is particularly fruitful when applied to *Silent Spring*. Adapted for political psychoanalysis, the corresponding roles of impulse, reason, and conscience (respectively the id, ego, and superego) can be used to calculate effects on a given

⁴² Waddell, *And No Birds Sing*, 3.

⁴³ Gartner, “When Science Writing Becomes Literary Art,” in Waddell, *And No Birds Sing*, 105.

audience.⁴⁴ Unsurprisingly, Carson tends to appeal to the superego (the conscience) and the ego (reason/reckoning with reality).

However, the greater importance of a tripartite personality is how it explains the underlying forces that “divert people from serving their own broad interests or from allowing others to serve theirs.”⁴⁵ Ascher and Hirschfelder-Ascher explain that “Lasswell’s political psychology is, in one sense, a catalogue of the mechanisms by which the pursuit of values is distorted.” Four psychodynamic patterns are responsible for this distortion:

1. Personality distortions that cripple the balanced pursuit of the broad range of values;
2. Displacements that focus attention and emotion in ineffective or even destructive directions;
3. Inappropriate affects shaped by symbol manipulation (inadvertently or by propaganda); and
4. Counter-productive reactions to crisis and other stresses.⁴⁶

Having identified these patterns, it is clear that policy progress is much less straightforward than it might seem and that apparently obvious objectives should not be taken for granted. Lasswell’s work helps to ensure logical comprehensiveness in the

⁴⁴ Harold D. Lasswell, “The Triple-Appeal Principle: A Contribution of Psychoanalysis to Political and Social Science” *American Journal of Sociology* 37 (January 1932): 523-538.

⁴⁵ William Ascher and Barbara Hirschfelder-Ascher, “Linking Lasswell's Political Psychology and the Policy Sciences,” *Policy Sciences* 37 (March 2004): 26.

⁴⁶ Ascher and Hirschfelder-Ascher, “Linking Lasswell's Political Psychology and the Policy Sciences,” 26.

evaluation of motives and objectives by keeping an eye on the psychological appeals of any given policy or work. Likewise, in order to analyze *Silent Spring* with logical comprehensiveness, it is essential to keep in mind Carson's rhetorical appeals and deployment of various literary techniques.

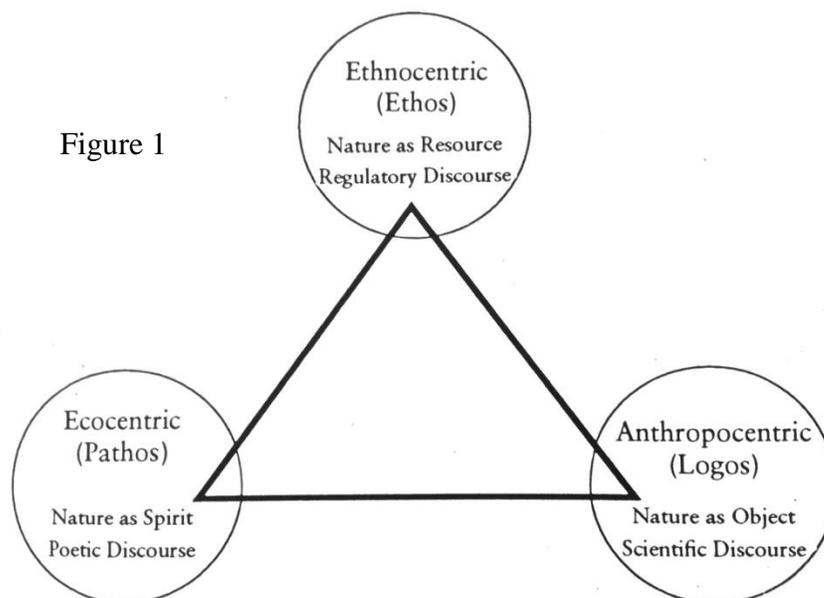
Carson's tendency to appeal to the ego and superego at the expense, in some cases, of the id also deserves attention. Does Carson avoid id driven appeals to avoid sullyng her appeals to the superego? Perhaps. Her instinctive avoidance of the id may also derive from her scientific background. In the scientific world, reactions would be far more sympathetic to rational claims than those based on raw impulse. Though *Silent Spring* has instances which appeal to the id, it is never the driving force or theme of the work, as is the case with reason (ego) and conscience (superego).

Carson's argument offers a new way of seeing nature, a perspective that requires a serious paradigm shift and reframing of familiar relationships between humankind and nature. This is easier to conceive in view of Herndl's and Brown's constructivist interpretation of the environment. They claim that the environment is "a concept and an associated set of cultural values that we have constructed" through the way we use language.⁴⁷ It is useful to examine the tripartite rhetorical model that Herndl and Brown set forth to describe environmental discourse. See Figure 1.⁴⁸

⁴⁷ Carl Herndl and Stuart Brown, "Introduction" ed. Carl Herndl and Stuart Brown, *Green Culture: Environmental Rhetoric in Contemporary America* (Madison: University of Wisconsin Press, 1996), 3 as cited in James Burke, "Silent Spring's Metaphors: Insights for 21st Century Environmental Discourse" (Thesis, Virginia Polytechnic Institute and State University, 2004), 22.

⁴⁸ Herndl and Brown, "Introduction" ed. Herndl and Brown, *Green Culture*, 11, figure 1.

Figure 1



A rhetorical model for environmental discourse

Herndl and Brown describe the ethnocentric part of the model:

The regulatory discourse at the top of the model represents the discourse of the powerful institutions that make decisions and set environmental policy. This discourse usually regards nature as a resource, one among many others, to be managed for the greater social welfare. In many ways this discourse is the legacy of Gifford Pinchot's vision of a utilitarian management of natural resources which eventually won out in the contest with John Muir's wilderness philosophy. As a result, we call this an ethnocentric discourse, one devoted to negotiating the benefits of environmental policy measured against a broad range of social interests...Political power of this discourse comes from its institutional context, but its rhetorical power emerges from the rhetorical notion of

ethos, the culturally constructed authority of the speaker or writer who represents these institutions.⁴⁹

The authors suggest that the failures of many policy-making processes emerge, in part, from the failure to construct an acceptable authority from which to promulgate decisions.

Herndl's and Brown's rhetorical model asserts the existence of a singular scientific discourse, a claim with which some critics might take issue because of perceived divides within the scientific community itself. Nevertheless, Herndl and Brown highlight important aspects of the anthropocentric argument. Their overview is as follows:

The scientific discourse in the model represents the specialized discourse of the environmental sciences. Within this discourse, nature is usually regarded as an object of knowledge constructed through careful scientific methodology. Because this discourse locates the human researcher as outside and epistemologically above nature, we call this anthropocentric discourse, one grounded in its faith in the human ability to come to know nature's secrets. The immense cultural power of this discourse comes from our rationalist faith in science and in the productivity of the scientific method. The rhetorical power of this discourse emerges from the rhetorical notion of logos, the appeal to objective fact and reason.⁵⁰

The authors explain that this is the discourse grounds the arguments of policymakers; technical data and expert testimony usually represent the basis of policy decisions, often

⁴⁹ Herndl and Brown, "Introduction" ed. Herndl and Brown, *Green Culture*, 11.

⁵⁰ Herndl and Brown, "Introduction" ed. Herndl and Brown, *Green Culture*, 11-12.

at the expense of other participants or other forms of the rhetorical appeal. They fail to explain the scientists who participate more heavily in the poetic environmental discourse, or are at least cited as such, like Rachel Carson herself.

The third and final part of Herndl's and Brown's rhetorical model is poetic discourse, which refers to "the language we use to discuss beauty, the value, the emotional power of nature." The authors elaborate:

In this discourse, nature is usually regarded as a spiritual or transcendent unity. Because this discourse largely considers humanity as part of nature and seeks to locate human value in a harmonious relation to the natural world, we call this an ecocentric discourse. The power of this discourse comes largely from aesthetic or spiritual responses to the rhetorical notion of pathos...⁵¹

Though Carson's scientific background firmly roots her in the anthropocentric model, her literary and philosophical approach, which emphasizes interconnectedness and a sense of wonder, is clearly ecocentric. These rhetorical models of environmental discourse help to clarify Carson's methods, showing where she converges and diverges with traditional environmental discourse.

Ambiguity and Metaphor

Yaakov Garb argues that Carson's *Silent Spring* was not a particularly radical critique of society. Garb contends that Carson invokes the "balance of nature" because it was sufficiently vague so as not to be threatening to most of society. He writes:

⁵¹ Herndl and Brown, "Introduction" ed. Herndl and Brown, *Green Culture*, 12.

Terms like “nature,” “natural,” and the “balance of nature” have great discursive force not in spite of but because of their fuzziness. Their multiple connotations and self-evident (thus unexamined) definition within the community that shares them enable protean versatility. We add great force to any argument by adducing the “natural” to it, so long as no one asks carefully what we mean by the term. If they do, it will often turn out that nature (and its cognates) are not pre-existing, ontologically firm objects or conditions in the natural world, but a reification of human criteria and definitions.⁵²

Whatever the resonance of these words for the public, for Carson they had precise meaning, anchored in a vision of that world Carolyn Merchant called organic.⁵³

Despite Garb’s argument that *Silent Spring* was not particularly extreme, Carson sparked a redefinition of environmental discourse and the human-nature relationship by forcing readers to examine the use of warlike rhetoric in connection with pesticides—an injection of linguistic technique that really was quite radical. Implicitly and explicitly, Carson was “able to exploit Cold War fears that already recognized the possibility of global destruction through nuclear conflict” with warlike and apocalyptic language.⁵⁴ A

⁵² Yaakov Garb, “The Politics of Nature in Rachel Carson’s *Silent Spring*,” in *Minding Nature: The Philosophers of Ecology*, ed. David Macauley (New York: Guilford Press, 1996), 238, 229-56; William Cronon, ed., *Uncommon Ground: Rethinking the Human Place in Nature* (New York: Norton, 1995).

⁵³ Smith, ““Silence, Miss Carson!”” 746.

⁵⁴ Jimmie Killingsworth and Jacqueline Palmer, “Millennial Ecology: The Apocalyptic Narrative from *Silent Spring* to Global Warming,” in Herndl and Brown, *Green Culture*, 22, 27, as cited in Burke, “*Silent Spring*’s Metaphors,” 22.

letter Carson wrote to the editor of the *Washington Post* shows that she was fully cognizant of the political and social atmosphere in which she wrote. The letter concludes, “It is one of the ironies of our time that, while concentrating on the defense of our country against enemies from without, we should be so heedless of those who would destroy it from within.”⁵⁵ It follows, then, that the working title for her book was *War Against Nature*.⁵⁶ Gartner argues that Carson’s skillful use of warfare terms becomes a “thematic extended metaphor” for pesticides.⁵⁷ In his book *War and Nature*, Edmund Russell observes that “Carson relied on literal and metaphorical similarities between chemical warfare and pest control” in making her case against DDT and other widely used pesticides.

“Man with a spray gun” is a phrase Carson employs to describe the militaristic fervor with which pesticide users have carried out their project to “eradicate” the enemy: insects. This “man with a spray gun” has ignored the balance of nature, destroying as pests insects which preyed on insects even more destructive to the sculpted environment of humans. There are laws more fundamental than Bacon’s or Newton’s. Carson argues that the “balance of nature...is a complex, precise, and highly integrated system of relationships between living things which cannot safely be ignored any more than the law

⁵⁵ Lear, *Lost Woods*, 100, as cited in Burke, “Silent Spring’s Metaphors,” 52.

⁵⁶ Cheryll Glotfelty, “Cold War, *Silent Spring*: The Trope of War in Modern Environmentalism in Waddell, *And No Birds Sing*, 170, as cited in Burke, “Silent Spring’s Metaphors,” 21.

⁵⁷ Gartner, “When Science Writing Becomes Literary Art”, in Waddell, *And No Birds Sing*, 116, as cited in Burke, “Silent Spring’s Metaphors,” 21.

of gravity can be defied with impunity by a man perched on the edge of a cliff...Man, too, is a part of this balance.”⁵⁸

Control is another aspect of warfare. Control requires strategy, confidence, and risks. It requires one group to be the conqueror and one to be the conquered. Carson combats “control of nature” as a goal, a possibility, and a philosophy by connecting it with the thoughtless devastation of warfare, a state conveyed by the chapter title “Needless Havoc.” Carson paints those who support chemical “controls” as religious extremists with “fanatic zeal” “on a crusade to create a chemically sterile, insect-free world.”⁵⁹ Her phrase “salvation...at the end of a spray nozzle” goes so far as to connect her militaristic metaphors with her religious metaphors, implying a violent path to a religious goal.⁶⁰

Carson herself said the entire book could be summarized as follows, “This is a book about man’s war against nature, and because man is part of nature it is also and inevitably a book about man’s war against himself.”⁶¹ Carson is deeply concerned with the false sense of power that comes with the use of chemicals. She recognizes that to many, pesticides are a “bright new toy” that gives them a “giddy sense of power.”⁶² She

⁵⁸ Carson, *Silent Spring*, 218; Smith, “‘Silence, Miss Carson!’” 746.

⁵⁹ Carson, *Silent Spring*, 12.

⁶⁰ Carson, *Silent Spring*, 144.

⁶¹ Rachel Carson, *Always, Rachel: The Letters of Rachel Carson and Dorothy Freeman, 1952-1964*, ed. Martha Freeman (Boston: Beacon Press, 1995), 380; Lisa Sideris, “The Ecological Body: Rachel Carson, *Silent Spring* and Breast Cancer,” Sideris and Moore, *Legacy and Challenge*, 137.

⁶² Carson, *Silent Spring*, 68.

cringes to know that chemicals are placed in the hands of “persons largely or wholly ignorant of their potentials for harm.”⁶³ Her invocation of a “bright new toy” metaphor bestows childlike ignorance of consequences and feeble capacity for envisioning the “bigger picture.”

Carson’s objections were to chemical rather than biological “warfare.” She frequently invoked the metaphor of war in support of natural pest controls, citing a “whole battery of armaments,” new “lines of attack,” and means of direct destruction” available to those willing to seek the permanence of biological solutions in place of quick-fix chemicals.”⁶⁴ Sideris clarifies Carson’s perspective:

One of the “more attractive possibilities” emerging from biological approaches, she notes, involves “what might be termed an experiment in psychological warfare” wherein entomologist use insects’ own sexual secretions to confuse and trap males of the species. Compared to such creative methods, she argues, chemical pesticides are an inferior means of warfare, “as crude a weapon as the cave man’s club.” Better—and more discriminate—weapons were available. Crude chemical controls provide irrefutable evidence of a Darwinian struggle in nature, Carson notes, for spraying results in weeding out the “weaker members” of insect populations, leaving the strong and fit...to defy our efforts to control them.” If we are to succeed in this war, she argues, we must learn the art

⁶³ Carson, *Silent Spring*, 12.

⁶⁴ Sideris, “The Ecological Body” ed. Sideris and Moore, *Legacy and Challenge*, 144.

of “forging weapons from the insect’s own life processes,” thereby turning the “strength of a species against itself.” She had dropped the references to warfare from the title of her book but the motif of combat persists in more subtle forms.⁶⁵

Carson supported the use of “natural enemies to control the insects that have come uninvited to our shores,” an evocative image of wartime battle fronts. Ultimately, she advocated thoughtful “military” strategy rather than pacifism.

One of the most immediately apparent and widely discussed techniques used in *Silent Spring* is metaphor. The role and effect of metaphorical language has been intensely debated, culminating in recent years with the works of Lakoff and the cognitive studies of Glucksberg, whose experiments describe how listeners comprehend and process metaphorical meanings in the same way, and as fast, as literal meanings.⁶⁶ Lakoff’s work is founded on the belief that “human thought processes are largely metaphorical” and that the foundation of creative thought is in experiences rather than language.⁶⁷ A huge part of what makes metaphor important, especially in the case of *Silent Spring*, is that certain metaphors, called “generative metaphors” can frame situations, create understanding beyond mere description, and can guide or shape

⁶⁵ Sideris, “The Ecological Body” ed. Sideris and Moore, *Legacy and Challenge*, 144-145, citing Carson, *Silent Spring*, 286, 297, 263, 285, and 279.

⁶⁶ Sam Glucksberg, “The Psycholinguistics of Metaphor,” *Trends in Cognitive Science* 7 (February 2003), 92, as cited in Burke, “Silent Spring’s Metaphors,” 6.

