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The Death Wish of Humanity:
Religious and Scientific Apocalypticism in the United States, 1859-2001

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An abstract of
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Abstract

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Scholars writing about modern American apocalyptic beliefs tend to separate the secular from the religious. The most prominent form of popular religious apocalypticism in the twentieth century U.S., dispensational premillennialism, developed among American conservative Protestants at the same time that the beginnings of a scientific apocalyptic was being articulated in the late nineteenth century. These two forms of apocalypticism matured alongside each other in the United States, ultimately converging on the twin threats of nuclear war and environmental destruction after World War II.

Though their adherents usually differed politically, there is a surprising amount of correlation between the two accounts of the end. Conservative evangelicals writing on Bible prophecy believed that scientific revelations about the effects of nuclear weapons as well as environmental threats provided insight into how to interpret prophetic books of the Bible like Revelation. Scientific apocalypticists, in the form of scientists writing popular works and science fiction authors grappling with the same issues, struggled to find solutions to these threats and give meaning to human existence in the face of such catastrophe. The result was that American religious and scientific visions of the end, far from being diametrically opposed to one another, became more compatible during the twentieth century. This continued right up until the millennium, when the slow fracturing of scientific authority that took place over the last half of the twentieth century began to be reflected in both the religious and scientific apocalypses.

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Introduction

Two seemingly different understandings of the history and destiny of man emerged during the late nineteenth century in the United States. One was based on the theory of evolution as articulated by Darwin, while the other emerged among conservative evangelicals who adopted a systematic version of Bible prophecy known as dispensational premillennialism. Contemporaries believed that these two understandings of the world were diametrically opposed to one another, aided by the American scientist (born in England) John William Draper's *History of the Conflict between Religion and Science* in 1874 and historian Andrew Dickson White's *A History of the Warfare of Science with Theology in Christendom* in 1896.¹ These two works established the idea that there was an unbridgeable rift between religion and science.

Modern scholars have largely rejected this thesis, sometimes called the “conflict thesis.” Ronald L. Numbers, a historian of science who has written on the American historiography of this idea, notes:

In the form proposed by White and Draper and adopted by countless others, it [the conflict thesis] assumes the existence of two static entities, ‘science’ and ‘religion,’ thus ignoring the fact that many of the debates focused on the questions of what should be allowed to define them; it distorts a complex relationship that rarely, if ever, found scientists and theologians in simple opposition; it celebrates the triumphs of science in whiggish fashion; and, all too often, it fails to treat religious ideas and institutions with the respect accorded to the realm of science.²

Elsewhere, Numbers has argued along with fellow historian David C. Lindberg that science-and-religion studies need to approach the relationship without recourse to the simplistic warfare metaphor. They write, “in the future we must not ask ‘Who was the

¹ Note that Draper targeted Roman Catholicism as being much more oppressive than Protestantism historically towards science.

² Ronald L. Numbers, “Science and Religion,” *Osiris* 1, 2nd series (1985): 80. See also George M. Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth-Century Evangelicalism 1870-1925*, new ed. (Oxford: Oxford University Press, 2006), 212.

aggressor' but 'How were Christianity and science affected by their encounter?'"³ An analysis of the apocalyptic theories of conservative evangelical Christians, scientists, and science fiction writers illustrates how science and religion have interacted in modern America without necessarily existing in conflict.

As scholars have repudiated the conflict thesis, they have reconceptualized the relationship between science and religion. At one extreme in defining this relationship lies the opinion of Stephen Jay Gould. Gould, a paleontologist, argues science and religion do not actually conflict: "Science tries to document the factual character of the natural world, and to develop theories that coordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meanings, and values—subjects that the factual domain of science might illuminate, but can never resolve."⁴ Gould proposes a "respectful noninterference" between science and religion, which he names NOMA, or Non-Overlapping Magisteria.⁵

At the opposing end of the spectrum are astronomer Carl Sagan and physicist Stephen Hawking, both of whom see science as answering questions that Gould would consider in the purview of religion; they each hint at a modern version of the "conflict thesis." Hawking describes attending a 1981 conference on cosmology at the Vatican in *A Brief History of Time* (1988). When the pope asked the cosmologists not to inquire into what existed prior to the Big Bang (thereby respecting the work of God), Hawking relates: "I was glad then that he did not know the subject of the talk I had just given at the conference—the possibility that space-time was finite but had no boundary, which means

³ David C. Lindberg and Ronald Numbers, "Beyond War and Peace: A Reappraisal of the Encounter between Christianity and Science," *Church History* 55 (1986): 354.

⁴ Stephen Jay Gould, *Rocks of Ages: Science and Religion in the Fullness of Life* (New York: The Ballantine Publishing Group, 1999), 4.

⁵ *Ibid.*, 5.

that it had no beginning, no moment of Creation. I had no desire to share the fate of Galileo, with whom I feel a strong sense of identity, partly because of the coincidence of having been born exactly 300 years after his death!”⁶

Like Hawking, Sagan rejects NOMA, but he also argues in *The Demon-Haunted World: Science as a Candle in the Dark* (1995), “Science is not only compatible with spirituality; it is a profound source of spirituality. When we recognize our place in an immensity of light-years and in the passage of ages, when we grasp the intricacy, beauty, and subtlety of life, then that soaring feeling, that sense of elation and humility combined, is surely spiritual.”⁷ While Sagan does not worry about sharing the fate of Galileo, he suggests that science is superior to religion: “Again, the reason science works so well is partly that built-in error-correcting machinery. There are no forbidden questions in science, no matters too sensitive or delicate to be probed, no sacred truths. That openness to new ideas, combined with the most rigorous, skeptical scrutiny of all ideas, sifts the wheat from the chaff.”⁸

Between these two extremes are scholars, including historians, sociologists, and philosophers as well as scientists, who propose a complex view of the relationship between science and religion, seeing them as neither inhabiting separate spheres nor necessarily at odds. Sometimes their concerns overlap as sociologist Steve Fuller asserts in *Science vs. Religion? Intelligent Design and the Problem of Evolution* (2007): “Science and religion are not mutually exclusive categories. There is no evidence that belief in a deity, even a supernatural one, inhibits one’s ability to study the natural world

⁶ Stephen Hawking, *A Brief History of Time*, 10th anniversary ed. (New York: Bantam Books, 1998), 120.

⁷ Carl Sagan, *The Demon-Haunted World: Science as a Candle in the Dark* (New York: Random House, 1995), 29.

⁸ *Ibid.*, 31.

systematically. If anything, history provides evidence for the contrary thesis—that there is a synergy between the two.”⁹

Scholars like Fuller search for common ground between the religious and scientific enterprises. Physicist Adam Frank sees the two as responding to the same impulses: “Science and spiritual endeavors are both responses to the lived sense of the world’s great mystery. What matters most is not the latest results of evolutionary theory or cosmology but the common aspiration they share.”¹⁰ Science tends to deny the spiritual dimension of life, according to Frank.¹¹ But, in his view, “[w]isdom and understanding can no longer be separated on a planet pushed by technology and science to the limits of its carrying capacity. Our world is saturated with the fruits and poisons of science.”¹²

Philip Hefner, a theologian and editor of *Zygon: Journal of Religion and Science*, also believes that imposing a separation between science and religion can have dangerous consequences. In discussing the origins of the journal *Zygon*, he notes that its founders

believed that because science and scientific culture had destabilized traditional religious frameworks of meaning and because these frameworks are essential to any wholesome society, the challenge [for *Zygon*] is clear: To persuade scientists and other intellectual leaders of society that the same evolutionary processes that underlie the natural world described by science have also produced religion and selected its wisdom for the survival of the world and its human community. The goal is nothing less than the salvation of society in the face of the anomie and destruction at the hands of scientific explanations that lack a sense for ultimacy, and technology that is insensitive to the values that make for survival.¹³

⁹ Steve Fuller, *Science Vs. Religion? Intelligent Design and the Problem of Evolution* (Malden, M.A.: Polity Press, 2007), 11.

¹⁰ Adam Frank, *The Constant Fire: Beyond the Science vs. Religion Debate* (Berkeley: University of California Press, 2009), 9.

¹¹ *Ibid.*, 10.

¹² *Ibid.*, 12.

¹³ Philip Hefner, “The Science-Religion Relation: Controversy, Convergence, and Search for Meaning,” *International Journal for the Psychology of Religion* 7, no. 3 (1997): 146.

A comparison of scientific apocalyptic beliefs and dispensational premillennial beliefs that developed in the United States between the late nineteenth century and throughout the twentieth century reveals rhetorical similarities between the two. This dissertation proposes that far from inhabiting separate spheres, science and religion, as practiced by scientific apocalypticists and dispensational premillennialists, are concerned with the same fundamental questions about the meaning and purpose of life and the fate of humankind. Premillennialists and scientific apocalypticists both centered their apocalypics on nuclear weapons and environmental problems for much of the twentieth century.

The scientific apocalyptic was new in the nineteenth century, and at that time, less like a religious apocalyptic than at any other period since. Initial scientific apocalyptic musings wondered how nature could effect the end of the world. Soon, however, scientific apocalypticists wondered how humans could cause the end of the world or of the species; it was during the speculation of a manmade apocalypse that scientific apocalypticists' use of premillennial language and scenarios became prominent. Each apocalyptic during this period described a perpetual sense of crisis because of an impending catastrophe caused by human action. That the rhetoric of both was analogous is not a coincidence. Conservative evangelicals purposely incorporated science into their visions of the end. While scientific apocalypticists did not always consciously duplicate the way premillennialists envisioned the end, they did not have a language of crisis of their own. As scientific apocalypticists tried to warn humans about the dangers facing them and push the solutions that they thought were necessary to lessen such hazards, they

tended to use comparable language to, and imagine like scenarios as, dispensational premillennialists.

As scientific apocalypticists learned to live with the perennial threat of destruction, the scientific apocalypse became as ingrained and commonplace as that of premillennialists. That the world was in decline became accepted wisdom of both scientific apocalypticists and premillennialists after 1945. The similarities between the two types of apocalypticism became only more pronounced during the latter half of the twentieth century, as scientists, science popularizers, and science fiction authors began to question whether science could resolve humanity's problems, or whether a spiritual transformation would be required.

Science fiction has been key to the development of the scientific apocalyptic since the late 1800s; it fleshed out the apocalyptic by spelling out what is only implicit in much popular science writing; science fiction throughout the twentieth century often portrayed humanity as deserving of judgment, with a worthy remnant emerging from a worldwide disaster to build a better world—just as premillennialists believed would happen during the end times. Historian James Gilbert has written about the relationship between science fiction and religion:

science fiction literature frequently revealed a powerful religious motivation. Much of this spirit reflected the transfer of apocalyptic speculation from its traditional place in Christian eschatology to imagination about the future. The sudden, terrible birth of atomic energy and then the anxieties of the Cold War made such plots inevitable and popular. Frequently stories contained prophecy, revelation of things to come, secret knowledge, myths about origins and ends, the paranormal, and salvation imposed from beyond—all of which addressed the sorts of questions that religion traditionally answered.¹⁴

¹⁴ James Gilbert, *Redeeming Culture: American Religion in an Age of Science* (Chicago: The University of Chicago Press, 1997), 239.

Gilbert argues that science fiction counted among its readers professional scientists who appreciated that science fiction could deal with the implications of their discoveries and theories. Gilbert concludes, “It [science fiction] glamorized science while often posing questions about the larger moral and ethical meaning of experiment.”¹⁵

In addition to science fiction writers, the scientific apocalyptic included scientists who worried about the fate of humanity (and the world) and popular science writers who warned Americans that they needed to change their way of life. All scientific apocalypticists engaged the same basic questions about the purpose of life that premillennialists did. A historian of science, Michael Shermer, in offering an explanation of why science is important, points to its concern with questions about the meaning of life: “Science matters because it is the preeminent story of our age, an epic saga about who we are, where we came from, and where we are going.”¹⁶ In telling this epic saga, scientists and science fiction writers hit upon remarkably similar stories to conservative evangelicals.

The meaning of the stories that each provided to make sense of the world and ease the fears of worried Americans, however, was quite different from one another. Premillennialists’ answer to problems facing humanity was Jesus Christ, whose return was the event all of human history led up to. Christ would stop humans from destroying each other in a nuclear war and cleanse the earth of pollution. Meanwhile, scientific apocalypticists, despite using the language and formulas of premillennialists, looked at the same problems facing the world and proposed political, technological, and toward the end of the twentieth century, vaguely spiritual solutions. Both felt that humans were

¹⁵ Ibid., 238.

¹⁶ Michael Shermer, *Why Darwin Matters: The Science of Good and Evil* (New York: Henry Holt and Company, LLC, 2006), 161.

guilty of terrible acts (and feared that humanity would not restrain itself in the future from even worse acts involving nuclear war or damage to the environment). But, for premillennialists, Christ could change an individual's heart to make them more mindful of the environment; accepting Christ was also the only way to live through any final nuclear or environmental crisis. For scientific apocalypticists, individual humans were not the problem; they envisioned a fundamental flaw within the human species itself. Science fiction writers suggested that passing through a nuclear war might purge the species of its defects, but when it came to the environment, science fiction authors worried that humans might simply pollute their surroundings to the extent that all life would simply perish.

These differences do not, however, amount to an endorsement of the conflict thesis. Despite their differences, both apocalypticists largely co-existed without conflict until the 1980s. Scientific apocalypticists did not take notice of premillennialists until the 1980s and 1990s when premillennialists began growing in visibility and apparent political power. When they addressed the growing prominence of conservative evangelicals and fundamentalists who subscribed to premillennialism, scientific apocalypticists tended to paint them as zealots who were willing to cause the end of the world out of a misguided belief that it would bring Christ back sooner. Premillennialists incorporated the observations of scientific apocalypticists into their analyses of how the end times would play out without questioning their conclusions until the 1990s.

The comparison between conservative evangelicals and scientists, science popularizers, and science fiction writers would be abhorrent to the latter. As they have revised the "conflict thesis," scientists have concluded that if there is any conflict

between science and religion, conservative evangelicals and fundamentalist Christians are the ones causing it. Other forms of Protestantism were more palatable to scientists like Gould. Liberal Protestants, for instance, found that evolution could be entirely consistent with the Bible. Other Christians, including neo-orthodox Protestants, liberal evangelicals, and Catholics, did not see efforts to reduce the risk of nuclear warfare or alleviate environmental problems as pointless; rather, they believed the Bible provided an imperative to do so. Scientists like Gould could reconcile religion and science by only referencing forms of Christianity that did not overtly challenge their own beliefs. In *Rocks of Ages*, Gould argued that fundamentalist Christians do not respect NOMA, and their insistence that evolution is a false theory is a violation of NOMA.¹⁷ Sagan was in agreement that conservative evangelicals who advocate creationism have declared war on science: “other sects, sometimes called conservative or fundamentalist—and today they seem to be in the ascendant, with the mainstream religions almost inaudible and invisible—have chosen to make a stand on matters subject to disproof, and thus having something to fear from science.”¹⁸

A more sober-minded analysis comes from historian D.G. Hart in “Evangelicals, Biblical Scholarship, and the Politics of the Modern American Academy” (1999). According to Hart, many American Protestants during the twentieth century stressed that “religion . . . concerned piety and morality while science explored what was observable, rational, and physical. Fundamentalists, however, denied the separation between religion and science by arguing that the Bible was more than just a guidebook to morality and a source of religious experience, that it made claims that trespassed the

¹⁷ Gould, 94.

¹⁸ Sagan, *Demon-Haunted World*, 277. See also Shermer, 30.

boundaries of science.”¹⁹ On this view, conservative evangelicals who read the Bible literally represent a special case in the relationship between science and religion; they have continually mounted an overt attack on science, according to these scholars.

Far from challenging or failing to respect science, premillennialists integrated scientific conclusions into how they interpreted the Bible. Nor have scientific apocalypticists only engaged issues that fall strictly into the realm of science. As they grappled with the threats they feared would cause the end of the world, scientific apocalypticists addressed matters such as the most ethical way to live and the purpose of human existence. When there appeared to be conflict between the two apocalypses, it was initiated by scientific apocalypticists who painted premillennialists in an unflattering light. When, in the 1990s, more premillennialists began to question the science behind environmentalism, they did so in the context of scientists and the wider public contesting the idea of infallible scientific authority.

Science experienced its heyday as this infallible authority in the late nineteenth century. Anthropologist Christopher Toumey observes that during this time, many assumed that “because science seemed to be the source of social progress and material prosperity, it must be an autonomous moral authority, independent of Protestantism: As popular culture increasingly linked social progress to science, scientists found their intelligence and knowledge to be unchallenged and their opinions in great demand.”²⁰ Chemist Henry Bauer, who has written on the popularization of science, agrees with the assessment that some Americans concluded that science would lead to unending progress

¹⁹ D.G. Hart, “Evangelicals, Biblical Scholarship, and the Politics of the Modern American Academy” in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D.G. Hart, and Mark A. Noll (New York: Oxford University Press, 1999), 311.

²⁰ Christopher P. Toumey, “Modern Creationism and Scientific Authority,” *Social Studies of Science* 21, No. 4 (Nov. 1991): 688.

and even had the capacity to discover life's truths in the late 1800s. Bauer notes, "By the nineteenth century it seemed reasonable enough to most thinkers to believe that science had made triumphant progress by subordinating theory to evidence. . . . This was the grand age of science, when it seemed to the leading scholars of humanity that the sure road to understanding all things had finally been discovered in science and its Rosetta stone, the scientific method."²¹ Over the course of the twentieth century, postmodern analyses of science and the accumulation of nuclear and environmental problems originating from the work of scientists led to a declining respect for scientific authority. Subsequently, scientists and other scholars began to revise the "conflict thesis" and asked what religion could contribute to the effort to resolve the crises facing humanity.

That science and religion have a multitude of similarities is borne out by the science-and-religion scholarship, even if the similarities are not always seen as applying to fundamentalists and conservative evangelicals. Physicist Robert Jastrow contends in *God and the Astronomers* (1978), "There is a kind of religion in science; it is the religion of a person who believes there is order and harmony in the Universe, and every event can be explained in a rational way as the product of some previous event; every effect must have its cause; there is no First Cause."²² John C. Burnham, a historian, is even more explicit in his assertion that there exists a religion in science. Burnham suggests that toward the end of the nineteenth century, scientists and science popularizers promoted science with a zeal that was akin to religious ardor. He argues that a "religion of science" arose, which

²¹ Henry H. Bauer, *Scientific Literacy and the Myth of the Scientific Method* (Urbana, IL: University of Illinois Press, 1992), 34.

²² Robert Jastrow, *God and the Astronomers* (New York: W.W. Norton and Company, Inc., 1978), 113.

consisted of an informal set of beliefs that filled followers with evangelical fervor. They thereupon attempted to convert both individuals and the public at large. Their enthusiasm and their approach were taken . . . from protestant evangelism. These enthusiasts had their martyrs to superstition—Copernicus, Galileo, Servetus, and, later on, the victims of antievolutionary churchmen. Moreover, the apostles had visible forces of evil with which to contend: superstition, ignorance, and, now, added in accordance with Anglo-American political traditions, intolerance—since scientific findings presumably could stand up to any opinion. The goal of the evangelicals of the religion of science was to bring enlightenment by exposing everyone to the truth, that is, by popularizing science.²³

A scholar of science and religion, James Hedley Brooke, has also noted similarities between the scientific and religious enterprises ”in the sense that, in both, one often finds a protected core of received wisdom surrounded by belts of more negotiable doctrine.”²⁴ As a result, Brooke asserts, it has become difficult to maintain a sharp division between science and religion: “the scientific attitude has had a good run for its money in twentieth century societies. It has permeated popular cultures and has fed on technological success. But is impossible to be an informed citizen in the late twentieth century and to imagine that such neat dichotomies between science and nonscience can be sustained. . . . Despite the pressures to insulate scientific and religious vocabularies, there have been profound changes in our understanding science itself that have created space for renewed dialogue between scientist and theologian.”²⁵ The changes in the understanding of science that Brooke describes are related to how philosophers of science have questioned concepts like the scientific method.

²³ John C. Burnham, *How Superstition Won and Science Lost: Popularizing Science and Health in the United States* (New Brunswick, NJ: Rutgers University Press, 1987), 23.

²⁴ James Hedley Brooke, *Science and Religion: Some Historical Perspectives* (New York: Cambridge University Press, 1991), 326-327.

²⁵ *Ibid.*, 326.

Burnham explains how the scientific method came to be considered the backbone of science during the nineteenth century:

By thus emphasizing open-mindedness and then the method associated with naturalistic explanation, proponents found a distinctive element that helped identify science; namely, the essence of science was the method. By the twentieth century, this identifying abstraction was widely utilized, and many writers discussed the nature of ideal science (using ‘ideal’ in a more less Platonic sense). . . . The mid-twentieth-century emphasis on scientific method . . . still echoed this view, that the subject matter of science was not as important as the method. Meantime, the method could be, and was, applied to any category of inquiry to which the imperialists of science wished to apply it.²⁶

Over the course of the twentieth century, scholars like Austrian philosopher Karl Popper and American physicist Thomas Kuhn raised questions about the methodology of scientists. Prior to Popper and Kuhn, as researcher Hugh G. Gauch, Jr., notes, the traditional understanding was that “true and scientific statements were based on empirical observations and their deductive logical consequences.”²⁷ Popper suggested in the 1930s that the task of science is to attempt to disprove the hypotheses about nature that scientists set forth. But, while theories could be proven false, he asserted, they could never be proven true.²⁸ Kuhn, in his 1962 *The Structure of Scientific Revolutions*, contended that scientists operate under paradigms, or a set of beliefs about how the world works. The implication of both Popper’s and Kuhn’s ideas was that scientists could not make observations about the world without any prior beliefs affecting the outcome.²⁹ As a result, philosophers of science began to stress the role of consensus in science—the idea that a majority of scientists determine what theories will be accepted as true. As Gauch

²⁶ Burnham, 28.

²⁷ Hugh G. Gauch, Jr., *Scientific Method in Practice* (New York: Cambridge University Press, 2003), 82.

²⁸ Howard Sankey, “Methodological Pluralism, Normative Naturalism and the Realist Aim of Science” in *After Popper, Kuhn and Feyerabend: Recent Issues in Theories of Scientific Method*, ed. Robert Nola and Howard Sankey (Boston: Kluwer Academic Publishers, 2000), 211. See also Achinstein’s discussion of realists and antirealists in Peter Achinstein, introduction to *Science Rules: A Historical Introduction to Scientific Methods*, ed. Peter Achinstein (Baltimore: The Johns Hopkins University Press, 2004), 1-3.

²⁹ Gauch, 82.

explicates, “Whereas the traditional account of scientific method explained how science achieved truth, with consensus as a by-product, the constructivist account offered consensus as the product, with no attendant claim of truth, ordinarily.”³⁰

American historian James T. Kloppenberg assesses the impact of Kuhn in “Why History Matters to Political Theory.” For scholars who desired certainty,

[t]he natural sciences provided an attractive model for inquiry of all sorts, generating through systematic, rigorous research a reliable body of knowledge commanding respect and assent from specialists and nonspecialists alike. . . . The natural sciences, whose claims to objectivity had intimidated humanists and inspired philosophers and social scientists—and whose hold on solid knowledge had seemed so secure—fell before the historicist analysis of Thomas Kuhn.³¹

After Kuhn, scholars increasingly viewed science as social construction privy to the same sort of criticism as other forms of information.

In conjunction with the new postmodern view of science, specialization in science also played a role in the decline of respect for the scientific method. Specialization led to the development of some fields, like physics, where theory sometimes preceded data. Bauer writes, “Those who studied some things found that they progressed best by taking more note of theory, whereas others found themselves going astray if they ventured too far from observation—and so some specialties came to understand that experimental evidence should not be accepted until it has been confirmed by theory, whereas most sciences and most scientists at least claim to believe the opposite.”³² As the scientific method ceased to be one single method practiced by all scientists regardless of field, specialization also made science more confusing and inaccessible to most Americans.

Gilbert says of the effects of increasing specialization: “Consequently a certain portion

³⁰ Ibid., 95.

³¹ James T. Kloppenberg, “Why History Matters to Political Theory” in *Scientific Authority and Twentieth-Century America*, ed. Ronald G. Walters (Baltimore: John Hopkins University Press, 1997), 185.

³² Bauer, 26.

of science—especially physics—was open only to a special few who could understand its opaque language and obscure theories. If this conferred enormous power and prestige on scientists, it also rendered them susceptible to suspicion, mistrust, and misunderstanding, especially in a democratic society.”³³

The developments in the philosophy of science and the increased specialization in science have led some scholars like Bauer to pronounce the scientific method as nothing more than a myth: “Science is seen not to be dealing in permanent or absolute truth, as it was or could be seen if the scientific method could crucially test hypotheses against reality.”³⁴ As the result of the doubts about the scientific method expressed by scholars like Bauer, Howard Sankey, in “Methodological Pluralism, Normative Naturalism and the Realist Aim of Science,” divides scientists and philosophers of science into two categories: monists and pluralists. Monists believe that science has a single method that can be used in every specialty and has not changed over time.³⁵ Pluralists, on the other hand, argue the opposite—that methods change according to historical circumstances and the demands of a specialty.³⁶ Pluralists question the degree to which science describes reality.

Pluralists like Bauer include a modified scientific method in their description how science works, post-Kuhn: “In the modern understanding of science that has discarded the myth of the method, nature does still constrain observation and experiment and thereby also interpretation (or theory, or scientific belief). It does so less directly, less

³³ Gilbert, 7.

³⁴ Bauer, 61.

³⁵ Howard Sankey, “Methodological Pluralism, Normative Naturalism and the Realist Aim of Science” in *After Popper, Kuhn and Feyerabend: Recent Issues in Theories of Scientific Method*, eds. Robert Nola and Howard Sankey (Boston: Kluwer Academic Publishers, 2000), 211. See also Achinstein’s discussion of realists and antirealists in Peter Achinstein, *Introduction to Science Rules: A Historical Introduction to Scientific Methods*, ed. Peter Achinstein (Baltimore: The Johns Hopkins University Press, 2004), 1-3.

³⁶ Sankey, 211.

precisely, less automatically, and less quickly than is envisaged in the classical formulations of the scientific method; nevertheless, nature cannot but remain the ultimate and entirely firm arbiter.”³⁷

Even if the understanding of science by philosophers of science has changed, physicist Robert Park insists that this is not true for the day-to-day work of scientists. Park concedes that a scientist’s personal beliefs may affect her conclusions but insists that the fact “science works” proves the value of the scientific method.³⁸ Scholars like Park, who are monists, argue that science can reveal truth and contend that everyone needs to respect the “scientific worldview,” which is “an understanding that we live in an orderly universe, governed by physical laws that cannot be circumvented.”³⁹

Despite a growing sense that the scientific method is not unassailable as once believed, other scholars also emphasize the efficacy of science, pointing to its methodology as the reason why. Gauch similarly disagrees that the scientific method is only a myth. Practicing scientists, according to Gauch, use “general principles of scientific method that are applicable to all of the sciences, but excessive specialization often causes scientists to neglect the study of these general principles, even though they undergird science's rationality and greatly influence science's efficacy and productivity. These general methodological principles involve the use of deductive and inductive logic, probability, parsimony, and hypothesis testing.”⁴⁰ Shermer would agree with Gauch; he defines science as “*a testable body of knowledge open to rejection or confirmation.*”⁴¹

³⁷ Bauer, 89. See also Gauch, 409.

³⁸ Robert Park, *Voodoo Science: The Road from Foolishness to Fraud* (New York: Oxford University Press, 2000), 34.

³⁹ *Ibid.*, 40.

⁴⁰ Gauch, xv.

⁴¹ Shermer, 94.

Scientists employ methods to test this body of knowledge; among these methods are “hunches, guesses, ideas, hypotheses, theories, and paradigms, and testing them involves background research, experiments, data collection and organization, colleague collaboration and communication, correlation of findings, statistical analyses, conference presentations, and publications.”⁴²

While science may be less likely to be viewed as an irrefutable source of authority, the methodology of science is still its most distinctive characteristic.⁴³ Despite the similarities between the scientific apocalyptic and dispensational premillennialism, their similarities did not (and do not) extend to methodology. Science continually revises itself; whether or not Popper’s view of how science works is precisely correct, his observation that science concerns the disproving of scientific theories points to its evolving nature. By contrast, conservative evangelical and fundamentalist theology has remained relatively static; the dispensational premillennialists under study in this dissertation make many of the same arguments in the late 1800s as they do one hundred years later.