⁶⁷ George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980), 6; George Lakoff “The Contemporary Theory of Metaphor,” in *Metaphor and Thought*, ed. Andrew Ortony (Cambridge: Cambridge University Press 1993), 245, as cited in Burke, “Silent Spring’s Metaphors,” 6.

particular actions and activities.⁶⁸ Authors can compose metaphors to construct conceptions of new realities, motivating readers to alter their behavior in light of the new frame. Lakoff and Johnson are the chief proponents of the theory that “new metaphors have the power to create new reality.”⁶⁹ Those motivated to construct a different social and political reality can use metaphor as a powerful tool.⁷⁰ For example, Lakoff and Johnson use the metaphor “time is money” to demonstrate a new reality of the commodification of time and its role in Westernization.⁷¹

The relevance of metaphor, as more than a descriptive, but evocative of social phenomena is the primary defense of Berggren, who criticizes antiquated notions of metaphor. He writes, “For centuries metaphor was considered to be nothing more than a stylistic ornament, superimposed on cognitive discourse for emotive purposes, or else a mere illustrative comparison whose possible meanings and truth could merge only when the metaphor was reduced to literal statements.”⁷² Ultimately, however, metaphors have the power to “change reality when they are used to transfer knowledge and power within

⁶⁸ Donald Schon, “Generative Metaphor: A Perspective on Problem-Setting in Social Policy,” *Metaphor and Thought*, ed. Ortony, 137, as cited in Burke, “Silent Spring’s Metaphors,” 6.

⁶⁹ Lakoff and Johnson, *Metaphors We Live By*, 145, as cited in Burke, “Silent Spring’s Metaphors,” 9.

⁷⁰ Lakoff and Johnson, *Metaphors We Live By*, 159, as cited in Burke, “Silent Spring’s Metaphors,” 9.

⁷¹ Lakoff and Johnson, *Metaphors We Live By*, 145, as cited in Burke, “Silent Spring’s Metaphors,” 9.

⁷² Douglas Berggren, “The Use and abuse of Metaphor (Part I and II),” *Review of Metaphysics* 16 (1963): 237, as cited in Burke, “Silent Spring’s Metaphors,” 4.

a discourse.”⁷³ Rachel Carson knew this and took great care to integrate metaphorical language into the fabric of her argument.

Allusion to Keats

Rachel Carson opened *Silent Spring* with an epigraph from John Keats’ poem “La Belle Dame San Merci.” It reads “The sedge is wither’d from the lake,/ and no birds sing.” The allusion forms the title of chapter eight and inspires the title of the whole book. “La Belle Dame San Merci,” like most of Keats’ poetry, has been interpreted and re-interpreted in numerous ways, but there is a central story of knight pining over a mysteriously sad woman who understands something which he cannot yet see. Carson’s allusion invokes the sensibility of the entire poem, evoking her awareness of the disappearance of the natural world and thus profound sadness at a time when few others recognized the relationship between synthetic chemicals and the natural environment.⁷⁴

The allusion to Keats, made explicitly in the epigraph and more subtly in the chapter and book title, was a clever rhetorical device. While the allusion is certainly a mark of Carson’s education (recall that she studied literature at Johns Hopkins before changing her major to biology) it moves readers to feel tenderness for delicate ecosystems damaged by the assault of pesticides; it moves them to study the quiet loss and deep sadness of that particular moment in time.

⁷³ Sabine Maasen, “Metaphors in the Social Sciences: Use and Making Sense of Them,” in *Metaphor and Analogy in the Sciences* (Boston: Kluwer, 2000), 18, as cited in Burke, “Silent Spring’s Metaphors,” 9.

⁷⁴ Danielle Castelli, “Eco Profile: Rachel Carson: Scientist, Activist, and Writer,” *Under the Microscope* (29 April 2011) accessed March 12, 2012, <http://www.underthemicroscope.com/blog/eco-profile-rachel-carson-scientist-activist-and-writer>.

Carson's Writing Habits

Steingraber contemplates Carson's writing and her writing process: that she wrote prose like a poet is one of the most common claims made about her writing. She was "reassured to learn that the process of her prose writing also resembled the making of poetry. That is, she wrote at a snail's pace and then rewrote. And rewrote."⁷⁵ Carson once said about herself, "I write slowly, often in longhand, with frequent revision. Being sensitive to interruption, I write most freely at night. As a writer, my interest is divided between the presentation of facts and the interpretation of their significance, with emphasis, I think toward the latter."⁷⁶

Reception

To describe the reception of *Silent Spring* is to weave a story of the media frenzy, the public, and the organizations and affiliated publications, which feared that Rachel Carson's indictment of profligate pesticide use would change the way they did business. The headline in the *New York Times* on July 22nd, 1962 defined the buzz: "*Silent Spring* is now noisy summer."⁷⁷ Though Carson died just eighteen months later in the spring of 1964, at the age of fifty-six, she had sparked a new debate about the use of chemical pesticides, the regulatory role of the government, and the relationship between humans and nature, drawing forth a new public environmental discourse, if not consciousness.

⁷⁵ Sandra Steingraber, "Living Downstream of *Silent Spring*," ed. Sideris and Moore, *Legacy and Challenge*, 225.

⁷⁶ Rachel Carson, as quoted in Jonathan Norton Leonard, "Rachel Carson Dies of Cancer; 'Silent Spring' Author Was 56," *New York Times*, April 15, 1964; Steingraber, "Living Downstream of *Silent Spring*," ed. Sideris and Moore, *Legacy and Challenge*, 225.

⁷⁷ John Lee, "*Silent Spring* is now noisy summer," *The New York Times*, July 22, 1962.

In a disturbing study of the public relations industry, John Stauber and Sheldon Rampton describe how the public relations arms of the chemical industry and the Department of Agriculture learned of Carson's work even before its serialization in the *New Yorker* and took swift action. By the end of the summer of 1962, while the book was being prepared for press, the anti-Carson machinery was already moving into high gear, frantically preparing an intense, well-financed campaign against the book and its author.⁷⁸ Even before the book was released, a tidal wave of mail fell upon Congress, the Agriculture and Interior departments, the Public Health Service, and the Food and Drug Administration in response to the *New Yorker* articles.⁷⁹ This rush of public concern pushed Velsicol Chemical Corporation to attempt to stop Houghton Mifflin from publishing the book; they threatened to sue the publisher in a dialogue that linked Carson to "food faddists" and other "fringe" groups.⁸⁰ Monsanto published a grotesque parody of *Silent Spring's* opening chapter in its in-house magazine titled "Desolate Year", which described a world overrun by insects, "as the garrote of Nature rampant began to tighten."⁸¹

Genus by genus, species by species, subspecies by innumerable
subspecies, the insects emerged. Creeping and flying and crawling into the

⁷⁸ Smith, "'Silence, Miss Carson!'" 736; Al Gore, "Introduction", Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1994), xv-xxvi.

⁷⁹ Steiguer, *The Origins of Modern Environmental Thought*, 34.

⁸⁰ Steiguer, *The Origins of Modern Environmental Thought*, 34; Smith, "'Silence, Miss Carson!'" 736.

⁸¹ John Stauber and Sheldon Rampton, *Toxic Waste Is Good for You! Lies, Damn Lies, and the Public Relations Industry* (Monroe, Maine: Common Courage Press, 1995), 123-27; Smith, "'Silence, Miss Carson!'" 736; Murphy, *What a Book Can Do*, 100.

open, beginning in the southern tier of states and progressing northwards. They were chewers and piercer-suckers, spongers, siphoners, and chewer-lappers, and all their vast progeny were chewers—rasping, sawing, biting maggots and worms and caterpillars...

A cattleman in the Southwest rubbed the back of a big red steer, and his hand found two large lumps under the hide...gritting his teeth, he placed his thumbs at the sides of one of the lumps and pressed. The hair parted, a small hole opened and stretched. A fat, brown inch-long maggot slowly eased through the hole...

But food and fur animals weren't the only ones that died to the hum of the insects that year. Man, too, sickened, and he died...One day, he was stricken by an old foe that had returned violently—malaria. While he suffered, the mosquitoes kept biting, and as each keen proboscis siphoned off his blood it also sucked in deadly gametocytes that were in the red corpuscles...[he] suffered the fiendish torture of chills and fever and the hellish pain of the world's greatest scourge⁸²

Monsanto successfully used florid language and revolting images to dramatize the horrors of a world without pesticides. The pastiche reveals the intensity of the opposition and while it might first appear that the corporation was simply preaching to the choir by publishing the piece in its in-house magazine, Monsanto sent five-thousand galley-proofs to “book reviewers; syndicated science and gardening writers; editors of Sunday, farm, and science papers; trade publications in eleven big industries; national magazines; and

⁸² “The Desolate Year,” *Monsanto Magazine*. (October 1962): 4-9.

radio and TV farm editors” assuring influential readership.⁸³ *PR News* reported that “more than 25,000 reprints and 10,000 extra copies [of the Monsanto parody] were distributed” and claimed that “requests came from government officials, educators, businessmen, Monsanto’s customers, prospects, and stockholders.”⁸⁴ *PR News* “joined those who faulted Carson’s writing as ‘hysterical, dangerous extremism’ describing Monsanto’s exaggerated imitation of her style in ‘Desolate Year’ as admirable, persuasive prose.”⁸⁵ Though the parody was surely satisfying for the anti-Carson crowd, its intent to undermine the skill of Carson’s writing may still have backfired and not hit its mark for many groups. Nevertheless, “Desolate Year” is just an example of how the opposition achieved its goal of gaining media attention and altering the conversation and media coverage of *Silent Spring*. After all, mass mailings were aimed substantially at the media rather than the public at large.⁸⁶

Opponents of Carson’s work also invoked the imperatives of the Cold War. They contended that “an overly credulous and uninformed public might fall for the elimination

⁸³ “Monsanto Chemical Company Published a Rebuttal to Rachel Carson’s *Silent Spring*,” *PR News* (February 1963), reprinted in *PR News Casebook: 1000 Public Relations Case Studies*, ed. David P. Bianco (Detroit: Gale Research, 1993), 440; Murphy, *What a Book Can Do*, 113.

⁸⁴ “Monsanto Chemical Company Published a Rebuttal to Rachel Carson’s *Silent Spring*,” 440; Murphy, *What a Book Can Do*, 111.

⁸⁵ Murphy, *What a Book Can Do*, 104.

⁸⁶ Murphy, *What a Book Can Do*, 113.

of pesticides and that ‘our food supply will be reduced to East-curtain parity.’”⁸⁷ Ultimately, they threatened a libel suit against Carson’s so called innuendos.⁸⁸

Paul Brooks, Carson’s editor and biographer, believes that the attacks on her book were motivated by what the chemical and agricultural interests perceived as a direct threat to their very existence. Brooks describes this concept:

Her opponents must have realized—as indeed was the case—that she was questioning not only the indiscriminate use of poisons but the basic irresponsibility of an industrialized, technological society toward the natural world. She refused to accept the premise that damage to nature was the inevitable cost of ‘progress.’ The facts she revealed were bad enough, but it was the point of view behind them that was really dangerous, and must be suppressed.⁸⁹

As Brooks says, “Perhaps not since the classic controversy over Charles Darwin’s *The Origin of Species*...had a single book been more bitterly attacked by those who felt their interests threatened.”⁹⁰ The National Agricultural Chemical Association led the attack, spending a quarter of a million dollars to improve the image of the industry and refute

⁸⁷ Lewis A. McLean, General Counsel, Velsicol Chemical Corporation to Houghton Mifflin, 2 Aug. 1962; Smith, “‘Silence, Miss Carson!’” 736; Steiguer, *The Origins of Modern Environmental Thought*, 34.

⁸⁸ Frank Graham, *Since Silent Spring* (Boston: Houghton Mifflin, 1970), 49; Smith, “‘Silence, Miss Carson!’” 736.

⁸⁹ Brooks, *The House of Life*, 293-294.

⁹⁰ Brooks, *The House of Life*, 293.

Carson's case against the indiscriminate use of chemical insecticides; the Manufacturing Chemists' Association also attacked the book.⁹¹

It is difficult to remember the cultural climate that greeted Carson's book. Linda Lear aptly describes the climate in her introduction to the 2002 edition of *Silent Spring*:

Carson wrote at a time of new affluence and intense social conformity. The cold war, with its climate of suspicion and intolerance, was at its zenith. The chemical industry, one of the chief beneficiaries of postwar technology, was also one of the chief authors of the nation's prosperity. DDT enabled the conquest of insect pests in agriculture and of ancient insect-borne disease just as surely as the atomic bomb destroyed military enemies and dramatically altered the balance of power between humans and nature. The public endowed chemists, at work in their starched white coats in remote laboratories, with almost divine wisdom. The results of their labors were gilded with the presumption of beneficence. In postwar America, science was god, and science was male.⁹²

Lear goes on to say how in addition to being a woman, Carson's chosen field, biology, was also held in low esteem in the nuclear age.⁹³ One letter to the *New Yorker* captures the biases of the time: "Miss Rachel Carson's reference to the selfishness of insecticide manufacturers probably reflects her Communist sympathies, like a lot of our writers these

⁹¹ Brooks, *The House of Life*, 294; Linda J. Lear, "Rachel Carson's *Silent Spring*," *Environmental History Review* 17.2 (1993): 413.

⁹² Linda Lear, "Introduction," Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 2002), xi.

⁹³ Lear, "Introduction," Carson, *Silent Spring* (2002), xi.

days. We can live without birds and animals, but, as the current market slump shows, we cannot live without business. As for insects, isn't it just like a woman to be scared to death of a few little bugs! As long as we have the H-bomb everything will be O.K.”⁹⁴

The response from the reading public was, however, overwhelmingly positive. By December, more than one hundred thousand copies had been sold in bookstores. In addition, the Book-of-the-Month Club chose *Silent Spring* as its main selection for October, and the Consumer's Union ordered a special paperbound edition for its members.⁹⁵ By the following spring, sales had passed the half-million mark.⁹⁶ On 3 April 1963, CBS *Reports* aired “The Silent Spring of Rachel Carson,” which led to a dramatic escalation of the debate.⁹⁷ When questioned in a press conference, President Kennedy replied that the Department of Agriculture and the Public Health Service were taking a closer look at the concerns raised by Carson.”⁹⁸

In May 1963, one month after the CBS special, the U.S. Office of Science and Technology released a report titled “Use of Pesticides.” The study, prepared by a select panel of scientists, amounted to official scientific endorsement of *Silent Spring*. Industry and government agencies alike were roundly criticized for their lax handling and administration of pesticides. *Silent Spring* was, in turn, praised for having performed a

⁹⁴ “In the Mail,” *The New Yorker* 71 (20 and 27 Feb. 1995): 18.

⁹⁵ Graham, *Since Silent Spring*, 69; Waddell, *And No Birds Sing*, 7.

⁹⁶ Gore, “Introduction,” Carson, *Silent Spring* (1994), xvii; Waddell, *And No Birds Sing*, 7.

⁹⁷ Lear, “Introduction,” Carson, *Silent Spring* (2002), 39; Waddell, *And No Birds Sing*, 7.

⁹⁸ Waddell, *And No Birds Sing*, 7; Steiguer, *The Origins of Modern Environmental Thought*, 35.

valuable service by informing the public of the dangers of these toxic substances. Soon after the release of the government's report, the highly respected American Association for the Advancement of Science issued a statement saying, "the pesticides report...adds up to a fairly thorough-going vindication of Rachel Carson's *Silent Spring* thesis."⁹⁹ As one official from the Department of the Interior said, "It became obvious that she was many, many times better informed than her critics...because she approached the problem from the viewpoint of basic science while [they] functioned at the technician level."¹⁰⁰

Some say that the Office of Science and Technology report served to sufficiently hush Carson's critics and clear her name, but in truth anti-Carson rhetoric is alive and well. In 2009, Phelim McAleer and Ann McElhinney produced a film entitled "Not Evil Just Wrong" to challenge Al Gore's *An Inconvenient Truth*, averring that evidence of global warming is inconclusive. The film takes several opportunities to decry Rachel Carson as a figurehead of the environmental movement, asserting that Carson's analysis of DDT has led to the death of millions from malaria. They do not make clear that Carson never suggested a total ban on DDT—it was only banned for use in agriculture—or that she supported its careful employment for fighting disease. The film also fails to discuss the varying effectiveness of the insecticide due to genetic change in the mosquito population. The producers of "Not Evil Just Wrong" and "Mine Your Own Business", which is described as "a look at the dark side of environmentalism" frequently speak at conservative conferences, especially at the annual Conservative Political Action Conference (CPAC), which is billed as the largest annual gathering of conservatives in

⁹⁹ Brooks, *The House of Life*, 306.

¹⁰⁰ Brooks, *The House of Life*, 311.

the United States. In 2009, a U.S. poll identified McElhinney and McAleer as the most popular conservative speakers after broadcaster Rush Limbaugh and columnist Ann Coulter.¹⁰¹ These two, however, are simply contributing to a much larger debate of Carson as a “mass murderer.”

Journalist Aaron Swartz reports on a recent trend in which critics blame Rachel Caron for malaria deaths resulting from the failure to spray DDT in some African countries. He opens his article with an off-putting introduction to the discussion: “Sometimes you find mass murderers in the most unlikely places. Take Rachel Carson. She was, by all accounts, a mild-mannered writer for the U.S. Fish and Wildlife Service—hardly a sociopath’s breeding ground. And yet, according to many in the media, Carson has more blood on her hands than Hitler.”¹⁰² He claims that the that failure to spray DDT in developing countries to protect against malaria-carrying mosquitoes has caused malaria rates to skyrocket and 1 million people to die each year. He writes that some argue, “...the solution seems simple: Forget Carson’s emotional arguments about dead birds and start spraying DDT again so we can save human lives.”¹⁰³ In an April 2004 issue of *New York Times Magazine* Tina Rosenberg wrote that “*Silent Spring* is now killing African children because of its persistence in the public mind.”¹⁰⁴

¹⁰¹ "Donegal-Born Film-Maker Slams Blockbuster 'Avatar' ." *Donegal Democrat*, March 9, 2010, http://www.donegaldemocrat.ie/news/local/donegal_born_film_maker_slams_blockbuster_avatar_1_2002657.

¹⁰² Aaron Swartz, “Rachel Carson, Mass Murderer?: The Creation of an Anti-Environmental Myth” October 2007. <http://www.fair.org/index.php?page=3186>.

¹⁰³ Swartz, “Rachel Carson, Mass Murderer?”

¹⁰⁴ Swartz, “Rachel Carson, Mass Murderer?”

Until recently a web page on Stephen Milloy's website, JunkScience.com, featured a live Malaria Death Clock next to a photo of Rachel Carson.¹⁰⁵ A conservative think tank known for disputing global warming, Competitive Enterprise Institute, launched the website RachelWasWrong.org in 2007, which features photos of deceased African children along the side of every page.¹⁰⁶ The web page now sends visitors directly to openmarket.org without explanation. This reasoning has led conservative magazine *Human Events* to give *Silent Spring* (and *The Population Bomb*) an honorable mention in their list of the "Ten Most Harmful Books of the 19th and 20th Centuries," which includes the Communist Manifesto and the Kinsey Report).¹⁰⁷

Historically, however, there have been two groups (excluding corporations) that make up the opposition: members of the scientific community and the popular press. Some scientists found her research to be suspect and questioned her credentials, calling her an "amateur" or a mere "scientific journalist." Evidently, the expectation of writings about science to be "scientific"—that is to say disinterested, objective and balanced between two inferred views—was a theme in the critiques made by the opposition. Stare's appraisal was picked up in several newspapers: "Miss Carson writes with passion and with beauty, but with very little scientific detachment. Dispassionate scientific evidence and passionate propaganda are two buckets of water that simply can't be carried

¹⁰⁵ Swartz, "Rachel Carson, Mass Murderer?"

¹⁰⁶ The pages as they were can be viewed using a web archive service called the Wayback Machine.

¹⁰⁷ "The Ten Most Harmful Books of the 19th and 20th Centuries," *Human Events*, May 31, 2005, accessed March 10, 2012, <http://www.humanevents.com/article.php?id=7591>.

on one person's shoulders." Murphy makes a keen observation of the irony that the Stare's efforts, and many others among the opposition, especially Monsanto's "Desolate Year" constituted "passionate propaganda."¹⁰⁸

Many of members of the scientific community dismissed Carson's writing as "emotional" and "lacking the kind of cold, rational risk assessment required of modern applied science."¹⁰⁹ They compared her to a "pamphleteer' who ignored the rules of proper scientific engagement."¹¹⁰ As mentioned earlier regarding the cultural climate at the time, many have noticed the implicit distinction between the "hard" science of chemistry and the "soft" science of biology. This divide rises out of the era in which the popular press defended notions of progress and justified means to ends colored by cold war fears. Michael Smith writes about how many of these writers engaged in gendered critiques of what they called Carson's emotionalism and her vision of progress rooted in "sentimentalism" rather than reality, critiques which appeared in magazines from *Good Housekeeping* to *Sports Illustrated* to *Life*.¹¹¹ Smith makes a somewhat extreme attribution, stating that when a magazine with the wide readership of *Time* called her findings and writing "patently unsound," hysterically emphatic," and an "emotional outburst," the roots of the criticism, the reasons Carson was so threatening, become clear:

¹⁰⁸ Murphy, *What a Book Can Do*, 103-104.

¹⁰⁹ Smith, "'Silence, Miss Carson!'" 737.

¹¹⁰ Murphy, *What a Book Can Do*, 104.

¹¹¹ Smith, "'Silence, Miss Carson!'" 737.

“she was a woman and she was challenging a cornerstone of industrial capitalism with a passion considered unbecoming to a scientist.”¹¹²

It is unsurprising, however, that the most vicious attacks came from those with the greatest economic stake in the widespread use of synthetic pesticides. In a review written by for *Chemical and Engineering News* by William Darby titled “Silence, Miss Carson!”, Darby concludes that “It is doubtful that many readers can bear to wade through its high-pitched sequences of anxieties” with a tone reminiscent of sexist critiques of so-called feminine styles of discourse.¹¹³ The bend remains, however, that modernity had sprung from science, and thus that all alternatives to the current scientific practice were anti-modern. To many critics, science was “almost solely responsible for the extraordinary standard of living Americans were experiencing in the early 1960s. To head Carson’s warnings would be tantamount to killing the goose that was laying the golden egg.”¹¹⁴ In a trade journal with a different orientation, *Nutrition Reviews*, Frederick J. Stare made clear that Carson’s “emotional picture” disqualified her as a scientist, raising questions about her real commitment to humanity, for “the broad application of a brilliant technology” has allowed humanity to “stave off starvation, disease, and social and political unrest.” To him, Carson’s interrogation of the application of science was naïve at best and unpatriotic at worst. Ultimately, he asserts, “In Miss Carson’s case, research limited to selective reading, plus the urging of ‘friends’ with special interests, is certainly

¹¹² Smith, “Silence, Miss Carson!” 741.

¹¹³ William Darby, “Silence, Miss Carson!” *Chemical and Engineering News* 40 (1 Oct. 1962): 60.

¹¹⁴ Smith, “Silence, Miss Carson!” 744.

no diploma of equivalency for the academic training and experience required for authority.”¹¹⁵

Rachel Carson, her agent, and her publishers all knew that her attack on pesticide abuse would not go unanswered. “Where Carson thought of her final targets in terms of the collectivity of activist reader-citizens, her opposition’s energies—perhaps because they were designed to fend off action rather than to mobilize it—were devoted to manipulation of the media. Though each side had an eye to government practice and policy changes, the opposition’s hope was that policymakers would necessarily interpret the flood of information to the media as proof of popular rejection of *Silent Spring*’s warnings.”¹¹⁶ They hoped that with enough airing of their take on the matter in venues where the opposition had some control, the general public might be convinced that reading the book would be unnecessary or, better yet, inadvisable. This reasoning “underestimated the power of the spotlight the critics themselves had thrown on *Silent Spring*, and it underestimated the power of a message conveyed in book form, even if *not* read.”¹¹⁷

Conclusion

In seventeen chapters, Rachel Carson roused readers (and even non-readers through the fury of media coverage.) Her detailed research, deft storytelling, and genuine passion lifted off the pages of *Silent Spring* and into the minds of a generation. Carson’s

¹¹⁵ Frederick J. Stare, "Some Comments on Silent Spring," *Nutrition Reviews* 21 (January 1963): 1, 4.

¹¹⁶ Murphy, *What a Book Can Do*, 118.

¹¹⁷ Murphy, *What a Book Can Do*, 118.

four salient points reached beyond the pages of the book into the lives of farmers, gardeners, housewives, PR specialists, media gurus, business executives, chemical salesmen, academic scientists, government officials, and even the President of the United States.

First, Carson informs readers that we are all being contaminated without our consent by poisonous chemicals, which were first developing in the 1940s as weapons and subsequently marketed to farmers as pest control without testing their long-term safety or efficacy. Second, the health consequences to humans and the ecosystem we live in are unwarranted because we could develop successful nontoxic methods of pest control if we were committed to it rather than taking the path that is “deceptively easy.”¹¹⁸ Third, often alternative methods are more effective than chemical pesticides because the crop dusting and aerial spraying not only does not work very well, but makes the situation worse rather than better by disturbing natural checks and balances. Fourth, citizens have the right to know the risks of pesticides because they are forced to assume them.

These points imply ethical expectations of readers. Across all her works, it is evident that Rachel Carson was both attentive to science and open to wonder and mystery. She reveled in the details of the natural world and wished for others to cultivate wonder as a way of seeing, of being, and of searching for meaning and relevance. Kathleen Moore writes an ideal summation of this philosophy, surmising that the position of her essay on wonder, reissued as *The Sense of Wonder*, is significant. Sandwiched between *The Edge of the Sea*, a close observation of the intricate balance of life, and *Silent Spring*, a plea for its protection, a sense of wonder closes the distance between

¹¹⁸ Carson, *Silent Spring* (1962), 277.

“this is wonderful” and “this must remain,” between the “is” and the “ought.”¹¹⁹ It is a bridge of moral resolve that links the physical world and the moral world. To Carson, a sense of wonder is nearly a moral virtue, one that undergirds an environmental ethic.¹²⁰

Despite opposition, Carson’s *Silent Spring* made major inroads. It altered the consciousness of the American public regarding the deceptive human control of nature and brought on real policy change in the United States. Her work led to a special investigation by President John F. Kennedy’s Science Advisory Committee, which confirmed her conclusions, and eventually led to the formation of the Environmental Protection Agency (EPA) and the banning of DDT in 1972 can be traced directly to Carson’s work.¹²¹ Carson successfully highlighted the dangerous self-deception of human control of nature.

Though some effects of *Silent Spring* can be measured, others are more intangible, rooted in Carson’s persuasive concepts, which challenge assumptions and seek to change them. One of these is Carson’s attempt to reframe the debate by challenging militaristic rhetoric—words and phrases like “battle,” “control,” “man with a spray gun,” and “eradication campaign”—replacing it with a holistic interpretation of natural processes and thus the conclusion that our relationship with nature is not a zero-sum game and therefore should not be characterized as a battle at all.

¹¹⁹ Kathleen Dean Moore, “The Truth of the Barnacles: Rachel Carson and the Moral Significance of Wonder,” ed. Sideris and Moore, *Legacy and Challenge*, 269.

¹²⁰ Moore, “The Truth of the Barnacles,” ed. Sideris and Moore, *Legacy and Challenge*, 269.

¹²¹ Waddell, *And No Birds Sing*, 2; Thomas R. Dunlap, *DDT: Scientists, Citizens, and Public Policy* (Princeton: Princeton University Press), 234-236.

In her 1963 television appearance, Rachel Carson said, “Now, I truly believe, that we in this generation must come to terms with nature, and I think we’re challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves.”¹²² Generations later we are still so challenged. *Silent Spring* leaves us a legacy of purpose. Rachel Carson sought to inform and mobilize the public. Fighting cancer, Carson worked with fury on the pressing case of pesticide abuse. Her book is an astonishing testament to the productive power of concern: concern for scientific fact, for human relevance, and for the natural world.

¹²² “The Silent Spring of Rachel Carson,” *CBS Reports*, April 3, 1963, quoted in Steingraber, “Living Downstream of *Silent Spring*”, ed. Sideris and Moore, *Legacy and Challenge*, 228.

Chapter Three: Call and Response

Part One: Paul Ehrlich's *The Population Bomb*

The Population Bomb was a sensation. Written by Stanford professor Paul Ehrlich and published by the Sierra Club in 1968 for mass consumption, it sold two million copies within its first two years and was reprinted twelve times, breaking Rachel Carson's sales record for an environmental book.¹ Cataloguing the woes of overpopulation—both environmental and otherwise—Ehrlich predicts widespread famine and disease, as food production and modern medicine become outpaced by massive growth in demand and suffer the consequences of severe ecological damage. Believing that we have already depleted our resources to such an extent that humanity has little chance of surviving, Ehrlich posits that further devastation may only be averted by implementing successful population control: we simply have “too many people.”

Catapulted to celebrity status by the book's success, Ehrlich's personal appearances were booked a year in advance. He appeared on Johnny Carson's *Tonight Show*, received two dozen speaking requests daily, and logged eighty thousand miles of air travel annually.²

¹ Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington, D.C.: Island Press, 1993), 256; Susan Elizabeth Bender, “Immigration and the Environment: The Story of a Sierra Club Policy Initiative” (PhD diss., University of Nevada, 2003).

² Joseph E. Steiguer, *The Origins of Modern Environmental Thought* (Tucson: University of Arizona, 2006), 110.

When Paul Ehrlich wrote *The Population Bomb*, he was a professor of entomology and director of graduate studies in the Department of Biological Sciences at Stanford University. Having authored two books previously and many scientific publications, Ehrlich's *The Population Bomb* was his first work written to mobilize lay readers. Composed in just three weeks, it does not impress as a scholarly document (as, say, *Silent Spring*), but clearly hit its mark in elevating popular concern for population growth and awareness of environmental degradation.³

Though Ehrlich's primary predictions have been disproven with the passage of time, the book should not be written off as simply alarmist and incorrect. While some of the phenomena he mentions have been quelled to a certain degree (LA smog, for example), many of his points remain salient and little acknowledged even today. Among these are the dangers of global climate change, the permanence of ecological loss, and the health risks associated with pesticides.

In his first chapter, straightforwardly entitled, "The Problem," Ehrlich predicts that in the next nine years (by 1977) the world would experience acute food shortages and that one in every seven people would die from nutrition-related causes. The message was a pessimistic overview of our ever shortening "doubling time," that is, the amount of time required for the Earth's population to double. Despite its thematic similarity to Thomas Malthus' 1798 *Essay on the Principle of Population*, Ehrlich never refers to Malthus, an odd omission, especially given his distinctly neo-Malthusian viewpoint.

³ Steiguer, *The Origins of Modern Environmental Thought*, 111.

The second chapter gives readers a sense of the desperate tone of *The Population Bomb*. Titled “The Ends of the Road” in obvious contrast with Carson’s last final chapter “The Other Road,” Ehrlich outlines scenarios of future world conditions:

- Struggles over wheat supplies lead the United States to make tactical nuclear strikes against China.
- The President’s environmental advisers recommend sterilization of all persons with IQs less than 90.
- After a thermonuclear war in 1979, two-thirds of the Earth is uninhabitable and only cockroaches survive.
- In Ehrlich’s most optimistic scenario, one-half billion of the planet’s population starves.⁴

After presenting his audience with such frightening scenarios, Ehrlich challenges readers to envision a more optimistic outcome in view of the current situation.

The next chapter, “What Is Being Done,” outlines social and political failures in controlling population growth. A favorite target of Ehrlich’s is the Roman Catholic Church, which he criticizes for a number of reasons especially its support of the so called rhythm method of contraception, a technique Ehrlich calls “Vatican roulette.”⁵ He uses the topic to segue into the general failure of family planning in general: “As Vatican roulette is to family planning, so family planning is to population control. Family

⁴ Steiguer, *The Origins of Modern Environmental Thought*, 111-112.

⁵ Steiguer, *The Origins of Modern Environmental Thought*, 112; Paul R. Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1969), 73.

planning doesn't work either."⁶ Ehrlich views abortion as a "highly effective weapon in the armory of population control." The militaristic language used here is, of course, familiar to readers of *Silent Spring*, though its social connotations are entirely different.

"What Needs to Be Done?" the book's fourth chapter, discusses the difficulty of proposing solutions. Ehrlich argues that the United States should take a leading role in reducing its resource consumption. Ehrlich considers several solutions, which are abhorrent to some: adding sterilants to water supplies, economic incentives to encourage couples to have fewer children, and federal laws guaranteeing the right of every woman to an abortion, and sex education.⁷

The chapter quickly flips between solutions and criticisms. Ehrlich urges the United States to withhold food aid from less developed countries refusing to implement population control programs, going so far as to say that in those nations sterilization should be implemented by coercion if necessary. Next, Ehrlich condemns the Catholic Church for its conservative views on abortion and points to Christianity as a force that encourages the domination and exploitation of nature. Ehrlich's penultimate chapter, "What Can You Do?" is particularly memorable because of its format and direct recommendations. His immediate answer to the question posed in the chapter title is to not have more than two children, to write letters warning about the population problem to officials and opinion leaders (he includes several examples in the appendix), and to proselytize friends and associates. Sample conversation points for "targets" are included.

⁶ Ehrlich, *The Population Bomb*, 73.

⁷ Steiguer, *The Origins of Modern Environmental Thought*, 112; Ehrlich, *The Population Bomb*, 126.