Methodology is responsible for the historical consistency of dispensational premillennialism. Conservative evangelicals and fundamentalists, who make up the population of dispensationalists, rely foremost on the Bible; the extent to which they incorporate science into their theology is mediated by how well it fits the biblical verses under interpretation. Evangelical theologian Clark H. Pinnock, in describing how

⁴² Ibid., 94.

⁴³ Some scholars argue that the similarities between science and religion include their methods, but Wildman’s argument may not include fundamentalist or conservative evangelical theology. See Wesley J. Wildman, “Introduction to Methods” in *Religion and Science: History, Method, Dialogue*, ed. W. Mark Richardson and Wesley Wildman (New York: Routledge, 1996), 85; Wesley J. Wildman, “The Quest for Harmony: An Interpretation of Contemporary Theology and Science” in *Religion and Science: History, Method, Dialogue*, ed. W. Mark Richardson and Wesley Wildman (New York: Routledge, 1996), 43.

evangelical theology operates, suggests that most evangelicals “do theology without thinking about how. Probably a number do not view method as a complicated business. They know instinctively that it involves exegesis and collation. What is there to discuss aside from the inspiration and interpretation of the Bible?”⁴⁴ Evangelical theology, according to Pinnock, tends to eschew novelty and embraces a plain approach: “Although capable of subtlety, evangelical theology is not often subtle, because it is written for a popular movement rather than the academy. Laity may not want subtlety, and leaders who wield power often want the theology to be simple and stark. They tend not to favor theology with mysterious, paradoxical and experiential elements.”⁴⁵ Nevertheless, theologians, including those of an evangelical bent, use reason to constrain their analyses, according to Pinnock; reason “pressures theology to crosscheck its assertions with reality to see if they agree with the relevant data.”⁴⁶

Robert K. Johnson, a theologian at Fuller Theological Seminary, also points to the Bible as the “starting point” for an evangelical theologian, explaining that evangelicals, unlike other Christian theologians, are wary of using outside information to provide context for the Bible. Johnson urges evangelical theologians to ask him or herself, “Is a fully developed contextualization the opportunity to hear Scripture speak again with clarity and conviction, or is it the abdication of a commitment to Biblical authority?”⁴⁷ Johnson argues that evangelicals should practice a christocentric theology; if theologians keep Christ foremost in their interpretation, it will allow them to avoid being tied to a

⁴⁴ Clark H. Pinnock, “New Dimensions in Theological Method” in *New Dimensions in Evangelical Thought: Essays in Honor of Millard J. Erickson*, ed. David S. Dockery (Downers Grove, IL: Intervarsity Press, 1998), 199.

⁴⁵ *Ibid.*, 202.

⁴⁶ *Ibid.*, 205.

⁴⁷ Robert K. Johnson, introduction to *The Use of the Bible in Theology/Evangelical Options*, ed. Robert K. Johnson (Atlanta: John Knox Press, 1985), 7.

particular worldview.⁴⁸ Johnson also emphasizes the role of the Holy Spirit, which helps the interpreter understand the “saving work of Christ” as revealed by the Bible.⁴⁹

Just as physicists use different methods from biologists (with physicists emphasizing theory over data and biologists stressing the opposite), so too does theology differ according to a practitioner’s beliefs. Conservative evangelicals and fundamentalists who believe the Bible should be read literally and should be the primary source of authority for a theologian would find a liberal Protestant’s theology, which might include a symbolic reading of Genesis or a historicist interpretation of Revelation, erroneous at best and blasphemous at worst. Dispensational premillennialism is not the only religious apocalyptic in the United States, even among conservative evangelicals, but it is arguably the most prominent: dispensational premillennialism has had a steady growth in cultural visibility throughout the course of the twentieth century and has been more politically influential than any other form of religious apocalyptic. Nevertheless, even within dispensational premillennialism, proponents have had disagreements over how to interpret the Bible; at times these disagreements have been acrimonious.⁵⁰

Despite these differences, I argue that as the scientific apocalyptic and dispensational premillennialism matured during the twentieth century, they converged on the same concerns and envisioned the end in similar ways. Their similarities, though surprising, reveal the hollowness of Gould’s proposal of NOMA and invalidate Sagan’s

⁴⁸ Ibid., 12.

⁴⁹ Ibid., 13-14.

⁵⁰ For instance, dispensational premillennialists are divided into pre-, mid-, and post-Tribulationism, which refers to whether Christ will return prior, in the middle of, or after the Tribulation period. Yet another view is that of partial Tribulationism, or the idea that Christians who are “right with God” will be raptured; other Christians will have to go through the Tribulation. Most prominent dispensationalists are pre-Tribulationist. The debate over which view is right has been at times harsh. For instance, in Jean Grant’s *The Revelation*, Christians lose their faith during the Tribulation period because they have been taught a pre-Tribulation view of Revelation instead of the proper post-Tribulation view. See Jean Grant, *The Revelation* (Nashville, TN: Thomas Nelson Publishers, 1992).

and Hawking's contentions that religious and scientific conclusions will necessarily conflict. As Gilbert notes, "Despite considerable effort, they [science and religion] could not really be kept apart; no artificial borders, distinctions, and traditions could prevent one from staring across to the other's territory."⁵¹ As revealed by a comparison of scientific apocalypticism and dispensational premillennialism, the science-and-religion relationship is continually evolving—sometimes overlapping in concerns, sometimes conflicting in answers—but much more complex than either a NOMA orientation or conflict thesis would suggest.

It should be noted that scholars, clergy, and laypeople use the term "apocalyptic" in different ways. The word "apocalypse" is a synonym for revelation, but in popular usage, apocalypse is used in myriad ways—to describe any great disaster, the end of civilizations, the extinction of humankind, and the actual destruction of the earth. A historian of Christianity, Bernard McGinn, has noted that "[t]he conflict of interpretations between academic readings [of Revelation] carried on in schools of divinity and religion and in departments of English on the one hand, and the mass of general readers [influenced, for example, by Hal Lindsey or Billy Graham] on the other, is probably greater now than ever before."⁵² The British literary critic Frank Kermode has contrasted how literary critics define the apocalyptic to how the word is used in a popular sense: "the End itself, in modern literary plotting loses its downbeat, tonic-and-dominant finality, and we think of it, as the theologians think of Apocalypse, as

⁵¹ Gilbert, 12-13.

⁵²Bernard McGinn, "Revelation" in *The Literary Guide to the Bible*, ed. Robert Alter and Frank Kermode (Cambridge, MA: Harvard University Press, 1987), 539. Quoted in Frank Kermode, *The Sense of an Ending: Studies in the Theory of Fiction with a New Epilogue* (New York: Oxford University Press, 2000), 184.

immanent rather than imminent. Thus . . . we think in terms of crisis rather than temporal ends; and make much of subtle disconfirmation and elaborate peripeteia.”⁵³

Other scholars refer to the concept of a “philosophical apocalypse,” which David Ketterer, a scholar focusing on Canadian science fiction, describes: “As William Blake recognized, the emergence of America brought about an apocalypse of mind, the discovery of a new world of mind—similar to the philosophical apocalypse that Norman Mailer sees as following in the wake of Apollo 11.”⁵⁴ In *Toward A New Earth: Apocalypse in the American Novel* (1972), by American literary scholar John R. May, the apocalyptic is neither strictly theological (in an existential sense) nor philosophical; he describes as apocalyptic any secular themes in American literature that could stand metaphorically for the battle between good and evil: “Where the traditional apocalyptic symbols are transformed into a secular or worldly analogue, we are dealing with American literary innovations in apocalypse. I refer specifically to the transformation of the losing of Satan into the advent of the confidence man and the conversion of cosmic destruction or death as a spiritual reality into the emptiness of strikes, riots, bombings, and wars—those man-made disruptions of civil and international life.”⁵⁵

Since my research is focused on popular works by conservative evangelicals, scientists, and writers of speculative fiction, I employ both the definition of apocalypse as referring to the end of history brought about by Jesus Christ in premillennialism as well as the more popular definition of apocalypse as concerning the end of civilization (sometimes referred to, popularly, as “the end of the world as we know it”), the end of

⁵³ Kermode, 30.

⁵⁴ David Ketterer, *New Worlds for Old: The Apocalyptic Imagination, Science Fiction, and American Literature* (Garden City, NY: Doubleday, Anchor Books, 1974), 26.

⁵⁵ John R. May, *Toward A New Earth: Apocalypse in the American Novel* (Notre Dame, IN: University of Notre Dame Press, 1972), 215.

humanity, or the destruction of the earth.⁵⁶ Apocalyptic can also refer to the sense that the world is in severe decline or to a disaster with the capacity to change drastically the lives of those who experienced it. In relation to the threat of nuclear war and environmental disasters, apocalyptic refers to the mindset that these problems are intractable and could lead to any number of “ends”—the end of a comfortable life, the end of the United States, the end of humanity, or the end of all life on earth.

Millennialism is also a term that scholars, clergy, and laypeople employ differently and that has changed over time. In a theological sense, there are at least three forms of millennialism today—in addition to premillennialism, Christian viewpoints include amillennialism, or the idea that the one-thousand-year reign of Christ (not literally one thousand years in this view) is occurring right now for Christians. Among American Protestants, amillennialism has largely replaced postmillennialism, which gained popularity during the nineteenth century. Postmillennialism is the idea that Christ will return after a millennium (again, not a literal thousand-year period) during which more people will come to know Christ and the world will experience alternating periods of worsening and improving conditions.⁵⁷ Historian James H. Moorhead has argued that

⁵⁶ Note that I use the term “conservative evangelicals” throughout this thesis to refer to Protestant Christians who subscribe to a literal interpretation of the Bible and premillennialism. Fundamentalist is a narrower term, often excluding charismatic and Pentecostal Christians who agree with other conservative evangelicals on those two core issues but differ on other doctrinal issues. For discussion of this terminology, see Joel A. Carpenter, “The Scope of American Evangelicalism: Some Comments on the Dayton-Marsden Exchange,” *Christian Scholar’s Review* 23, no. 1 (1992): 53-61; *The Variety of American Evangelicalism*, ed. Donald W. Dayton and Robert K. Johnston (Knoxville: The University of Tennessee Press, 1991); Harriet Harris, *Fundamentalism and Evangelicals* (Oxford: Clarendon Press, 1998); *Evangelicalism and Modern America*, ed. George Marsden, (Grand Rapids, MI: William B. Eerdmans Publishing Company, 1984), vii-xvi; George Marsden, *Understanding Fundamentalism and Evangelicalism* (Grand Rapids, MI: William B. Eerdsman Publishing Company, 1991); Martin Marty, “Will Success Spoil Evangelicalism?” *Christian Century* 117, no.21 (19-26 July 2000): 757-761; Douglas Sweeney, “Historiographical Dialectics: On Marsden, Dayton, and the Inner Logic of Evangelical History,” *Christian Scholar’s Review* 23, no. 1 (1992): 48-52.

⁵⁷ James H. Moorhead, “Between Progress and Apocalypse: A Reassessment of Millennialism in American Religious Thought, 1800-1880,” *Journal of American History* 71 (December 1984): 534.

“[i]n whatever form, millennialism looks forward to an ultimate merger of the sacred and the secular, for it envisions a time when ‘the kingdoms of this world are become the kingdoms of our Lord.’”⁵⁸

Scholars have also used the term millennial or millennialism in a secular sense. Referring to essays in an anthology on modern millennialism, historian Richard Landes explains, “The essays that constitute the chapters of this volume use the term ‘millennial’ to designate the belief that at some point in the future our world will be radically transformed into a world of peace, justice, fellowship, and plenty. Millennialism can, but need not, entail a belief in God.”⁵⁹ This dissertation uses the term millennialism in both the context of dispensational premillennial theology but also in a secular sense, as defined by Landes above. Scientific apocalypticists, in anticipating a future world in which humans return to nature or purge the worst characteristics of the species, were millennial in the sense Landes describes. In imagining the future world emerging from a violent catastrophe, scientific apocalypticists often mimicked premillennialism in particular.

The history of how the scientific apocalyptic developed alongside dispensational premillennialism in the United States reveals that they continually responded to same societal trends. Dispensational premillennialism began making inroads among evangelicals during the same time period that witnessed the birth of the scientific apocalyptic. Both were initially minority viewpoints in a nation that felt optimistic about what the future held. Americans had entered the nineteenth century having dually

⁵⁸ Ibid., 531.

⁵⁹ Richard Landes, “Millenarianism and the Dynamics of Apocalyptic Time” in *Expecting the End: Millennialism in Social and Historical Context*, ed. Kenneth G. C. Newport and Crawford Gibben (Waco, TX: Baylor University Press, 2006), 7. On the secularization of millennial ideas, see Eugen Weber, *Apocalypses: Prophecies, Cults, and Millennial Beliefs Through the Ages*, 1st Harvard University Press pbk. ed. (Cambridge, MA: Harvard University Press, 2000), 230.

embraced the scientific and political ideals of the Enlightenment as well as the emphases on personal salvation and evangelism of the Great Awakening. They were confident in the human capability for progress but also strongly believed that Western nations, especially the United States, were spiritually, culturally, and racially suited to lead the rest of the world's nations. By the end of the nineteenth century, even as Americans increasingly felt as if there was an impassable gap between science and religion, Christian and secular-minded Americans alike shared a growing sense that the world was in a state of decline with destruction perpetually threatening.

Chapter one discusses how Americans began to repudiate the idea of progress and adopt worldviews imported from Great Britain in the realms of religion and science. The sense that human history was not a never-ending story of progress eventually gave way to apocalypticism among scientists and science fiction writers, while premillennialism among conservative evangelicals, which stressed the corruption of the world, became part of fundamentalist efforts to stave off modernism.

Chapter two focuses on specific examples of these new apocalyptic sensibilities between 1859 and 1945. The first examples of scientific apocalypticism came from Great Britain and Europe; Americans were slower to express scientific apocalyptic theories. The scientific apocalyptic gradually grew out of an interpretation of natural selection that *Homo sapiens* could go extinct just like any other species. Initially British and European, and narrow in focus, scientific apocalypticism became simultaneously more American and broader in its considerations. The implications of natural selection combined with societal trends like the influx of Asian immigration into the Western United States and the troubling power of new technologies, resulting in Americans

following the lead of other Westerners in imagining the end of their country, the human species, and eventually the world. Meanwhile, conservative evangelicals grappled with scientific challenges to the authority of the Bible, but not by repudiating science. In the late nineteenth century and the first half of the twentieth century, American conservative Protestants emphasized that science, done properly, only reinforced their literal reading of Revelation.

The third chapter begins in 1945 when the atomic bomb provided a new focus to the American scientific and religious apocalypics. The advent of nuclear power meant the maturation of the American scientific apocalyptic, as both scientists and science fiction writers wrestled with a world in which their country was the only nation to have used these new and powerful weapons that could cause the extinction of humanity. For those who adhered to a fundamentalist reading of the Bible, nuclear weapons merely provided confirmation of particular passages in 2 Peter and Revelation that seemed to describe the end of the world by fire. Though typically on an opposing political side to conservative evangelicals, scientists and fiction writers who grappled with atomic destruction casually employed the language of the biblical book of Revelation and attempted to find meaning amidst such a totalizing threat in ways that echoed premillennialists' efforts. Conservative evangelicals, meanwhile, paid attention to the scientific debate over issues like fallout, incorporating new understandings of the effects of the bomb into their visions of the end.

As chapter four illustrates, the growing recognition of environmental threats to the world had a similar effect as the threat of the bomb had on these scientists, science fiction authors, and premillennialists. Scientists began warning of abuses to the land even before

the nuclear bomb was invented; gradually these concerns about the environment grew more global and alarming in nature. Science fiction authors quickly included the observations of scientists like Rachel Carson and Paul Ehrlich into their visions of how the world might end. So, too, did Bible prophecy experts respond to the modern environmental movement by mulling over how abuse of the planet was predicted in a Biblical vision of the End.

The penultimate chapter describes the decade of the 1980s when the dual threats from nuclear weapons and abuse of the environment became intertwined as scientists argued that humans could radically alter the climate and the atmosphere. Both issues became politicized in this decade as anti-environmental arguments gained ground and convinced prominent figures such as President Ronald Reagan. Scientific apocalypticists, feeling besieged by the Right, became insistent on the necessity of personal and societal transformation to avoid the end of the world. Not all science fiction writers followed suit, with many preferring the same solutions they had been proposing since the 1940s or remaining pessimistic about humanity's ability to change. Although fundamentalist Christians became more involved in politics during the "conservative revolution" of the 1980s, the influence of anti-environmental claims was not immediately evident. Many Bible prophecy books and articles still asserted that nuclear winter and ozone depletion were foretold in biblical books like Revelation.

The final chapter describes how these trends developed in the 1990s. Scientists in popular works increasingly argued that only a worldwide, spiritual transformation could save the earth from numerous threats, often eschewing solutions that only emphasized technological fixes. Meanwhile, science fiction writers continued to emphasize the

potential saving graces of technology even while agreeing with scientists on the essential threats to the continued existence of humanity. As anti-environmental proponents gained prominence, especially in the media, many conservative evangelicals turned away from incorporating new scientific conclusions into their images of the end. Instead, more Bible prophecy authorities emphasized supernatural interpretations of the same passages that had once seemed to verify threats like global warming.

Both scientific apocalypticism and the dominant form of religious apocalypticism developed in the United States during a period of scientific ascendancy—amidst a growing sense that humans wielding science either could create a utopia that would free mankind from the drudgery of existence or would destroy the world completely. Embracing the latter idea, both suggested that mankind might have a “death wish” of sorts; in spite of the evident dangers of doing so, humans engaged in unrepentant construction of weapons of mass destruction and wholesale pollution of the environment. Humanity might get exactly what it deserved whether in the form of a judgment of unworthiness by natural selection or a judgment by God. These pessimistic worldviews embraced the same trends over the course of the twentieth century, until finally, approaching the millennium, scientific apocalypticists began wondering if scientific research was enough to save the world and religious apocalypticists began wondering if modern science was really reflected in the Bible.

Chapter One

The Origins of Modern American Apocalypticism

That the world could end without a supernatural cause did not occur to Westerners until scientists offered a convincing explanation for a naturalistic origin of the world. Creation stories and corresponding stories of the End help societies make sense of their existence; a naturalistic account of the beginning of the world and the origins of humankind would be incomplete without a naturalistic understanding of its ending.¹ Until the late nineteenth century, the dominant assumption in the West for over two thousand years had been that a supernatural force created humanity and would similarly act as the instrument of the world's destruction. Prior to the late nineteenth century, intellectuals who rejected a supernatural model of creation struggled with the project of offering alternative models of the world's beginning, often in order to strengthen atheistic beliefs. Scholars have debated to what degree these alternative models anticipated the theory of evolution.² The lack of a solid account of how the world might have come into being without God was accompanied by the lack of a corresponding secular explanation for how the world would come to an end.

¹ On the idea that societies "need" creation stories, see, for instance, Karl Giberson and Donald A. Yerxa, *Species of Origins: America's Search for a Creation Story* (Lanham, Md.: Rowman & Littlefield, 2002), 1; Frank Kermode, *The Sense of an Ending: Studies in the Theory of Fiction*, new ed. (New York: Oxford University Press, Inc., 2000), 3-4.

² Some scholars have argued that the first evolutionists could be found among the Greeks in the fifth and sixth centuries B.C.E., including Anaximander and Empedocles, but this is a matter of some controversy. See Robert Adler, *Science Firsts: From the Creation of Science to the Science of Creation* (New York: John Riley, 2002), 7-9; David Furley, *The Greek Cosmologists*, vol. 1, *The Formation of the Atomic Theory and Its Critics* (New York: Cambridge University Press, 1987), 94-102, for the argument that the Greeks did propose some form of evolution. See C. Leon Harris, *Evolution, Genesis and Revelations, with Readings from Empedocles to Wilson* (Albany: State University of New York Press, 1981), 31-33 for an opposing view. More recently, in mid-18th century Europe, Enlightenment philosophers like Baron D'Holbach, Pierre Louis Maupertuis, and Denis Diderot looked for a way to explain how life was created without reference to a Creator. See Peter J. Bowler, *Evolution: The History of an Idea* 3d ed. (Berkeley, CA: University of California Press, 2003), 81-84 for a discussion of the theories including evolution that these thinkers proposed for the origins of life.

In 1859 Charles Darwin's theory of natural selection provided the basis for the widespread acceptance of evolution, but Darwin's theory also unintentionally furnished a naturalistic "creation story," bolstering religious skepticism. With an established scientific origins story in hand, Westerners theorized that the world could end (or at least humanity could become extinct) without any assistance from God or possibly even due to human misadventure. Darwin's theory constituted an important intellectual shift for science, as scientists increasingly left theological concerns out of their work completely and argued that science and religion attempt to answer different questions.

While the theory of "natural selection" sparked a debate over the origins of humanity, during the same time period, many British and American Protestants began to reconceptualize millennialism, arguing that no spiritual progress could be made on Earth prior to Christ's return. British and American Protestants started believing that contemporary events and societal trends portended God's imminent judgment of the earth as predicted in the Bible, according to their literal reading of the books of Daniel and Revelation. By the 1870s, divisions within U.S. Protestantism caused conservative, evangelical Protestants to separate from their liberal counterparts, leading the way for premillennialism to become the most influential and visible viewpoint in American Protestant eschatology by the twentieth century. Within these two Western intellectual shifts in science and Protestant Christianity during the late nineteenth century lie the roots of modern scientific and religious apocalypticism.

When scholars write about apocalyptic belief, the natural starting point seems to be determining the "origins" of apocalypticism; scholars have often asserted that these origins are found in ancient mythologies from over three thousand years ago. Such an

introduction suggests that apocalyptic belief is a widespread, natural element of all human societies. For instance, sociologist Max Weber locates the sources of apocalypticism in what he sees as a universal desire to explain a painful existence: “[t]he suffering of the present generation, it was believed, was the consequence of the sins of the ancestors, for which god holds the descendants responsible . . .”³ Weber’s analysis implies that theodical questions are common and instinctive for all humans—and humans, in grasping for answers, come to similar conclusions apart from time, culture, or historical circumstances.

More recently, two of the most prominent scholars of modern American apocalypticism, Paul Boyer and W. Warren Wagar, situate their histories of doomsday ideas in the context of a brief sketch of the history of prophetic belief across cultures and time periods. Neither is clear, however, on the meaning of that context.⁴ Historian Abbas Amanat notes in his introduction to *Imagining the End: Visions of Apocalypse from the Ancient Middle East to Modern America* that similar apocalyptic beliefs can be found in the “salvation” religions that originated in the Middle East.⁵ Amanat demonstrates his assertion through the historical and intellectual relationships among Zoroastrianism, Judaism, Christianity, and Islam.

While the purpose of *Imagining the End* was to take a comparative approach to apocalyptic beliefs, scholars who write about the history of prophetic ideas for a

³ Max Weber, *The Sociology of Religion*, intro. by Talcott Parsons, foreword by Ann Swidler (Boston: Beacon Press, 1993), 139.

⁴ See Paul S. Boyer, *When Time Shall Be No More : Prophecy Belief in Modern American Culture* (Cambridge, Mass.: Harvard University Press, Belknap Press, 1992), 21-45; W. Warren Wagar, *Terminal Visions : The Literature of Last Things* (Bloomington: Indiana University Press, 1982), 33-61.

⁵ Abbas Amanat, “Introduction: Apocalyptic Anxieties and Millennial Hopes in the Salvation Religions of the Middle East” in *Imagining the End: Visions of Apocalypse from the Ancient Middle East to Modern America*, edited by Abbas Amanas and Magnus Bernhardsson (New York: I.B. Tauris Publishers, 2002), 1-19.

particular society during a limited time period are not always as careful to explain why the long history of apocalypticism throughout the world is important to their subjects. Such an approach denies the strength of comparative history while amplifying the dangers of mapping one's own cultural assumptions onto others' beliefs. For example, Boyer, in *When Time Shall Be No More: Prophecy Belief in Modern American Culture*, notes that the apocalyptic is "found in many ancient literatures, including Ugaritic, Akkadian, Babylonian, Egyptian, Canaanite, Greek, Hellenistic, and Roman."⁶ Although Boyer concedes that the origins of the modern apocalyptic are difficult to ascertain, his conviction that American apocalypticism cannot be addressed apart from a more general history of apocalypticism implies that end of the world beliefs, no matter their location and time frame, must be somehow related to each other, even if the relationship is not obvious.

Even when Boyer confines his discussion to the history of Christian apocalypticism, his purpose seems to be proving the worthiness of his contemporary topic. While he asserts that outlining the history of Christian apocalyptic belief was necessary to demonstrate that "apocalypticism has historically served many different and complex functions," Boyer himself admits that he finds contemporary American end of the world beliefs a bit peculiar.⁷ He confesses: "[a]t times in my research, as I shook my head over some particularly bizarre interpretative flight, I doubted whether this material merited all the attention I was giving it. Certainly prophecy belief is pervasive, but is that justification enough?"⁸ For Boyer, the history and intricacy of apocalyptic beliefs confers legitimacy on modern American end of the world beliefs through the reminder

⁶ Boyer, 21.

⁷ Ibid, 55.

⁸ Ibid, x.

that even if they may seem a little wacky, in fact “[p]ost-1945 prophecy writers who discussed—usually in sepulchral tones—America’s prophetic destiny were merely the latest participants in a discourse that had been under way for nearly four centuries.”⁹

Wagar, in his history of the secular apocalypse, similarly notes the existence of apocalypticism in various cultures across time; this observation also offered legitimacy for Wagar’s study but, unlike Boyer, Wagar does not position secular apocalypticism in a long tradition of prophetic belief because he finds the topic too strange. On the contrary, Wagar sees the secular apocalypticism expressed in contemporary fantastical literature as modern-day prophecies. He asserts: “The bulk of eschatological fictions—not just a few fabulations or tales of multiple calamity—can be read as indicators of a growing consciousness within modern Western culture that its end is in view and that a new, higher or radically different civilization and public order will replace it during the next century.”¹⁰ According to Wagar, previous apocalyptic beliefs were responses to real societal threats; the tradition of apocalypticism provides a template for modern anxieties even if, in Wagar’s view, modern society has been secularized.¹¹ Writing in 1982, Wagar describes trends across the world that were troubling and would likely lead to humanity’s destruction in his opinion: “In the early 2080s our descendants may be living with the same chaos of Coca-Cola, fundamentalist Islam, suburban shopping malls, starving East Africans, Eurocommunism, and H-bombs crouching in their silos that we know so well in the early 1980s. But it is not bloody likely.”¹²

⁹ Ibid, 68.

¹⁰ Wagar, 204.

¹¹ Ibid, 65-67.

¹² Ibid, 204.

Another scholar of the secular apocalypse, Chris Lewis, similarly sees truth in the secular future imaginings that he analyzed, noting that “out of these cultural and scientific visions could come a new dominant cultural myth and a new world view. What guiding religious and scientific mythology will replace the myth of progress in this post modern world?”¹³ But, Lewis worries that there might not be enough time to replace the paradigm of progress with a concept that is less destructive: “Or will the rapidly accelerating development of the Earth bring an apocalyptic end to modern industrial civilization?”¹⁴

Boyer’s, Wagar’s, and Lewis’s political sympathies color their judgments of modern apocalypticism; the apocalypticists that Boyer studies are conservative evangelical Christians while Wagar’s and Lewis’s apocalypticists tend to endorse liberal positions on the environment, poverty, and the accumulation of nuclear weapons. They are not alone in this bias.¹⁵ A Christian and historian, Richard Kyle directly announces his partiality when he ends his history of end times thought by criticizing popularizers of twentieth-century premillennialism, like Hal Lindsey, who see contemporary events as lining up with Biblical descriptions of the end. Kyle then asserts that Christians should take seriously environmental and nuclear threats.¹⁶

¹³ Chris H. Lewis, "Science, Progress, and the End of the Modern World," *Soundings: An Interdisciplinary Journal*, 75, nos. 2-3 (Summer/Fall 1992): 328.

¹⁴ *Ibid.*, 328.

¹⁵ Another example of this bias can be found in Martha F. Lee, *Earth First! : Environmental Apocalypse* (Syracuse, N.Y.: Syracuse University Press, 1995). Though her analysis of the movement is excellent, at the end she reveals her hand as so often scholars do in such studies by stating, “[a]s human civilization puts ever-increasing pressure upon the natural environment, and as state structures cease to be the chief source of meaning for much of the world’s population, it is likely that many more environmental millenarian movements will emerge. Even in a technological age, it is the earth that most fundamentally sustains all human life. To envision its demise is to envision the apocalypse” (p. 150). In the end, Lee sees Earth First! as performing a valuable service in bringing to the political forefront environmental issues.

¹⁶ Richard G. Kyle, *The Last Days Are Here Again : A History of the End Times* (Grand Rapids, Mich.: Baker Books, 1998), 196-201.