Ehrlich delineates the best ways to convert targets, from those with eight kids to those with none, from extreme conservatives to extreme liberals, from Catholics to those who support eugenics, from professors to schoolteachers, and those he terms “doves.” “Above all,” Ehrlich insists, “raise a stink.” Parents, “Give your kid an IUD to take to ‘show and tell.’”⁸

The last chapter, only two pages in length, is “What If I’m Wrong?” Ehrlich admits that he finds this highly unlikely, but adds that if he is wrong, “people will be better fed, better housed, and happier, thanks to our efforts.”⁹

Language

Ehrlich employs a mixture of the four basic modes of discourse in his *The Population Bomb*. Relying heavily on description and narration, Ehrlich makes many of his points by developing elaborate scenarios which he expects will horrify the reader. By creating emotional hypothetical situations, Ehrlich depicts a fearful future worth avoiding all costs, giving him the freedom—and leverage—to leave his solutions suspended among scenarios with neither proper argumentation nor exposition. Ehrlich’s failure to provide sound reasoning and discussion to prove the validity of the scenarios, let alone the solutions, leaves his conclusions dangling hopelessly at the hands of serious readers.

Ehrlich rarely uses his own experiences to frame his chapters, but his profession as an ecologist and thus his respect for ecologists above others colors his work. In one instance, Ehrlich draws directly from his own experience, using the narrative mode—

⁸ Ehrlich, *The Population Bomb*, 163.

⁹ Ehrlich, *The Population Bomb*, 175.

conspicuously and for the first time in the body of his text—to make his point. He tells a story:

My first job after I got my doctorate was working as a research associate with Dr. Joseph H. Camin, then of the Chicago Academy of Sciences. That was in 1957-1958. Now, ten years later, Joe Camin is spending a sabbatical leave with me at Stanford. The other day Joe and I were reminiscing over some extremely pleasant times we had had working together on a field problem. We had been studying natural selection in water snakes which lived on island in the western end of Lake Erie. The problem was fascinating and we would be very much interested in continuing in the research today. But all we can do is reminisce. You see, in the past decade Lake Erie has died. The snakes are almost gone, as are all the fishes on which they fed. The once beautiful lake is now a septic tank—a stinking mess.¹⁰

This is the first time Paul Ehrlich mentions his credentials to bolster his credibility as an author. Elsewhere, it is very difficult to divine his academic origins. Hints, however, are sprinkled throughout the text. For example, Ehrlich writes, “But ecologists, as usual, have been looking at the less obvious.”¹¹ His admiration for ecologists is evident throughout *The Population Bomb*.

This affection for ecological science is quite unlike Ehrlich’s attitude towards science more generally, making an examination of these perspectives particularly

¹⁰ Ehrlich, *The Population Bomb*, 53.

¹¹ Ehrlich, *The Population Bomb*, 51.

worthwhile to expose the ramifications of his view of science for his theory of overpopulation. Unfortunately, Ehrlich treats science with a snide tone. This may be best captured by the line, “But, you say, surely Science (with a capital “S”) will find a way for us to occupy the other planets of our solar system and eventually of other stars before we get all that crowded.”¹² Though his tone never fully reaches disdain, it is clear that Ehrlich is hesitant to allow technology a role in his theory calculations about the fate of humanity. This is not really a surprise, of course, because of his role as an ecologist and witness to the omni-destructive powers of humankind. Ehrlich viewed technology as part of the problem (huge demand for limited resources and the illusion of control) rather than the solution. He tends to equate science and technology. While Ehrlich uses inquisitive science to determine the configurational workings of nature (food chains, ecosystems, etc.), he is leery of manipulative science (here, technology designed to re-engineer natural systems and processes) as a solution. Ehrlich’s skepticism about technology seriously impairs his predictions. By remarking that “It may be in vain that so many look to science and technology to solve our present day ecological crisis,” Ehrlich shifts the onus from science and technology to social institutions as the key to remedying population growth and environmental degradation.¹³

As a rule, Ehrlich’s argument is insufficiently nuanced. Either he does not see nuance or he chooses to ignore it. Ehrlich makes a concerted effort in the early chapters of his book to remove himself from association with “conservationists.” He writes, “You

¹² Ehrlich, *The Population Bomb*, 15-16.

¹³ Paul R. Ehrlich and Anne H Ehrlich, *Population, Resources, Environment: Issues in Human Ecology* (San Francisco: W. H. Freeman, 1970), 191; Steiguer, *The Origins of Modern Environmental Thought*, 116.

will note that my discussion of man's environment has not dwelt on the themes that characterize the pleas of conservationists...I've shed no tears here for the passenger pigeons, now extinct, or the California condors, soon to join them."¹⁴ Here, Ehrlich mischaracterizes conservationists as preservationists and takes a subtle jab at Carson's *Silent Spring*, a critique which becomes more explicit when he continues: "I haven't written about them, or of the pleasantness, beauty, indeed glory of many natural areas. Instead I have concentrated on things that seem to bear most directly on man. The reason is simple. In spite of all the efforts of conservationists, all the propaganda, all the eloquent writing, all the beautiful pictures, the conservation battle is presently being lost."¹⁵ This analysis, of course, does not accord with our historical perception of books like *Silent Spring* and *A Sand County Almanac*, of their roles in inspiring public concern, instilling a new environmental ethic, and sparking policy change. Ehrlich's argument devolves into categorical reasoning, again displaying a failure or unwillingness to reconcile the nuances of environmental debate: "Our population consists of two groups; a comparatively small one dedicated to the preservation of beauty and wildlife, and a vastly larger one dedicated to the destruction of both (or at least apathetic toward it.)"¹⁶ He adds, "I'm assuming that the first group is with me and that the second cannot be moved to action by an appeal to beauty, or a plea for mercy for what may well be our only living

¹⁴ Ehrlich, *The Population Bomb*, 56.

¹⁵ Ehrlich, *The Population Bomb*, 56.

¹⁶ Ehrlich, *The Population Bomb*, 56-57.

companions in a vast universe.”¹⁷ These conclusions bespeak his explicit commitment to the “human” aspects of the debate, creating an arguably false dichotomy between what impacts “man” and what impacts “nature,” as well as explaining Ehrlich’s rhetorical reliance on the id and the ego.

As mentioned in brief before, it is useful to make a distinction between preservation and conservation, a difference that seems lost on Ehrlich, as he tends to treat the words as synonyms. Conservationists seek to determine the proper use of nature whereas preservationists seek to protect nature from use.¹⁸ When Ehrlich blurs this line, he abets the destructive/apathetic group by lumping all environmentally concerned people into one ill-fitting category.

It is worthwhile to investigate Ehrlich’s psychological appeals. Ehrlich appeals to impulse and to reason (id and ego) rather than the spiritual undertones of the conscience (superego), convinced that human needs and strategy for their fulfillment are the best way to elicit an immediate response. This approach makes sense in Ehrlich’s calculation as higher notions of truth, beauty, and propriety become moot in the face of the dire jeopardy of the human race. Appeals to the id and ego fit the author’s reliance on narration and description as the modes of discourse which elicit the most instinctive responses from readers.

¹⁷ Ehrlich, *The Population Bomb*, 57.

¹⁸ K. Akamani, “The Wilderness Idea: A Critical Review.” *A Better Earth.org*, accessed June 1, 2006.

In one descriptive passage, Ehrlich employs id appeals to repulse his readers, causing immediate gut reactions to the “disease,” “filth, corruption, and noise” of the overpopulation of the earth.

What, then is being done overall to nurse our sick environment back to health? How well are we treating these symptoms of the Earth’s disease of overpopulation? Are we getting ahead of the filth, corruption, and noise? Are we guarding the natural cycles on which our lives depend? Are we protecting ourselves from subtle and chronic poisoning? The answer is obvious—the palliatives are too few and too weak. The patient continues to get sicker.¹⁹

Ehrlich successfully evokes horror first and concern second for the sickly state of the earth, a prime example of the powerful effects of revulsion through rhetoric.

Reception

Initially, the reaction to *The Population Bomb* was split between those who welcomed the message and those who opposed it. Opposed might be too gentle a word, however, as opponents’ criticisms were intense, as they found the contents of the book absolutely abhorrent. *San Francisco Chronicle* columnist Charles McCabe said Paul Ehrlich was “worse than Hitler.”²⁰ Steiguer writes that “Militant black leaders regarded his birth control schemes as nothing more than a program of genocide aimed at racial minorities. Religious Catholics were incensed by his condemnation of their faith and its

¹⁹ Ehrlich, *The Population Bomb*, 115.

²⁰ Mary Hager, “Professor leaps from butterflies to birth control,” *Washington Post*, February 22, 1970, D5, as cited in Steiguer, *The Origins of Modern Environmental Thought*, 113.

ordained leaders.”²¹ These reactions are hardly surprising, as Ehrlich called for serious societal restructuring, trampling many values of Western culture.

Most of the opposition to the book rose out of the social attacks, although there were certainly grounds for concern with regard to the scholarship of the work. Steiguer notes that “many of the book’s major ideas seemed hastily conceived, and, in places, a bit naïve.”²² Indeed, Ehrlich’s definition of “optimum population size” as the “one permitting any individual to be as crowded or alone as he or she wished” leaves much to be desired.²³

Ehrlich incited a cacophony of reactions from the media and the public, but the response to his book was very different from the response received by *Silent Spring*. Though Ehrlich decries pesticide use, his book rode largely on hypotheticals, lacking scholarship, and failing to offer precise critiques government agencies, industries, and scientists. Due to this working difference, *The Population Bomb* did not alter assumptions about the relationship between humans and the environment as *Silent Spring* did. Though Ehrlich’s informal voice successfully included lay readers, it also shaped the book as a narrative of personal fears, hypothetical scenarios, and extreme solutions rather than serious yet accessible work founded on scientific fact. It offers a wholly pessimistic account of the environmental future of the planet, which is not to say the future of the earth is not pessimistic, simply that the solutions that Ehrlich offers are so inconceivable

²¹ Steiguer, *The Origins of Modern Environmental Thought*, 113.

²² Steiguer, *The Origins of Modern Environmental Thought*, 114.

²³ Steiguer, *The Origins of Modern Environmental Thought*, 114, citing Ehrlich, *The Population Bomb* (1968), 168.

that the work reads like an apocalyptic novel with no saving grace. Ehrlich suggests injecting sterilants (compulsory birth control) into water supplies—“Doses of the antidote would be carefully rationed by the government to produce the desired population size.”²⁴ Ironically, we see here that Ehrlich’s solutions are technological solutions, despite his antagonism toward scientific manipulation.

Because of the inflammatory suggestions previously cited by this thesis, Paul Ehrlich was hurled into the spotlight, but not taken seriously by the government or the chemical industry. Despite the weakness of *The Population Bomb* as a scholarly work, its suspect reliance on hypotheticals and impulse, disproven predictions, and draconian suggestions, the book had a huge impact on the public consciousness, triggering serious soul-searching with regard to population policies and family planning. Ehrlich repeated the classic environmental message, “We’ve met the enemy and they are us,” in a new and mobilizing way, setting the agenda for fresh discourse about the devastation and degradation brought about by overpopulation and the dangers of future ecological damage. Ehrlich focused attention on the issue and established the valence of emotion, provoking the public and policymakers to think deeply about the social and ecological implications of overpopulation.

²⁴ Ehrlich, *The Population Bomb*, 122.

Part Two: Julian Simon's *The Ultimate Resource*

In 1981, Julian Simon published *The Ultimate Resource* in response to *The Population Bomb*, arguing that our notions of increasing resource-scarcity ignore the long-term declines in wage-adjusted raw material prices. He claims that viewed economically, increasing wealth and technology make more resources available. Simon believes that although supplies may be limited physically, they ought to be viewed as economically infinite, as old resources are recycled and new alternatives are developed by market forces to replace them. Anderson and Lear clarify his point: “Human ingenuity is switched on by market prices that signal increasing scarcity and provide rewards for those who mitigate resource constraints by reducing consumption, finding substitutes, and improving productivity.”²⁵

This perspective of how we can, and will, perpetually avert resource crises made Julian Simon a source of inspiration for the concept of free-market environmentalism, “an environmental vision that eschews government mandates in favor of markets, and replaces regulatory prohibitions with property rights.”²⁶ The neoliberal term, “free market environmentalism,” describes an outlook promising “a virtuous fusion of economic

²⁵ Terry Lee Anderson and Donald R. Leal, *Free Market Environmentalism* (New York: Palgrave, 2001), 3.

²⁶ Jonathan H. Adler, “Review of Anderson’s and Leal’s *Free Market Environmentalism*,” *Cato Journal*, 182, accessed March 25, 2012, <http://www.cato.org/pubs/journal/cj22n1/cj22n1-12.pdf>.

growth, efficiency and environmental conservation” via market means.²⁷ The main contention against this perspective is that most environmental degradation arises from the failure of unregulated markets to assign adequate property rights and values to natural resources.²⁸ This situation, proponents of the theory respond, can best be corrected by incorporating externality costs into price signals while still allowing the allocative efficiencies of the market to address environmental degradation and the inefficient use of resources.²⁹ Free market environmentalists believe that governments often fail to control pollution or to provide public goods at a reasonable cost and that the private sector is more responsive than government to environmental demands.³⁰

Many have noted the growing influence of neoliberal ideas over environmental policy and natural resource management. Bakker argues that this trend has “radically rewritten the priorities of environmental policy, instilling cost-efficiency, competitiveness, and the prioritization of self- or co-steering market processes over

²⁷ Ian Bailey, “Market Environmentalism, New Environmental Policy Instruments, and Climate Policy in the United Kingdom and Germany,” *Annals of the Association of American Geographers* 97, 3 (September 2007): 531; K. Bakker, “Neoliberalizing nature? Market environmentalism in water supply in England and Wales,” *Annals of the Association of American Geographers* 95 (2005): 543.

²⁸ Bailey, “Market Environmentalism, New Environmental Policy Instruments, and Climate Policy,” 532, citing W. Baumol and W. Oates, *The Theory of Environmental Policy* (Cambridge, U.K.: Cambridge University Press, 1988) and Repetto, et al. “Green fees: How a Tax Shift Can Work for the Environment and the Economy,” World Resources Movement (Washington, DC: 1992).

²⁹ Bailey, “Market Environmentalism, New Environmental Policy Instruments, and Climate Policy,” 532.

³⁰ Richard L. Stroup, “Free-Market Environmentalism,” *The Concise Encyclopedia of Economics* 2008: Library of Economics and Liberty, accessed March 31, 2012, <http://www.econlib.org/library/Enc/FreeMarketEnvironmentalism.html>.

government mandates alongside environmental protection as core elements of effective environmental regulation.”³¹ The neoliberalization of natural resource management has received a great deal of attention from those concerned with the consequences of “increased private-sector involvement for environmental governance, social equity, and the valuation of non-human natures.”³²

Simon’s general attitude, however, tends to alienate those who have witnessed serious market failure and environmental degradation. His thesis informs an overly rosy view of environmental and historical events. He cites many historical “resource crises” to make his points about “infinite resources.” Among them are the disappearing forests in Greece in 550 BC and in England from the 16th century to the 18th century, coal in Great Britain in the 19th century, oil since the 1850, and some metals since the 1970s, all described to emphasize the temporary nature of resource crises and the ability for both the region and resource to recover from ecological hardship.

The criticism above, that Simon’s forecasts are too unrealistic, is ironically one that Simon applies to *Limits to Growth*, a work that he describes as “a fascinating example of how scientific work can be outrageously bad and yet be very influential.”³³ Where *Limits to Growth* simulations fail to provide for technology; Simon accounts for no transition costs when switching from one resource to another and assumes unlimited

³¹ Bailey, “Market Environmentalism, New Environmental Policy Instruments, and Climate Policy,” 530, outlining the arguments made in Bakker, “Neoliberalizing nature?”

³² Bailey, “Market Environmentalism, New Environmental Policy Instruments, and Climate Policy,” 530.

³³ Julian Lincoln Simon, *The Ultimate Resource* (Princeton, NJ: Princeton University Press, 1981), 286.

economies of scale, both significant oversights for predictions about the effect of population growth on natural resources.

Simon justifiably believes that the benefits of population growth had been overlooked, if not outright ignored in the debate up to that point. In his 1977 book, *The Economics of Population Growth*, he distinguishes between short-run economic consequences of population growth, which, he agrees, were largely negative, and the long-run effects, which, he argues were largely positive.³⁴ This optimistic take branded him as a “revisionist” economist and polar opposite of Paul Ehrlich.

Simon’s optimism stemmed from the results of a simulation model of population growth and economic development. He concludes that “*positive* population growth produces considerably better economic performance in the long run (120-180 years) than does a *stationary* population, though in the short run (60 years), the stationary population performs slightly better. A *declining* population does very badly in the long run.”³⁵ It is worth noting, however, that Simon thought that the experience of developing countries was likely to vary. In countries such as India, the short-run negative effects of population growth were more severe and the long-run benefits would be slower in appearing. Thus, the argument for reducing population growth in these countries held more force.³⁶

³⁴ Dennis Ahlburg, “Julian Simon and the Population Growth Debate,” *Population and Development Review* 24 (1998), 318.