In addition to judging the value of apocalyptic beliefs, scholars have seen disturbing political elements in apocalypticism. Weber's conviction that beliefs about the End arose as a response to theodicy led to an interpretation of eschatology as revolutionary; he writes that "[o]ne solution [to the problem of theodicy] is to assure a just equalization by pointing, through messianic eschatologies, to a future revolution in this world. In this way the eschatological process becomes a political and social transformation of this world."¹⁷

Some have found it tempting to conclude from Weber's association of theodicy and eschatology that apocalypticism has inherently revolutionary tendencies, for instance, acting as a motivating ideology for an underclass experiencing oppressive conditions. The British historian Norman Cohn endorses such a position in his classic work *The Pursuit of the Millennium*, a study of peasant uprisings in the Middle Ages with millennial overtones. From the perspective of 1957, Cohn thought it was important to note that "the more carefully one compares the outbreaks of militant social chiasm during the later Middle Ages with modern totalitarian movements the more remarkable the similarities appear."¹⁸ In particular, according to Cohn, "[t]he old symbols and the old slogans have indeed disappeared, to be replaced by new ones; but the structure of the basic phantasies seems to have changed scarcely at all."¹⁹ From Cohn's perspective, millennialism has an inherently dangerous component in that a millennial fervor could seize any population, leading them to blindly follow a charismatic leader who assumed the title of prophet.

¹⁷ Weber, 139.

¹⁸ Norman Cohn, *The Pursuit of the Millennium*, 2d ed. (New York: Harper and Brothers, 1961), xiv.

¹⁹ *Ibid*, xiv.

A journalist named Grace Halsell who grew up as a fundamentalist Christian in Texas agrees with Cohn that apocalyptic beliefs can threaten society. In two works about dispensational premillennialists, *Prophecy and Politics: Militant Evangelicals on the Road to Nuclear War* (1986) and *Forcing God's Hand: Why Millions Pray for a Quick Rapture—And Destruction of Planet Earth* (1999), she similarly painted apocalyptic beliefs as potentially dangerous. In both books, Halsell concludes that conservative evangelicals are fatalistic about societal problems and even anxious for the end of the world. She reports in her 1986 work, “I have heard [minister and televangelist Jerry] Falwell preach on a nuclear Armageddon, and I saw his face turn radiant at the thought.”²⁰ In her 1999 book, she puts it even more bluntly, arguing that preachers “declare God does not want us to work for peace but rather *demands* that we wage a nuclear war that destroys planet Earth.”²¹ Halsell does not merely see revolutionary potential in millenarian beliefs but believes that they could be self-fulfilling.

Though most scholarly criticism of apocalyptic beliefs are leveled at religious, not scientific, versions, Michael Barkun, a political scientist, worries that the general atmosphere of apocalypticism—in both of its forms—might lead to disaster. He warns, “[t]he disquieting possibility remains, however, that if both strands of apocalyptic thought should agree on the reading of events, then the potential for one grand self-fulfilling prophecy is greatly increased, and panic may produce the effects once assigned to supernatural agents.”²² However, this is an unusual viewpoint; most scholars

²⁰ Grace Halsell, *Prophecy and Politics: Militant Evangelicals on the Road to Nuclear War* (Westport, CT: Lawrence Hill & Company, 1986), 197.

²¹ Grace Halsell, *Forcing God's Hand: Why Millions Pray for a Quick Rapture—And Destruction of Planet Earth* (Washington, D.C.: Crossroads International Publishing, 1999), 114. Emphasis is hers.

²² Michael Barkun, "Divided Apocalypse: Thinking About the End in Contemporary America," *Soundings: An Interdisciplinary Journal*, 66, 3 (Fall 1983): 278.

analyzing apocalypticism forgive scientists or secularists for doomsday language because they see it as an accurate description of the problems plaguing humanity.

Scholars and journalists have conceptualized apocalyptic beliefs as frightening, revolutionary, or just plain bizarre; scholars have difficulty accepting apocalyptic beliefs on their own terms. At the core of these perceptions are basic assumptions about the superiority of Western philosophy. Francis Fukuyama, a political scientist who was a major influence on the neo-conservative movement, argued in 1992 that the history of the world was directional and evolutionary and was nearing the end of its development: “the end of history” was liberal democracy. Fukuyama, deploring what he saw as the pessimism of the age, suggested that in the future, boredom would be the biggest problem of societies. He did not acknowledge the prospect that society might turn from liberal democracy, which he thought was the ideal form of government for humanity: “A true cyclical history is conceivable only if we posit the possibility that a given civilization can vanish entirely without leaving any imprint on those that follow. . . . Modern natural science, however, is so powerful, both for good and evil, that it is very doubtful whether it can ever be forgotten or “un-invented” under conditions other than the physical annihilation of the human race.”²³

Fukuyama’s arguments echoed those of a historian who wrote for the post-World War II generation. Arthur Schlesinger, Jr., in *The Vital Center: The Politics of Freedom* (1952), wrote that liberal democracy serves as an important bulwark against oppressive extremes of the right and left, or fascism and communism. Both Schlesinger and Fukuyama illustrate the assumption that secular democracies are superior forms of

²³ Francis Fukuyama, *The End of History and the Last Man* (New York: Avon Books, 1998), 88. The book was an expansion of a 1989 essay in the summer issue of *The National Interest*.

government and are inherently progressive. The association of liberal, secular democracy with progress can lead scholars to condemn ideas that are not secular or liberal as fundamentally dangerous or retrogressive, such as the premillennial beliefs of many conservative evangelicals.

The tendency to equate secular liberalism with progress might be responsible for scholars of American apocalypticism studying scientific and religious apocalyptic beliefs separately. Even those scholars who treat the secular and religious apocalyptic within the same study often divide them strictly into their own chapters and offer only the most vague connection.²⁴ Michael Barkun, a political scientist who has written on secular apocalypticism, gives a reason for this strict separation in his article “Divided Apocalypses”: the secular is not clearly derived from the religious.²⁵ Any similarities are a “congruence” in events in his account; when both use the same environmental or nuclear imagery it is a coincidence of usage.²⁶

Lewis in a 1992 article in *Soundings* criticizes the separation of the religious and the secular apocalyptic, but in his own analysis, concentrates on the secular side, arguing that secular apocalypticists draw on the Christian tradition. The problem with separating the two types of apocalypticism, according to Lewis, is that such a separation is based on the erroneous conviction that modern society is “rational and scientific.”²⁷ Lewis is correct to point out the dominance of the idea that modern society represents a sharp

²⁴ For instance, Kyle’s *The Last Days Are Here Again* is an excellent survey of apocalyptic beliefs but provides no interpretive or historical framework to connect the secular and religious. Similarly, Daniel Wojcik, *The End of the World As We Know It: Faith, Fatalism, and Apocalypse in America* (New York: New York University Press, 1997) surveys everything from Hal Lindsey to UFO beliefs under the canopy of “folklore” and “folk beliefs” but there is no clear historical theory underpinning his discussions, with each chapter acting as individual essays.

²⁵ Barkun, 264.

²⁶ Ibid, 264-265, 277-278.

²⁷ Chris H. Lewis, "Science, Progress, and the End of the Modern World" *Soundings: An Interdisciplinary Journal*, 75, 2-3 (Summer/Fall 1992): 308.

break with a religious past. At the heart of this strict separation and Barkun's argument that the secular and religious apocalyptic are unrelated is the assumption that secularization has overtaken Western society, leaving hardcore religious advocates on the periphery. Wagar points to the steady decline of the Christian and Jewish faith in the nineteenth and twentieth centuries, making obligatory mention of Friedrich Nietzsche's pronouncement of the "death of God."²⁸ While Boyer questions the notion of a thorough secularization and clearly states that more study needs to be done on the vitality of religion, especially on its fundamentalist and evangelical forms, his very hesitancy and strong need to legitimize his topic undercuts this assertion.²⁹

In addition to a strong faith in secular liberalism, a particular stance on how ideas influence events has encouraged scholars to make political judgments about millenarian movements. Cohn, Boyer, and Halsell see ideas as having causal elements. Cohn certainly does not neglect the real social and political grievances at the heart of the uprisings he describes, but he repeatedly emphasizes that chiliasm inspired particularly turbulent and violent protests: eschatology "explained their suffering, it promised them recompense, it held their anxieties at bay, it gave them an illusion of security—even while it drove them, held together by a common enthusiasm, on a quest which was always vain and often suicidal."³⁰ While Boyer admits, "prophecy belief does not *absolutely* determine most people's worldview," he cautions that "we cannot safely

²⁸ Wagar, 60-61, 90

²⁹ Boyer, 16. Boyer also has a strange passage on the same page saying that "even historians of American religion have slighted the world of modern evangelicalism and charismatic Protestantism (although a growing company of scholars beginning with Timothy Smith, George Marsden, and Ernest Sandeen, and including Robert Mapes Anderson, Timothy Weber, Nathan Hatch, Joel Carpenter, Mark Noll, R. Laurence Moore, and William Trolinger are gradually rectifying this omission)." Again, he undercuts his own insistence that this has been an under-studied field by listing 10 rather well-known scholars who have each produced more than one work on these topics.

³⁰ Cohn, 74.

dismiss it altogether.”³¹ Halsell implies that premillennial ideas could lead to direct action because fundamentalist Christians “are obsessed with their own belief system, their own ideology, their own certitude that they have both the right and the power to help orchestrate not only their own End of Times, but doomsday for the rest of the species.”³²

In discussing premillennial views during the Cold War period, Boyer suggests that such views have a political impact. According to Boyer, “convinced that the Bible foretells the end and secure in the knowledge that believers will be spared, [premillennialists] . . . tend toward passive acquiescence in the nuclear-arms race and Cold War confrontation.”³³ Halsell makes a similar contention, saying that dispensational premillennialists believe “one need not work to eliminate pollution in our cities or starvation in India and Africa. One need not concern oneself with nuclear proliferation. One need not attempt to prevent an Arab-Israeli war. Rather—pray for it to explode and engulf the world, since this is part of the divine scheme.”³⁴

Scholars of apocalypticism feel as if they must rationalize the importance of apocalyptic studies—and this often includes passing judgment on apocalypticists or exaggerating their influence. Perhaps a better approach is to acknowledge the frequency of apocalypticism while avoiding universalizing conclusions. The study of end of the world beliefs then becomes particular to a culture and time period and about the form such beliefs assume and why. Millenarian thought loses its apparent oddity, is not somehow farsighted for secular Americans but irrational for religious Americans, and is

³¹ Boyer, xii.

³² Halsell, *Prophecy and Politics*, 200.

³³ Boyer, 146.

³⁴ Halsell, *Prophecy and Politics*, 39.

not necessarily prone to inspire revolutionary upheaval. Rather, *the* apocalyptic becomes multiple apocalypses, each with their own distinct histories. Twentieth-century American interest in the end of the world becomes another specific example of apocalypticism instead of the endpoint of a long history of such beliefs or a particularly strange example of such beliefs.

Far from beginning an analysis of how modern American apocalypticism developed by alluding to ancient Babylonian beliefs, in order to understand the forces that shaped how Americans saw the End in the twentieth century, such an analysis should start in the late nineteenth century. Contemporary doomsday belief in the United States is indebted to the relationship between scientific and religious end times scenarios that arose in the late nineteenth century. Modern American apocalypticism is better understood within the context of the specific social, political, and intellectual developments that molded this relationship rather than in the light of a cursory overview of various beliefs about the End. Understanding this relationship begins with an assessment of the impact of Charles Darwin's *On the Origin of Species* (1859). Darwin's theory of natural selection led directly to secular theories of how the world might end and prompted conservative evangelicals in the U.S. to rally around a literal interpretation of the Bible that included dispensational premillennialism.

Historian Jacques Barzun's observation that "the *Origin of Species* was greater as an event than as a book" emphasizes the importance that Darwin's work had in its long-term impact as a synthesis of biological and geological studies, far beyond what Darwin and his contemporaries could have ever predicted.³⁵ Darwin had no interest in displacing

³⁵ Jacques Barzun, *Darwin, Marx, Wagner: Critique of a Heritage*, Phoenix ed. (Chicago: The University of Chicago Press, 1981), 30.

God with natural selection or undermining the Bible and was quite sensitive to the theological implications of natural selection.³⁶ The theory of natural selection, insofar as it provided a reasonable explanation as to how life could have evolved, was a plausible alternative to the account of creation in the book of Genesis. For believers in this alternative “creation story,” the removal of God from the origins of life potentially left the future of humanity to an arbitrary and unplanned series of events, similar to that which had resulted in the evolution of human life.

After Darwin published the *Origin of Species*, evolution largely became the accepted explanation in the scientific community for how life had developed, but the social and theological implications of evolutionary theory troubled many scientists in the nineteenth century. The notion that humans had evolved from apes prompted questions about human nature. Such questions could undermine the rule of elites by challenging their birthright or could deny the innate moral sense of humans.³⁷ Sensitive to controversy, Darwin did not directly discuss human evolution until 1871 in *The Descent of Man*.

In addition to hesitation over how evolution might be received by the public, doubts about the motor of evolution that Darwin had proposed, natural selection, also bothered scientists until the 1930s and 1940s. One of the main obstacles to the acceptance of natural selection among scientists was a continued view of evolution as progressive.³⁸ In the decades after Darwin first proposed natural selection, non-

³⁶ Barzun, 27-28; Edward J. Larson, *Evolution: The Remarkable History of a Scientific Theory* (New York: Modern Library Chronicles, 2004), 71.

³⁷ Sharon Kingsland, “Evolution and Debates Over Human Progress from Darwin to Sociobiology,” *Population and Development Review* (1988) 14, Supplement: Population and Resources in Western Intellectual Traditions: 167-168, 173-174.

³⁸ One of the other primary stumbling blocks was a general resistance to the idea that change could be the natural order of things. What Ernst Mayr refers to as “essentialism” and Edward Larson describes as

Darwinian theories of evolution that upheld progress flourished.³⁹ Thomas Kuhn notes in his landmark work *The Structure of Scientific Revolutions* (1962) that it was not religious concerns that made scientists reluctant to accept natural selection:

All the well-known pre-Darwinian evolutionary theories—those of Lamarck, Chambers, Spencer, and the German *Naturphilosophen*—had taken evolution to be a goal-directed process. The ‘idea’ of man and of the contemporary flora and fauna was thought to have been present from the first creation of life, perhaps in the mind of God. That idea of plan had provided the direction and the guiding force to the entire evolutionary process. Each new stage of evolutionary development was a more perfect realization of a plan that had been present from the start. . . . The *Origin of Species* recognized no goal set either by God or nature.⁴⁰

Nevertheless, even Darwin began to waver on pure “selectionism” in later years, leaning toward aspects of Lamarckism, or the idea that when a member of a species acquired a characteristic through use (or disuse), it could be inherited.⁴¹ “Neo-Darwinian” became the label for scientists who attributed evolution to the process of natural selection alone.⁴² Lamarckism, which had been articulated in 1800 by a French natural historian, was consistent with a progressive worldview because it suggested that as organisms adapted to their environment, they became increasingly complex.⁴³

Alongside a continued regard for Lamarckism arose another rival interpretation to natural selection. Orthogenesisists, according to evolutionary biologist Ernst Mayr, attributed evolution “to a built-in tendency or drive toward progress and ever greater

“German idealism” was the belief that each species had its own archetype; evolution invariably led to this ideal form. Mayr traces this idea to Plato, whose idealism, he suggests, dominated Western thinking until the nineteenth century. See Ernst Mayr, *The Growth of Biological Thought* (Cambridge, MA: Harvard University Press, Belknap Press), 45-47; Larson, *Evolution*, 111.

³⁹ Larson, *Evolution*, 125.

⁴⁰ Thomas Kuhn, *The Structure of Scientific Revolutions*, 3d ed. (Chicago, IL: University of Chicago Press, 1996), 171-172.

⁴¹ Peter J. Bowler, *The Eclipse of Darwinism: Anti-Darwinian Evolution Theories in the Decades Around 1900*, 3d ed. (Baltimore: Johns Hopkins University Press, 1983; reprint, Baltimore: Johns Hopkins University Press, 1992), 28.

⁴² Larson, *Evolution*, 107.

⁴³ *Ibid*, 39-41.

perfection.”⁴⁴ Although Darwin rejected the idea of a deity directing evolution toward a particular goal, he did see evolution as progressive, culminating in *Homo sapiens*.⁴⁵ His belief in progress lent credence to the notion that evolution was teleological. Historians Sheridan Gilley and Ann Loades note “Darwin’s bulldog,” the English biologist Thomas Henry Huxley, “had a clearer appreciation than Darwin of the teleology implicit in Darwinism, and was more careful than Darwin to purge his phrasing of the design theology.”⁴⁶

Theistic evolution, the concept that God directed evolution, was a popular way to address this desire to see design in the development of life in the late nineteenth century. Biologist Asa Gray in the United States argued that God could have injected commands into the blueprints for organic development so that evolution would proceed according to God’s will. Natural selection was troubling because it allowed the possibility that human life had originated, not according to design, but according to a series of undirected, albeit rather fortuitous, chain of events.

Theistic evolution was not a satisfying solution to the theological questions that arose from evolution. The Democratic politician and creationist William Jennings Bryan asserted in 1922 that the widespread acceptance of evolution could result in feeling that existence was pointless *even if* evolutionists still retained a belief in God as creator. To Bryan, evolution deprived humanity of a “personal God” by removing the supernatural

⁴⁴ Ernst Mayr, “Prologue: Some Thoughts on the History of the Evolutionary Synthesis” in *The Evolutionary Synthesis: Perspectives on the Unification of Biology*, Ernst Mayr and William B. Provine, eds. (Cambridge, Mass.: Harvard University Press, 1980), 5. See also, Larson, *Evolution*, 126-127.

⁴⁵ Sheridan Gilley and Ann Loades, “Thomas Henry Huxley: The War Between Science and Religion,” *The Journal of Religion* 61, no. 3 (July 1981): 302. <http://www.jstor.org> (accessed 14 February 1006); Kingsland, 174.

⁴⁶ *Ibid*, 302.

and miraculous from everyday life.⁴⁷ Bryan concluded that placing God at such a far remove could lead to agnosticism or atheism.⁴⁸ However, even for evolutionists who avoided such spiritual pitfalls, in Bryan's opinion the lack of a personal God still could lead to a life devoid of meaning. Bryan wrote, "Darwinism offers no reason for existence and presents no philosophy of life; the Bible explains why man is here and gives us a code of morals that fits into every human need."⁴⁹ By eroding the idea that humans were created in God's image, evolution triggered doubts about the practicality of social progress, especially in one individual's life given the age of the earth, and about the presence of a design for humanity since even theistic evolution suggested that God had long stopped intervening in earthly events.⁵⁰ Theistic evolution largely faded among evolutionary theorists by 1900, but it is indicative of the continued desire to see design and progress in evolution.⁵¹

When Bryan referred to "Darwinism," he alluded not to the theory of natural selection but to evolutionary theory as a whole. In fact, it would have been remarkable if Bryan *had* challenged natural selection; while evolutionary theory largely overcame opposition by the 1870s, the theory of natural selection encountered resistance even from many professional scientists until the 1940s. Mayr notes that "[d]uring the first 60 years after its publication in 1859, natural selection was accepted virtually only by naturalists."⁵² In the 1930s and 1940s biologists fashioned the "evolutionary synthesis," an integration of genetics into the theory of natural selection. The evolutionary synthesis

⁴⁷ William Jennings Bryan, *The Menace of Darwinism* (New York: Fleming H. Revell Company, 1922), 41-42.

⁴⁸ *Ibid.*, 45-46.

⁴⁹ *Ibid.*, 63.

⁵⁰ *Ibid.*, 63-64.

⁵¹ Larson, *Evolution*, 126.

⁵² Ernst Mayr, "The Ideological Resistance to Darwin's Theory of Natural Selection," *Proceedings of the American Philosophical Society* 135, no. 2 (June 1991): 124.

was an intellectual development that put neo-Darwinian theory at the core of the biological sciences.⁵³

Even with the enunciation of the evolutionary synthesis that made natural selection the accepted means of evolution, the tendency to see progress in evolution remained. The grandson of Thomas Huxley and a biologist at Oxford University in England, Julian Huxley, wrote *Evolution: The Modern Synthesis*, one of the works that articulated the evolutionary synthesis in the 1940s. Discussing the issue of progress in evolution, Huxley remarked on one troubling implication: “[i]f man were wiped out, it is in the highest degree improbable that the step to conceptual thought would again be taken, even by his nearest kin.”⁵⁴ Huxley shied away from asserting that evolution necessarily leads to the creation of humankind, but, as Huxley made clear, our present evolution ended with the development of sentience, an important advance that we must not take for granted.

Huxley’s warning may have been necessary because after the publication of *Origin of Species*, Western writers began to speculate that another species might displace *Homo sapiens*. An unplanned apocalypse is a natural corollary to human creation by chance. The idea of the world ending due to the whims of nature negated the possibility of a purpose for humanity. It is in this realization—that natural selection meant that humans might not exist in the future—that the origin of a true secular apocalyptic lies.

Scholars do not agree on the origins of secular apocalypticism. Wagar saw the development of what has been called the “secular apocalypse” as dating to 1826 with

⁵³ Ernst Mayr, *Growth of Biological Thought*, 536. Julian Huxley coined the term “evolutionary synthesis” in 1942. See also, Mayr, *Evolutionary Synthesis*, 1.

⁵⁴ Julian Huxley, *Evolution: The Modern Synthesis* (New York: Harper and Brothers Publishers, 1942), 571.

Mary Shelley's novel *The Last Man*, the first of a series of "last man" novels written by romantics in the nineteenth century. These works contained depictions of the end of the world from the perspective of a lone survivor.

Other scholars concentrate on twentieth-century trends as the source of a secular apocalyptic. Political scientist Michael Barkun sees secular apocalypticism emerging from scientists during the 1960s and 1970s due to the environmental movement, the turmoil of the Civil Rights Movement and anti-war movement, and the oil shortages of the seventies. He says scientists became convinced of a pessimistic future: "The scientific world view, which had grown accustomed to increasingly effective future predictions, became the victim of its virtues as extrapolations of present trends pointed toward global calamity."⁵⁵ Spencer Weart, a physicist who writes science history, pinpoints the beginning of speculation regarding the destructive (and hopeful) possibilities of atomic power at the beginning of the twentieth century as the real beginning of a secular apocalyptic in *Nuclear Fear* (1988).⁵⁶

Chris Lewis responded to Barkun's analysis in his 1992 *Soundings* article. He places the origin of secular apocalypticism in the 1930s, seeing it as part of a backlash against science.⁵⁷ He considers this backlash to be a part of a long intellectual tradition in Western society: "What Barkun calls secular apocalypticism, and I call ecological apocalypticism, grew out of the fear of sixteenth and seventeenth century Christian and cultural critics that human domination of nature would cause the decay and death of the natural world. Since the sixteenth century, critics of progress and modernity have drawn

⁵⁵ Barkun, 274.

⁵⁶ Spencer R. Weart, *Nuclear Fear : A History of Images* (Cambridge, Mass.: Harvard University Press, 1988), 18-21.

⁵⁷ Lewis, 322.

from both the Christian apocalyptic tradition and contemporary science in shaping their prophetic warnings about the death of nature.”⁵⁸

Unlike Wagar, Lewis argues that the “last man” stories “are not really secular stories because it is almost impossible to determine whether the end of the world is caused by nature alone or by God’s punishment of humanity through nature for its sin and arrogance.”⁵⁹ But, Wagar was right to pinpoint the Romantic period as the era during which the first known contemplations of a fictional secular apocalypse emerged. Shelley’s work made no mention of God or any deity as causing the end of the world, but in fact she was playing with a theme that other writers had addressed in earlier in the nineteenth century. Contemplations on possible ends of the world during the Romantic period that were secular tended to be more philosophical in their reflections rather than scientific and may properly be termed secular. By the 1870s fictional apocalypses would be connected to current scientific and technological trends.

These early fictional explorations of the secular apocalypse that came in the form of “last man” narratives are useful for distinguishing between a secular apocalyptic and a scientific apocalyptic. After Darwin gave Westerners a feasible naturalistic creation story, fiction and non-fiction writers grounded their descriptions of how the world might end without God in science. Earlier writers exploring a secular apocalypse made no attempt to explain how the world had ended without God, let alone how one man could be left after an apocalypse.

The secular apocalyptic “last man” stories that Wagar believes signal the beginning of a secular apocalyptic sensibility were actually inspired by an earlier entry in

⁵⁸ Ibid, 309.

⁵⁹ Ibid, 316-317.

the nineteenth-century “last man” genre. This work deviated from the Biblical apocalyptic associated with the books of Daniel and Revelation but emphasized a continuing belief in God, sometimes in an explicitly Christian God. A French writer, Jean-Baptiste François Xavier Cousin de Grainville, wrote this earliest known “last man” work. Published posthumously in France in 1805, a pirated translation appeared in England the following year with no authorial credit.⁶⁰ De Grainville posits a last man and woman who parallel the first man and woman, Adam and Eve. His account, though it deviates from the Biblical narrative of Revelation, was firmly positioned within a Christian understanding of the End.⁶¹

There were only two “last man” works of literature in the Romantic era that could properly be termed atheistic—a true rejection of the idea of divine action in bringing about the end of the world or in providing a means of redemption for humanity at the end of time. While “last man” works written from a purely atheistic perspective were rare, they are notable for illustrating how Christian apocalypticism inspired early reflections on a secular apocalypse and how these secular visions of the world differ from later scientific conceptions of the End.

Of the two atheistic works, the most explicit rejection of a supernatural ending for the world was found in Lord Byron’s 1816 poem, “Darkness.” Byron’s poem was notable

⁶⁰ I.F. Clarke, preface to Jean-Baptiste François Xavier Cousin de Grainville, *The Last Man*, trans. by I.F. and M. Clarke (Middletown, CT: Wesleyan University Press, 2002), xi-xiv, xvii. The publisher evidently meant to imply that the anonymous writer of *The Last Man; or, Omeragus and Syderia: A Romance in Futurity* was English; the title page included a quote from Joseph Addison’s *Cato*, a popular English play from the early 18th century, and the translated text published in 1806 left out an extended celebration of Napoleon I (an obvious nod to English nationalism in consideration of the ongoing Napoleonic Wars). But despite the deception, scholars of this literary period argue that de Grainville’s work had little impact on English conceptions of “the last man.”

⁶¹ Thomas Campbell, a Scottish poet, wrote a poem titled “The Last Man” in 1823, preserving Biblical elements in his work as well. See Thomas Campbell, *The Poetical Works of Thomas Campbell* (New York: S. & D. A. Forbes, 1830), lines 8-10; lines 60-69, p. 167.

for a lack of an explanation for the apocalypse as well as a millennium following. As contemporaries of Byron noted, “Darkness” included apocalyptic elements that resonated with prophetic passages from Jeremiah, Isaiah, Ezekiel, and Revelation.⁶² Byron wrote his poem during the summer of 1816, a year that many called “the year without a summer” because of the unusually cold temperatures and dark skies. Not known to Westerners then, an eruption of a volcano in Tambora, Indonesia the prior year caused the seemingly apocalyptic climatic conditions. The idea for Byron’s poem came to him on a particularly dark day that summer when he had to light candles to provide light even at noon.⁶³ The portrait of the last days that Byron painted was harsh and barren: “The world was void, / The populous and the powerful—was a lump, / Seasonless, herbless, treeless, manless, lifeless— / A lump of death—a chaos of hard clay. / The rivers, lakes, and ocean all stood still, / And nothing stirred within their silent depths.”⁶⁴

Morton Paley, a scholar of Romantic literature, suggests that what is important about Byron’s use of Biblical imagery is “what Byron did *not* take from the Bible.”⁶⁵ Byron’s poem, in Paley’s interpretation, raises the hopes of a millennium by playing with Biblical imagery to describe the actual end. For instance, men and women in Byron’s poem had “but one thought—and that was death”⁶⁶ as total darkness fell upon the earth; similarly, Revelation reports that “And in those days shall men seek death,” but according to the biblical account, men “shall not find it.”⁶⁷ Byron’s vision was deeply disturbing to his contemporaries; commentators suggested that he had broached a topic

⁶²Morton D. Paley, *Apocalypse and Millennium in English Romantic Poetry* (Oxford: Clarendon Press, 1999), 201-202.

⁶³ *Ibid.*, 198.

⁶⁴ Lord Byron, *Selected Poetry*, ed. Jerome J. McGann (New York: Oxford University Press, 1997), lines 69-74, p. 73.

⁶⁵ Paley, 202.

⁶⁶ Byron, line 42, p. 73.

⁶⁷ Rev. 9:6 KJV.

that was unthinkable. Byron's idea of humanity living and dying in an empty and meaningless way remained rather unimaginable to the Westerners who later articulated a scientific apocalypse.

Mary Shelley was a close friend of Byron's; her novel *The Last Man* on the same theme tells of a tight-knit group of couples that slowly experience the end of the world due to an inexplicable plague. By the end, only the narrator, Lionel Verney, remains, as "the last man" in the world. Verney occupies his isolation by writing a personal history of his life and of the last days of humanity. He remarks on the futility of writing:

I...will write a book, I cried—for whom to read?—to whom dedicated?
And then with silly flourish (what so capricious and childish as despair?) I
wrote, "DEDICATION / TO THE ILLUSTRIOUS DEAD. / SHADOWS,
ARISE, AND READ YOUR FALL! / BEHOLD THE HISTORY OF
THE / LAST MAN."⁶⁸

While Verney questions the very possibility that his account will be read, Shelley as author formally addressed the issue by transforming the account into a prophecy. The "author's introduction" tells readers that the author discovered Verney's narrative, which takes place in the year 2100, on a trip to Naples in 1818 upon a visit to "Sibyl's Cave," with "Sibyl" a reference to a legendary female prophet in ancient Rome.⁶⁹ While Shelley attempts to redress the problem formally, she does not escape the dilemma that is imbedded in "the last man" genre; in their implicit assumption of a readership, fictional narratives of "the last man" suggest a resistance to an end of the world without design. Documenting the final days of human life on Earth is an attempt to make sense of the event and, as Verney attempts to do, leave an epitaph for humanity.

⁶⁸ Mary Shelley, *The Last Man*, ed. Hugh J. Luke, Jr. (Lincoln, NE: University of Nebraska Press, 1965; reprint, Lincoln, NE: University of Nebraska Press, 1993), 339.

⁶⁹ *Ibid.*, 1-4.

Shelley wrote her novel after the deaths of her husband, Percy Shelley, their friend, Byron, and two of her children. *The Last Man* is an expression of Shelley's despair and loneliness in the aftermath of her losses. But, it also expresses the idea that humanity is alone, without any deity to provide comfort or meaning. Shelley's atheism was particularly empty. The last man's account of the end days as well as his embarking on a desperate search for other survivors illustrates this barren worldview that Shelley shared with Byron. Scientific apocalypticists, writing after Darwin, in many ways mirrored the attempts of Verney to understand his predicament.

These two atheistic "last man" works, while in the minority, laid a foundation for later scientific apocalyptic fiction, at least in terms of themes. One survivor (or a small group of survivors) of an apocalypse roaming the world in search of others is a theme that appears again in twentieth-century end of the world literature. But the despair of Byron and Shelley without a God to guide human history is not found in scientific apocalyptic works. Science helped mitigate the threat of a meaningless existence and purposeless end. Atheism was not necessarily (or even often) a motivation of scientists and science fiction writers writing on the End; some maintained religious beliefs even while envisioning a scientific end of the world. That is the distinction between this earlier secular apocalyptic that Wagar identifies and the scientific apocalyptic that emerged after 1859 in both fiction and non-fiction.

At the same time Byron and Shelley visualized ends of the world without God, British Christians were devising a particularly detailed system of premillennialism. At the beginning of the nineteenth century, postmillennialists and premillennialists were not too different from each other. Whether Christ was to return before or after the millennium,

both felt urgency to their beliefs: either the millennium or Christ's return was at hand. By the end of the century, premillennialism had taken on a very distinct form.

In the late 1820s, John Nelson Darby, a former priest in the Church of Ireland, began to express new views about a premillennial apocalypse that placed prophetic events in the future instead of locating them in the past.⁷⁰ Leading a separatist group known as the Plymouth Brethren, Darby came up with the idea of a secret Rapture, the idea that Christ would return for believers separately prior to his Second Coming at which time he would usher in the millennium. He also preached a system of prophetic belief that divided human history into "dispensations," which he determined by the way in which God proffered salvation to humankind in different eras. Most importantly, there was a dispensation in which the law of Moses applied to the Jews and the current dispensation, the age of the Church, where Christ's crucifixion was the determinant of salvation. The age of the Church would end after the Rapture; the unbelievers left on Earth would then undergo a seven-year "tribulation" in which the Antichrist would rise to power and fall at the hands of Christ upon his Second Coming.⁷¹ Called dispensational premillennialism, Darby's doctrine began the articulation of a rather precise pattern of prophetic events that became associated with conservative Protestant eschatology by the end of the century in the United States.

In the United States, dispensational premillennialism was not associated with one particular denomination. Ernest R. Sandeen's *The Roots of Fundamentalism: British and American Millenarianism, 1800-1930* (1970) describes the introduction of Darby's

⁷⁰ Ernest R. Sandeen, *The Roots of Fundamentalism: British and American Millenarianism, 1800-1930* (Grand Rapids, MI: Baker Book House, 1978), 37.

⁷¹ George M. Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth Century Evangelicalism, 1870-1925*, 2d ed. (New York: Oxford University Press, 1980), 48-55, Boyer 86-90.

system to America. The American historian notes, “In spite of the strong sectarian emphasis in American religion and the churchly character of the British, the two nations were not developing in isolation. American and British clergy were continually and vitally concerned with the state of their sister churches, and each felt the impact of the other’s ecclesiastical history.”⁷² So, perhaps it is not surprising that in Sandeen’s estimation, “[b]y the middle of the nineteenth century British millenarian theology had been imported into the United States and had become the most popular form of American millenarianism.”⁷³ The proponents of dispensational premillennialism in the United States did not leave their denominations as Darby advised, but neither were they only confined to one single denomination. Preachers of Darby’s doctrine could be found in Episcopal, Presbyterian, and Baptist churches.⁷⁴

Historian Timothy P. Weber in his *Living in the Shadow of the Second Coming: American Premillennialism, 1875-1925* (1979) discusses the acceptance of Darby’s brand of premillennialism. Dispensationalism was not popular among the faculty of American Protestant seminaries but did find prominent advocates among celebrated ministers. Weber cites a survey made in 1919 of 236 theological professors from 28 seminaries in 8 denominations that only discovered seven premillennialists. Nevertheless, Weber emphasizes that premillennialism still had a strong following: “Premillennialists may not have had a majority of seminary professors on their side, but they could point to a number of respected and prominent evangelicals in their movement who were known

⁷² Sandeen, 57.

⁷³ Ibid, 42.

⁷⁴ Ibid, xix.

neither for their eccentricities nor for their tendencies to follow after foolishness.”⁷⁵ The doctrine did not spread from seminary professor to student but through the teachings of leaders of missions and prominent pastors from their pulpits.⁷⁶ Weber concludes that after Dwight Lyman Moody, a prominent Chicago preacher, promoted Darby’s system, “nearly every major evangelist . . . adopted his eschatology.”⁷⁷

A growing rift within U.S. Protestantism because of German criticism and historicism aided the growing acceptance of premillennial dispensationalism. These trends cast doubt on the authenticity of certain parts of the Bible for its proponents. Liberal Protestants distanced themselves from the more mystical aspects of postmillennialism, which suggested an ongoing struggle between God and Satan in which good would ultimately triumph. When read scientifically, Biblical dilemmas appeared, for instance, whether Jesus was supposed to return as quickly as his disciples seemed to expect. Liberals began to view the Bible symbolically, whereas fundamentalists subjected the Bible to an ever more rigorous and literal reading.⁷⁸

By 1868 evangelical minister John Cumming could ask, “[a]re not the coincidences between the words of the prophet and the events of the age at least striking and suggestive?”⁷⁹ By citing news articles, primarily American in origin,⁸⁰ that reported recent earthquakes and volcanic eruptions over the world, Cumming’s eschatological work shows that even conservative Protestants felt the need to bolster their Biblical

⁷⁵ Timothy P. Weber, *Living in the Shadow of the Second Coming: American Premillennialism, 1875-1925* (New York: Oxford University Press, 1979), 32.

⁷⁶ *Ibid*, 33.

⁷⁷ *Ibid*, 32-33.

⁷⁸ Marsden, 54.

⁷⁹ John Cumming, *The Seventh Vial; or, The Time of Trouble Begun* (New York: G. W. Carleton and Company, Publishers, 1871), xiii.

⁸⁰ *Ibid*, 160-172.

interpretations with scientific observations by the late nineteenth century; one such article referenced in Cumming's work wondered,

[w]hat is to be the end of that earthquake shock and subterranean rumblings of which accounts are reaching us from all parts of America and Europe? If they do not show that the world is coming to an end, they certainly show that it is being shaken by some force possessed of a power sufficiently strong to shatter its solid structure in a way altogether beyond human calculation.⁸¹

In the 1870s as evolutionary theory promoted debates among scientists over meaning and purpose in life, Darby's premillennial eschatology, which encouraged a systematic interpretation of the Bible, provided conservative evangelicals in the United States explanations to the same questions that scientists were asking themselves in the wake of Darwin's *Origin of Species*. The roots of modern scientific and religious American apocalypticism are in this period of scientific revolution and Protestant Christian realignment.

⁸¹ *The New York Times*, November 1868. Quoted in Cumming, 166-167.

Chapter Two

Science and the End of the World, 1859-1945

The religious conception of the end of the world that predominated in the West until the late nineteenth century was anthropocentric. Whether the solar system or the universe continued to exist after the Second Coming were not matters that concerned Christians; the story of humanity ended at the point of Christ's return. The earliest examples of writers thinking about the end of the world, or at least the end of the world as we know it, from a scientific perspective were also anthropocentric, emphasizing the end of civilization, the end of races, or the end of humanity. In the late 1800s and early 1900s, advancements in cosmology led scientists to theorize about the age, creation, and probable fates of the earth, sun, and universe. As the scientific apocalyptic matured, science writers distinguished between the end of the world as in the end of the human race and the end of the world as in the destruction of the earth. The incidence of one did not necessarily mean the occurrence of the other, and both might happen at the same time. While scientists gradually began to reflect on the many potential ends of the world, religious apocalypticists in the United States increasingly incorporated science into their visions of the end in the late nineteenth and early twentieth centuries leading up to 1945.

The gradual expansion of scientific apocalypticism provided definition to the concept of apocalypse by broadening apocalyptic anxiety to include the fate of the entire world, thus emphasizing a "human community." Not even Darwinism accomplished that; too easily was the struggle of an individual species mapped onto a supposed struggle among races. That all of humanity might be wiped out through a natural occurrence or because of human malfeasance was an intellectual watershed in recognizing the

connectedness of all humans. Religious apocalypticism did not emphasize the universal nature of the end in quite the same way; the practitioners of Christianity saw themselves as a special group destined to be saved from destruction, and it was not until the 1990s that American Christian apocalyptic fiction dealt with the fate of Christians outside of the West at the End.

Novelists were the first to consider the implications of Darwin's theory of natural selection on human history, writing stories of racial or species displacement. The scientific apocalyptic as articulated by these writers was relatively narrow: novelists told of the discovery of "lost races" that threatened the existence of *Homo sapiens*, expressed fear of the "yellow peril," and relayed a sense that Western civilization was doomed. During the late 1800s and early 1900s prior to World War II, scientific apocalyptic works of non-fiction were not as common as similar works of fiction. Morton Paley, a literary scholar, notes that after Romantic era poets turned their attention away from "the last man" theme, fictional explorations of a naturalistic end of the world were "relegated to utopian and dystopian prose narratives, and then to the science fiction."¹ In these early forms of speculative literature, the first examples of scientific apocalypticism are found.

Many of these early instances of scientific apocalyptic fiction came from British writers; the majority of these writers expressed the conviction that the British Empire represented the apex of civilization even as they fretted over humanity's future. As the United States became more powerful, militarily and economically, the amount of scientific apocalypticism issuing from American writers also grew. A relationship between apocalyptic beliefs and hegemonic world power is primarily evident in relation

¹ Morton D. Paley, *Apocalypse and Millennium in English Romantic Poetry* (Oxford: Clarendon Press, 1999), 289.

to scientific apocalypticism; Americans were writing an abundance of premillennial apocalyptic fiction and non-fiction by the late nineteenth century, and it would be hard to argue that any other Western nation, including England, produced more. The early scientific apocalyptic fears about technology, racial displacement, and natural disasters were anxieties common to most Western countries but may have seemed more relevant to Britons as they worried about maintaining their country's ascendancy.² Thomas Disch, a science fiction writer who writes on the history of the genre, may be a bit bombastic in *The Dreams Our Stuff Is Made Of: How Science Fiction Conquered the World* (1998) when he addresses the early British dominance of science fiction, contending that "Americans were too busy building the future to bother imagining it."³ Nevertheless, the increasing anxiety over technology that appeared in the late nineteenth century was sometimes aimed at Americans.

The nineteenth century was a century of inventions that changed how ordinary people lived: the telegraph, the steam engine, the telephone, the light bulb, and the automobile. It was an age when Westerners saw in science the potential to answer all of life's major questions and believed that technology would create a better world.⁴ Westerners, including Americans, met the inventions of the industrial age with optimism,

² An example of how British anxiety over national power could translate into apocalypse is Richard Jeffries's *After London* (1885). In a letter to a friend the same year his book appeared, Jeffries said that he believed that civilization was destined to be destroyed. See John Fowles, introduction to *After London*, by Richard Jeffries (London: Cassell and Company Ltd, 1885; reprint, New York: Oxford University Press, 1980), viii. *After London* describes the almost total destruction of the British Isles because of some sort of vague cosmological disaster, which is heavily implied to be a just judgment because of the corruption of English civilization.

³ Thomas Disch, *The Dreams Our Stuff Is Made Of: How Science Fiction Conquered the World* (New York: The Free Press, 1998), 69.

⁴ Henry H. Bauer, *Scientific Literacy and the Myth of the Scientific Method* (Urbana, IL: University of Illinois Press, 1992), 34; John C. Burnham, *How Superstition Won and Science Lost: Popularizing Science and Health in the United States* (New Brunswick, NJ: Rutgers University Press, 1987), 23; Christopher P. Toumey, "Modern Creationism and Scientific Authority," *Social Studies of Science* 21, No. 4 (Nov. 1991): 688.

but by the late nineteenth century, some writers began to express apprehension that such technological advances might prove to be perilous. These writers retained their faith in science, however, because as historian James Gilbert explains, science had the best “chance, as many Americans believed, for governing the racing engine of technology and braking the excessive speed of industrial change.”⁵ Though the writers questioning the link between technology and progress tended to be British or European, some Americans also articulated unease over technological developments. That American inventors and entrepreneurs were responsible for introducing many of these technological changes seemed to indicate that Americans might also be culpable for any disasters.

French writer Jules Verne, father of the “scientific romance” (or science fiction in contemporary language), alluded to such worries in at least two of his novels.⁶ Verne illustrates how Americans were perceived to be particularly adept, albeit reckless, at mechanical invention in *Around the World in 80 Days* (1873). As the main characters attempt to traverse the globe in a short period of time, they find various obstacles in their way. For instance, when a broken bridge threatens to slow their progress, an engineer proposes to cross it by going really fast: “[h]e told stories about engineers leaping their trains over rivers without bridges, by putting on full steam.” One character, Passepartout, however, “thought the experiment proposed a little too American.”⁷ Later in the novel, as the main characters are on a steamer from Singapore to Hong Kong, Passepartout, upon inspecting the engine, declares, ““The valves are not sufficiently charged!’. . .

⁵ James Gilbert, *Redeeming Culture: American Religion in an Age of Science* (Chicago: The University of Chicago Press, 1997), 6.

⁶ Disch calls Verne an “American manqué” because Verne set slightly more than a third of his novels in the United States, depicting these future American societies as “nightmarish, capitalist dystopias.” This fact, however, seems to add further support to the idea that Americans were a least one source of anxiety to the nationals of other Western nations. See Disch, 59.

⁷ Jules Verne, *Around the World in 80 Days* (New York: Airmont Publishing Company, 1963), 149.

‘We are not going. Oh, these English! If this was an American craft, we should blow up, perhaps, but we should at all events go faster!’”⁸ Similarly, in Verne’s 1863 novel, *Five Weeks in a Balloon*, one of the primary characters suggests that American mechanical genius could be humanity’s undoing. While passing over the United States in a hot air balloon, he muses that “[b]y dint of inventing machinery, men will end in being eaten up by it! I have always fancied that the end of the earth will be when some enormous boiler, heated to three thousand millions of atmospheric pressure, shall explode and blow up our Globe!” And, as one of his companions adds, the Americans “are great boiler-makers!”⁹

In contrast to the snarky comments of Verne’s characters, a dime novel published in the United States called *The Steam Man of the Prairies* in 1868 illustrates the positive feelings Americans had toward industrialization. Edward Ellis’s short novel tells the story of a boy who builds a mechanical man powered by a steam engine to which he attaches a wagon and uses to tour the West, hunting buffalo and scaring Native Americans. More boys’ adventure novel than science fiction, Ellis’s book depicts the steam man as being a triumph of the inventiveness of one boy from St. Louis. The narrator describes the steam man without a hint of trepidation:

It worked splendidly. The black smoke puffed rapidly from the top of the hat, and the machinery worked so smoothly that there was scarcely a click heard. The huge spiked feet came lightly to the ground, and were lifted but a short distance from it, and their long sweep and rapid movement showed unmistakably that the steam man was going at a pace which might well defy anything that had yet swept the prairies.¹⁰

⁸ Verne, 151.

⁹ Jules Verne, *Five Weeks in A Balloon; Or Journeys And Discoveries In Africa By Three Englishmen*, trans. William Lackland (New York: Hurst, 1869; reprint, Whitefish, MT: Kessinger Publishing, 2004), 123.

¹⁰ Edward Ellis, *The Huge Hunter; or The Steam Man of the Prairies* (London: Echo Library, 2007), 35.

According to historian Ronald Takaki, the technological prowess of the West proved, in the minds of many Westerners, that less technological societies, such as the American Indians in the United States, were inferior.¹¹ But just as fears over the destructive potential of technology accompanied technological advancement, so did worries over the future of Western civilization accompany brash imperialism and Social Darwinism. Social Darwinism rested on the premise that racial differences were organic and related to the process of evolution. This concept that human races competed for survival underlay the conviction that Westerners (especially Anglo-Saxons), with their imperial conquests and industrial supremacy, were the superior, or the fittest, race.

Racism, imperialism, and Darwinism combined to create an apocalyptic form that did not strictly describe “the end of the world.”¹² Darwinism did not merely explain the economic and military power of the West; those who expressed doubts about Western primacy also found evidence in one interpretation of natural selection that another race might replace Anglo-Saxons. To Americans who identified themselves as Anglo-Saxons, the threat of replacement felt no less apocalyptic simply because it did not involve the destruction of all of humanity, as evidenced by the language employed by “yellow peril” authors. The apocalyptic dimension contained in Darwin’s theory of natural selection could not only suggest that one race could be supplanted by another race, but also that

¹¹ Ronald Takaki, *Iron Cages: Race and Culture in Nineteenth Century America* (New York: Random House, 1979).

¹² I use the term “Darwinism” in a modern sense to refer specifically to the theory of evolution as driven by natural selection. When I use the term evolution, it is without regard to any particular theory, e.g. natural selection, deistic evolution, or Lamarckism. In fact, there has been and continues to be a lot of ambiguity in the usage of the terms Darwinism and evolution. Darwin himself hardly used the term evolution, and it was Herbert Spencer who adopted the term to describe the process of species development. Twentieth-century scientists often used “evolution” to refer to what they believed was its only acceptable form—that is, evolution by natural selection. Darwinism itself has been used to stand for evolution generally, regardless of the existence of other evolutionary theories. See Peter J. Bowler, “The Changing Meaning of Evolution,” *Journal of the History of Ideas* 36, no.1 (Jan.-Mar. 1975): 95-114, <http://www.jstor.org> (accessed: 15 May 2009); Ernst Mayr, *One Long Argument: Charles Darwin and the Genesis of Modern Evolutionary Thought* (Cambridge, MA: Harvard University Press, 1991), 91-107.

Homo sapiens was doomed to replacement by another species of sentient beings. In the late nineteenth century, the murky terminology of race intertwined with the scientific terminology of species to show how some saw in the theory of natural selection the potential for apocalypse.

An Englishman first considered this possibility in 1871. Edward Bulwer-Lytton published *The Coming Race* that year based on the idea of “racial displacement” that he believed was contained in Darwin’s theory.¹³ *The Coming Race*, though written by an Englishman, had an American narrator who describes the United States as “that glorious American Republic, in which Europe enviously seeks its model and tremblingly foresees its doom.”¹⁴ *The Coming Race* simultaneously suggested that civilization’s future lay in the United States and that Western civilization is neither as strong nor as enduring as the narrator seems to believe. The United States epitomized the narrator’s faith in Western civilization; he speaks of the “magnificent future that smiled upon mankind—when the flag of freedom should float over an entire continent, and two hundred millions of intelligent citizens, accustomed from infancy to the daily use of revolvers, should supply to a cowering universe the doctrine of the Patriot Monroe.”¹⁵

The narrator’s faith, however, is shaken upon his discovery of a heretofore-unknown society of humans who have evolved very different abilities and physical abilities (due to their mastery of a power akin to electricity called “Vril”). Initially his discovery inspires a fantasy in which the narrator becomes absolute ruler of the “Vril-ya”

¹³ David Seed, introduction to *The Coming Race* by Edward Bulwer-Lytton (Middletown, CT: Wesleyan University Press, 2005), xxiii.

¹⁴ Bulwer-Lytton, 25.

¹⁵ Bulwer-Lytton, 25. “The doctrine of the Patriot Monroe” refers to the Monroe Doctrine. Articulated by President James Monroe in 1823, it expressed the sentiment that the Western hemisphere was off-limits to European imperialism. It has been interpreted since then as a declaration of the United States’s own imperialist ambitions for the hemisphere.

(his name for the subterranean peoples he discovered), and he attempts to bring the “blessings” of American institutions to the people of the underworld.¹⁶ Despite the narrator’s origins from what he felt was the most advanced civilization on Earth, he becomes convinced that the Vril-ya are superior in power and would eventually climb to the surface to “destroy and replace our existent varieties of man.”¹⁷ Though he escapes from the Vril-ya and returns to the surface, the book ends ominously, suggesting that it is only a matter of time before the Vril-ya ascend to the surface and conquer the world.

Perhaps tellingly, the narrator does not refer to the Vril-ya as another species, but as another race. The narrator’s encounter with this powerful “race” of human beings suggested the apocalyptic possibilities of Darwin’s theory. Westerners, in spite of their conviction of their own superiority, could be displaced as indifferently as they had dislodged others in ascending the evolutionary ladder.

While Bulwer-Lytton demonstrated the anxieties attendant with Darwin’s theory of natural selection, other novelists and writers with similar anxieties did not resort to imagining a fictional race of beings conquering Western society. As immigration from China increased, some white Americans became persuaded that Western civilization was under siege from Asia. Americans were not alone in their racist alarm; Europeans, from their experience colonizing China and India and contending with Japan’s growing imperialist ambitions by the late nineteenth century, also believed that Asia threatened Western civilization.¹⁸

¹⁶ Bulwer-Lytton, 124-125.

¹⁷ Bulwer-Lytton, 134.

¹⁸ See Matthew Phipps Shiel, *The Yellow Danger* (London: Grant Richards, 1898) for an example of English fears over “the yellow peril.”

The so-called “yellow peril” of the Chinese (and later, the Japanese) had apocalyptic dimensions, and its proponents explicitly used evolutionary language to describe it. American author Jack London wrote in a 1904 essay that Anglo-Saxons had essential characteristics that other races could never hope to attain: “soul stuff . . . is the product of an evolution, which goes back to the raw beginnings of the race. Our soul stuff is not a coin to be pocketed by the first chance comer. The Japanese cannot pocket it any more than he can thrill to short Saxon words or we can thrill to Chinese hieroglyphics.”¹⁹ Even if Anglo-Saxons had special “soul stuff,” the Chinese and Japanese could still find another evolutionary advantage and conquer the world through their overwhelming numbers.

Pierton W. Dooner, an Arizona newspaper editor, wrote *The Last Days of the Republic* in 1880, a year before Chinese immigration was halted, in order to demonstrate how Asia threatened to overwhelm United States. Dooner is upfront about his sense of Anglo-Saxon supremacy. The eventual war that breaks out between the Chinese and the Americans has to be apocalyptic because, in Dooner’s conception, “[the Americans were] a people unlike the Asiatics in everything; a people who, having never felt the arm of despotism, would submit to nothing in the way of oppression or political injustice for any considerable length of time.”²⁰ The Americans, on the other hand, learn quickly that though they had considered the Chinese as beneath them, the Chinese are excellent soldiers, “executing all the evolutions of a difficult military drill and the manual of arms

¹⁹ Jack London, “The Yellow Peril” in *Revolution and Other Essays* (New York: The Macmillan Company, 1910), 284.

²⁰ Pierton W. Dooner, *The Last Days of the Republic* (San Francisco: Alta California Publishing House, 1880; reprint, New York: Arno Press, 1978), 158.

with an ease and regularity unsurpassed by even a body of veteran soldiers.”²¹ Dooner expresses his dismay at the situation of American politics in 1880, suggesting that by allowing Chinese immigration and valuing commercial interests above all else, the American government allowed a “fifth column” inside its borders, unwittingly aiding the destruction of the U.S.²² In the end, the Chinese replace Anglo-Saxons as the dominant power on Earth. Dooner says this of the defeat of the U.S.: “as she sank, engulfed, she carried with her the prestige of a race; for in America the representatives of the one race of man, which in its relation to the family of men, had borne upon its crest the emblem of sovereign power since the dawn of history, saw now the ancestral diadem plucked from its proud repose, to shed its luster upon an alien crown.”²³

Americans tended to view the “yellow peril” with apocalyptic-level anxiety—it meant no less than the end of modern civilization. However, in regard to technological growth, Americans on the whole were optimistic until World War II. One notable exception was American satirist and novelist Mark Twain, who expressed his doubts about modern industrial life in *A Connecticut Yankee in King Arthur’s Court* (1889). Twain’s novel, written after the American Civil War (1861-1865), the first war in which modern inventions, like the telegraph, trains, steamboats, and the Gatling gun, were employed, exemplifies the fear that technology could be turned to destructive purposes, especially if society could not keep up with the fast pace of change.

Hank Morgan, the “Connecticut Yankee,” is the champion of modern industrial America. He sees himself cut from the same cloth as those whom he terms the “creators of this world—after God—Gutenberg, Watt, Arkwright, Whitney, Morse, Stephenson,

²¹ Dooner, 179.

²² Dooner, 184.

²³ Dooner, 257-258.

Bell.”²⁴ His first-person tale of the events that transpire upon his mysterious transportation from Connecticut to sixth-century England reveals his unquestioning acceptance of nineteenth-century American capitalism and technology. Morgan, who had worked in a munitions factory where he “learned to make everything: guns, revolvers, cannon, boilers, engines, all sorts of labor-saving machinery,”²⁵ introduces that same technology to medieval England, seeing his magical teleportation as an opportunity to form the ultimate modern society under his leadership.

Morgan is proud of the new society he creates in old England: “[s]lavery was dead and gone; all men were equal before the law; taxation had been equalized. The telegraph, the telephone, the phonograph, the typewriter, the sewing machine and all the thousand willing and handy servants of steam and electricity were working their way into favor.”²⁶ But, when Morgan attempts to undermine the social structure of medieval England, attacking the clergy (for its superstition) as well as the aristocracy and the monarchy (for their undeserved privilege), the people he saw as no more than savages resist him. At the end of the novel, he barricades himself in his old headquarters at Camelot with a loyal follower and powerful guns. He says, “[w]e shan’t have to leave our fortress, now, when we want to blow up our civilization.”²⁷ And, in fact, Morgan does not merely destroy his factories and defend himself against the angry knights; he extinguishes them. His description of the battle is apocalyptic in its dimensions: “[t]he thirteen gatlings began to vomit death into the fated ten thousand. . . . Within ten short

²⁴ Mark Twain, *A Connecticut Yankee in King Arthur’s Court*, 1st Tor ed. (New York: Tom Doherty Associates, Inc., 1991), 235.

²⁵ Twain, 5.

²⁶ Twain, 291.