³⁵ Julian Simon, *The Economics of Population Growth*, (Princeton, NJ: Princeton University Press 1977), 305, as cited in Ahlburg, “Julian Simon and the Population Growth Debate,” 318.

³⁶ Ahlburg, “Julian Simon and the Population Growth Debate,” 318.

Dennis Ahlburg frames an interesting discussion of Simon's belief that his model and the empirical evidence he reported refuted Malthus and computerized Malthusian models. Ahlburg believes Simon's self-proclaimed refutation of Malthus is overstated:

In reviews of his model Warren Sanderson (1980) and I (Ahlburg 1987) noted a number of questionable features that are critical to the support of his optimistic findings. For example, social overhead capital (better roads and communications, economies of scale, improved government organization, and health benefits) are assumed to follow directly and costlessly from population growth. Social overhead capital then increases output. A doubling of the population would not just double production but increase output by an additional 20 percent. However, in a simulation with no increase in social overhead capital as a result of population growth, the model produces in a monotonic inverse relationship between the birth rate and economic performance. The finding of a positive impact of population growth is also very sensitive to the large effect on investment of a small difference in industrial output and the dependency effect of children. To paraphrase Simon, his findings were persuasive enough to cause one to distrust the Malthusian theorizing that is the basis of almost all academic strictures about the ill effects of population growth but not so persuasive as to lead on to reject Malthusianism out of hand.³⁷

³⁷ Ahlburg, "Julian Simon and the Population Growth Debate," 319.

Science and Technology

An important aspect of Simon's argument is the role of science and technology in demographics and the exploitation of resources. Indeed, the gist of Simon's book is: "Invention and technological innovation are called forth...when a given resource stock is depleted or when population increases."³⁸ In a review of *The Ultimate Resource*, Vernon Ruttan, Regent's Professor Emeritus in the Economics and Applied Economics departments at the University of Minnesota, analyzes limits-to-growth literature and Simon's conclusions. Ruttan says that limits-to-growth literature leads him to a perspective that is consistent in many respects with Simon's. He agrees that science and technology enable us to get more out of the earth, allowing us to shape it to our purposes. For this reason, Ruttan agrees that rhetoric about "finite earth" is misleading. Nevertheless, Ruttan states that he "cannot conclude with Simon that this fact implies the desirability even of a moderately rapid rate of population growth—for either rich or poor countries."³⁹ Simon comes to the dubious conclusion that technological advance, or accumulation of knowledge, is the result of population growth. Arguing that in the long-run population growth is positive, Simon tightly links population growth with economic growth and technological growth. While it is fairly routine to say that economic development is the product of technology, Simon stretches to propose that "a larger

³⁸ Meb Bolin, "Review of *The Ultimate Resource*, by Julian L. Simon," *Association for Evolutionary Economics* 17 (December 1983), 1176.

³⁹ Vernon W. Ruttan, "Review of *The Ultimate Resource*, by Julian Simon," *Economic Development and Cultural Change* 32 (July 1984), 888.

population implies a larger amount of knowledge being created, all else equal.”⁴⁰ Bolin’s review points out that Simon’s model presumes that the advantages of a large population are to be found in apparently unlimited economies of scale. Bolin also notes that the argument reduces to the not terribly exciting proposition that there will be more technological innovation in the United States than in Lichtenstein because the potential number of innovators is greater.”⁴¹ While many agree that the changing prices of resources induce innovation, connecting population growth to the number of innovators available is cause for pause.

This situation yields two serious questions: What is the value of an additional person? And, are we preparing those already living to be innovators? Some say the marginal value of a person depends on how each additional person is already valued by their government, society, and world, a sticky subject that Simon never needs to breach despite being the natural extension of his theory. He doesn’t have to deal with this topic because he argues that all people are inherently valuable. Ruttan takes issue with this:

The sources of the long-run benefits are, in Simon’s analysis, generated by economies of scale in the use of physical and institutional infrastructure and in the contribution of human capital—‘the most important economic effect of population size and growth is the contribution of additional people to our stock of useful knowledge.’ But Simon does not attempt to respond to the question of how a larger population can be expected to contribute to the advancement of knowledge and productivity in societies

⁴⁰ Simon, *The Ultimate Resource*, 210.

⁴¹ Bolin, “Review of *The Ultimate Resource*,” 1176.

that are unable or unwilling to provide their existing members with the health and education necessary to enable them to make more than a marginal contribution to their own or to national well-being. To lament the Edisons and Einsteins who will never be born because of effective constraints on population growth is almost obscene when the potential contributions of those who are already born go unrealized because of the high infant mortality rates, low school enrollment, and unrewarding employment.⁴²

While Simon applauds science, technology, and human ingenuity, he is at risk of being accused of not thinking deeply about the quality of life of each individual, as well as the strain placed on infrastructure by rapid population growth. Ultimately, Simon's economic assumptions of increased demand, economies of scale, social overhead capital, and endless opportunity for technological advancement as a means of side-stepping environmental disaster are simplistic. M Gordon Wolman, Professor of Geography and Chairman of the Department of Geographic and Environmental Engineering at Johns Hopkins University, explains it as thus:

To some extent, unfortunately, in his enthusiasm for people and markets, Simon leaves himself open to many of the same criticisms of those whom he attacks on the other side. The strident argument leaves the impression that history and economic theory, or technology and the price mechanism, coupled with the probability that more people give us more good brains,

⁴² Ruttan, "Review of *The Ultimate Resource*," 888.

presents obvious policy choices to the optimist. Even to an optimist, this is not self-evident.⁴³

Language

Simon's style varies greatly from place to place, but some aspects remain constant. Simon relies heavily on two basic modes of discourse: argumentation and exposition. Using argumentation, the author seeks to prove the validity of three main points. First, the human imagination is the "ultimate resource." Second, evidence does not demonstrate that basic resources such as food, raw materials, and energy are finite in a practical sense. Third, more people are better. Simon's rhetorical mode shifts from argumentation in Part 1 to a combination of argumentation and exposition in Part 2 to nearly solely exposition in Part 3. This changing emphasis may be attributed to the moral invocations in Part 3, "Ultimately—What Are Your Values?" The penultimate chapter relegates to secondary importance the economic argumentation that precedes it. Only briefly does Simon traverse into the territory of narration, at which point he describes his struggle with depression and the value of his research for increasing his optimism and improving his outlook.⁴⁴

In tone, Simon appears devoted to being well liked, carefully avoiding sarcasm when dealing with what he considers to be off-base environmentalist positions.⁴⁵ His work, though confrontational in its concepts and radical re-framing of the population

⁴³ M. Gordon Wolman, Review of *The Ultimate Resource*, by Julian L. Simon, *Journal of Policy Analysis and Management* 1 (Spring 1982), 423.

⁴⁴ Simon, *The Ultimate Resource*, 9.

⁴⁵ Robert McConnell, "Review of *The Ultimate Resource 2*," by Julian L. Simon, *Population and Environment* 20 (September 1998), 88.

debate, reads like a conversational presentation where the audience is included. Frequent use of first and second person pronouns establishes immediate familiarity, making the language more similar to that of Paul Ehrlich than to the prose of Rachel Carson.

Despite the myriad of graphs, scatterplots, and tables, analysts of Simon's work claim that Simon attempted to write for the layreader, a goal common to all the works analyzed in this thesis. He sought to write "a book that can be read and understood by the mythical interested layman who, Simon feels, is bombarded by doomsday pronouncements and pseudoanalyses."⁴⁶ To contend with the tiresome doomsday pronouncements, Simon became the Doomslayer, a title given to him by Ed Regis of *Wired Magazine*.⁴⁷

Simon makes the majority of his appeals in *The Ultimate Resource* to the id (impulse) and the superego (conscience.) Appeals to the superego reveal the distinctiveness of Simon's argument and cause friction among critics—do theological appeals belong in a work purporting to relay the economic truth about our environmental situation? Bolin begins his review of Simon's book with an observation that adduces the presence of appeals to the superego. Bolin describes this discovery:

It is certain from the outset that Julian Simon has concluded that there should be more people on the face of the earth, but the basis for his position, at first, is not clear. As the sometimes brilliant persuasive analysis unfolds, however, the reader begins to glimpse the specter of a theological presence. Finally, the spiritual essence of the book is laid bare

⁴⁶ Wolman, "Review of *The Ultimate Resource*," 423.

⁴⁷ Ed Regis, "The Doomslayer," *Wired Magazine* 5.02 (1997), 136.

when the author states, ‘But we also condemn murder on the moral ground that murder denies life to someone else—and in this sense it seems to me that there is no difference between murder, abortion, contraception, and abstinence from sex.’⁴⁸

Simon repeatedly encourages readers to consider the moral and religious implications of population policy. In one instance, he quotes Genesis: “And God said, Let us make man in our image, after our likeness: ...Be fertile and increase, fill the earth and master it; and rule the fish of the sea, the birds of the sky, and all living things that creep on earth.”⁴⁹ He juxtaposes the philosophy of the Bible with the philosophy of Greenpeace, which teaches that humankind is not at the center of life on the planet. In fact, ecology teaches us that the whole earth is part of our “body.”⁵⁰ He then asks readers to examine their own values about “Animals and plants versus people”⁵¹ Are we supposed to believe that readers fret—who is right? God or Greenpeace?

Simon’s appeals to the superego, particularly to the values of utilitarianism and Christianity tend to hurt rather than help Simon in the critical sphere. Critics wonder how Simon can possibly spend so much of the book attempting to validate his conclusions with scientific methodology and then state in his final section that science has nothing to

⁴⁸ Bolin, “Review of *The Ultimate Resource*,” 1175, citing Simon, *The Ultimate Resource*, 339.

⁴⁹ Simon, *The Ultimate Resource*, 334-335.

⁵⁰ Simon, *The Ultimate Resource*, 335.

⁵¹ Simon, *The Ultimate Resource*, 334.

do with policy because policy is a matter of values.⁵² What then, was the purpose of this book, with all its theological undertones and scatterplots?

A distinctive aspect of Simon's approach is his inclusion of creative, informal "afternotes." These are appended to some chapters and seek to treat the material differently, eliciting new reaction from the audience. One such afternote is entitled, "A Parable of Population Growth, Racquetball, and Squash."⁵³ The afternote offers a "parable" about how in the short-term population growth means greater congestion and competition amongst students vying for the racquetball courts on a university campus, but in the long-term we reap the benefits of population growth by enjoying the natural response, which is to build new facilities. Simon then delineates the situation of squash courts that lack the vitality of players and are empty most of the day. He asks, "So which do you want? Will you choose the genteel, run-down, peaceful, and slightly depressing no-growth policy, as with the squash courts? Or do you prefer the less-peaceful, slightly jostling population growth that costs you capital for a while, as with the racquetball courts?"⁵⁴ The false dichotomy offered by the parable is made more complex by Simon's inclusion of the words of "the sage Hillel": "If I am not for myself, who will be for me?" and next "But if I am for myself alone, what am I?"⁵⁵ Another interesting afternote is "A

⁵² Bolin, "Review of *The Ultimate Resource*," 1177.

⁵³ Simon, *The Ultimate Resource*, 194.

⁵⁴ Simon, *The Ultimate Resource*, 195.

⁵⁵ Simon, *The Ultimate Resource*, 194-195.

Dialogue on ‘Finite’”, in which Simon develops an imaginary dialogue between “Peers Strawman (PS) and Happy Writer (HW).”⁵⁶

Simon frequently adapts Gresham’s law to language, asserting that “bad terms drive out good.”⁵⁷ He makes this point by explaining how it is much easier to show the costs of cars than the benefits of cars because annual deaths from car accidents and pollution appear more egregious than the benefits of transportation and timing appear good.⁵⁸ The power of maleficence compared to beneficence is a point Simon also pursues in a discussion of “Inflammatory Terminology and Persuasion by Epithet.”⁵⁹ Simon condemns the use of “extravagant language” by “distinguished scientists and professors.” Simon particularly despises demographer Kingsley Davis’ use of “the population plague,” Norman Borlaug’s “population monster” and “population octopus,” and Paul Ehrlich’s “population bomb” and statement “We can no longer afford merely to treat the symptoms of the cancer of population growth; the cancer itself must be cut out.”⁶⁰ Simon writes that, “Such language is loaded, pejorative, and unscientific.” He even goes so far as to connect the language with the underlying psychology of “anti-natalist writers.” Simon indicates, “Psychiatrist Frederick Wertham pointed out that many of these terms have overtones of violence, for example, ‘bomb’ and ‘explosion,’ and many show

⁵⁶ Simon, *The Ultimate Resource*, 51.

⁵⁷ Simon, *The Ultimate Resource*, 312.

⁵⁸ Simon, *The Ultimate Resource*, 320.

⁵⁹ Simon, *The Ultimate Resource*, 311.

⁶⁰ Simon, *The Ultimate Resource*, 311.

contempt for other human beings, such as ‘people pollution.’”⁶¹ Simon quotes Wertham: “Are we justified in even speaking in the same vein of violent death and birthrate? And is it not a perverse idea to view population destruction and population growth as twin evils?”⁶² Simon concludes that “Reasoning by epithet may well be part of the cause of the fear of population growth in the U.S.” He next critiques “value-smuggling neologisms,” mentioning that “environmentalists now speak of ‘wetlands lost,’ a phenomenon earlier referred to as ‘swamps drained.’”⁶³

Under the loaded section header “Grabbing Virtue, Daubing with Sin” Simon investigates the rhetorical device of self-identification and moral positioning. He writes, “A rhetorical device of the anti-natalists (as of all rhetoricians, I suppose) is to attribute to themselves the most virtuous and humanitarian of motives, while attributing to their opponents motives that are self-serving or worse.” Ironically, this statement applies just as well to Simon as it does to Ehrlich. McConnell notes that “those who seek the requisite “I am an environmentalist” disclaimer won’t be disappointed. There it is, a paean to nature, birding and the outdoors, on page xxxiv.”⁶⁴ Ruttan observes that “*The Ultimate Resource* is marred by the same qualities of simplistic analysis and exaggerated rhetoric

⁶¹ Simon, *The Ultimate Resource*, 312.

⁶² Simon, *The Ultimate Resource*, 312.

⁶³ Simon, *The Ultimate Resource*, 312.

⁶⁴ McConnell, “Review of *The Ultimate Resource 2*,” 87.

that disturb Simon in the work he criticizes. The book lends itself to being used and misused...⁶⁵

Reception

There are several themes that appear in the criticism of Simon's work *The Ultimate Resource* and its revised edition reprint *The Ultimate Resource 2*. The most universal critique is of Simon's "unfettered optimism" and, more precisely, that his cornucopian perspective is founded on simplistic assumptions. Other critics frown upon Simon's citation of the ever-improving state of welfare as evidence that population growth is not a threat to human welfare, admonishing Simon's failure to address quality of life issues and the costs of social overhead capital. Another significant critique is of Simon's theological appeals and exaggerated language, deeming them inappropriate and hypocritical.

Geologist and energy specialist Robert McConnell describes his problems with optimistic projections based on improving welfare and the rosy acknowledgement of access to cheap food and natural resources:

One of the book's main points is that the present condition of humanity is much improved over the past, and that all, or most, statistics which purport to measure human welfare are improving...to be sure many of these assertions are widely accepted. Child mortality has indeed fallen, and as a result human life expectancy has significantly increased during the past 100 years. But 80% of Americans 70 and over have chronic illnesses.

Simon does not address the *quality* of that longer life. And natural

⁶⁵ Ruttan, "Review of *The Ultimate Resource*," 888.

resources and food have become cheaper by certain measures, if environmental costs dumped onto the global ecosystem (Lake Coeur d'Alene, Idaho, comes to mind) or onto the health-care system (underground coal mining costs, for example) are ignored. Without a doubt, certain aspects of human well-being, using selected comparisons with the past, have shown improvement.⁶⁶

McConnell's concern about selected comparisons is an apt one, harkening back to Simon's use of historical resource crises as a way of discounting current and future ecological crises. Simon's discussion of deforestation in England from the 16th century to the 18th century is a case and point. Simon implies that the forests were conserved by human ingenuity when, in fact, they were given the opportunity to recover from extreme ecological imbalance during a period of famine and bubonic plague when the population of England fell by as much as 60 percent.⁶⁷

Ultimately, Simon's conclusion that more people are better does not align with the conclusions of the scientific community. McConnell explains this critical divide:

But perhaps the central and most contentious assertion made by Simon (and with it he parts company with most of the planet's scientific and environmental community) is that, since people represent 'the ultimate resource,' given that each person means an incremental addition to the vast pool of creativity and ingenuity that humans have always used to

⁶⁶ McConnell, "Review of *The Ultimate Resource 2*," 87.