²⁷ Twain, 309.

minutes after we had opened fire, armed resistance was totally annihilated. . . . Twenty-five thousand men lay dead around us.”²⁸

Though Twain appeared to subscribe to Darwinism, unlike many of his contemporaries in the United States, he had little faith that evolution necessarily meant human progress. Hank Morgan laments at one point: “[a]ll that is original in us, and therefore fairly creditable or discreditable to us, can be covered up and hidden by the point of a cambric needle, all the rest being atoms contributed by, and inherited from, a procession of ancestors that stretches back a billion years to the Adam-clam or grasshopper or monkey from whom our race has been so tediously and ostentatiously and unprofitably developed.”²⁹ According to Twain’s novel, capitalism and technology do not make better humans, and indeed, could prove to be the undoing of civilization. *Connecticut Yankee* was an early American example of the types of fears—human unimportance in the face of long evolutionary history and the potential for technological disasters—that would come to characterize much scientific apocalypticism after World War II.

An 1890 book by the American Populist Ignatius Donnelly inspired Jean Pfaelzer, who has analyzed literature of the late nineteenth century in *The Utopian Novel in America, 1886-1896: The Politics of Form* (1984), to argue that some American writers thought that the apparent end of the world could actually bring about an utopia, mirroring the judgment and destruction of the world followed by a millennium in premillennialism.³⁰ These writers were among the minority of Americans who did not

²⁸ Twain, 326.

²⁹ Twain, 109-110.

³⁰ Jean Pfaelzer, *The Utopian Novel in America, 1886-1896: The Politics of Form* (Pittsburgh, PA: University of Pittsburgh Press, 1984), 112-114.

see unending progress in America's future, as discussed in Frederic Cople Jaher's *Doubters and Dissenters: Cataclysmic Thought in America, 1885-1918* (1964). Jaher describes how immigration, urbanization, and the rise of corporations and factories seemed to be undermining the American way of life in the last decades of the nineteenth century. As Jaher notes, "To many who thrived on memories of a rural, agricultural, native-born, and small-propertied community, these elements embodied the threat of modern times—they were the manifestations of the cataclysmic trend of industrial capitalism."³¹

Donnelly's 1890 book *Caesar's Column* depicted an American society so riddled with corruption, along the lines Jaher describes, that it must be destroyed.³² The book references the "yellow peril" and has also been considered anti-Semitic as Jews make up a large part of the ruling oligarchy that has so little regard for the underclass.³³ But, racial displacement is only a minor part of the novel. The utter destruction of civilization to root out the corruption of the ruling class is the main action of the novel. God has a firm place in this novel even as the characters decide to bring about an apocalypse, but God's plan for the world limits their actions. The narrator believes that "while God permits man to wreck himself, he denies him the power to destroy the world."³⁴ Gabriel, the narrator, believes in evolution *and* God, asserting that man's evolution from "brute form, then advanced to human and savage life, yet a robber and murderer; then reached civility and culture and philanthropy" proves that God was at work in the development of

³¹ Frederic Cople Jaher, *Doubters and Dissenters: Cataclysmic Thought in America, 1885-1918* (New York: Collier-Macmillan Limited, The Free Press of Glencoe, 1964), 3.

³² Ignatius Donnelly, *Caesar's Column*, ed. Walter B. Rideout (Cambridge, MA: Harvard University Press, Belknap Press, 1960), 34, 172.

³³ Donnelly, 38, 97. See Jaher, 133-140 for a discussion of anti-Semitism in Donnelly's novel.

³⁴ Donnelly, 235.

humanity.³⁵ Indeed Gabriel finds hope in evolution, saying, “even though civilization should commit suicide, the earth would still remain—and with it some remnant of mankind; and out of the uniformity of universal misery a race might again arise worthy of the splendid heritage God has bestowed upon us.”³⁶

The revolution that results from the masses’ discontent with the Oligarchy has apocalyptic dimensions—a war with airships that drop bombs and rids the earth of three-fourths of its population;³⁷ so destructive is the war that the narrator says, “[i]t was the very efflorescence of the art of war—the culmination of the evolution of destruction—the perfect flower of ten thousand years of battle and blood.”³⁸ Maximilian tells his comrades that it was “God’s way of wiping off the blackboard.”³⁹ Though not strictly a work of scientific apocalypticism because of its concentration on socialism, Donnelly’s work is remarkable in combining fears over technology (in the depiction of airships helping conduct the war) and worries about racial displacement. *Caesar’s Column* is also notable for presenting the idea that humans could bring about an apocalypse to allow humans to start over, much like the flood did in the Biblical book of Genesis. The theme of humans purposefully causing that amount of destruction in order to start over recurs during the twentieth century.

The initial works that can be considered part of the scientific apocalyptic tradition emphasized racial displacement and limited technological destruction. By the end of the nineteenth century, these concerns gave way to considerations of how the world might end from a natural disaster, without any aid from God. The theory of thermodynamics,

³⁵ Donnelly, 188.

³⁶ Donnelly, 235.

³⁷ Donnelly, 310.

³⁸ Donnelly, 251.

³⁹ Donnelly, 292.

which scientists articulated in the mid-nineteenth century, included the idea of entropy, or the concept that the energy of the universe was slowly running out. The world might exist for a long time, ending only when the sun failed to provide the necessary heat for life. For instance, the founder of the British scientific romance, H.G. Wells, painted a picture in an 1893 essay of “the last men” living deep underground as Earth grows colder and colder.⁴⁰ Similarly, Wells’s *The Time Machine* in 1895 described a chilly end for the world. The time traveler of the novel goes thousands of millions of years into the future where he discovers the sun has become large and red, and the earth’s rotation has ended.⁴¹ He travels forward thirty million more years to find the earth cold and dark; the sun has died. The silence is horrifying: “[a]ll the sounds of man, the bleating of sheep, the cries of birds, the hum of insects, the stir that makes the background of our lives—all that was over.”⁴²

In 1894, Camille Flammarion, a French astronomer, presented a similar fate for Earth in *Omega: The Last Days of the World*, but unlike Wells, was unable to present such a bleak future without reservation. He portrays the End as occurring ten million years in the future through the disappearance of water and the advance of cold until only two survivors remain. In a supernatural ending, the two last humans, Omegar and Eva, are magically transported to Jupiter (where other humans before them had migrated) to live out their lives. In his epilogue, Flammarion discusses the end of the solar system with the death of the sun, “[a]nd one after another the stars, each one of which is a sun, a

⁴⁰ H.G. Wells, “The Man of the Year Million” in *H.G. Wells: Journalism and Prophecy, 1893-1946*, ed. W. Warren Wagar (Boston: Houghton Mifflin Company, 1964), 9.

⁴¹ H. G. Wells, *The Time Machine*, Bantam classic ed. (New York: Bantam Books, 1982), 101.

⁴² Wells, *Time Machine*, 106.

solar system, shared the same fate; yet the universe continued to exist as it does today.”⁴³

As an astronomer, Flammarion may have found it easier than others to differentiate among the ends of Earth, humanity, and other worlds. But, Flammarion was not content with allowing all life to die; his novel imagined two extinct suns colliding and causing a fire that revives the universe. Nor could Flammarion abide the perishing of humanity. He concocted a scheme for its continuing existence: *Omega*'s narrator notes, “[t]he conscious existence of mankind had attained an ideal state. Mankind had passed by transmigration through the worlds to a new life with God, and freed from the burden of matter, soared with a progress in endless light.”⁴⁴

Just as scientists like Flammarion broadened their concerns about the future of humanity to consider how the entire planet might be affected by a natural event, so did they turn their attention to the universe at large. In the late nineteenth century, observations of Mars and its “canals,” first reported by an Italian priest in 1876, inspired ruminations on the possibility of life on other planets. Wells in *The War of the Worlds* was the first novelist to grapple with the possibilities that might ensue from an alien encounter.

Wells was a student of T. H. Huxley's (Darwin's so-called “bulldog”) at the Normal School of Science in London during the 1880s, where Huxley no doubt instructed Wells in evolutionary theory.⁴⁵ Wells used the lessons he learned in *The War of the Worlds* (1898). The Martians have an advantage over humans by virtue of having evolved streamlined bodies and developed powerful weapons. When he leaves an inn

⁴³ Camille Flammarion, *Omega: The Last Days of the World* (New York: The Cosmopolitan Publishing Company, 1894; reprint, New York: Arno Press, 1975), 277.

⁴⁴ Flammarion, 286.

⁴⁵ W. Warren Wagar, introduction to *H.G. Wells: Journalism and Prophecy, 1893-1946* by H.G. Wells (Boston: Houghton Mifflin Company, 1964), xx.

that had served as his refuge from the aliens, the narrator compares himself to “a rat leaving its hiding place—a creature scarcely larger, an inferior animal, a thing that for any passing whim of our masters might be hunted and killed. Perhaps they also prayed confidently to God.”⁴⁶ God has no place in this apocalypse, but the Martians are still defeated by bacteria that have ravaged humanity since its beginning: “[b]ut by virtue of this natural selection of our kind we have developed resisting power; to no germs do we succumb without a struggle . . . But there are no bacteria in Mars.”⁴⁷ Though humanity survives this attack, the narrator muses on the inevitable end of the world, and the knowledge of life on other planets allows him to distinguish between the end of the earth and the end of humanity: “when the slow cooling of the sun makes this earth uninhabitable, as at last it must do, it may be that the thread of life that has begun here will have streamed out and caught our sister planet within its toils.”⁴⁸

An American, seemingly unsatisfied with the ambivalent ending of Wells’s *The War of the Worlds*—after all, the Martians could find a way to resist the bacteria and return—wrote an “unauthorized” sequel, published also in 1898. In Garrett P. Serviss’s work, the Americans prove to be the salvation of mankind as Thomas Edison discovers how to duplicate the power of the Martians and builds a spaceship. The world, having come together in the wake of the Martian attack, mounts an assault against the Martians on their home world. In Serviss’s book, the Martians are an “older” species than humans, living on “an aged and decrepit world”⁴⁹ and thus have “the advantage of ages of

⁴⁶ H. G. Wells, *The War of the Worlds* (Mahwah, N.J.: Watermill Press, 1980), 212.

⁴⁷ Wells, *War*, 241.

⁴⁸ Wells, *War*, 257.

⁴⁹ Garrett P. Serviss, *Edison’s Conquest of Mars* (Wildside Press, 2006), 31.

evolution, which for us [humans] are yet in the future . . . ⁵⁰ Serviss, unlike Wells, used religious imagery to describe the crisis on Earth. Upon seeing a Martian, the narrator suggests that “[t]he sensations of one who had stood face to face with Satan, when he was driven from the battlements of heaven by the words of his fellow archangels, and had beheld him transformed from Lucifer, the Son of the Morning, into the Prince of Night and Hell, might now have been unlike those which we now experienced . . . ⁵¹ The expedition succeeds in routing the Martians, creating a great flood on that planet that drowns most of the enemy.

However blustering Serviss’s nationalism might have been, his conviction that humanity’s salvation lay with American ingenuity was hardly unusual, as the example of Bulwer-Lytton’s 1871 book shows. Serviss’s book is extraordinary, however, in envisioning humanity itself creating an apocalypse on another world, perhaps revealing how effortless it was for an American in 1898, living in a country at war for national expansion (the Spanish-American War) and seemingly on the cusp of global power, to be optimistic about humanity’s future.

In addition to the expansion of apocalyptic speculation to include the fate of the universe or threats emanating from other planets, fiction writers in the West mulled over the idea that humanity might somehow induce a “natural” disaster that would wipe out the entire species. The possibilities for a human-caused end of the world appeared numerous. For instance, English writer John Mills in his 1897 story, “The Aerial Brick Field,” imagined an inventor and entrepreneur finding a way to package part of the atmosphere into a solid brick. But the inventor eventually realizes that his actions are

⁵⁰Serviss, 21.

⁵¹Serviss, 59.

causing destructive floods and concludes, “Had I continued making the bricks on the scale I planned, you will readily see that in no great length of time the air would have become so thin that no one could have breathed with comfort, and thus the human race would have been slowly exterminated.”⁵²

Other scientists suggested that dependence on natural resources might lead to humanity’s doom. In 1897, Scottish physicist William Thomson (Lord Kelvin) gave a scientific paper at a Toronto conference in which he suggested that it was possible to burn enough coal to deplete all of the oxygen in the atmosphere within four or five hundred years.⁵³ After the deadly earthquake along the New Madrid fault in 1895, some theorized the extraction of minerals had caused it.⁵⁴ This led to the fear that the removal of resources like oil from the earth might destabilize the crust and cause it to collapse.⁵⁵ English writer George C. Wallis wrote a story in 1901 titled “The Last Days of Earth,” which visualizes the end of the world through a slow freezing. The earth’s resources, which could have permitted humanity to continue its existence, have all been depleted: “Coal had long since been exhausted, along with peat and wood and all inflammable oils and gases; no turbine could work from frozen seas, no air wheels revolve in an

⁵² John Mills, “The Aerial Brick Field,” in *Beyond the Gaslight: Science in Popular Fiction, 1895-1905*, ed. Hilary and Dik Evans (London: Frederick Muller Limited, 1976), 50.

⁵³ Silvanus Phillips Thompson, *The Life of William Thomson, Baron Kevil of Largs*, vol. 2 [book on-line] (London: Macmillan, 1910), 1001-1002, http://books.google.com/books?id=S_PPAAAAMAAJ (accessed: 1 June 2009).

⁵⁴ “What Caused the Earthquake?,” *Philadelphia Inquirer*, 10 Nov. 1895, 6. <http://infoweb.newsbank.com> (accessed 13 December 2006).

⁵⁵ Herbert C. Fyfe, “How Will the World End?,” *Pearson’s Magazine*, July 1900. <http://www.forgottenfutures.com/library/wend/wend.htm> (accessed 13 December 2006).

atmosphere but slightly stirred by a faded sun.”⁵⁶ Some humans flee to other planets, leaving a dead Earth but preserving a remnant of humanity.⁵⁷

Not only the British speculated along these lines. During the same time period, Serbian-born American inventor Nikola Tesla offered novel theories as to how the world could end accidentally as well as purposefully. He suggested that the atmosphere could catch fire: “And who can tell with certitude that periodical cessations of organic life on the globe might not be caused by ignition of the air and destruction of its life-sustaining qualities, accidentally or as a consequence of some accumulative change?”⁵⁸ Tesla, whose reputation as a mad scientist has grown throughout the twentieth century (some blame an experiment of his for the 1908 Tunguska event in Siberia), also claimed that he could destroy the earth on his own, according to one of his biographers. He reportedly said he could cleave the earth in two if he could only “obtain perfect mechanical resonance of the earth” by sending vibrations and accelerating them through dynamite.⁵⁹

Striving to wrest control over nature, as Tesla did, is the subject of *The Purple Cloud*, a novel by Matthew Phipps Shiel, a British novelist who wrote in the science fiction and future war genres. His 1901 novel in the “last man” mold explicitly pairs scientific concerns with religious ones. The characters in this work realize that there are

⁵⁶ George C. Wallis “The Last Days of Earth” in *Beyond the Gaslight: Science in Popular Fiction, 1895-1905*, ed. Hilary and Dik Evans (London: Frederick Muller Limited, 1976), 148.

⁵⁷ There was also fear that the world might not be able to produce enough food in the future. In 1898 English chemist William Crookes gave an address to the British Association of the Advancement of Science in which he proposed that by 1931 there would not be enough wheat for the world’s demand; scientists had to step in and figure out a way to increase productivity of existing fields. He was confident, however, that chemists would find a way to make the soil richer, and therefore, meet future demands for wheat. See William H. Brock, *William Crookes (1832-1919) and the Commercialization of Science* (Farnham, England: Ashgate Publishing, Ltd., 2008), 376-380.

⁵⁸ Nikola Tesla, “Some Experiments in Tesla’s Laboratory with Currents of High Potential and High Frequency” *Electrical Review - N.Y.* (29 March 1899): 195-197, 204, <http://www.lostartsmidia.com/nikolatesla.html> (accessed 13 December 2006).

⁵⁹ Margaret Cheney, *Tesla: Man Out of Time* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1981), 116-117. For a brief discussion of the theory that Tesla caused the Tunguska explosion, see Marc J. Seifer, *Wizard: The Life and Times of Nikola Tesla: Biography of a Genius* (New York: Citadel Press, 1998), 476.

areas of knowledge that humanity should not pursue lest the anger of God be provoked; in particular, when the narrator, Adam Jeffson, the lone survivor of an expedition to reach the North Pole, finally reaches the destination alone, a poisonous cloud is mysteriously released, killing everyone on Earth except the narrator. When he realizes what has happened, he laments, “Well, Lord God, Thou has destroyed the work of Thy hand.”⁶⁰

But, God does not have a direct presence in Shiel’s apocalypse as he would in a Christian one. The narrator wonders later in the novel, in light of this cataclysm, what the point of evolution is, “in which we seem to see the artistry of the Dramaturgist? . . . Can it be that the Manager, utterly dissatisfied, would sweep all off, and ‘hang up’ the piece for ever?”⁶¹ Though the narrator eventually finds another survivor, a young woman, Jeffson is at first determined to let humanity die with them; he refuses to have children, calling it the “nobility of self-extinction” in killing such a sinful species.⁶² He remains confident that humanity will die with him, insisting that “the earth is old, old, and has lost her evolving fervours now.”⁶³ The female survivor wins Jeffson over at the end, and the two last humans finally wed at the end of the novel as Jeffson insists that this time humanity will be better. As in *Caesar’s Column*, the poisonous cloud took on the work of the Genesis flood in this work, allowing humanity a second chance.

American novelists were not quite ready to engage in the kind of apocalyptic speculation that Shiel did, even by the turn of the century. John Ames Mitchell’s *The Last American* (1902) envisioned the end of the United States by 1990 due to internal corruption in the Donnelly mold. A Persian on an archaeological expedition to the old

⁶⁰ M. P. Shiel, *The Purple Cloud* (Lincoln, NE: University of Nebraska Press, 2000), 82.

⁶¹ Shiel, *The Purple Cloud*, 87.

⁶² Shiel, *The Purple Cloud*, 230.

⁶³ Shiel, *The Purple Cloud*, 248.

United States, where no humans any longer live, observes: “They were a sharp, restless, quick-witted, greedy race, given body and soul to the gathering of riches. Their chiefest passion was to buy and sell.”⁶⁴ Unlike Donnelly, however, Mitchell was much more pessimistic; the avarice of the “Mehrikans” results in the complete eradication of the nation: “And their greed, at last, resulted in this war. By means of one-sided laws of their own making they secured themselves a lion’s share of all profits from the world’s commerce. This checked the prosperity of other nations, until at last the leading powers of Europe combined in self-defence against this all-absorbing greed.”⁶⁵

Pessimism among Americans remained confined to social trends in the United States until after World War I. Americans continued to express faith that science would solve any emerging problems. Despite the misgivings of British authors like Shiel, Nathaniel Shaler, an American geologist at Harvard from 1868 until 1906, claimed that science could allow humanity to escape possible threats to its existence. His non-fiction work *Man and the Earth* (1905) was a contemplation of the future of natural resources on the earth. He believed that mankind “is by his intellectual quality exempted from most of the agents that destroy organic groups.”⁶⁶ While natural resources might be in danger of exhaustion in the future, Shaler was confident that science would be able to revitalize the fertility of worn-out soil and be able to tap into other sources of energy like wind and water when coal and oil are exhausted.⁶⁷ Addressing growing fears of environmental degradation introduced by proto-environmentalists like John Muir, Shaler asserted that

⁶⁴ John Ames Mitchell, *The Last American* (New York: F.A. Stokes, Co., 1902; reprint, Upper Saddle River, N.J.: Literature House, 1970), 31.

⁶⁵ Mitchell, 110.

⁶⁶ Nathaniel Southgate Shaler, *Man and the Earth* (New York: Fox, Duffield and Company, 1905), 12.

⁶⁷ Shaler, 19, 41.

nations would embrace the idea of preserving areas of their countryside.⁶⁸ There were limits to his concern for nature, however. Though the progress of humanity might result in the extinction of other species, Shaler did not think this should deter humanity from ascending to its destiny, although he argued that humans should strive to preserve some mammals from extinction for scientific study.⁶⁹ Shaler concluded his survey of the possible obstacles to human growth with this statement: “[t]here is no reason to forecast the end of this new order until the sun goes out, or the under-earth ceases to renew to the theatre of life.” And that, according to Shaler, is “as remote in the future as the dawn of life is in the past.”⁷⁰

In contrast to Americans who still tended to have faith in a technological future, British fiction writers only became more pessimistic as British science fiction writer and analyst Brian Aldiss notes.⁷¹ In 1909, English novelist E. M. Forster, in a short story titled “The Machine Stops,” carried the idea that technology was potentially destructive to its logical conclusion. This story portrayed a future in which machines dominate the world. All of humanity lives underground because the surface of the earth has been reduced to dust and mud with temperatures so cold that a person would immediately die. Though Forster does not explain how the environment became so degraded, the humans living below the surface do not seem to regret their necessary refuge underground. They appear to worship the “machine,” which provides all of their needs: food, water, electricity, information, and so on. Each person lives alone in a mechanical pod, rarely straying from his or her quarters. These humans see their life as advanced despite the

⁶⁸ Shaler, 185.

⁶⁹ Shaler, 199-208.

⁷⁰ Shaler, 226.

⁷¹ Brian Aldiss with David Wingrove, *Trillion Year Spree: The History of Science Fiction*, 1st American ed. (New York: Atheneum, 1986), 176.

lack of emotional connection—they only communicate through the machine. When the unthinkable happens and the “machine stops,” or malfunctions, humanity panics, as no one knows how to live without mechanical assistance. The “machine stopping” is not only the metaphorical end of the world; humanity, unable to go to the surface and unable to survive without the machine, sits “down to wait for the end.”⁷²

England’s famous mystery writer, Arthur Conan Doyle, offered a similar image of the entire end of the world in a 1913 novel. Flammarion had proposed in *Omega* that a comet passing close to the earth might result in the death of humanity. This idea inspired Doyle’s *The Poison Belt*. Its plot concerns the earth passing through the tail of a comet, resulting in everyone on Earth, except for a group of friends led by an incredibly prescient professor, taking on the appearance of death. The group, having survived passing through the “poison belt” because of a supply of oxygen, emerges from Professor Challenger’s house and believes that everyone else has died. Though the death of humanity has appeared to be painless—the poison has the effect of laughing gas—Challenger opines to his friends that he “could sympathize with the person who took the view that the horror lay in the idea of surviving when all that is learned, famous, and exalted had passed away.”⁷³ The professor is optimistic that evolution would ensure the survival of life on Earth, saying, in spite of the calamity, “you would see some few million years hence—a mere passing moment in the enormous flux of the ages—the whole world teeming once more with the animal and human life which will spring from

⁷² E. M. Forster, “The Machine Stops” in *Classics of Modern Fiction: Ten Short Novels*, 2d ed. (New York: Harcourt Brace, 1972), 269.

⁷³ Arthur Conan Doyle, *The Poison Belt* (New York: The MacMillan Company, 1913), 62.

this tiny root”—the amoeba.⁷⁴ In the end, everyone wakes up, having just been struck by a condition the professor names “catalepsy.”⁷⁵

Despite this exit strategy, this novel’s suggestion that a natural disaster could kill all of humanity—and at any moment—is an important development in how humanity saw itself to nature, a theme that would come to dominate scientific apocalypticism during last half of the twentieth century. *The Poison Belt* implied that nature could be indiscriminate in its effects. Aldiss, discussing Doyle’s novel, observes, “After the 1914-18 war, such meek reversions to the prosaic would no longer be possible [for British writers].”⁷⁶ Nevertheless, in comparison to American visions of the future at the same time, Doyle’s image of a comet potentially affecting everyone on Earth—with no recourse to technological solutions—is much darker and anticipates the direction science fiction in Great Britain and the United States would take after 1945.

Aldiss says of the differences between British scientific romance and American science fiction in the first half of the twentieth century: “Much of the scientific romance had been sturdily dark in tone, just as a robust optimism dominated scientifiction [an American term used prior to “science fiction”]. In part, the marked contrast is attributable to different life-experience in Britain and the United States.”⁷⁷ Not even World War I evened out the differences between the tones of speculative fiction in the U.S., Britain, and Europe. As Aldiss notes, Britain had many more casualties in World I, and afterwards “[e]conomic decline in the one country was counterbalanced by economic

⁷⁴ Doyle, 96.

⁷⁵ Doyle, 137.

⁷⁶ Aldiss, 149.

⁷⁷ Aldiss, 175-176.

ascendancy in the other.” The late nineteenth-century predictions of Verne and Bulwer-Lytton of growing American power seemed to be coming true after World War I.

But, even as American science fiction writers retained their confidence in an U.S.-led future after the First World War, the American intellectual historian Henry F. May in *The End of American Innocence: A Study of the First Years of Our Own Times, 1912-1917* (1959) suggests that World War I demolished the notion of progress, one of several dominating doctrines in the U.S. prior to the war, for American intellectuals.⁷⁸ This decline of faith in progress occurred even before Americans entered the war: “As 1914 wore on to its end, the news from Belgium seemed to challenge not only the progressive view of history, but an assumption still more deeply rooted in dominant American ideology, the fundamental decency of modern, civilized human nature.”⁷⁹ Elsewhere, May notes of the postwar period that “American writers had often been discontented yet there was something new in the discontent of the twenties. There was more of it, it was louder and sometimes more weepingly expressed, and it was noticed, and sometimes resented, by the optimistic majority.”⁸⁰

While intellectuals like H. L. Mencken and mainstream authors such as F. Scott Fitzgerald represented the rejection of optimism that May describes, American scientists in popular works on the future of humanity began to match the pessimism of British and European scientists after World War I, even though as Aldiss argues, science fiction in the United States remained more optimistic at least until the 1930s.⁸¹ The view that

⁷⁸ Henry F. May, *The End of American Innocence: A Study of the First Years of Our Own Times, 1912-1917* (New York: Alfred A. Knopf, 1959), 6.

⁷⁹ May, *End of American Innocence*, 361.

⁸⁰ Henry May, *The Discontent of Intellectuals: A Problem of the Twenties* (Chicago: Rand McNally & Company, 1963), 1.

⁸¹ For popular science works of the twenties and thirties written by British and European scientists, or in the case of Papp, by historians of science, that speculate on the future of humanity, see Geoffrey Pomeroy

humanity could be displaced depending on the future course of its evolution was central to Stanton Arthur Coblentz's 1925 work *The Decline of Man*. An American writer and poet, Coblentz used evolutionary theory and language to describe what he saw as the social ills that would fell humankind. He alluded to the implications of Darwinism for the future of humanity, discussing the future of humans in the context of the extinction of other species such as the dinosaurs. Examining the particular aspects of these species that may have made them "unfit" for survival, he concluded that the very same problems plague man.⁸²

While Coblentz did mention "environmental" causes of extinction such as climate changes, deforestation, and epidemics, he did not discuss them in any detail. For Coblentz, the social situation of humans would determine whether they could respond and adapt to any such changes.⁸³ He recommended birth control for the poorer classes and eugenics to direct the evolution of humanity so that it could survive.⁸⁴ In his view, such remedies were vital because unlike in the past, "it is no longer one race and one civilization that is threatened; it is all races and the civilization of all men . . ." ⁸⁵ His analysis was a mix of the racial fears of writers like Dooner and the worries over species displacement of Wells and Serviss. The species, for Coblentz, could not survive without making sure "inferior" races did not reproduce.

Dennis, *The End of the World* (New York: Simon Schuster, 1930); J. B. S. Haldane, *The Last Judgment: A Scientist's Vision of the Future of Man* (New York: Harper & Brothers, 1927); Joseph McCabe, *The End of the World* (New York: E.P. Dutton and Company, 1920); Desiderius Papp, *Creation's Doom* (New York: D. Appleton-Century Company, 1934).

⁸² Stanton Arthur Coblentz, *The Decline of Man* (New York: Minton, Balch, and Company, 1925), 85. For example, he argued that humanity was suffering from something like spinescence with national military build-ups: "[w]hen the offensive of defensive equipment of a species of animals becomes too great for the physical resources of that species; when the antlers of the elk absorb too large a share of the creature's energy or the spines of a dinosaur become too bulky for the beast to carry with ease, we may safely conclude that the race is exhibiting signs of old age and will shortly disappear."

⁸³ Coblentz, 163.

⁸⁴ Coblentz, 242-247.

⁸⁵ Coblentz, 262.