⁶⁷ Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution* (San Francisco: Harper & Row, 1980), 48.

solve environmental and social problems, an ever-increasing human population is an *essential component* of human ‘progress.’ Contrast this statement with the 1992 manifest signed by 1600 of the planet’s most prominent scientists, including over 100 Nobel prize winners...The manifesto concluded that adverse human impact ‘may so alter the living world that it will be unable to sustain life in the manner that we know.’⁶⁸

McConnell seems shocked that “according to Simon, all problems humans have faced have generated solutions that have left humanity, and the planet, better off than before.”⁶⁹

Ed Regis, author of Wired Magazine article “The Doomslayer,” penned a response to the criticisms of Simon and his article:

Julian Simon's critics portray him as believing, as Tim Andrews puts it, ‘that everything on Earth is rosy.’ They then ‘refute’ him by pointing in shocked outrage to one or more aspects of life on Earth that are less than swell and dandy. Yet Simon has never said, and does not believe, that ‘everything’ on our planet is ‘rosy’ or otherwise perfect. He asserts - and the empirical record supports him - that in many specific and precisely defined areas, we are doing better than the groupthinking doomsters would have us believe.⁷⁰

The lively debate about Simon’s optimism and its justification continues.

⁶⁸ McConnell, “Review of *The Ultimate Resource 2*,” 87.

⁶⁹ McConnell, “Review of *The Ultimate Resource 2*,” 87.

⁷⁰ Ed Regis, “Rants & Raves,” *Wired Magazine* 5.05 May 1997, accessed April 8, 2012, <http://www.wired.com/wired/archive/5.05/rants.html>.

The Ultimate Resource was published again in 1996 as a revised edition entitled *The Ultimate Resource 2*. Although the title changed and some chapters were added, the conclusions and most of the chapters remained the same. An exciting addition to the book is the epilogue, “My Critics and I,” in which Simon seeks to address the criticisms of his work. In it Simon states that the majority of the criticism has come from biologists rather than economists, immediately discounting biologists, “who for many decades and centuries...have voiced the strongest fears of population growth.”⁷¹ Simon continues, “And much of what they write is outside the framework of economics (though the subject of the book is the economics of population), and even outside of ordinary scientific discourse...”⁷² Simon views economic criticism as the only kind of legitimate criticism for a book offering an economic perspective. This conviction is a dangerous one. Criticisms from different disciplines must be weighed and included by experts of other fields. This is an issue with which Carson was very much concerned. She wrote, “This is an era of specialists, each of whom sees his own problem and is unaware of or intolerant of the larger frame into which it fits.”⁷³ Carson emphasized the need for experts to collaborate with one another to give everyone a less “limited” awareness of the threat.

McConnell’s main criticism of Simon’s work was just that, that Simon’s dismissal of other viewpoints and disciplines is extremely detrimental, a point that percolates

⁷¹ Julian Simon, *The Ultimate Resource 2*, revised edition (Princeton, N.J.: Princeton University Press, 1996), 595.

⁷² Simon, *The Ultimate Resource 2*, 594.

⁷³ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962), 13.

several journal reviews. McConnell writes chiefly about *The Ultimate Resource 2* wherein his dismay reaches its peak:

Throughout the book's 616 text pages Simon extrapolates selected past trends into the future, and cites anecdotal evidence supporting his theses, while shrugging off or belittling pesky data or opinions that contradict them, including for example the 2,000+ scientists who constitute the U.N.'s Intergovernmental Panel on Climate Change, the three chemists who won Nobel prizes for characterizing the ozone hole, and virtually the entire scientific disciplines of ecology, marine science, and population biology.⁷⁴

While Simon criticizes biologists for not having the economic knowledge to understand or refute his claims, biologists criticize Simon for not being a scientist. McConnell writes, "Much of this [mischaracterization of scientific data] is probably unintentional, since the biggest problem with Simon's credibility is that he doesn't possess the technical expertise to sort out environmental fact from fiction. He is not a scientist and seems not to understand the scientific method or the scientific bases and intricacies of the environmental problems that confront our growing human numbers."⁷⁵ The geologist continues, making points that arouse laughter and tears from most scientists, "For example, he reports that as a result of human activity wiping out rainforest species in Puerto Rico, the invasion of the island by exotic species has increased the total number of bird and tree species! And he states, referring to climate

⁷⁴ McConnell, "Review of *The Ultimate Resource 2*," 87.

⁷⁵ McConnell, "Review of *The Ultimate Resource 2*," 88.

change ‘I am not an atmospheric scientist and I cannot address the technical issues.’ But he then goes on to dismiss the conclusions of the consensus of atmospheric scientists *who* can.”⁷⁶ Ultimately, each side of the debate is guilty of decrying the qualifications of the other. While conclusions must be tested and before cautiously accepted, the most holistic view of any problem includes the voices across disciplines.

Theological Underpinnings

Many critics contend that theological undertones (and overtones) of *The Ultimate Resource* obfuscate Simon’s argument. They assert that Simon’s emphasis on values and religious identification undercut his arguments for market forces and the power of technical analysis.

At the beginning of his book in a section titled “About the Author and His Values,” Simon describes an experience he had in Washington on a trip to the U.S. Agency for International Development office to discuss a project intended to lower fertility in less developed countries. Early for his appointment, he walked around the plaza and noticed a sign that said “Iwo Jima Highway.” Simon describes his experience:

I remembered reading about a eulogy delivered by a Jewish chaplain over the dead on the battlefield at Iwo Jima, saying something like, ‘How many who would have been a Mozart or a Michelangelo or an Einstein have we buried here?’ And then I thought, Have I gone crazy? What business do I have trying to help arrange it that fewer human beings will be born, each one of whom might be a Mozart or a Michelangelo or an Einstein—or

⁷⁶ McConnell, “Review of *The Ultimate Resource 2*,” 88, citing Simon, *The Ultimate Resource*, 266.

simply a joy to his or her family and community, and a person who will enjoy life?⁷⁷

Simon remarks his surprise at the omission one idea in the population debate: “Enabling a potential human being to come into life and to enjoy life is a good thing, just as enabling a living person’s life not to be ended is a good thing.”⁷⁸ This logic leads Simon into dangerous territory. He makes a statement that is attributed to Simon’s affection for hedonistic utilitarianism.⁷⁹ Simon continues:

Yet I find no logic implicit in the thinking of those who are horrified at the starvation of a comparatively few people in a faraway country (and apparently more horrified than at the deaths by political murder in that same faraway country, or at the deaths by accidents in their own country) but who are positively gleeful with the thought that 1 million or 10 million times that many lives will never be lived that might be lived.⁸⁰

This reduction to numbers, perception, and distance makes critics shudder. Yet it is not the only place where this philosophy is exposed. Simon raises this point again and again, whether in an afternote like the parable about racquetball and squash or th`e explicit section “A Value for More People.” In that section Simon writes, “Both the Bible, which

⁷⁷ Simon, *The Ultimate Resource*, 10.

⁷⁸ Simon, *The Ultimate Resource*, 10.

⁷⁹ Bolin, “Review of *The Ultimate Resource*,” 1175.

⁸⁰ Simon, *The Ultimate Resource*, 10.

urges people to be fruitful and multiply, and the utilitarian philosophy of ‘the greatest good for the greatest number’ lead to a value for more people...”⁸¹

Reviewer Meb Bolin concludes his review for the Association of Evolutionary Economics with the following statement:

Part 1 of this book is an optimistic, well-reasoned, insightful analysis of resources. Part 2 is a Pollyannic, muddled attempt to validate a theological conclusion with scientific methodology. And Part 3 is an assertion that science has nothing to do with policy, which is a matter of values. Values in turn are irrational, relative, and individual. But Simon advances a set of values rooted in utilitarianism and in Christian sectarianism. These values are the subject with which *The Ultimate Resource* is ultimately concerned.⁸²

As much as the preceding chapters of *The Ultimate Resource* rely on scatter plots, graphs, and tables, Simon concludes that science is not a sufficient guide to population policy. His summary of the chapter, “Ultimately—What Are Your Values?” gives a complete, genuine account of Simon’s feelings on the subject:

Science alone does not, and cannot, tell us whether any population size is too large or too small, or whether the growth rate is too fast or too slow. Science can sometimes give citizens and policy makers a better understanding of the consequences of one or another decision about population; sadly, however, too often scientific work on this subject has

⁸¹ Simon, *The Ultimate Resource*, 334.

⁸² Bolin, “Review of *The Ultimate Resource*,” 1177.

instead only misinformed people and confused them. Social and personal decision about childbearing, immigration, and death inevitably hinge upon values as well as upon probable consequences. And there is necessarily a moral dimension to these decisions over and beyond whatever insights science may yield.⁸³

Simon's summary acts as a disclaimer for his economic predictions and conclusions. It urges caution when making decisions entirely based on scientific evidence and cushions him against critiques that he fails to include or exclude particular aspects of the population debate.

Ahlburg acknowledges that Simon's book broke new ground in economics literature, going beyond purely economic considerations to include a discussion of the inherent value of human life. He elaborates on this point:

Simon argued that a birth had value in itself: except in rare cases, life is worthwhile at least to those living it. Because of differences placed on the value of an additional life, Simon concluded that 'within the ranges of common values and economic judgments, it is not possible to draw any conclusions about whether an increase of population is good or bad from an economic point of view'. Consideration of ethical issues played almost no part in the debate among most economists, demographers, and

⁸³ Simon, *The Ultimate Resource*, 344.

biologists but formed an important part of the larger debate among feminists and others.⁸⁴

Simon's conclusion, that economic findings are insufficient for decisions about population policy, shocked many reviewers. Bolin writes, "After devoting most of his book to proving, by scientific analysis, that population growth is good, Simon rejects scientific analysis as a basis for making the decision of goodness or badness."⁸⁵ Most readers struggle to reconcile the charts, graphs, and extensive references with Simon's sudden declaration that economic analysis means little for population policy-making.

Conclusion

Simon offers no concrete policy recommendations and the policy implications of his theses are mixed. His chapter on values, directed at policy choices, is highly inconsistent. Simon's logic would lead him to advocate for policies to stimulate population growth, but he never quite arrives at that conclusion. Simon believes in the capacity of the market to make the "right" decisions about resource allocation in accordance with individual preference, opposing all forms of coercion on matters of population control, such as tax incentives. Nevertheless, Simon does "accord to the community the right to make such a decision if there is a consensus on the matter."⁸⁶

At best, Simon offers incomplete evidence for the important issues he discusses. Even to an optimist, his conclusions are not self-evident. Nevertheless, it is easy to see

⁸⁴ Ahlburg, "Julian Simon and the Population Growth Debate," 319.

⁸⁵ Bolin, "Review of *The Ultimate Resource*," 1175.

⁸⁶ Bolin, "Review of *The Ultimate Resource*," 1176, citing Simon, *The Ultimate Resource*, 341-343.

how Simon's magnetic optimism inspired followers. Simon says he would be happy to see more children going to school and playing in the park, insisting that holding the standard of living constant and perhaps lower if there were more people around to enjoy it, it is "better to have more people rather than fewer people."⁸⁷ "In short, our cornucopia is the human mind and heart, and not a Santa Claus natural environment. So it has been in the past, and therefore so it is likely to be in the future."⁸⁸ Who would not want to believe that?

⁸⁷ Simon, *The Ultimate Resource*, 337.

⁸⁸ Simon, *The Ultimate Resource*, 41.

Chapter Four: Bjørn Lomborg's *The Skeptical Environmentalist*

In 2001, Bjørn Lomborg published a controversial book titled *The Skeptical Environmentalist: Measuring the Real State of the World*. Despite having never been published on matters of environmental science, economics, or policy, Lomborg, an associate professor of statistics at the University of Aarhus in Denmark, took a chance with his reputation and the subject he treated.¹

The crux of the best-selling book is that the state of the natural environment is not as bad as we think and that it is actually improving in nearly every measure. From food production and sanitation to pollution and deforestation, Lomborg claims that the health of the planet is getting better and will continue to do so by virtue of economic growth.² In addition, he asserts that looming problems (such as global warming and species extinction) are exaggerated by the media and environmentalists and therefore not cause for much concern. Lomborg's arguments are persuasively written—appealing exclusively to the id and the ego—and paired with his broad statistical analysis, give the impression of being comprehensive and scholarly (the book is 515 pages long with 2930 endnotes.)

Like Simon, Lomborg laments the public perception that the environment is getting worse, a falsehood he argues is perpetuated by environmentalists campaigning to

¹ Lomborg published a piece in 1996 about the prisoner's dilemma in the *American Sociological Review* that was categorized as social science; Andrew C. Aulisi, "Opportunity Lost: Error and Bias Undermine *The Skeptical Environmentalist*," *The Quarterly Review of Biology*, Vol. 78, No. 1 (March 2003): 68.

² Aulisi, "Opportunity Lost," 68.

raise money for their causes and the media's penchant for negative sensationalism. His criticism of environmentalists, the media, and the scientific community (for its failure to look for "good connections") leads him to state: "Coupled with the finely tuned PR units of the environmental organizations and problem-oriented research, this can provide serious bias towards a negative appraisal of the state of the world."³

Lomborg selects some popular environmentalists and organizations, especially the Worldwatch Institute, World Wide Fund for Nature, and Greenpeace, to pick on. He mines past publications for flawed use of statistics, reminding readers that "it is important not to be swayed merely by rhetoric or simplistic models."⁴ Following a broadside against scientific publishing and the news media, Lomborg deploys an ambitious compilation of statistics beginning with human welfare (health, food, and prosperity), resources (forests and energy), pollution (air, acid rain, water, and waste), and concluding with "tomorrow's problems" (chemicals, biodiversity, and global warming.)⁵

A principal conclusion of *The Skeptical Environmentalist* is that policymakers are allocating disproportionate resources to environmental conservation at the expense of other societal needs because of misguided concern about environmental degradation. Lomborg tells readers this is possible in an open, democratic society partly because citizens trust environmental groups more than they trust other special interests. Lomborg's chief prescription calls for the prioritization of public spending, which would

³ Bjørn Lomborg, *The Skeptical Environmentalist: Measuring the Real State of the World*, (Cambridge: Cambridge University Press, 2001), 36, 41.

⁴ Lomborg, *The Skeptical Environmentalist*, 31.

⁵ Aulisi, "Opportunity Lost," 69-70.

presumably expose wasteful environmental programs and reallocate funds towards more productive societal causes. Lomborg is particularly soft on developing countries, asserting that LDCs should not be expected to adhere to strict environmental regulations or spend much money on environmental protection now, as they are building the wealth that will support remediation and conservation in the future.

The Skeptical Environmentalist was a huge undertaking. As such, no one could be an expert on all the subjects Lomborg covers. From climate change to chemical fears, Lomborg seeks to raise the spirits of readers by showing them the brighter side of life, a path that earns him significant criticism for the selectivity of his data despite the range of figures that exist on nearly every subject. Selective use of data was just one of the many accusations hurled at Lomborg. Critiques ranged across data fabrication, distortion, plagiarism, deliberate misrepresentation of others' results, failure to seek peer review (to ensure scientific rigor), lack of objectivity, and simply asking the wrong questions.⁶

To understand the controversy surrounding *The Skeptical Environmentalist* it is necessary to understand the appeal of Bjørn Lomborg himself, "a firebrand convert."⁷ Andrew Aulisi details what he perceives to be the cornerstone of the book's marketing strategy:

The author conspicuously claims to be an ardent left-winger and former member of Greenpeace. Apparently he was so provoked by Julian Simon's

⁶ Matthew Cole, "Environmental Optimists, Environmental Pessimists and the Real State of the World," *The Economic Journal* 113 (June 2003): F377-F378; Caroline White, "Environmentalist Accused of Scientific Dishonesty," *BMJ: British Medical Journal* 326 (January 2003): 120.

⁷ Aulisi, "Opportunity Lost," 69.

views that he began a project with his statistics students to refute Simon, only to learn surprisingly that Simon was mostly correct—the state of the world is getting better. Despite his warning that environmental groups command disproportionate trust in society, the author tells us that we should trust him because he is, after all, a well-meaning lefty environmentalist, albeit one who has been enlightened... In the words of *The Economist*, “Mr. Lomborg is a soft-left Greenpeace defector ... a charming self-promoter who understands the importance of, as he puts it, ‘being seen to be nice’. That makes him a story.”⁸

With these personal attachments in mind, it is easy to see how critiques of *The Skeptical Environmentalist* quickly become critiques of the author himself. An anti-Lomborg website and the launching of a custard pie in an Oxford bookstore characterize the increasingly *ad hominem* nature of public response.⁹

At its start, the book provides inspiring statements about the need for objectivity and balance. Lomborg cautions readers that “it’s actually true that statistics can be used to manipulate the truth. But used judiciously statistics is the best source of information about our world.”¹⁰ He reassures his audience that “I care enough to want us not to act on the myths of both optimists and pessimists. Instead, we need to use the best available

⁸ Aulisi, “Opportunity Lost,” 69.