While Coblentz analyzed humanity's future in the context of evolution, one popular science work married scientific and religious apocalypticism. An American lawyer and writer, Nathan Grier Moore, analyzed potential ways the world could end from the perspective of science, trying to reconcile science and religion in the area of end times speculation. His *Man and His Manor* (1934) sought to give a layman's account of scientific conclusions about humanity's and the earth's past as well as the likely future fates of both. Like previous scientific apocalypticists in Britain and Europe, Moore conceded that the end of life on Earth and the destruction of the world may occur separately or together, but, he asserted, "[u]ltimately humanity will disappear."⁸⁶

Moore believed that the Biblical account of the End was not incompatible with science: "on a scientific, as on a scriptural basis, the picture by St. Peter may describe it [the end of the world]. It deals rather with the fact than the method, but it is there assumed that it will be 'burned with fervent heat.' If so the last remnant of availing life, and the last world of matter, may break up *together* in a cataclysm of fire."⁸⁷ The explosion of the sun is the end Moore thought to be consistent with Peter's image of world conflagration.⁸⁸ Moore's invocation of the description of global fire in 2 Peter presaged the repeated use of that passage by premillennialists after World War II when applying science to Biblical passages describing the apocalypse.

Despite the possibility that the Bible did not conflict with a natural cause of death for the world, the implication of evolution that humanity could be replaced was in direct conflict with the Christian belief that humanity is central to God's plan for the universe.

⁸⁶ Nathan Grier Moore, *Man and His Manor: The Past and Future of Earth and Man as Deduced from Accepted Modern Science* (Chicago: privately printed, 1934), 297.

⁸⁷ Moore, 300. Emphasis is his.

⁸⁸ Moore, 337.

After World War II, science fiction writers in particular would struggle with the idea that humans were not special. For instance, aliens either would resemble humans or reject Earthlings for being especially destructive towards their planet. In the 1920s, however, speculative fiction in the United States remained on the whole positive in nature, even as non-fiction writers like Coblenz were grappling with the negative ramifications of evolutionary theory. The man who coined the term science fiction, Hugo Gernsback, founded the first magazine dedicated to speculative fiction called *Amazing Stories* in 1926. Gernsback, an immigrant who came to the United States and became enamored of the American myth of the Edisonian inventor, wanted to publish fiction that would educate readers about science.⁸⁹ Gernsback had so much faith in the ability of fiction to communicate scientific and technological ideas that he proposed “that science fiction writers should be able to take out provisional patents on the devices they predicted in their stories. . . .”⁹⁰

Gernsback’s faith in technology led him to announce as editorial policy in 1931 that his magazine would not publish stories in which machines subjugated humans or in which scientists used their power to conquer the world.⁹¹ This policy implies that such stories were being written and submitted, though rejected by Gernsback, who had such an influence on the development of the science fiction genre. Despite Gernsback’s influence, several works of fiction by both science fiction and mainstream writers appeared in the 1930s that projected current trends into the future and saw disaster. The Great

⁸⁹ Andrew Ross, *Strange Weather: Culture, Science, and Technology in the Age of Limits* (New York: Verso, 1991), 108-09. See also, Brooks Landon, *Science Fiction After 1900: From the Steam Man to the Stars* (New York: Twayne Publishers, 1997), 43.

⁹⁰ Landon, 51.

⁹¹ Edward James, *Science Fiction in the Twentieth Century* (New York: Oxford University Press, 1994), 52-53.

Depression may have tempered the optimism of science fiction of prior decades; these works resembled the scientific romances of H.G. Wells rather than the preceding American pulp science fiction.

Philip Wylie and Edwin Balmer described a near encounter with human extinction in *When Worlds Collide* (1932). The League of the Last Days is the name of the group of scientists who determine that two planets are heading toward Earth, and the larger one will smash into Earth. The reaction of the characters to the threat of destruction is similar to the reaction of later atomic age characters to the threat of nuclear war. One wealthy character becomes enraptured at the news: “Delicious, isn’t it, to think of the end of all this? I feel stimulated, don’t you? All of it—going to pieces! I feel like saying, ‘Thank God!’ I was sick of it. Everyone was. Civilization’s a wretched parody. Evidently there was a just and judging God, after all.”⁹² Others conclude that it must be the work of God, punishing humanity for its sins, or proof that humanity is so insignificant as to mean nothing in the larger natural processes of the world.⁹³ The earth does not escape destruction, but humans discover that the second planet that passes very close to Earth is capable of supporting life, and a small remnant of humanity is sent there to carry on the species. The survivors decide that they must create a better civilization, saying, “It is nothing—if we merely continue the earth—here. When I recollect the filth of our cities, the greed of individuals and of nations, the savagery of war, the horrors of pauperism permitted to exist side by side with luxury and wealth, our selfishness, hates, diseases, filth—all the hideousness we called civilization—I cannot regret that the world which was afflicted by us is flying in fragments, utterly incapable of rehabilitation, about

⁹² Philip Wylie and Edwin Balmer, *When Worlds Collide*, Bison Books ed. (Lincoln, NE: University of Nebraska Press, 1999), 30.

⁹³ Wylie and Balmer, 33, 44.

the sun.”⁹⁴ In this way the end of the world by natural means leads to a secular millennium.

Humanity escapes apocalypse due to the actions of one man in a 1933 American novel that similarly rejects the notion of progress. Laurence Manning, who was born in Canada but became a United States citizen, serialized *The Man Who Awoke in Wonder Stories Magazine* (founded by Gernsback in 1930 though he did not serve as its editor). The main character, Norman Winters, puts himself into suspended animation so he can see the future. The first time he wakes up, he discovers that it is the year 5000 A.D. Another character tells him that the twentieth century is considered to be “[t]he height of the false civilization of Waste! Fossil plants were ruthlessly burned in furnaces to provide heat; petroleum was consumed by the billion barrels; cheap metal cars were built and thrown away to rust after a few years’ use; men crowded into ill-ventilated villages of a million inhabitants—some historians say several million. That was the age of race fights where whole countrysides raised mobs and gave explosives and poisons and sent them to destroy other mobs.”⁹⁵ Norman continues to travel in 5000-year intervals, discovering the human race controlled by a giant electronic brain in 10000 A.D. and people dreaming their lives away in 15000 A.D. He successfully destroys the brain and convinces a group of young people to rebel against the pressure to sleep their lives away. Due to his actions, the species overcomes these near misses at extinction and survives to the year 25000, when immortality is discovered. But, the ending is not entirely happy. Norman wonders if this final accomplishment of *Homo sapiens* makes up for the countless billions who suffered meaningless deaths.

⁹⁴ Wylie and Balmer, 188.

⁹⁵ Laurence Manning, *The Man Who Awoke* (New York: Ballantine Books, 1979), 21.

Not only science fiction authors, however, expressed anxiety over what the future held in 1930s. Stephen Vincent Benét, an American poet and author, published a short story in 1937 and a poem in 1938 that imagined wars so devastating that they decimate the human race. Benét's short story "The Place of the Gods" in the *Saturday Evening Post* (later republished as "By the Waters of Babylon") presaged later apocalyptic fiction about humans eking out primitive existences after a nuclear war. The title of the story refers to the ruins of New York City, which the main character visits on a quest to prove his manhood. As he climbs through the remains of "the place of the gods," he thinks to himself: "When gods war with gods, they use weapons we do not know. It was fire falling out of the sky and a mist that poisoned. It was the time of the Great Burning and the Destruction."⁹⁶ Though the story ends on an optimistic note with the narrator declaring, "We must build again," Benét followed up the story with a poem the following year in *The New Yorker*.⁹⁷ "Nightmare for Future Reference" looked forward to a third world war—" [t]he one between us and them."⁹⁸ The poem describes the second year of the war when the birth rate decreases precipitously; as a result, women all over the world destroy the centers of government, and the war ends. Nevertheless, the children do not start being born again, and the narrator in the poem concludes, "Well, we had a long run. That's something."⁹⁹ Though not strictly grounded in science, Benét's anticipation of wars so catastrophic captured the sense that technology had advanced to the degree that humanity might not be able to weather any further conflicts.

⁹⁶ Stephen Vincent Benét, "The Place of the Gods," *Saturday Evening Post* 210, no. 5 (31 July 1937): 60.

⁹⁷ Benét, "Place of the Gods," 60.

⁹⁸ Stephen Vincent Benét, "Nightmare for Future Reference," *The New Yorker* 14 (2 April 1938): 21.

⁹⁹ Benét, "Nightmare," 21.

The fear that the entire human species might experience a collective meaningless death became commonplace after the discovery of nuclear power. This development in physics promised enormous benefits to humanity but also an unprecedented potential for destruction. In 1911 a physicist named Ernest Rutherford proposed a new conception of the atom: most of the mass of an atom was contained at its core in what Rutherford called the nucleus. Combined with Einstein's proposal that mass can turn into energy and vice versa, Rutherford's study of radioactive materials led him to observe that enormous energy is contained within the nuclei of atoms.¹⁰⁰ If the nuclei could be split or if the nuclei of two atoms could be fused, then that energy could be released, but Rutherford did not think that humans would ever discover how to control such energy.¹⁰¹

Despite Rutherford's doubts, as early as 1914 Wells wrote in *The World Set Free* of a world transformed by atomic energy.¹⁰² This was a vision with lasting historical impact; Hungarian physicist Leo Szilard read it for the first time in 1932 and referred to it when he described building the first nuclear reactor in a scientific report.¹⁰³ A scientist in the novel proclaims that when humanity harnesses the power of the atom, "[t]hen that perpetual struggle for existence, that perpetual struggle to live on the bare surplus of Nature's energies will cease to be the lot of Man. Man will step from the pinnacle of this

¹⁰⁰ Marcelo Gleiser, *The Prophet and the Astronomer: A Scientific Journey to the End of Time* (New York: W.W. Norton and Company, 2003), 161-163.

¹⁰¹ Alan Lightman, *The Discoveries: Great Breakthroughs in 20th Century Science* (New York: Pantheon Books, 2005), 93.

¹⁰² H. Bruce Franklin has listed prior works by both Americans and Britons that imagined some sort of radioactive weapon, such as Robert Cromie's *The Crack of Doom* (1895), Roy Norton's *The Vanishing Fleets* (1907), and Hollis Godfrey's *The Man Who Ended War* (1908). See H. Bruce Franklin, *War Stars: The Superweapon and the American Imagination* (New York: Oxford University Press, 1988), 131. But it was Rutherford's discovery that came after these works that really made the idea of nuclear energy feasible.

¹⁰³ See Richard Rhodes, *The Making of the Atomic Bomb*, 1st Touchstone ed. (New York: Simon & Schuster, Inc., 1988), 24; Spencer Weart, *Nuclear Fear: A History of Images* (Cambridge, MA: Harvard University Press, 1988), 81.

civilization to the beginning of the next.”¹⁰⁴ The scientist’s predictions come true in the course of the novel. According to the narrator, although atomic energy provided the means to meet all of mankind’s needs, the lack of a method to fairly distribute the fruits of the new energy as well as the effect of displacing workers created chaos, blunting its revolutionary potential. Governments still squabbled, and in Wells’s novel, fight a war with this new technology. Wells invented a new element, Carolinum, which supplies the energy in the bombs used in this “last war,” bombs which, in his conception, are tossed from an airplane and continue exploding until the entire element is used up. The world’s major cities are destroyed and abandoned for generations because “[t]he radiations eat into people’s skins.”¹⁰⁵ Wells, without the reality of the bomb, provided an optimistic ending: leaders of the world realize that they must end “the use of these frightful explosives before the world was utterly destroyed.”¹⁰⁶ At the end, a world government is formed and life for humans is utterly transformed, which is another aspect of Wells’s novel that would have an enduring impact. Scientists like Szilard after World War II proposed similar solutions when they trying to find a way to prevent nuclear proliferation or a nuclear war.

Wells may not have been alone in anticipating the potential effects of atomic power prior to 1945, but the optimism about such energy waned even among Americans as the world hurtled from one world war to the next. A CBS radio play in 1937 envisaged the end of the world through an atomic explosion.¹⁰⁷ On the radio broadcast,

¹⁰⁴ H. G. Wells, *The World Set Free: A Story of Mankind* (New York: E.P. Dutton and Company, 1914), 37-38.

¹⁰⁵ Wells, *The World Set Free*, 224.

¹⁰⁶ Wells, *The World Set Free*, 146.

¹⁰⁷ “Technical Demonstration/ Incident of the Cosmos,” *Columbia Workshop*, CBS, 16 Jan. 1937. Audiorecording available at The Museum of Television and Radio in New York City. Catalog id: R76:0200. This appears to be based on a short story by Paul Y. Anderson (no obvious relation to Poul W.

an alien observer on Betelgeuse in 2179 observes Earth through a telescope, so powerful he can watch Earth's social and political events taking place. Of course, as he points out to his wife, he is witnessing events that occurred 242 years ago, placing them in 1937, the same year as the broadcast. On Earth, a scientist announces to colleagues that he has invented a "device for controlling and liberating atomic energy." "Save for an accident," he asserts, "man is liberated from death" and war because of this "bottled sunshine." In the course of lauding the characteristics of the machine, the inventor warns his associates not to touch a lever on the device; an accident follows in which the lever is pushed, and the Betelgeuse observer notes the destruction of the earth. He tells his wife that there are billions of planets like the now-defunct Earth, and the destruction of a planet happens around four times each night. Like the well-meaning inventor in Mill's short story who bottled atmosphere and the narrator of Shiel's *The Purple Cloud*, a scientist destroys the world while trying to discover and harness a new form of energy. Despite the destruction at the center of the story, the presence of the alien observer stressed that humanity, despite its own feelings of self-importance, is a trivial detail in the larger picture.

Scientists once again attempt to exploit atomic energy in American science fiction author Robert Heinlein's story, "Blowups Happen" (1940). In Heinlein's work, scientists build a potentially unstable atomic power plant in spite of their knowledge of the risks. The director of the plant calls it "the most dangerous machine in the world," and explains that it needs constant supervision to prevent a catastrophe.¹⁰⁸ For this fictional atomic power plant, a nuclear fission reaction using uranium provides power; rather presciently,

Anderson, the science fiction author), which was published in H. L. Mencken's and George Jean Nathan's literary magazine, *The Smart Set* in June 1923. See *The Smart Set Anthology*, ed. Burton Rascoe and Groff Conklin (Garden City, NY: Halcyon House, 1934).

¹⁰⁸ Robert Heinlein, "Blowups Happen" in *The Astounding Science Fiction Anthology*, ed. John W. Campbell, Jr. (New York: Simon and Schuster, 1952), 2.

Heinlein describes a chain reaction (which was just how the Manhattan Project created enough energy for a bomb).¹⁰⁹ Such is the potentially explosive nature of the power plant that the nuclear fission process is referred to as a “bomb.” A handful of leading scientists become convinced that an explosion is inevitable and shut it down despite the opposition. One scientist suggests that the moon used to be inhabited and a living planet until intelligent beings that had evolved on the moon blew it up after discovering the secret of nuclear power.¹¹⁰

Heinlein’s story had the same feeling as the CBS radio play that technology and the pursuits of science could result in a secular Armageddon as well as that humanity’s fate was in its own hands.¹¹¹ By the end of World War II, the idea that science could author the end of the world became commonplace in American science fiction. The bomb gave American scientific apocalypticists the foreboding sense that humanity was going to receive its just reward, ultimately serving as the handmaiden to its own destruction.

While scientists and writers in the United States only gradually rejected the idea of progress, at the core of Christian premillennialism was the idea that no real progress was possible because sin had doomed the world. As a prominent historian of evangelicalism, George Marsden, notes:

Such views hardly fit with the idea of progress that characterized European and American thought throughout the nineteenth century. The rapid spread of premillennial thought must have reflected some disillusionment with the progress

¹⁰⁹ Heinlein, 3.

¹¹⁰ Heinlein, 27.

¹¹¹ In one remarkable episode during World War II, military intelligence visited the offices of *Astounding Science Fiction Magazine*, edited by another luminary of early science fiction—John W. Campbell. Campbell, who had studied physics, had a penchant for publishing atomic stories in the magazine. Cleve Cartmill’s story “Deadline,” published in 1944, coincidentally resembled the reality of the nuclear bomb being built by the Manhattan Project a little too much for the comfort of the military. See Aldiss, 224.

of civilization. No doubt social pessimism contributed to the growth of the dispensationalist movement in post-Civil-War America during the Gilded Age.¹¹²

In the course of articulating their unfavorable view of civilization, premillennialists debated whether science could inform their interpretations of Bible prophecy.

Congregational minister E.P. Goodwin, at an 1886 prophecy conference in Chicago, condemned modernists who tried to temper Biblical accounts of miracles, creation, and the end of the world with scientific conclusions: “The only question for us is, what do these authorities—these books of God’s revealed will teach? No matter whether we can understand or explain, or harmonize their teachings with our view of things or not. They give us what God says, and we believe them because of that, and not because of our ability to explain or expound them.”¹¹³ But, in addition to believing that the Bible should be read as the God-inspired, infallible source that conservative evangelicals thought it to be, Goodwin criticized the notion that events in the Bible must be compatible with known physical laws: “With Him nothing is impossible, and the resources of omnipotence are as ample now as when they availed, however unphilosophically, or in contravention of natural law, to create a universe out of nothing, and make the original man out of the dust of the earth.”¹¹⁴ At the same conference, a Baptist minister, J.D. Herr, tackled the subject of a naturalistic end of the world, seizing on the uncertainty of how the world might end without God as a weakness: “[s]cientists have attempted to demonstrate the peculiar methods by which the present world is to be destroyed, together with the heavenly bodies beyond us. Yet no theory has ever been

¹¹² George M. Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth Century Evangelicalism, 1870-1925*, 2d ed. (New York: Oxford University Press, 1980), 67.

¹¹³ E.P. Goodwin, “The Return of the Lord, Personal and Literal” in *Prophetic Studies of the International Prophetic Conference* (Chicago: Fleming H. Revell, 1886) reprinted in *Fundamentalism in American Religion, 1880-1950*. Donald W. Dayton, ed., *The Prophecy Conference Movement* (New York: Garland Publishing, 1988), 7.

¹¹⁴ Goodwin, 11.

promulgated receiving a hearty and unhesitating approval from intelligent thinkers. . . . In the Bible alone do we find the sure word of prophecy.”¹¹⁵ American premillennialists in the late nineteenth century, like Goodwin and Herr, were not interested in using scientific data to bolster the Bible; in their opinion, science was only being used to undermine it.

This concern continued into the twentieth century, particularly when conservative evangelicals were responding to perceived modernist attacks on their theology. Baptist minister Isaac M. Haldeman, in a response to a 1917 essay by modernist theologian Shailer Mathews, made it clear that a belief in premillennialism was essential for true-believing Christians: “the Second Coming as recorded in the New Testament is so bound up with every fundamental doctrine, every sublime promise and practical exhortation, that it is impossible to read them in that connection without being impelled to accept and confess them.”¹¹⁶ James M. Gray at Moody Bible Institute in 1922 responded to the liberal Presbyterian Harry Emerson Fosdick, saying his “conception of his text is purely naturalistic, or rationalistic, if you prefer. The supernatural is excluded from his vision entirely.”¹¹⁷ In another essay, he criticized Fosdick for believing that “the revelation in

¹¹⁵ J.D. Herr, “Importance of Prophetic Study” in *Prophetic Studies of the International Prophetic Conference* (Chicago: Fleming H. Revell, 1886) reprinted in *Fundamentalism in American Religion, 1880-1950*. Donald W. Dayton, ed., *The Prophecy Conference Movement* (New York: Garland Publishing, 1988), 155.

¹¹⁶ I. M. Haldeman, “Professor Shailer Mathews’ Burlesque on the Second Coming of Christ” in *Fundamentalism in American Religion, 1880-1950*, ed. Joel A Carpenter, *The Fundamentalist-Modernist Conflict: Opposing Views on Three Major Views* (New York: Garland Publishing, 1988), 21.

¹¹⁷ James M. Gray, “The Static and the Dynamic: An Examination of Dr. Harry Emerson Fosdick’s ‘Now Famous Sermon’ on Progressive Christianity” in *Fundamentalism in American Religion, 1880-1950*, ed. Joel A Carpenter, *The Fundamentalist-Modernist Conflict: Opposing Views on Three Major Views* (New York: Garland Publishing, 1988), 5.

the Bible must now be qualified by modern philosophy, by the evolutionary hypothesis, and by comparative religion.”¹¹⁸

Marsden observes “[d]ispensationalist thought was characterized by a dual emphasis on the supernatural and the scientific. Supernaturalism was a conscious and conspicuous organizing principle. Underlying dispensationalist thought, however, was an almost equally important set of ideas concerning how to look at things scientifically.”¹¹⁹ In spite of the attempt of some conservative evangelicals to protect a literal interpretation of the Bible by eschewing the use of science, other evangelicals began to use scientific data to explain events in the Bible, especially when not responding to modernist theology.¹²⁰ This approach differed from what modernists were doing; far from using science to suggest that Bible was untrue or metaphorical in parts, such conservative evangelicals used the Bible to show how an event that seemed unlikely could occur.

Evangelical Asa Oscar Tait in *Heralds of the Morning* (1899) took a position similar to other conservative evangelicals dismayed by the modernist trend among Protestants: “[i]t is the boast of men to-day that ‘this age has outgrown many of the things taught in the Bible,’ and they call it an indication of great intellectual advancement.”¹²¹ But, unlike many of his premillennialist colleagues, Tait believed that humanity was not merely sinning against God by its immorality and lack of faith. The way humans treated their environment also indicated that the end was near: “The departing of earth’s vigor of youth, and the infirmities of age creeping over her, are thus pointed out as among the

¹¹⁸ James M. Gray, “The Deadline of Doctrine Around the Church” in *Fundamentalism in American Religion, 1880-1950*, ed. Joel A. Carpenter, *The Fundamentalist-Modernist Conflict: Opposing Views on Three Major Views* (New York: Garland Publishing, 1988), 102.

¹¹⁹ Marsden, 55.

¹²⁰ Marsden, 217.

¹²¹ Asa Oscar Tait, *Heralds of the Morning: The Meaning of the Social and Political Problems of To-day and the Significance of the Great Phenomena in Nature* (Chicago: Review and Herald Publishing Company, 1899), 39.

unmistakable tokens of her approaching dissolution.”¹²² In Tait’s account, humans had abused the earth’s natural resources: “[e]very tiller of the soil is painfully aware of the fact that it is becoming more and more difficult to raise a crop.”¹²³ As a result, humanity would receive the punishment it deserved: “[a]nd our earth itself is groaning because of ‘the transgressions thereof’ that is ‘heavy upon it.’ The pollutions of mankind, their transgression of physical law, their failure to observe the most thoroughly demonstrated principles of sanitary science, creates a soil for the growth of the germs of decay and pestilence.”¹²⁴ Much more than other premillennialists, Tait was willing to echo the beliefs of scientific apocalypticists that it was possible humans might not merely commit spiritual transgressions but crimes against the physical world as well.

Methodist theologian Luther T. Townsend’s 1913 overview of the possible ends of the world illustrates the growing comfort of conservative evangelicals with using science to help support their interpretation of the Bible as the fundamentalist movement grew stronger. He believed that science could be used to affirm the Biblical account of the end, saying “scientific specialists are no less pronounced in what they say of a destructive ending of physical things than are the utterances and warnings of Bible revelation.”¹²⁵ Townsend concluded that between Peter’s and John’s prophecies (in 2 Peter and Revelation respectively) the way the world will end, according to the Bible, is through fire: “the Bible, right or wrong, teaches that a day is coming when not a vestige of the physical universe is to remain; that the sun, moon, stars, the heavens and earth as now constituted shall be dissolved by some destructive agency and then vanish like

¹²² Tait, 241.

¹²³ Tait, 245.

¹²⁴ Tait, 248.

¹²⁵ L. T. Townsend, *End of the World: Biblical, Scientific and Other Points of View* (Boston: The Advent Christian Publication Society, 1913), 11-12.

smoke after a fire has done its work of devastation though the material may be transmuted into other forms.”¹²⁶ In like manner, scientists not only predict that the natural world will come to an end at some point, but also admit that extinction of a species is final, Townsend asserted.¹²⁷ He discussed the various ways scientists had speculated the end might come: through drought,¹²⁸ through freezing (because of the decline of the sun),¹²⁹ through the earth’s collision with a comet, another planet, or the sun,¹³⁰ by passing through the tail of a comet (which could contaminate the earth’s atmosphere),¹³¹ or through an explosion emanating from the interior of the earth.¹³²

When Townsend parsed through the various theories, however, he rejected all of the above except for the theories that contained an element of fire: “the coming deluge will be one of fire caused by cometic, planetic, or solar collisions, or by eruptions from the interior of the earth itself.”¹³³ Science takes on the appearance of prophecy for Townsend: “*Prepare*, for you are on the brink of a hell of fire, is the stern command that science is repeating.”¹³⁴

Townsend thought that God would use nature to bring about the End.¹³⁵ Consistent with the attempt of scientific apocalypticists like Nathan Grier Moore to reconcile the Bible with scientific conclusions, Townsend averred that “no scientist will question the statement that nature holds in reserve many intonings that could be heard world-wide among the unfoldings of the last things and that under the command of God

¹²⁶ Townsend, 9.

¹²⁷ Townsend, 12.

¹²⁸ Townsend, 14.

¹²⁹ Townsend, 15.

¹³⁰ Townsend, 18, 21-22.

¹³¹ Townsend, 19.

¹³² Townsend, 24.

¹³³ Townsend, 27.

¹³⁴ Townsend, 28. Emphasis is the author’s.

¹³⁵ Townsend, 31.

could thrill into ecstasy, or into terror every human being on earth and even start into motion every particle of matter builded into the earth.”¹³⁶

In a 1918 book on dispensational premillennialism, Baptist pastor Clarence Larkin, whose diagrams of dispensational premillennialism are famous, similarly used science to support Biblical accounts of creation and the End. Larkin told his readers that “the ‘Word of God’ and the ‘Works of God’” must harmonize. There can be no conflict between the Bible and Science.”¹³⁷ In discussing the creation of the world, he analyzed Pierre Simon Laplace’s 1796 “nebular hypothesis” that “the sun, planets and moons of our Solar System were once one vast spherical mass of nebulous of gaseous matter, out of which they have developed.”¹³⁸ He concluded that Laplace’s theory is likely and explains, for instance, the nearly circular orbits of the planets.

Though Larkin saw no necessary conflict between his faith and science, he was a fundamentalist and, as such, did not subscribe to evolutionary theory. In fact, Larkin and other conservative evangelicals only used science that accorded with their interpretation of the Bible. According to Larkin, Genesis does not allow for an interpretation of God working through evolution. For instance, the repeated phrase of a species being created “after his kind” suggests that God created separate species.¹³⁹ Larkin insisted that there are no “intermediate links” in the fossil record of the development of animal and plants nor are there any clear ongoing evolutionary processes; the same is true for humans.¹⁴⁰

¹³⁶ Townsend, 40.

¹³⁷ Larkin, 22,

¹³⁸ Clarence Larkin, *Dispensational Truth or God’s Plan and Purpose in the Ages* (Glenside, PA: by the author, 1920), 21.

¹³⁹ Larkin, 28.

¹⁴⁰ Larkin 28.

Larkin's willingness to consider scientific arguments in his biblical analysis also appeared in his discussion of the Apocalypse but was less profound than in his discussion of creation. He was willing to attribute some of the plagues described to natural causes. For instance, the blast of the third trumpet in Revelation 8:10-11 "sounds a 'great burning star,' called 'Wormwood'" and may very well be in the form of a meteor "that in exploding will fill the atmosphere with 'noxious gases,' that will be absorbed by the rivers and fountains of water, and poison them, so as to cause the death of all who drink of them."¹⁴¹ The correlation of natural events with Bible prophecy was repeated when Larkin alluded to Peter's prophecy that "the Heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up."¹⁴² Larkin argued that Peter used the Greek word *cosmos*, which suggested that not the earth but the atmosphere will burn up: "the intense heat will cause the gases in the atmosphere to explode, which the Apostle describes as the 'heavens (the atmosphere) passing away with a great noise.'"¹⁴³

Similar to scientific apocalypticists who believed it was possible for humans to colonize other planets, Larkin even speculated that God intended for humanity to inhabit other planets: "[i]t seems clear from the presence of the Tree of Life in the Garden of Eden, that God intended the human race to populate the earth, and when it became too thickly populated, to use the surplus population to colonize other spheres."¹⁴⁴ The sophistication of scientific arguments by Bible prophecy experts would grow during the twentieth century beyond the early attempts of writers like Townsend and Larkin.

¹⁴¹ Larkin, 135.

¹⁴² 2 Peter 3:10 (KJV).

¹⁴³ Larkin, 145.

¹⁴⁴ Larkin, 147.

World War I had the effect of making premillennialists pay attention to their surrounding culture. While they never had held out hope for civilization, seeing it as destined for destruction, Marsden argues that when premillennialists had to defend themselves against charges of being unpatriotic, they responded by transforming themselves from pacifists to supporters of the war effort. Premillennialists read the war against Germany as a conflict between Christian civilization and German rationalism. Marsden writes, “[b]efore World War I many premillennialists had stayed aloof from cultural concerns and all were skeptical of any plans concerned merely with the future of civilization. By the end of the war their strongest line of attack on modernism committed them to a position which put forward the survival of civilization as a principal concern.”¹⁴⁵

Fundamentalist preoccupation with saving civilization may have encouraged fundamentalists to try to rescue America by promoting anti-evolution laws during the 1920s in states like Tennessee, Florida, and Oklahoma.¹⁴⁶ The ensuing controversy, which led to a popular conception of fundamentalist Christians as anti-science, did not deter efforts to incorporate science into Bible prophecy. For instance, Charles G. Trumbull, editor of the *Sunday School Times* during the 1930s, saw sunspots, the discovery of a possible new planet that was affecting the orbit of Uranus, and meteor showers as fulfilling the prediction that “the powers of heaven shall be shaken” prior to the Second Coming in Luke 21.¹⁴⁷ The signs of the end continued to be interpreted as

¹⁴⁵ Marsden, 149.

¹⁴⁶ Edward J. Larson, *Trial and Error: The American Controversy Over Creation and Evolution* rev. ed. (New York: Oxford University Press, 2003), 33-57.

¹⁴⁷ Charles G. Trumbull, *Prophecy's Light on Today*, Fundamentalism in American Religion, 1880-1950, ed. Joel A Carpenter, (New York: Garland Publishing, Inc, 1988), 115-119.

being manifestations of known physical phenomena instead of mysterious supernatural events.

A similar desire to incorporate technological advances and scientific knowledge into descriptions of the apocalypse was also present in premillennial fiction during the 1930s. An American layperson, Eleanor De Forest, published *Armageddon: A Tale of the Antichrist* in 1938. The distinction that scientific apocalypticists made between the end of the world and the end of humanity informed her version of the Christian end. A character, in describing the End, says, “[t]here will be profound changes in this earth as when the new heavens and new earth of Revelation materialize, but never total destruction.”¹⁴⁸ Though De Forest’s description of a futuristic weapon is less accurate in its science than, say, Wells’s depiction of atomic weapons, De Forest’s novel centers in part on two scientists (a Russian and an American) who vie for the development of a powerful weapon—“the cathode ray”—described as “a terrible war weapon for aircraft use.”¹⁴⁹ Just as after 1945 the effects of atomic weaponry would be compared to Biblical passages that indicate destruction by fire, the cathode ray’s effects resemble, according to the scientist that developed it, a prophetic passage in Zechariah: “‘And this shall be the plague wherewith the Lord shall smite all the people that have fought against Jerusalem, their flesh shall consume away while they stand upon their feet, and their eyes shall consume away in their holes and their tongues shall consume away in their mouths.’”¹⁵⁰ When the cathode ray is used in the novel, an observer exclaims: “‘There’s nothing left but skeletons—grinning, horrible skeletons! The others are going to same way. The flesh

¹⁴⁸ Eleanor De Forest, *Armageddon: A Tale of the Antichrist* (Grand Rapids, MI: Wm. B Eerdmans Publishing Company, 1938), 60.

¹⁴⁹ De Forest, 124.

¹⁵⁰ De Forest, 179.

scabs, dries, falls off and disappears.”¹⁵¹ Far from being a supernatural event, humans create the means by which God metes out this particular judgment in De Forest’s novel.

In 1941, Dayton A. Manker, a Methodist minister, published *They That Remain: A Story of the End Times*. This novel shows how evolution could be rejected while using scientific advances to explain the amount of destruction in Revelation. The characters in Manker’s novel worry about the insidious effects of education, which for several of them lead inevitably to atheism and communism, inextricably intertwined. In Manker’s conception, the teaching of evolution was part of the spiritual downfall of humanity that was a sign of the apocalypse: “[b]elieving that man was a brute, it at last became easy for people to act the brute.”¹⁵² One student commits suicide after learning about evolution: “[w]hen he [her biology professor] convinced her that the blood of the brute and not the breath of God is the basis of human life, when he convinced her that evolution has no God and that we have no heavenly Father, she realized the senselessness of living for others . . . why shouldn’t she terminate this tragic farce called life?”¹⁵³ Manker’s criticism of science does not lead him to an exclusively supernatural interpretation of the Bible; at least one of the judgments of God is manmade. The armies of the Antichrist and his opposition use chemical weapons in this novel, helping the global war to be as destructive as described in the Bible.

Scientific phenomena did not merely reflect the description of events that would take place at Armageddon; science could explain how some of these events would occur. Conservative evangelical minister William S. McBirnie in 1943 wrote: “[s]cientists tell

¹⁵¹ De Forest, 200.

¹⁵² Dayton A. Manker, *They That Remain: A Story of the End Times* (Grand Rapids, MI: Zondervan Publishing House, 1941), 38.

¹⁵³ Manker, 90.

us that this earth is composed of three things: gas, liquids, and solids. Any one of the three can be changed into one of the other orders. . . . And that is what will happen to the old earth and the old heaven.”¹⁵⁴ He listed gases that make up the earth’s atmosphere, asserting, “[i]f you altered that mixture, or that composition, you would destroy life.”¹⁵⁵ In McBirnie’s account, the alteration of the mixture of gases in the atmosphere could explain Peter’s description of the heavens dissolving because oxygen and nitrogen are combustible.¹⁵⁶

Despite the incorporation of science and manmade weapons into their visions of the end, conservative evangelicals maintained an emphasis on the supernatural, often combining discussion of the two. For instance, the fundamentalist founder of the *Sword of the Lord*, John R. Rice, in *Bible Lessons on the Book of Revelation* (1943) discussed potentially apocalyptic effects of natural phenomena like comets and meteors, seeing the effects of a meteor crash in the description of Revelation 8:10-11: “[s]cientific men have long known that if a great meteor should fall to earth it might kill many thousands of people, if in a populated section, and that the gases and chemicals might poison millions.”¹⁵⁷ For Rice, even though God may work through natural phenomena, he certainly did not have to follow the laws of nature. Rice argued that Revelation 21: 23-24 suggests, “when the heavens pass away at the time when the earth is burned over (II Pet. 3:10, 12) that the sun will be done away with.”¹⁵⁸ The Earth would continue, with Jesus Christ providing it the light it needs, in Rice’s interpretation.

¹⁵⁴ William S. McBirnie, *50 Progressive Messages from Armageddon to New Earth* (Norfolk, VA: McBirnie Publications Association, 1944), 314.

¹⁵⁵ McBirnie, 175.

¹⁵⁶ McBirnie, 175-177.

¹⁵⁷ John R. Rice, *Bible Lessons on the Book of Revelation* (Murfreesboro, TN: Sword of the Lord Publishers, 1943), 25.

¹⁵⁸ Rice, 53.

Rice's pessimism about the future of the world prior to Christ's return to light the heavens, however, was matched by a similar pessimism from scientific apocalypticists by 1945. The technological advances of the nineteenth century initially inspired great optimism about the future among Westerners. The prominence of the English in directing scientific apocalypticism during this period suggested, however, that perceived threats to the national ascendancy of such a "superpower" could seem apocalyptic. Increasingly as Americans gained national power, they too began fearing what having such power and such technological expertise could mean. The world wars forced the United States to assume a greater role in world affairs. While World War I had induced apocalyptic fears—with some observers referring to World War I as "Armageddon" to evoke the new destructiveness of warfare—World War II proved to be the war that confirmed the idea that next time, a war would mean an apocalypse. And, because of Americans increasing technological prowess, they could likely help cause it.

Unlike after World War II, one overriding apocalyptic concern did not dominate the late nineteenth and early twentieth centuries leading up to 1945. After 1945 the nuclear bomb focused the attention of both scientific and Christian apocalypticists. In this earlier period, however, scientific apocalypticists expressed a variety of anxieties over race, technology, and natural disasters. Evolution provided a link for these different concerns; perceived racial groups within humanity and humanity itself were destined for extinction whether by their own obsolescence, their own technology, or a natural cause, like the death of the sun. In articulating these threats, scientific apocalypticists defined the end of the world in a new way. Some of these writers considered unambiguously how the Christian apocalypse might fit into their scheme of the world's end, while others

implicitly incorporated ideas like humanity deserving judgment through destruction. Compared to later in the twentieth century, however, during the late 1800s and early 1900s, the scientific apocalyptic was less likely to borrow religious imagery to describe the end. Scientists' and science fiction writers' concentration on the implications of evolution created a distinctive apocalyptic apart from premillennialism. When scientific apocalypticists proposed that humans could cause their own destruction, their formulations of the End became more similar to premillennialists. The idea of humanity causing its own death, however, was at odds during this time period with the optimistic idea that humanity will endure until the end of the solar system. The bomb largely ended that debate, and the idea that humanity was in danger from itself pervaded post-1945 apocalyptic literature.

Christian apocalypticists also did not display one overriding anxiety about the world; after 1945, for them, too, the bomb and the Cold War dominated their literature. In this earlier period, premillennialists were concerned with defending themselves against modernist interpretations of the Bible. Modernists tended to see Christ's Second Coming as metaphorical rather than literal, and for many conservative evangelicals, defense of dispensational premillennialism was just part of defending their faith. Increasingly, however, conservative evangelicals seemed to realize that science could become part of their arsenal in defending the Bible. While modernists may have tempered their beliefs and their interpretations in accordance with what was scientifically plausible, conservative evangelicals saw that science could be used in quite the opposite way: to show just how believable and possible Biblical events were, especially in relation to the book of Revelation. This trend became more pronounced after 1945. The dual focus of

scientific and religious apocalypticists on the bomb after the war meant that it became harder to pretend they were drawing their portraits of the end in isolation from one another.

Chapter Three

The Bomb: Fiery Ends and Strategic Dilemmas

The creation of the atomic bomb gave focus to scientific apocalypticists who had feared the decline of *Homo sapiens* since Darwin published the *Origin of Species* in 1859. The atomic bomb turned the possibility of an undirected apocalypse into a probability. Popular science writers as well as science fiction writers immediately began to offer visions of atomic destruction after the bombings of Hiroshima and Nagasaki in August 1945. For American premillennialists, however, the advent of the bomb was less of a watershed event. Frank Kermode, an English literary scholar, in *The Sense of an Ending* (1966) argues that “it would be childish to argue, in a discussion of how people behave under eschatological threat, that nuclear bombs are more real and make one experience more authentic crisis-feelings than armies in the sky.”¹ The atomic bomb did not make the apocalypse anymore “real” for conservative American Protestants, but it did give Bible prophecy analysts further evidence that the apocalypse was approaching. Premillennialists had grasped that science could bolster their visions of the end beginning in the late nineteenth century. The atomic bomb became yet another way in which scientific revelation could support Biblical apocalypticism, lending support to an already strong apocalyptic tradition. For scientific apocalypticists the atomic bomb aided in bringing the scientific apocalyptic to the forefront of popular culture. Despite these differences, scientific and religious apocalypticists were agreed: the atomic bomb made the end of the world more likely than ever before.

¹Frank Kermode, *The Sense of an Ending: Studies in the Theory of Fiction*, new ed. (New York: Oxford University Press, 2000), 95.

When the scientists who helped create the bomb began to look back at the significance of their work, their memories were suffused with apocalyptic fears. In a 1942 summer meeting of physicists that J. Robert Oppenheimer, director of the Manhattan Project, assembled at Berkeley to discuss developing the bomb, Hungarian physicist Edward Teller proposed that an atomic explosion might ignite the atmosphere; he and other scientists worked out calculations that it would not, and work on the bomb proceeded. On the day of the first atomic bomb test, 16 July 1945, Italian physicist (and future Nobel Prize winner) Enrico Fermi resurrected the old fear, jokingly taking bets from his colleagues as to whether or not the Trinity shot would set fire to the atmosphere, thus ending the world or at least obliterating New Mexico.²

While the bomb did not blow up New Mexico, it still elicited apocalyptic musings from the scientists involved, at least in retrospect. Oppenheimer has famously said that the test brought to mind the *Bhagavad-Gita*, a text which Oppenheimer was often known to quote, when Vishnu says, “Now I am become Death, the destroyer of worlds.”³ I. I. Rabi, a Polish physicist who worked on the project, later described his reaction upon seeing the first nuclear explosion as first of joy, then “there was a chill, which was not the morning cold; it was a chill that came to one when one thought, as for instance when I thought of my wooden house in Cambridge, and my laboratory in New York, and of the millions of people living around there, and this power of nature which we had first understood it to be—well, there it was.”⁴

In fact, the scientists who toiled at Los Alamos had done so with the limited intention of beating the Germans to the invention of an atomic bomb; not until after the

² Richard Rhodes, *The Making of the Atomic Bomb* (New York: Simon & Schuster, 1986), 664.

³ *Ibid.*, 676.

⁴ *Ibid.*, 675.

Hiroshima and Nagasaki bombings did they realize that their creation was a world-changing event. After the successful test in July 1945, Leo Szilard, who had urged Albert Einstein to write the letter to President Franklin Roosevelt that led to the Manhattan Project, offered a petition urging that a demonstration of the bomb be given to the Japanese, rather than the surprise, outright use of it on a Japanese target. Many of the physicists at the University of Chicago who had worked on the problem of separating plutonium from uranium signed the petition. Many of the Los Alamos scientists, Fermi, Oppenheimer and Teller among them, did not sign the petition, saying that “in any case, physicists had no special competence on the moral question” over whether to use the bomb or mount an invasion of the Japanese mainland.⁵

Unlike the Los Alamos scientists who seemed to delay thinking about the long-term consequences of the bomb until after the end of the war, Truman grasped the apocalyptic potential of the bomb immediately. When he was informed of the successful test, he wrote in his diary, “We have discovered the most terrible bomb in the history of the world. It may be the fire destruction prophesied in the Euphrates Valley Era, after Noah and his fabulous Ark.”⁶

After the bombings of Hiroshima and Nagasaki, physicists began to openly voice concern that their work would lead to the destruction of mankind. Late in 1945, Oppenheimer met with Truman at the White House where he told the president that he felt as if he had blood on his hands; Truman proffered him a handkerchief in return.

After Oppenheimer’s departure, Truman told Dean Acheson, his Under Secretary of State

⁵ Roger Hilsman, *From Nuclear Military Strategy to a World Without War: A History and a Proposal* (Westport, CT: Praeger, 1999), 11.

⁶ Robert H. Ferrell, ed., *Off the Record: The Private Papers of Harry S. Truman* (New York: 1980), 55. Quoted in Ronald Takaki, *Hiroshima: Why America Dropped the Atomic Bomb*, 1st American ed. (Boston: Little, Brown and Company, 1995), 15.

at the time, that he did not want to see Oppenheimer again and reportedly complained, “‘Blood on his hands! Dammit, he hasn’t half as much blood on his hands as I have! You just don’t go around belly aching about it.’”⁷

Physicists turned to organizing and writing to broadcast their opinions. An early effort to convey the troubling implications of the bomb to Americans was a group of essays by physicists such as Hans Bethe, Einstein, Oppenheimer, and Szilard published as *One World or None* in 1946.⁸ These essays described the destructive effect the bomb could have on American cities and urged the world to unite in order to prevent a nuclear war from ever coming to pass. Many of the essays in *One World or None* were quite technical; not all of the physicists who contributed to the volume had mastered the art of explaining complicated scientific issues in a way the public could understand. But, some of the writers found ways to make the threat of atomic weaponry relevant to non-scientists.

Philip Morrison, a physicist who contributed to the invention of nuclear weapons at both the University of Chicago and Los Alamos, supplied a powerful essay titled “If the Bomb Gets Out of Hand.” Concluding that American readers could not properly visualize the scene at Hiroshima and Nagasaki, Morrison offered a portrait of an atomic attack on New York City.⁹ He described the injuries and radiation burns that New Yorkers going about their business would suffer, sketched the likely damage to

⁷Peter Michelmore, *The Swift Years: The Robert Oppenheimer Story* (New York: Dodd Mead and Company, 1969), 121-122. Quoted in Michio Kaku and Daniel Axelrod, *To Win a Nuclear War: The Pentagon’s Secret War Plans* (Boston: South End Press, 1987), 33. See also Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (New York: Simon and Schuster, 1995), 205.

⁸*One World or None*, ed. Dexter Masters and Katherine Way (McGraw-Hill Company, Inc., 1946).

⁹The American military confiscated all film made at the two sites in the days following the bombings; the footage was kept classified until the late 1960s.

structures, including famous ones like the Empire State building, and emphasized the long-range effect of radiation from the bomb. He ended his essay by warning:

New York City had thus suffered under one bomb, and the story is unreal in only one way: The bombs will never again, as in Japan, come in ones or twos. They will come in hundreds, even in thousands....If the bomb gets out of hand, if we do not learn to live together so that science will be our help and not our hurt, there is only one sure future. The cities of men on earth will perish.¹⁰

Morrison's essay illustrates how scientists grasped immediately that fear could be a powerful impetus to political reform. If Americans did not act to unify the world, then destruction of that caliber would be their fate. This was no cynical ploy, however. Physicists like Morrison were in a position to imagine how nuclear weapons would only become more powerful in the years to come. With the threat of extinction looming, Morrison portrayed how the end would look with an amount of detail that rivaled the descriptions of Armageddon by premillennialist writers. In spite of Oppenheimer's and other physicists' attempts to repent for their work on the bomb after 1945, science fiction writers regularly depicted scientists as being completely unconcerned with the consequences of their research to the detriment of all humanity.¹¹

While physicists such as Oppenheimer might have felt guilty about the bomb, the nuclear bombing of Hiroshima and Nagasaki in August of 1945 initially elated Americans; the U.S. had harnessed a new power that ended the war with Japan, averting the possibility of a bloody invasion of the Japanese mainland. Ron Hirschbein, a philosopher, writes in "Peace on Earth Without Goodwill Toward Men: Nuclear

¹⁰Philip Morrison, "If the Bomb Gets Out of Hand" in *One World or None*, ed. Dexter Masters and Katherine Way (McGraw-Hill Company, Inc., 1946), 6.

¹¹See especially Kurt Vonnegut, *Cat's Cradle* (New York: Delta Trade Publishers, 1998). See also L. Sprague De Camp, "Judgment Day" (1955) in *The Best of L. Sprague de Camp* (Garden City, NY: Nelson Doubleday, 1978); Philip K. Dick, *Dr. Bloodmoney, or, How We Got Along After the Bomb* (New York: Ace Books, 1965; reprint, Boston: Gregg Press, 1977).

Weapons and American Millenarian Aspirations” (1997) of the promise of nuclear power:

The advent of nuclear weapons culminated American faith in the redemptive power of what Walt Whitman called, ‘the strong, light work of engineers.’ The time in the Los Alamos desert, the epiphany at the Trinity test site, and the apocalyptic destruction of Hiroshima and Nagasaki were construed as the fulfillment of a resonant millenarian promise: evil was vanquished by a wondrous power ushering in a *pax Americana*. . . . According to the new civic eschatology, nuclear weapons would usher in the millennium: national salvation—unprecedented peace, prosperity and power—for the elect among nations.¹²

Popular culture reflected the celebratory response to the American development of the bomb. Americans listened to songs on the radio celebrating the power of the atomic bomb, such as Slim Gaillard’s late 1945 song “Atomic Cocktail.” Gaillard sang, “It’s the drink that you don’t pour /Now when you take one sip you won’t need anymore /You’re small as a beetle or big as a whale-BOOM-Atomic Cocktail.”¹³ Fred Kirby, a dj in North Carolina, wrote a song the week of the atomic bombings in Japan that was later recorded by the Buchanan Brothers in 1946. Called “Atomic Power,” the chorus announced, “Atomic power, atomic power /Was given by the mighty hand of God.”¹⁴ When the United States began further atomic testing on Bikini Atoll in 1945, a tiny, new bathing suit appeared, named the “bikini” after the tests.¹⁵

¹²Ron Hirschbein, “Peace on Earth Without Goodwill Toward Men: Nuclear Weapons and American Millenarian Aspirations” in *The Writing on the Cloud: American Culture Confronts the Atomic Bomb*, ed. Alison M. Scott and Christopher D. Geist (Lanham, MD: University of Press of America, Inc., 1997), 174.

¹³ Slim Gaillard, “Atomic Cocktail,” *Like an Atom Bomb: Apocalyptic Songs from the Cold War Era*, 2004 Chrome Dreams, compact disc.

¹⁴Fred Kirby, “Atomic Power,” *Like an Atom Bomb: Apocalyptic Songs from the Cold War Era*, 2004 Chrome Dreams, compact disc.

¹⁵ For more on the opinion of Truman and others that God gave Americans the bomb, see Paul Boyer, *By the Bomb’s Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon Books, 1985), 211.

Despite this early jubilant response, science fiction writers and popular non-fiction writers followed the lead of the scientists in *One World or None* in reformulating the scientific apocalyptic to be based on nuclear weapons; it was a vision in which Americans and perhaps all of humanity would have to pass through a fiery conflagration before achieving the “millennium.” A prominent historian of the Puritans, Perry Miller, acknowledged this apocalyptic when he wrote in “The End of the World” that “[t]he authors of the highly official *United States Bombing Survey* are not, I am persuaded, theologians or poets, and they probably did not know that they were falling into the pattern of a literary form more ancient, and more rigid than the sonnet. Yet artists of the apocalyptic vision would envy them the stark simplicity, as well as the perfect tense, of their summation: ‘The atomic bomb shattered the normal fabric of community life and disrupted the organizations for handling the disaster.’”¹⁶

Science fiction writers in particular saw themselves as prophets and educators of the new atomic age, a conclusion that scholars have also reached in recent years. Clifton Fadiman, commenting on Ray Bradbury in an introduction to a 1958 edition of *The Martian Chronicles* (1946), suggested that Bradbury “puts his aims all too casually when he says, ‘Science fiction is a wonderful hammer; I intend to use it when and if necessary, to bark a few shins or knock a few heads, in order to make people leave people alone.’”¹⁷ Charles William Sullivan in an introduction to *As Tomorrow Becomes Today* (1974), an

¹⁶ Perry Miller, “The End of the World” in *Errand into the Wilderness* (Cambridge, MA: Harvard University Press, Belknap Press, 1956), 238.

¹⁷ Clifton Fadiman, introduction to *The Martian Chronicles* by Ray Bradbury (Garden City, NY: Doubleday & Company, Inc., 1958).

anthology of science fiction aimed at high school students, contended that science fiction helps people prepare for the future and aids “problem recognition and solving.”¹⁸

American science fiction writers began to “knock heads” in early 1946, offering graphic visions of a destroyed Earth at the hands of irresponsible scientists and unrepentant humans. The apocalypses they described at first were gloomy and meaningless. The year 1946 saw several science fiction offerings in which humanity completely destroys itself with nuclear bombs. For instance, Philip Wylie, co-writer of *When Worlds Collide* (1933), published a short story in January of 1946 called “Blunder” in which a brief nuclear war devastates much of the earth, and an atomic energy experiment destroys the rest of the planet. The narrator comments at the end: “If Mars had inhabitants, they certainly rejoiced, for there was created in their chilly firmament a small but profligate sun where the earth had circled, blue-green, for two billion years.”¹⁹ Ray Bradbury’s *The Martian Chronicles* (1946) matched that bleak outlook. Set at the beginning of the twenty-first century, humanity destroys Earth through nuclear war and kills off the Martians by introducing bacteria when they arrive to establish colonies. Humanity wreaks similar havoc on its native planet in Edmond Hamilton’s “Day of Judgment” (1946). Hamilton’s story depicts the return of two humans from the stars to find that humanity has destroyed itself. Hamilton connected the end to evolution like

¹⁸ Charles William Sullivan, introduction to *As Tomorrow Becomes Today*, ed. Charles William Sullivan (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1974), 4. Paul Boyer has noted that major novelists in the United States did not address the bomb directly in their works, and that the bleakest portraits of an atomic future came from science fiction writers. See Boyer, *By the Bomb’s Early Light*, 246-247, 265.

¹⁹ Philip Wylie, “Blunder” in *Strange Ports of Call*, ed. August William Derleth (New York: Pellegrini & Cudahy, 1948), 379.

previous scientific apocalypticists; intelligent animals, mutations from a nuclear war, have taken humanity's place.²⁰

These initial desolate visions gave way to more complicated stories of protracted wars and the effects of radiation by the late 1940s and early 1950s. American novels such as Leonard Engel and Emanuel Piller's *World Aflame: The Russian-American War of 1950* (1947) and Will Jenkins's *The Murder of the US* (1947) featured nuclear war, limited in its effects.²¹ Even if nuclear war could lead to extinction, humans could choose what was best for the entire species instead of privileging nationalistic interests. For example, Americans rise above their desire for revenge after a devastating nuclear war in Theodore Sturgeon's "Thunder and Roses" (1947). Rather than destroying all life as in Wylie, Bradbury, and Hamilton's works, a character in Sturgeon's short story successfully convinces the military not to destroy the world: "We must *not* strike back. Mankind is about to go through a hell of his own making. We can be vengeful—or merciful, if you would sterilize the planet so that not a microbe, not a blade of grass could escape, and nothing new could grow. We could reduce the earth to a bald thing, dead and deadly."²²

Evolution took a new turn in stories of mutations created by radioactivity in other science fiction stories in the late 1940s. Radiation creates mutants who are horrifying to

²⁰ Edmond Hamilton, "Day of Judgment" in *The Last Man on Earth*, ed. Isaac Asimov, Martin Harry Greenberg, and Charles G. Waugh (New York: Fawcett Crest, 1982).

²¹ Leonard Engel and Emanuel Piller, *World Aflame: The Russian-American War of 1950* (New York: Dial Press, 1947); Will F. Jenkins, *The Murder of the U.S.A.* (Kingston, NY: Quinn Publishing Company, Inc., 1947).

²² Theodore Sturgeon, "Thunder and Roses" in *Nuclear War*, ed. Gregory Benford and Martin Harry Greenberg (New York: Ace Books, 1988), 36.

humans but destined to usurp *Homo sapiens* in short stories published in 1948 by American authors Judith Merrill, John D. MacDonald, and Margaret St. Clair.²³

The Soviet Union tested their first atomic bomb in 1949. Though Truman had told Oppenheimer of his belief that the Soviets would never be able to build the bomb, the Soviet accomplishment came as no surprise to science fiction writers who had been writing stories of atomic wars since the bombings of Hiroshima and Nagasaki.²⁴

Production of nuclear war stories and novels accelerated during the 1950s. The number of stories being written about nuclear war led the editor of *Galaxy*, a science fiction magazine, to call for a moratorium on nuclear war stories by 1952.²⁵

Beginning in the 1950s, writers combined other science fiction themes with the theme of nuclear war. Though nuclear concerns merged with stories of time travel, species displacement, cosmic disaster, robots, and aliens, nuclear weapons did not become just another one of many stock science fiction themes. Prior to 1945 writers had expressed anxiety over technology, the apocalyptic implications of Darwinism, and the potential for an apocalyptic natural disaster. In such stories and novels in the late nineteenth and early twentieth centuries, humanity was not unredeemable and so did not necessarily deserve species death. After 1945, humanity's production of nuclear weapons demonstrated the essentially degenerate nature of the species to American science fiction writers. While other species are destined to replace humanity in Arthur Porges's "The Rats" (1950), Clifford Simak's *City* (1952), Lewis Padgett's *Mutant* (1953), Philip K.

²³ Judith Merrill, "That Only a Mother" in *Countdown to Midnight: Twelve Great Stories About Nuclear War*, ed. H. Bruce Franklin (New York: Daw Books, Inc., 1984), 76-87; John D. MacDonald, "A Child Is Crying" in *The Science Fiction Galaxy*, ed. Groff Conklin (New York: Permabooks, 1950), 115-130; Margaret St. Clair, "Quis Custodiet..." in *The Science Fiction Galaxy*, ed. Groff Conklin (New York: Permabooks, 1950), 130-143.

²⁴Rhodes, *Dark Sun*, 241-242.

²⁵H. Bruce Franklin, "Nuclear War and Science Fiction" in *Countdown to Midnight: Twelve Great Stories About Nuclear War*, ed. H. Bruce Franklin (New York: Daw Books, Inc., 1984), 23-24.