⁹ Cole, “Environmental Optimists, Environmental Pessimists,” F362.

¹⁰ Lomborg, *The Skeptical Environmentalist*, xx.

information to join others in the common goal of making a better tomorrow.”¹¹ Lomborg’s statements set a high bar for the work to follow. They promise both sound analysis and sound judgment. However, Lomborg fails to deliver the dispassionate analysis he makes the case for, leaving readers in the hands of another form of bias once again. Lomborg countered what he perceived to be pessimistic, environmental bias with optimistic, market-driven bias, providing readers with a misleading set of data and further exposing our need for balanced, accurate information from which to derive better environmental policy.

Language

Lomborg’s preferred modes of discourse, exposition and argumentation, are tightly linked in *The Skeptical Environmentalist*. The author’s goal of exposing “the real state of the world” to lay readers (and perhaps academics alike) is achieved through a largely question-driven approach, which blurs the line between argumentation and exposition. The precision arising from this method gives the author strict control over the progression and interpretation of his argument. The strikingly independent chapter sections and subsections allow Lomborg to conduct an orderly revelation of the “real” nature each subject, which often yields inappropriately pat answers.

The separation of sections is imperative to the lucidity of Lomborg’s arguments, although, from the point of view of an ecologist, it imposes false separations and fails to convey the complex interactions among all ecological processes. Ecologists argue that Lomborg’s segmentation of environmental challenges paints an inaccurate, incomplete

¹¹ Lomborg, *The Skeptical Environmentalist*, 1.

picture of the costs and the benefits of each issue, rather than shedding light on the environmental situation.

Cost-benefit analysis informs most of Lomborg's language and logic, inciting both criticism and praise. For example, Aulisi explains that "In pressing the case for more cost-benefit analysis and prioritization of spending, the author vaguely tells readers that we should "compare the costs and benefits of . . . [environmental] investments to similar investments in all the other important areas of human endeavor."¹² The ambiguity of "similar investments" is a source of consternation for those wishing to extract a policy recommendation from the 352-page book. Aulisi continues, arriving at an important conclusion:

Yet here we are given little guidance, as if all public expenditures were controlled by some omnipotent dictator. Where is the political scientist when we need one? What constitutes 'similar investments'? If environmental protection is viewed as, for example, a quality of life issue, can we compare it to spending on highways or security programs such as a missile defense shield? Lomborg tells us that environmental protection must be viewed through the lens of human welfare, so presumably 'similar expenditures' would mean those related to human health. But where does nature fit in? What is the value of protecting the bald eagle as opposed to simply letting it go extinct— something that could have happened in the U.S. were it not for intervention? This question exposes something fundamental that escaped the author's analysis—that the public's attitude

¹² Lomborg, *The Skeptical Environmentalist*, 351; Aulisi, "Opportunity Lost," 72.

toward the environment is based on values, not merely perception, and values are not easily rolled into a statistic and added to a balance sheet.¹³

One can draw two important points from Aulisi's assessment: first, that Lomborg's repeated invocation of cost-benefit analysis leaves out his economic and ethical assumptions; second, that a chiefly economic approach to environmental policy will fail to encompass our nuanced experience of the environment and therefore what we conceive to be important about it. Simon nods to the role of values in *The Ultimate Resource*, but Lomborg leaves it out of his analysis completely. In this way, Lomborg's cornucopian vision is, on the whole, colder than Simon's.

An instance, however, where Lomborg acknowledges the magnitude of the debate on global warming, hints that the author is somewhat aware of the of the nuanced policy preferences of his readers. He asks, "Why is it that global warming is not discussed with an open attitude...but rather with a fervour more fitting for preachers of opposing religions? This is an indication that the discussion of global warming is not just a question of choosing the optimal economic path for humanity, but has much deeper political roots as to what kind of future society we would like."¹⁴ This awareness, however does not keep Lomborg from asserting, against "alarmists" but with equal lack of qualification, that "There is no ecological catastrophe looming around the corner to punish us."¹⁵ This divergence in tone and pretense is evidence of the disparity between

¹³ Aulisi, "Opportunity Lost," 72.

¹⁴ Lomborg, *The Skeptical Environmentalist*, 321.

¹⁵ Lomborg, *The Skeptical Environmentalist*, 348.

the state of the environmental policy debate and the manner in which Lomborg counters commonly-held assumptions about the environment.

Lomborg's simple language lends itself to accessible and moderately flexible interpretation. The simplicity of the author's prose often makes his meaning more ambiguous rather than less ambiguous, which works in his favor. On the whole, Lomborg cleverly treats inflammatory subjects with, in contrast to Ehrlich, tempered language.

A moment where Lomborg walks a particularly fine line is in the chapter titled, "Our Chemical Fears." The author is especially sensitive to the subject of Rachel Carson and her seminal work, *Silent Spring*. Throughout the section it is clear Lomborg is keenly—and often self-consciously—aware of his audience's psychological associations with the environmental icon. Lomborg's coverage of Carson's legacy is true though selective. For example, the author writes, "This claim of chemical cataclysm in the making became a runaway best-seller, spreading its message far beyond the US. And the message was not only that chemicals could harm birds and bees but...that chemicals could kill us and our children. This message has been the legacy of Carson and has remained one of the major underpinnings of the environmental movement: our fear of chemicals."¹⁶ This is a statement with which most readers would not argue, although it is certainly not without a value judgment. It provides an incomplete and reduced account of Carson's legacy. This invocation, in itself, does not seem unjust, but within the context of the entire work, Lomborg pigeonholes Carson into the same fearmongering, doomsaying category as other environmentalists. He even goes beyond that, insinuating that negative sensationalism was the reason *Silent Spring* became a "runaway best-seller," thereby

¹⁶ Lomborg, *The Skeptical Environmentalist*, 215.

counting her as contributing to the at-fault media. Remember, in Lomborg's argument the media is responsible for the public's perception of the deteriorating state of the world. Thus, the author makes Carson a figure representative of "the Litany." Lomborg's term, "Litany" (with a capital L) refers to the pessimistic treatment of environmental issues by the media (hungry for negative news) and environmentalists (who exaggerate the negative aspects of the world to gain attention and funding for their causes.) Perspective, therefore, is essential for readers to see that Lomborg's allusion to Carson is pejorative beyond what can be gleaned from a glance at the section.

While the tone of some statements bothers readers, (take, for instance, the implicit hubris of the subtitle "The Real State of the World") more often precise word choice is the cause for concern. The subjects Lomborg treats are so critical that diction, in even the minutest detail, is everything. In a discussion of deforestation between 1978 and 1999 Lomborg writes that as a share of total forests, Amazonian deforestation has "only been about 14%"¹⁷ His use of the word "only" implies that this is an insignificant sum, although the 20 year time period and powerful ecosystem services of the Amazon would appear to render it a significant percentage. Another instance where Lomborg's word choice significantly alters its effect is in the "Our Chemical Fears" chapter. He writes, "A very few pesticides such as arsenic, benzene and chromium have been confirmed as carcinogenic in humans, but then naturally these have all be regulated and banned"¹⁸ This

¹⁷ Lomborg, *The Skeptical Environmentalist*, 144, as cited in Cole, "Environmental Optimists, Environmental Pessimists," F372.

¹⁸ Lomborg, *The Skeptical Environmentalist*, 231.

statement is dismissive to those still skeptical about the safety of pesticides, downplaying the battle to ban and regulate chemicals.

Lomborg appeals exclusively to the id and the ego in *The Skeptical Environmentalist*. By appealing to human impulse and reason, the author makes clear his anthropocentric position on environmental issues. At the outset, he acknowledges this: "...the needs and desires of humankind represent the crux of our assessment of the state of the world."¹⁹ When considering biodiversity, he observes, "Man is in so many and so obvious ways dependent on other life forms, and for this reason alone they will be preserved and their welfare appreciated."²⁰ But, he adds, "Whether we want an untouched forest or a cultivated field depends on man's preferences with regard to food and undisturbed nature."²¹ Here one sees that economics is—in some abstract way—the study of id. On the other hand, the intrinsic value perceived in biodiversity by the discipline of ecology is an appeal to the superego. The debate between Lomborg the economist and Lovejoy the biologist makes this distinction especially clear. Peter Balint explains this rhetorical worldview: "To Lomborg ...the value of biodiversity derives from human preferences. Its value, where value exists, is instrumental. For Lovejoy, questions relating

¹⁹ Lomborg, *The Skeptical Environmentalist*, 29, as cited in Peter J. Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists: What We Can Learn from Lomborg and His Critics," *Politics and the Life Sciences* 22 (March 2003): 18.

²⁰ Lomborg, *The Skeptical Environmentalist*, 30, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 18.

²¹ Lomborg, *The Skeptical Environmentalist*, 30, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 18.

to conservation of biodiversity are ethical as well as instrumental.”²² Juxtaposing the economist’s and the biologist’s views reveals inherent reliance on different sets of rhetorical appeals. It is without question that Lomborg’s preference for appeals to the id and the ego shape his conclusions as much as his conclusions shape his preference for the aforementioned rhetorical appeals.

Reception

While *The Skeptical Environmentalist* was widely attacked by scientists, popular news sources bestowed it with praise and significant media attention. The commentators writing for *The Economist*, *The New York Times*, *The Wall Street Journal* and *The Washington Post* gave the work especially glowing reviews.²³ The Post’s reviewer, a philosophy professor from New Zealand, declared that the book was “a magnificent achievement” and “the most significant work on the environment since the appearance of its polar opposite, Rachel Carson’s *Silent Spring*, in 1962.”²⁴ *The Economist* exclaimed: “This is one of the most valuable books on public policy—not merely on environmental policy—to have been written for the intelligent general reader in the past ten years.”²⁵

The Union of Concerned Scientists accused groups with a vested interest in maintaining the status quo of using the book to promote their “no need to take action to

²² Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 19.

²³ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 16.

²⁴ “UCS Examines 'The Skeptical Environmentalist',” Union of Concerned Scientists, accessed April 13, 2012, www.ucsusa.org/global_warming/science_and_impacts/global_warming_contrarians/ucs-examines-the-skeptical.html.

²⁵ Cole, “Environmental Optimists, Environmental Pessimists,” F362; Aulisi, “Opportunity Lost,” 68-69.

address global environmental problems” agenda. They cite that “the ‘Cooler Heads Coalition’ -- formed by the Competitive Enterprise Institute and others to ‘dispel the myths of global warming’ -- featured Lomborg in a Capitol Hill briefing on global warming,” appropriating him as a poster boy of the “environmentalists need to relax” school of thought.²⁶

Questioning the high praise and immediate adoption of his conclusions, the Union of Concerned Scientists (UCS) invited several of the world's leading experts on water resources, biodiversity, and climate change to carefully review the sections in Lomborg's book that address their areas of expertise. They asked them to evaluate “whether Lomborg's skepticism was coupled with the other hallmarks of good science - namely, objectivity, understanding of the underlying concepts, appropriate statistical methods and careful peer review. Reviewing Lomborg's claims are Dr. Peter Gleick, an internationally recognized expert on the state of freshwater resources; Dr. Jerry Mahlman, one of the most highly regarded atmospheric scientists and climate modelers; and top biologists and biodiversity experts Dr.'s Edward O. Wilson, Thomas Lovejoy, Norman Myers, Jeffrey Harvey and Stuart Pimm.”²⁷

The separately written expert reviews unequivocally demonstrate that “on closer inspection, Lomborg's book is seriously flawed and fails to meet basic standards of credible scientific analysis.” The authors note how “Lomborg consistently misuses, misrepresents or misinterprets data to greatly underestimate rates of species extinction,

²⁶ “UCS Examines 'The Skeptical Environmentalist'.”

²⁷ “UCS Examines 'The Skeptical Environmentalist'.”

ignore evidence that billions of people lack access to clean water and sanitation, and minimize the extent and impacts of global warming due to the burning of fossil fuels and other human-caused emissions of heat-trapping gases.”²⁸ The experts repeatedly find that Lomborg's assertions and analyses are marred by flawed logic, inappropriate use of statistics and “hidden value judgments.”²⁹ He uncritically and selectively cites literature—often not peer-reviewed—that supports his assertions, while ignoring or misinterpreting scientific evidence that does not. Lomborg’s consistently flawed use of scientific data is, in Peter Gleick's words “unexpected and disturbing in a statistician.”³⁰

The UCS is not alone in this conclusion. Once it reached the bookstands, *The Skeptical Environmentalist* was reviewed by experts on behalf of *Science*, *Nature*, *Scientific American*, *BioScience*, and other scientific journals who came, independently, to the same conclusion: Lomborg’s report was hardly as balanced and holistic as it purported itself to be.³¹

The review by the Union of Concerned Scientists concludes that the positive reviews show that *The Skeptical Environmentalist* “fits squarely in a tradition of contrarian works on the environment that may gain temporary prominence but ultimately fail to stand up to scientific scrutiny,” naming Julian Simon and Gregg Easterbrook forefathers of the same tactics and sentiments. They emphasize that “Correcting the

²⁸ “UCS Examines 'The Skeptical Environmentalist'.”

²⁹ “UCS Examines 'The Skeptical Environmentalist'.”

³⁰ “UCS Examines 'The Skeptical Environmentalist'.”

³¹ Aulisi, “Opportunity Lost,” 69.

misperceptions these works foster is an essential task, for...groups with anti-environmental agendas use these works to promote their objectives.”³²

Conservation biologists have found the chapter on biodiversity to be both the shortest and the weakest. Lomborg refers to the theory of island biogeography as “appealingly intuitive,” yet discredits the application of the theory to larger land masses.³³ His rationale is that “If islands get smaller, there is nowhere to escape. If, on the other hand, one tract of rainforest is cut down, many animals and plants can go on living in the surrounding areas.” Reviewer Brian Czech writes, “For a statistician who clearly prides himself on his grasp of logic, such a logical last resort is one more indication of Lomborg's bias.”³⁴

Lomborg argues that the value of biodiversity may be overstated and extinction rates are actually low, selectively quoting scientific literature in a manner that slants interpretation.³⁵ Thomas Lovejoy, the environmental scientist who coined the term “biological diversity” in 1980, was asked to review the biodiversity section for *Scientific American*. On extinctions, Lovejoy argues that “Lomborg erroneously focused on proven extinctions, which have been relatively few, primarily because of the stringency of standards required for formal declarations of extinction, while disparaging estimates of

³² “UCS Examines 'The Skeptical Environmentalist'.”

³³ Brian Czech, “Julian Simon Redux,” *Conservation Biology* 16 (April 2002): 570.

³⁴ Czech, “Julian Simon Redux,” 570.

³⁵ Aulisi, “Opportunity Lost,” 71.

biodiversity decline derived following accepted practice from habitat-loss and species-area data.”³⁶

Lomborg’s section on deforestation illustrates the kind of oversight common to *The Skeptical Environmentalist*. For example, Lomborg cites United Nations Food and Agriculture Organization (FAO) estimates of global forest cover as the foundation for his insights. In the surveys informing the estimates, deforestation is defined as the removal of forests and their replacement by another land use class (such as mining or permanent agriculture.) Logging, therefore, does not result in deforestation if the forest is allowed to regenerate, or simply left alone while someone decides what to do with it.³⁷

Lomborg says that, at a global level, forest cover has fallen only very slightly in recent years. He concludes that “basically...our forests are not under threat.”³⁸ Matthew Cole explains the deforestation data in his examination of *The Skeptical Environmentalist* published in *The Economic Journal*:

The problem with Lomborg's argument is that, within his global aggregate, he is masking conflicting trends in tropical and non-tropical regions and also confusing natural forests with plantations. In the non-tropical developed world, total forest cover is actually increasing due to the increased use of plantations. Natural woodland, which is of far greater ecological value than the often monoculture plantations, is still declining.

³⁶ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 15.

³⁷ Cole, “Environmental Optimists, Environmental Pessimists,” F371.

³⁸ Lomborg, *The Skeptical Environmentalist*, 117; Cole, “Environmental Optimists, Environmental Pessimists,” F371.

However, in the biodiversity rich tropical forests total deforestation rates are much higher. Since plantations still form a very small percentage of total forest cover in tropical regions (approximately 1 per cent, for instance, in Latin America) this deforestation is almost entirely occurring in natural forests.³⁹

The FAO report on which Lomborg relies comes to a very different conclusion, claiming that over the period 1990-2000 “the world's natural forests continued to be lost or converted to other land uses at a very high rate.”⁴⁰

Cole’s examination of Lomborg’s work reveals that reporting only trends in global forest cover can be extremely misleading. Deforestation is far more rapid in tropical regions than in temperate regions. Furthermore, the fact that tropical forests are so much richer in biodiversity compared to temperate forests, not to mention the fact that they also form human habitats, suggests that deforestation in tropical regions deserves special emphasis.

Cole is smart to point out that, “Given that tropical forests are typically located in relatively low income countries with rapid population growth, there may be a case for arguing that the socially optimal rate of deforestation is not zero (assuming that we could identify the full costs of deforestation).”⁴¹ However, this is not Lomborg's argument. He

³⁹ Cole, “Environmental Optimists, Environmental Pessimists,” F371.

⁴⁰ Cole, “Environmental Optimists, Environmental Pessimists,” F371, citing FAO, “The Global Forest Resources Assessment 2000: Main Report. Rome: Food and Agriculture Organisation of the United Nations,” 2001, 343.

⁴¹ Cole, “Environmental Optimists, Environmental Pessimists,” F372.

is not claiming that the deforestation that is occurring is socially efficient. Instead he argues that deforestation is not happening, or else is so minor as to be insignificant.

Anthropogenic climate change, however, is probably the most controversial section, characterized by the critical remarks that the analysis is “fatally flawed” and that the author is a nobody: “And who is Lomborg?”⁴² Lomborg concludes that despite gross exaggerations by environmentalist, climate change is still a problem, but the social costs of taking action against it exceed the social costs of adaptation, possibly by a factor of two or three.⁴³ Essentially, it is in our best interest to avoid drastic action. Aulisi writes, “To accept Lomborg’s conclusions is to accept that he has better individual judgment of climate science and economics than the collective judgments of the Intergovernmental Panel on Climate Change, the U.S. National Academy of Science, and hundreds of climate experts.”⁴⁴ He continues, “*The Skeptical Environmentalist* slants its coverage of climate science disproportionately in favor of skeptics, incorrectly assesses the design of climate models, overlooks key factors in estimates of greenhouse gas effects, uncritically accepts speculative theories on warming, and is generally ‘deeply flawed and biased’”⁴⁵

⁴² John Rennie, Stephen Schneider, John P. Holdren, John Bongaarts, Thomas Lovejoy, "Misleading Math about the Earth: Science Defends Itself against *The Skeptical Environmentalist*," *Scientific American* 286 (2002): 62-63.

⁴³ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 15.

⁴⁴ Aulisi, “Opportunity Lost,” 71.

⁴⁵ Aulisi, “Opportunity Lost,” 71, citing J.D. Mahlman, “Global Warming: Misuse of Data and Ignorance of Science; A Review of the ‘Global Warming’ Chapter of Bjørn Lomborg’s *The Skeptical Environmentalist: Measuring the Real State of the World*,” 6 December 2001, <http://www.ucsusa.org/warming/mahlman.pdf>.

While most objections to Lomborg's work question its scientific validity, others hinge on the shortcomings of Lomborg's logic regarding environmental enthusiasm. For example, Lomborg fails to make a distinction between environmental advocates and environmental scientists, a huge oversight.⁴⁶ Additionally he makes the mistake of treating problems one at a time, though the problems occur simultaneously and interrelatedly rather than separately. For example, the interaction between global warming and severe smog or ozone depletion is not discussed. Even if one of the problems is not so severe by itself, it should not be taken out of its context of interaction and aggregation.⁴⁷ A critique separate from those questioning the scientific validity of the work challenges the characterization of the intentions of environmentalists: "One of the great shortcomings of Lomborg's analysis is that it is informed by the belief that those who claim the environment is under siege are driven by desires for publicity that can be met only by feeding the "bad news" maw of journalism."⁴⁸ He would have readers believe that mainstream environmentalism is nothing more than fictional doom-mongering that has hijacked environmental policymaking.

After receiving four detailed complaints, all of which hinged on the scientific validity of *The Skeptical Environmentalist*, the Danish Research Agency's Committee on Scientific Dishonesty launched a 6-month investigation.⁴⁹ It concluded that although

⁴⁶ William R. Moomaw, "Lomborg's *The Skeptical Environmentalist*: Refuting a Scientific Model without Science," *Conservation Biology* 16 (August 2002): 861.

⁴⁷ Moomaw, "Refuting a Scientific Model without Science," 862.

⁴⁸ Moomaw, "Refuting a Scientific Model without Science," 861.

⁴⁹ White, "Environmentalist Accused of Scientific Dishonesty," 120.

Lomborg was not deliberately deceptive, his naiveté resulted in “systematic one-sidedness in the choice of data and line of argument, [Lomborg] has clearly acted at variance with good scientific practice.”⁵⁰ Committee chair Hans Henrik Brydensholdt, a high court judge, told *Science*, “Lomborg is highly selective in his use of references in practically every field he covers. This is not in accord with scientific standards.”⁵¹ They concluded that *The Skeptical Environmentalist* was intended to be evaluated as science, and as such, the scientific message had been sufficiently perverted to warrant the author guilty of scientific dishonesty, although not guilty of deliberate intention to mislead or of gross negligence.⁵²

Ecologist Carsten Rahbek of Copenhagen University explains that it’s “an unusually hard ruling by a committee known for being immensely difficult to convince of any wrongdoing.” Stuart Pimm, an ecologist at Duke University who authored one of the complaints filed with the panel and conducted part of the Union of Concerned Scientists review, added that the ruling “serves as a warning to people who think they can hijack the scientific process.” Lomborg defends his book and protests that the committee’s 16-page report “does not actually give examples” of any missteps. Brydensholdt doesn’t dispute that, saying that the details can be found in 600 pages of supplemental materials that the committee analyzed, particularly Lomborg’s blatant disregard for known extinction rates

⁵⁰ White, “Environmentalist Accused of Scientific Dishonesty,” 120.

⁵¹ Lone Frank, “*Skeptical Environmentalist* Labeled ‘Dishonest,’” *Science* 299 (January 2003): 326.

⁵² White, “Environmentalist Accused of Scientific Dishonesty,” 120.

when estimating species loss.⁵³ “As for air pollution, Lomborg cites trends of declining nitrogen oxide concentrations in Europe and North America, but ignores the alarming rise in nitrogen oxide and other pollutants and the deterioration in air quality in developing countries.”⁵⁴

Andrew Aulisi sums up the critical reaction to *The Skeptical Environmentalist* in his piece published by *The Quarterly Review of Biology* which laments the lost opportunity for a balanced take on the “real state of the world.” Aulisi writes:

Lomborg’s house of cards teeters on a shaky foundation of flawed statistical analysis and collapses under the weight of ill-formed conclusions. Not all of the book’s information is misleading or erroneous, though. To the contrary, the volume is a curious and often frustrating mix of fact, reason, error, opinion, and hand-picked information, all cemented together with a heavy dose of skeptical bias, and a seemingly genuine concern for the environment.⁵⁵

The final sentence of the review expresses Aulisi’s sentiments about the book. He writes, “Maybe the only lasting impact of Lomborg’s work is that a few more trees were felled to meet the demand for this polemic. To some, anyway, it was economic progress.”⁵⁶

⁵³ Frank, “*Skeptical Environmentalist* Labeled ‘Dishonest,’” 326.

⁵⁴ Moomaw, “Refuting a Scientific Model without Science,” 861.

⁵⁵ Aulisi, “Opportunity Lost,” 69.

⁵⁶ Aulisi, “Opportunity Lost,” 72.

Lomborg operates in the realm of opinion, disqualifying him as a dispassionate source and infuriating scientists with his selectivity of data and failure to seek peer review before publishing the sweeping work. William Moomaw, Professor of International Environmental Policy at the Fletcher School of Law and Diplomacy at Tufts University, founding director of the Center for International Environment and Resource Policy at Tufts University and the lead author of three IPCC reports (1995, 2005, and 2007), which were recognized with the 2007 Nobel Peace Prize, published a review of Lomborg's work titled "Lomborg's *The Skeptical Environmentalist*: Refuting a Scientific Model without Science." In it, he writes, "[David] Orr correctly points out that the entire book is lacking a sense of the roles of societal values and the political process in bringing about cleaner air and water, where this has occurred, or in protecting a global commons such as the ozone layer. Lomborg asks us to trust him and studies that he likes and to not worry about overwhelming evidence of planetary deterioration."⁵⁷

Lomborg's claim that "higher income in general is correlated with higher environmental sustainability" is simplistic at best and extremely damaging at worst.⁵⁸ Lomborg condones complete disregard for environmental regulation in LDCs and intones that improvements in water and air quality are the natural outcome of economic growth rather than the hard-won battles of policy and science. His apparent naiveté about the political economy of environmental protection hampers his argument. Failure to as much as nod to the role of industry in policymaking, particularly the iron triangle of

⁵⁷ Moomaw, "Refuting a Scientific Model without Science," 862.

⁵⁸ Lomborg, *The Skeptical Environmentalist*, 33, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 21.

corporations, politicians beholden to corporations, and neoclassical economists (whose research is funded largely by the corporations and who advise the politicians) engenders skepticism and cynicism among academic readers. In his review, Czech cites the exclusion of the iron triangle as “virtually all that is necessary to explain why Lomborg will take the place of Simon as the darling of economic-growth advocates.”⁵⁹ It should be noted that economic growth is not sufficient to induce environmental improvement in general. The effects of economic growth cannot be ignored nor should the Earth’s resource base be considered capable of supporting infinite economic growth in its current form. This raises a strong point made by Czech: “Lomborg disregards the trophic structure of the human economy, the foundation of which is agriculture and the extractive sectors (logging, mining, ranching), upon which are perched the manufacturing and services sectors. He thinks the entire economic enterprise can expand without concomitant liquidation of natural capital...”⁶⁰ For scientists hired to review *The Skeptical Environmentalist*, public policy plays a critical role in environmental protection. “For Lomborg, when done well, policy interventions play at best a complementary role, and if done poorly they can have a significant detrimental effect.”⁶¹

⁵⁹ Czech, “Julian Simon Redux,” 571.

⁶⁰ Czech, “Julian Simon Redux,” 570.

⁶¹ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 21.

Conclusion

Lomborg's thesis is essentially identical to Simon's in which human ingenuity prevails and we find a way to increase economic carrying capacity. Therefore, why worry about limits?⁶² It ignores that the ingenuity that allows us to protect the environment (and also the economy) is in large part motivated by worries about carrying capacity. "Lomborg must sense the weakness of this thesis, because in his conclusion he quibbles that worry is not the same as productive concern."⁶³

Is *The Skeptical Environmentalist* enduring or simply polarizing? The empirical and theoretical shortcomings, deceptive language, accusations of environmentalists for exaggerating to promote activist political and professional agendas, and Lomborg's own admission—"I am not myself an expert as regards environmental problems"—damage the book's potential to positively affect the environmental debate.⁶⁴ By infuriating the environmental community and giving a selective account of the "real state of the world," Lomborg polarizes the environmental debate even further.

⁶² Czech, "Julian Simon Redux," 570.

⁶³ Czech, "Julian Simon Redux," 570.

⁶⁴ Aulisi, "Opportunity Lost," 72.

Chapter Five: Conclusion

The debate between environmentalists and cornucopians has in no way reached its conclusion. The stakes are high and the tenor of the rhetoric is becoming increasingly shrill, heightening our need for balanced, accurate information from which to derive better environmental policy. Why is the divide between the pro and counter arguments so wide? Why does it feel like it is ever-widening? The two worldviews—anthropocentric and biocentric—that inform distinctive policy preferences may hint at the answer.

The argument about the value of biodiversity illuminates the divergence between these two perspectives. From the point of view of economists, using economics to assess the value of biodiversity is both rational and moral: rational because confronting trade-offs is unavoidable in sensible policymaking and moral because, in the context of rational decision-making, policies founded on cost-benefit and cost-effectiveness analyses have the best chance of maximizing (human) well-being.¹ In contrast, environmental scientists, noting that the value of ecosystem services is ignored or underestimated in conventional economic assessments because no markets exist for these services, imply that relying on these types of analyses is both irrational and immoral: irrational because they are not coherent even within their own framework of assumptions—that is, true costs and true benefits of many, if not most, environmental goods and services cannot be measured with confidence—and immoral because “the approach centers solely on human needs,

¹ Peter J. Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists: What We Can Learn from Lomborg and His Critics,” *Politics and the Life Sciences* 22 (March 2003): 20.

discounts the future, and emphasizes efficiency over equity and other conceptions of distributional justice.”²

When evaluating the contributions of Simon and Lomborg to environmental discourse, it is important to remember that their anthropocentric, utilitarian, neo-classical perspective is not an extreme position. The belief that the value of biodiversity derives from its contribution to human well-being is accessible and reasonable. It is a definition that can be found in nearly any economics textbook. It is likely, too, that Lomborg faced harsher criticism because he described himself as an environmentalist.³

In contrast to the anthropocentric view reflected in the dominant theories of environmental economics, many biologists and ecologists concerned with conservation see the value of biodiversity through a biocentric lens. This view posits that nonhuman life forms, and the environment that supports them, have inherent value distinct from any instrumental value to humans.⁴ Many biologists, ecologists, and scientists who conducted reviews of the works of Simon and especially Lomborg maintain this worldview.

Some scientists have expressed their views on environmental ethics in print, but none so famously as Aldo Leopold, who proposed the adoption of a “land ethic.” Leopold’s environmental conception of ethical evolution illustrates the great divide between anthropocentric and biocentric worldviews, but also suggests that the two could, and should, coalesce to form a more coherent, ethical notion of the earth. In this book, *A Sand County Almanac*, he likened this adoption to previous cultural changes that led, for

² Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 20.

³ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 18.

⁴ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 20.

example, to abolishing slavery and recognizing the rights of women.⁵ In contrast to anthropocentric utilitarian views of nature, in which morally right acts are those that protect or increase human well-being, Leopold offers the following recommendations for moral action and belief: "...quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."⁶ Leopold suggests that movement toward such an ethic "is...an evolutionary possibility and an ecological necessity...Individual thinkers since the days of Ezekiel and Isaiah have asserted that the despoliation of land is not only inexpedient but wrong. Society, however, has not yet affirmed their belief. I regard the present conservation movement as the embryo of such an affirmation."⁷ Leopold argues that the unlimited prerogative to own nature—defined to include "soils, waters, plants, and animals, or collectively: the land"⁸—that humans have bestowed upon themselves should be replaced by a constrained set of rights and an expanded set of responsibilities founded on principles of membership and citizenship in—rather than domination and exploitation of—the community of nature. In an analysis of moral progress and the acceptance of a

⁵ Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 21.

⁶ Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (New York: Oxford University Press, 1987), 224-225, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 21.

⁷ Leopold, *A Sand County Almanac*, 52, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 21.

⁸ Leopold, *A Sand County Almanac*, 53, as cited in Balint, "How Ethics Shape the Policy Preferences of Environmental Scientists," 21.

land ethic, Balint concludes that “many who disagree about the current state of the planet, and about appropriate environmental policies given present conditions, are divided, often unwittingly, by Leopold’s third stage of moral-social evolution. Lomborg has spoken for those who do not—or do not yet—accept a land ethic, while his critics have spoken for those who do.”⁹

While the “land ethic” improves our understanding of the divide between environmentalists and cornucopians, rhetorical appeals expose the fundamental value sets of each worldview. Economists primarily appeal to the id and the ego because it is in the nature of their discipline to do so. Economists make a distinction among scientists, respecting those who practice “hard science” (science with a capital S) and considering themselves members of this group. Ecologists, on the other hand, appeal to the superego, because their discipline emphasizes the intrinsic value of biotic communities. Ecology refuses to accept calculations of human preferences as the single indicator of worth. Thus, while the connotations of economic analysis are strikingly divergent for economists and environmental scientists, we can see how their rhetorical appeals fit the underlying values of each discipline.

The divide between disciplines is certainly reason for concern. Ehrlich, Simon, and Lomborg frequently discount the criticisms and opinions of other disciplines, causing anger and frustration. Only Carson makes pleas for experts to collaborate, to include a range of views, and to develop a holistic perspective of environmental issues.

As a whole, the body of environmental literature has not led to a more reasonable discourse. If anything, it has exacerbated the divisions and made less clear the nature of

⁹ Balint, “How Ethics Shape the Policy Preferences of Environmental Scientists,” 22.

the issues we face. Only Carson struck out to unite the two world views; the other authors—Simon, Lomborg, and Ehrlich—used language, charts, tables, and graphs to obscure rather than to elucidate the state of our environment and the path to sustainability. If environmental literature is to be heard not as a booming echo or as high pitched whine, is not to be viewed as the grave concern of a few, but listened to, analyzed, and acted upon by many, it must be rooted in scientific fact and developed with a narrative structure that is meaningful to not just some, but to all.

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