Dick's "Planet for Transients" (1955), and Tom Godwin's "You Created Us" (1955), it is not merely because of the vagaries of natural selection.²⁶ These stories of species displacement have a moral component. Humanity has relinquished its place in evolution, either having destroyed itself through nuclear war or having created its successors through radiation. For instance, in Dick's "Planet for Transients," this is the reply to one character's assertion that *Homo sapiens* is the pinnacle of life on Earth:

Not any more. Earth is alive, teeming with life. Growing wildly—in all directions. We're one form, an old form. To live here, we'd have to restore the old conditions, the old factors, the balance as it was three hundred and fifty years ago. A colossal job. And if we succeeded, if we managed to cool Earth [by ridding it of radioactivity], none of this would remain. . . . In a way it's what we deserve. *We* brought the War. *We* changed Earth. Not destroyed—*changed*. Made it so different we can't live here any more.²⁷

Similarly, alien invasion fantasies in the 1950s emphasized humanity's uniquely debased character. The first major Hollywood film to criticize the arms race came in 1951, and it argued that if alien civilizations exist, they would probably be morally superior to Earth. *The Day the Earth Stood Still* featured an alien protagonist, Klaatu, who threatens the earth with destruction unless humans give up their warring ways and make peace. Fiction presented the same theme in print. For example, aliens force humanity to give up nuclear weapons and warfare in *Hero's Walk* (1954) by Robert Crane, and a benevolent Martian virus has the effect of increasing humanity's intelligence and ending war in William Tenn's "The Sickness" (1955). Even when humans are the ones who are technologically superior, serving as the rulers of an alien race instead of

²⁶ Arthur Porges, "The Rats" in *The Best Science Fiction Stories: 1952* (New York: F. Fell, 1952); Everett F. Bleiler and T. E. Dikty (New York: Frederick Fell, Inc., Publishers, 1952); Clifford D. Simak, *City* (New York: MacMillan Publishing Company, 1952); Lewis Padgett, *Mutant* (New York: Gnome Press, 1953); Philip K. Dick, "Planet for Transients" in *A Handful of Darkness* (London: Panther Books, 1980); Tom Godwin's "You Created Us" (1955) in *Best Science Fiction Stories and Novels 1956*, ed. T.E. Dikty (New York: F. Fell, 1956).

²⁷ Philip K. Dick, "Planet for Transients" in Philip K. Dick, *A Handful of Darkness* (London: Panther Books, 1980), 58-59.

being the ruled in H. Beam Piper's *Uller Uprising* (1952), they do not conquer another species out of benevolent aims but out of capitalistic ones.

Humanity's development of nuclear weapons, then, indicated to some writers in the United States that something was fundamentally wrong with the human species.²⁸ As a result of humanity's potential for self-destruction, robots are seemingly fitter to lead humanity than humans in Jack Williamson's *The Humanoids* (1948). In E.B. White's "The Morning of the Day They Did It" (1950), the sheer power of wielding such powerful weapons eradicates any sense of morality. The exchange between two soldiers manning a space platform with nuclear weapons aimed at enemies of the U.S. reveals the casualness that White felt Americans had towards nuclear weapons: "'See that continent down there, Obie? That's where old Fatso Recoil lives. You feel drawn toward that continent in any special way?' 'Naa,' said Obblington. 'You feel like doing a little shooting, Obie?' 'You're rootin' tootin' I feel like shootin'.'"29

White's conviction that humanity is inherently truculent was echoed in a 1954 novel. After a nuclear war completely destroys Earth, humans continue to fight among themselves on another planet in J. T. McIntosh's *Born Leader* (1954), leading a character to observe:

On the two worlds, Mundis and Secundis, there should be two flourishing, friendly settlements, patiently building up again what had been destroyed on Earth. Instead there were two groups preparing to fight, like the two last men alive battling for the honor of being last man alive. . . . Wasn't it [because of] a fault in every human being, a fatal flaw that was bound to mean the end of man this time, next time, the time after?³⁰

²⁸Philip K. Dick was unique in suggesting that the real problem is with the government who misleads its citizens into war for its own purposes. See Philip K. Dick, *The Penultimate Truth* (New York: Leisure Books, 1954); Philip K. Dick, *The Zap Gun* (New York: Dell Publishing, 1965).

²⁹E.B. White, "The Morning of the Day They Did It" in *The Second Tree from the Corner* (New York: Harper & Brothers Publishers, 1954), 59.

³⁰J. T. McIntosh, *Born Leader* (Garden City, NY: Doubleday & Company, Inc., 1954), 191.

Like McIntosh's novel, Walter M. Miller, Jr.'s *A Canticle for Leibowitz* (1959) pictured the earth as having recovered from a previous nuclear war and about to destroy society again through another.³¹

While most of the science fiction envisioning a nuclear apocalypse was by professional writers, Leo Szilard, a Hungarian physicist who became a U.S. citizen in 1943, tried his hand at science fiction. Having been inspired by his reading of *The World Set Free* in the 1930s, he believed in the power of fiction to persuade. As Michael Lewis notes, "Szilard's stories were motivated by the hope that what other people read as fiction might affect them much as H. G. Wells' novel of atomic power had affected him, opening up possibilities of alternative futures."³² Szilard's short stories on such topics as the role of scientists in solving problems presented by nuclear weapons appeared in publications like *The Bulletin of Atomic Scientists* and *The University of Chicago Magazine*. One particularly bleak example was "Report on Grand Central Terminal," written in 1948 and published in 1952. In "Report," aliens visit Earth and find all life extinct. When they figure out that the residents of Earth must have extinguished themselves in a nuclear war, their reaction is one of puzzlement: "Since the earth-dwellers who built all these cities must have been rational beings, it is difficult to believe that they should have gone to all this trouble of processing uranium just in order to destroy themselves."³³ A debate among the alien landing party ensues, with one observer suggesting that perhaps

³¹ Walter M. Miller, Jr., *A Canticle for Leibowitz*, Bantam Trade Paperbacks ed. (New York: Bantam Books, 1997).

³² Michael L. Lewis, "From Science to Science Fiction: Leo Szilard and Fictional Persuasion" in *The Writing on the Cloud: American Culture Confronts the Atomic Bomb*, ed. Alison M. Scott and Christopher D. Geist (Lanham, MD: University of Press of America, Inc., 1997), 100.

³³ Leo Szilard, "Report on the Grand Central Terminal" in *The Voice of the Dolphins and Other Stories* (New York: Simon and Schuster, 1961), 116. *The Voice of the Dolphins* is a collection of short stories that Szilard published in various places during the 1940s and 1950s.

divisions within humanity caused the war. Upon finding coins, a second member of the landing party theorizes that an irrational economic system may have led to scarcity, and then to war. The implication of Szilard's story was that something must be terribly wrong with the way humans live—racial division and capitalism being prime examples. Szilard's story served as warning of the catastrophic consequences if humanity did not unite in the face of the threat from nuclear weapons.

While writers were passing judgment on humanity in the form of fiction, during the 1940s and 1950s non-fiction appeared on how a nuclear war would affect the United States in particular. David Bradley's *No Place to Hide* (1948) and R. E. Lapp's *Must We Hide?* (1949) differed on just how devastating a nuclear war would be. Bradley, a doctor who served on Operation Crossroads (a series of atomic tests on Bikini Atoll in 1946), reported that there was no way to defend against nuclear weapons, no method for decontamination after radiation exposure, and no medical safeguards against the effects of nuclear weapons. He also believed that nuclear weapons were especially dangerous because they affected the land of nations bombed for hundreds of years after. He said, "It is not the security of a political system but the survival of the race that is at stake in the indiscriminate use of atomic energy for political coercion."³⁴

By contrast, Ralph E. Lapp, an American physicist, argued that the dangers of nuclear war were exaggerated, and that with proper education, nuclear war could easily be survived. He argued, "The atomic bomb is truly a powerful weapon; we do not wish to imply that it is not. On the other hand, it does do only *finite* damage and this fact must be appreciated."³⁵ Lapp believed that technology could ameliorate the effects of the

³⁴ David Bradley, *No Place to Hide* (Boston: Little, Brown, 1948), 165.

³⁵ R. E. Lapp, *Must We Hide?* (Cambridge, MA: Addison-Wesley Press, 1949), 74. Emphasis is his.

atomic bomb and suggested that the advent of the bomb presented an opportunity to better the lives of urban residents by forcing them to disperse.³⁶

Science fiction writers responded to the debate over nuclear war's effects with novels detailing the impact of nuclear war on a single town or family. Judith Merrill's *Shadow on the Hearth* (1950) showed one Chicago family battling radiation sickness and worrying about the fate of its patriarch who is missing for most of the book. Even though several of the characters become sick, they quickly recover. As if taking lessons from Lapp, the government is remarkably well-organized; emergency relief teams are in place and work to organize Chicagoans in the aftermath of the bomb. One doctor tells the family: "Oh, we've been getting ready for this a long time....Our country wasn't so dumb."³⁷ Similarly, Philip Wylie's *Tomorrow!* (1954) laid out the fate of two towns, one that prepares for nuclear war and one that does not. The moral of Wylie's novel was a repudiation of the notion that there is no defense against nuclear war: preparation means survival. A character in the novel writes in an editorial on civil defense that scientists' apocalyptic predictions should be taken seriously: "But today it is *not* the priest, *not* the self-appointed prophet with his crackpot interpretation of Daniel or the Book of Revelation, who says, 'The earth may end.' It is that very group of reasonable, orderly, unhysterical men upon whom society has learned, a little, to lean for comfort and truth: *the scientists themselves!*"³⁸

That the scientists themselves were warning of the End in Wylie's novel was not evidence that science had somehow become perverted; rather, if the scientists thought the world could end, then the characters in Wylie's novel deemed the threat serious. In the

³⁶ Ibid., 157, 180.

³⁷ Judith Merrill, *Shadow on the Hearth* (Garden City, NY: Doubleday & Company, Inc., 1950), 53.

³⁸ Philip Wylie, *Tomorrow!* (New York: Rinehart & Company, Inc., 1954), 123-124.

1950s, prior to the postmodern criticism of science and the environmental movement, Americans still had an enormous amount of confidence in scientists and tended to not contest their conclusions.

A scientific apocalypse had a scientific answer in Wylie's book. In both of these works, nuclear war is terrible but the characters are able to overcome the hardships and rebuild their towns. *Shadow on the Hearth* and *Tomorrow!* are rare examples of nuclear fiction that mirrored the government line on atomic warfare—that it was survivable with proper preparation. Their conception of a mild nuclear war was entirely believable until 1954 when the invention of the hydrogen bomb justified the more prevalent pessimistic visions of a nuclear apocalypse.

The United States began testing the hydrogen bomb in the Marshall Islands in 1954.³⁹ That same year a famous incident made public the danger of fallout. During a test of a hydrogen bomb on Bikini Atoll, men on a Japanese fishing boat, the *Lucky Dragon*, despite being officially out of the “danger” zone established by the U.S. military during its test, fell ill from radiation sickness. One man eventually died. The result was that the public became aware of the danger of fallout—not just in the case of war but also from nuclear testing. In 1959, *Consumer Reports* warned Americans about the presence of Strontium-90 in their milk as a result of atmospheric nuclear tests, while advertisements peddled comfortable shelters for the middle-class family in case of a nuclear attack. The upshot was that Merrill's and Wylie's visions began to seem hopelessly optimistic. Even if one survived the blast, the fallout would probably be fatal. Wylie even answered his own work with another novel in 1963 in which only thirteen

³⁹The United States tested its first thermonuclear device in 1952, but it was not until 1954 that it began testing a device that was actually feasible as a bomb.

Americans survive, returning to a more pessimistic approach like the one he had taken with “Blunder” in 1945.⁴⁰

As a result of these developments, historian Paul Boyer argues that the time period between 1954 and 1963 (the year of the Test Ban Treaty) was a time of heightened concern about nuclear weapons. During these years, civil defense was at the height its popularity, Americans were reading best-selling apocalyptic books like *On the Beach* (1957) by Australian author Nevil Shute, and movies like *Dr. Strangelove* (1964) and *Fail-Safe* (1964) hit the big screen. Adlai Stevenson in the 1956 presidential campaign spearheaded the idea of no more nuclear testing, while activists founded a protest group, the National Committee for a Sane Nuclear Policy (SANE), in 1957. That same year strategists and politicians began to worry about a perceived missile gap, as the Russians took the lead in the space race by launching Sputnik.⁴¹

Scientists continued to be active in nuclear politics in this period, arguing that abolition and world unity were the only solutions to the arms race. Linus Pauling, a scientist who won the Nobel Prize in Chemistry in 1954 and the Nobel Peace Prize in 1962, published *No More War!* (1958) in which he echoed the earlier arguments of *One World or None*. He exhorted Americans to support international agreements to end nuclear testing (which he hoped would lead to agreements on abolition).⁴² The price of not passing such agreements was considerable: “There is a real possibility that a great nuclear war would change the nature of the pool of human germ plasm in such a way that the human species, as we know it, would not survive. This danger is a significant one for

⁴⁰Philip Wylie, *Triumph* (Garden City, NY: Doubleday & Company, Inc., 1963).

⁴¹ Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon Books, 1985), 352-367. This is the final chapter in Boyer's book and provides an overview of American attitudes toward nuclear weapons from 1950 to 1980.

⁴² Linus Pauling, *No More War!* (New York: Dodd, Mead & Company, 1958), 12.

people living in every part of the world, but especially great for those in countries in which the nuclear war would be fought.”⁴³ Pauling used the specter of species destruction to argue that humans needed to change dramatically.

Despite the warnings of scientists like Pauling, Eisenhower’s Secretary of State, John Foster Dulles, made “massive retaliation” the reigning nuclear policy of Eisenhower’s administration. Massive retaliation was a clever way for the White House to keep the budget balanced by holding down costs of maintaining conventional forces, relying on nuclear threats “at places and times of American choosing” to any type of provocation for national security. “More bang for the buck” was the catchphrase describing this early policy. The policy of mutual assured destruction (MAD) eventually supplanted massive retaliation in the 1960s. MAD rendered nuclear weapons practically and politically unusable—as long as both the United States and the Soviet Union had enough nuclear weapons to destroy one another, employing these destructive weapons was suicide.

During this period there was a re-emergence of fiction that envisaged the total extinction of mankind from a nuclear war. The new and much more deadly H-bomb, the fear of fallout, and Russia’s seeming lead in the arms race resulted in American works like Mordecai Roshwald’s *Level 7* (1959) and Helen Clarkson’s “The Last Day” (1959).⁴⁴ The plots of both are the same: a community awaits the inevitable death of all life from fallout. As hopeless and meaningless as the apocalypses are in these works, these works were in the minority, much like the 1946 works that similarly pictured human extinction.

⁴³ Ibid., 149.

⁴⁴ Helen Clarkson “The Last Day” in *New Eves: Science Fiction About the Extraordinary Women of Today and Tomorrow*, ed. Jean Marie Stine, Janrae Frank, and Forrest J. Ackerman (Stamford, CT: Longmeadow Press, 1995); Mordecai Roshwald, *Level 7* (New York: McGraw-Hill Book Company, Inc., 1959).

Most writers continued to articulate that humanity deserved to undergo a trial-by-fire, but that some vestige of humanity would emerge stronger than before.

This idea was the theme of Pat Frank's *Alas, Babylon* (1959), which detailed the activities of a fictional small town, Fort Repose, in Florida after an all-out nuclear war cuts the town off from civilization. The town pulls together and fares quite well, cooperating to make sure everyone has food and essential supplies. Some characters find in the new situation a new purpose for their lives. The librarian of the town, whose services are suddenly quite valuable, thinks to herself: "It was strange, she thought, pedaling steadily, that it should require a holocaust to make her own life worth living."⁴⁵ Frank followed his novel with a non-fiction survival guide to nuclear war. Though his analysis of what the United States would be like after a nuclear war was hardly optimistic, he still urged people "to dig in" and try to survive the aftermath.⁴⁶

As nuclear war seemed more likely with the Russians' apparent lead in the arms race, nuclear strategists like Bernard Brodie and Herman Kahn debated the wisdom of deterrence in published books in the 1960s. Kahn, in particular, was known for analyzing the acceptable human collateral damage of a nuclear war. Kahn argued that Americans should prepare for limited nuclear war—he called MAD, or mutually assured destruction, a "war-gasm" in that the military planned to shoot off all its missiles in the case of an attack.⁴⁷ In the novel *Fail-Safe* (1962), the author uses a Herman Kahn-like character to question the morality of deterrence. Kahn appears as the coldly rational and ambitious

⁴⁵ Pat Frank, *Alas, Babylon* (New York: J. B. Lippincott Company, 1959), 154.

⁴⁶ Pat Frank, *How to Survive the H-Bomb...and Why* (Philadelphia: J.B. Lippincott Company, 1962). For a survivalist take on nuclear war that is wholly negative—imagining the complete collapse of morality—see Ward Moore, "Lot" (1953) in *Countdown to Midnight: Twelve Great Stories About Nuclear War*, ed. H. Bruce Franklin (New York: Daw Books, Inc., 1984), 108. See also the film that was based upon "Lot"—*Panic in the Year Zero* (1962).

⁴⁷ Kahn, *On Escalation: Metaphors and Scenarios* (Washington, D.C.: Frederick A. Praeger, Publishers, 1965), 194, n11.

Walter Grotteschele. In the following passage, Burdick and Wheeler drew upon the popular portrait of Kahn as someone who brutally and callously discussed the acceptable costs of a nuclear war:

There was a morbidity about his subject matter which somehow flowed over onto Grotteschele and gave him an aura. He was extremely careful never to discuss classified information in public, but even so he could draw a picture of how the United States would look after a thermonuclear first strike, the awful seductions of surrender, the number of children who would suffer malignant genetic defects from radioactivity.⁴⁸

Similarly, Philip Wylie's *Triumph* (1963) criticized Kahn and other theorists.

Triumph's nuclear war results in only thirteen American survivors; they escape death only because Australians come to their rescue at the end. One of the characters remarks on the war:

Operation Suicide, it was. Mutual suicide. The Rand Corporation, Kahn, all the rest, chatted about 'doomsday machines' and how to make them and then ignored the likelihood they'd *be* made. Sodium-jacketed H-mines. Depressed radiocobalt dusting a continent. It was *all* known to be possible. Only, von Neumann's *Theory of Games* was used by ten thousand dullards wearing uniforms or plastered with academic degrees, to extrapolate such wars, in an atomic age, that like *games* the United States might win.⁴⁹

Most nuclear fiction concluded that people like Kahn were only making the apocalypse more likely.

The following year a major Hollywood film appeared that disapproved of deterrence but with less moral outrage than *Fail-Safe* or *Triumph*. *Dr. Strangelove, Or: How I Stopped Worrying and Learned to Love the Bomb* was the result of director Stanley Kubrick's conclusion that deterrence could only be treated with absurdity. Kubrick was familiar with nuclear strategy; he subscribed to the *Bulletin of Atomic*

⁴⁸ Eugene Burdick and Harvey Wheeler, *Fail-Safe* (New York: McGraw-Hill Book Company, Inc., 1962).

⁴⁹ Philip Wylie, *Triumph* (Garden City, NY: Doubleday & Company, Inc., 1963), 262.

Scientists, which published the work of Kahn, Brodie, and physicists like Edward Teller. In addition, he talked with Kahn as well as Thomas Schelling, another nuclear strategist, about the possibility of accidental nuclear war. One scholar has alleged that the title character in Kubrick's movie is part Teller (in his occupation as a scientist pushing for nuclear weapons), part Henry Kissinger (in his appearance and accent), and part Kahn (in his research into the doomsday bomb).

Kubrick lifted dialogue and ideas out of Kahn's works. Perhaps the most vivid example of this comes in the war room when General Buck Turgidson urges the president to "choose between two admittedly regrettable but nevertheless distinguishable postwar environments." Turgidson insists, "I'm not saying we wouldn't get our hair mussed. But I do say no more than ten to twenty million killed, tops—depending on the breaks."⁵⁰ The general's dialogue invokes Kahn's phrase of "distinguishable postwar states" and mocks his declaration that the United States should consider that 50 million dead to be preferable to 100 million dead.

Both *Fail-Safe*, which also appeared as a film in 1964, and *Dr. Strangelove* concerned the problem of accidental nuclear war. In *Fail-Safe* the President of the United States is only able to prevent a nuclear war by sacrificing New York (and his wife who is visiting New York at the time) after a bomber mistakenly receives orders to bomb Moscow. Deterrence fails outright in *Dr. Strangelove*; the Russians fail to realize that a doomsday machine is pointless if no one knows about it. In assessing deterrence, both works suggested that it is impossible to "plan" for a nuclear war. *Fail-Safe*, however, is oddly more hopeful than *Dr. Strangelove*. One man is able to prevent

⁵⁰ Charles Maland, "Dr. Strangelove (1964): Nightmare Comedy and the Ideology of Liberal Consensus," *American Quarterly* 31, no. 5 (Winter 1979): 708.

nuclear war by making a difficult decision that puts the survival of humanity before nationalism; in *Dr. Strangelove*, one insane man is able to destroy the world. At the end of *Dr. Strangelove*, the characters are already preparing to prevent a “mine shaft gap” in the building of underground bunkers. But, both adopted the arguments of anti-war scientists like Szilard and Pauling: planning for nuclear war only increases its probability. Films like these subscribed to the philosophy that showing Americans the possible outcome of war was the best approach to increase awareness and change policy.

The second part of the title of *Dr. Strangelove*—“How I Learned to Stop Worrying and Love the Bomb”—was meant ironically, but nuclear apocalypse by the time of *Dr. Strangelove* was a static feature of American life. John F. Kennedy urged Americans to build shelters in 1961, prompting debates in *Time* magazine over “shelter ethics.”⁵¹ Kennedy and Khrushchev may have successfully resolved the Cuban Missile Crisis in 1963, but the narrow aversion of nuclear war reinforced the perpetual threat of nuclear apocalypse. Americans, much like Christians whose expectation of the Second Coming is ever present, learned to live with the knowledge that the world could end at any moment. Science fiction writers dealt with this knowledge by writing stories in which humanity survived a nuclear war to rebuild a better society another day.

The idea that nuclear war could bring about a secular millennium, or an age of peace for humanity, had started appearing in American science fiction in the late 1940s. In Bradbury's “The Other Foot” (1951), the millennium seems within grasp as nuclear

⁵¹See “Gun Thy Neighbor,” *Time*, 18 August 1961, <http://www.time.com/time/magazine/article/0,9171,872694-2,00.html> (accessed: 17 January 2007). Also, “The Sheltered Life,” *Time*, 20 October 1961, <http://www.time.com/time/magazine/article/0,9171,872787,00.html> (accessed: 17 January 2007).

war ends racial conflict among Americans.⁵² A character in Philip Wylie's *The Disappearance* (1951) embraces this idea of revolution through nuclear war; he speculates that the creation of the atomic bomb was the result of an unconscious desire on the part of humanity to start over.⁵³ Similarly, Bernard Wolfe describes an improved society through nuclear conflict in *Limbo* (1952): “Apparently the H-bomb had in one great continental sizzle accomplished what the reformers and uplifters had never been able to: with a spurt of social-engineering efficiency it had cleared the slums from America overnight.”⁵⁴ Robert Heinlein's characters in *Farnham's Freehold* (1964) are less liberal in their vision of a millennium but still see the possibility of a revolution through nuclear war: “[nuclear war] might be good for us. I don't mean us six; I mean our country. . . . This may be the first war in history which kills the stupid rather than the bright and able—where it makes any distinction.”⁵⁵

In the 1950s, writers developed the theme of freedom through nuclear apocalypse. American writers imagined wars that destroyed civilization, leaving in its wake a primitive society that had purged the worst elements of the culture responsible for nuclear war. Ray Bradbury hinted at this theme in “The Highway” (1950). A Mexican man and his wife, while working their land, encounter a young American who tells them that nuclear war has finally happened—“it's the end of the world.” The farmer turns to his wife and asks, “What do they mean, ‘the world’?”⁵⁶ Similarly, the main character in Jack Kerouac's *On the Road* (1955) reflects on the hollowness of civilization. While driving

⁵²Ray Bradbury, “The Other Foot” in *The Illustrated Man*, Grand Masters ed. (New York: Bantam Books, 1967).

⁵³Philip Wylie, *The Disappearance*, Bison Books ed. (Lincoln, NE: The University of Nebraska Press, 2004), 383.

⁵⁴ Bernard Wolfe, *Limbo* (New York: Random House, 1952), 93.

⁵⁵ Robert Heinlein, *Farnham's Freehold* (Baen Books, 2001), 33.

⁵⁶Ray Bradbury, “The Highway” in *The Illustrated Man* (New York: Bantam Books, 1967), 42.

to Mexico City, the main characters pass by groups of Indians standing on the side of the road:

All had their hands outstretched. They had come down from the back mountains and higher places to hold forth their hands for something they thought civilization could offer, and they never dreamed the sadness and the poor broken delusion of it. They didn't know that a bomb had come that could crack all our bridges and roads and reduce them to jumbles, and we would be as poor as they someday, and stretching out our hands in the same, same way.⁵⁷

In the sixties, two authors expanded this theme even further. In Edgar Pangborn's *Davy* (1964) and Piers Anthony's *Sos the Rope* (1968), a primitive society arises from the ruins of the United States. In both, society consciously rejects technology as evil. The title character of *Davy* wonders “whether the generations could some day restore the good of Old Time without the evil, and the ocean that was a voice in my mind suggested: Maybe soon, maybe only another thousand years.”⁵⁸ Characters in Piers Anthony's *Sos the Rope* (1968) worry that people will turn back to old ways:

Now you travel in large tribes and you fight for other men when they tell you to. You till the land, working as the crazies do, because your numbers are too great for the resources of any one area. You mine for metals, because you no longer trust the crazies to do it for you, though they have never broken trust. You study from books, because you want the things civilization can offer. But this is not the way it should be. We know what civilization leads to. . . . It brings competition for material things you do not need. Before long you will overpopulate the Earth and become a scourge upon it, like shrews who have overrun their feeding grounds.⁵⁹

According to Boyer, public attention to nuclear weapons dropped away after 1963, the year of the Test Ban Treaty. By placing nuclear tests underground, the treaty

⁵⁷ Jack Kerouac, *On the Road* (New York: Penguin Books, 1997), 298.

⁵⁸ Edgar Pangborn, *Davy* (New York: Ballantine Books, 1973), 265.

⁵⁹ Piers Anthony, “Sos the Rope” in *Battle Circle* (New York: Avon Books, 1978), 162. See also A.M. Lightner, *The Day of the Drones*, Bantam ed. (New York: Bantam Books, 1970). For works that imagine degraded groups of humans amidst the rubble of civilization, see Walter van Tilburg Clark, “The Portable Phonograph” in *Bangs and Whimpers: Stories about the End of the World* (Chicago: Lowell House, 1999), 151; Harlan Ellison, “A Boy and His Dog” in *The Beast that Shouted Love at the Heart of the World* (New York: Avon, 1969); *Glen and Randa*, directed by Jim McBride (1971).

soothed a lot of anxieties surrounding nuclear weapons; it seemed to remove the threat from fallout. The treaty gave the public hope that politicians were attempting to address the threat from nuclear weapons, and with the nuclear tests gone from newspaper headlines, the issue receded into the background. Boyer further argues that the seeming promise of nuclear power to transform the world also lessened fears about its apocalyptic aspects. Nuclear power plants seemed to hold the key to the world's future by solving the problem of dwindling natural resources like coal and oil.⁶⁰ Boyer also contends that the rise of nuclear strategy, which "had become an esoteric, complex pursuit involving computers, game theory, and specialized technical vocabulary," put nuclear strategy out of the reach of ordinary citizens, who responded with disengagement.⁶¹ Perhaps the most important reason, in Boyer's view, for a decline in public interest in nuclear issues is that the Vietnam War absorbed public energies regarding communism and liberal desires for peace; in 1965 Johnson dramatically increased the American commitment in response to a Viet Cong attack on an American base in Pleiku, and the debate over U.S. involvement in Vietnam began in earnest.

Nuclear apocalyptic speculation in science fiction continued in the seventies, but the number of such stories and novels dramatically declined. At least two authors during the seventies belatedly wrote books about the failure of shelters to protect humanity from fallout, resulting in the extinction of all life on Earth.⁶² Nevertheless, concern about nuclear weapons began to shift by the late 1970s to the ecological effects of nuclear energy. In 1979, the debut of *The China Syndrome*, a movie in which an accident at a

⁶⁰ See, Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge, MA: Harvard University Press, 1988), 174-176.

⁶¹ Boyer, *By the Bomb's*, 358.

⁶² Elizabeth Benoist, *Doomsday Clock* (Naylor Company, 1975); Dan Ljoka, *Shelter* (Manor Books, 1977).

nuclear power plant almost destroys the surrounding area, preceded only by weeks the near-meltdown of a nuclear energy plant at Three Mile Island in Pennsylvania. The result was an outcry over the potential devastation and pollution that could arise if a nuclear energy plant did suffer a meltdown.

Between the nuclear bombings of Hiroshima and Nagasaki in 1945 and the Three Mile Island incident in 1979, nuclear war in science fiction was often the result of some inherent flaw within *Homo sapiens*. The war offered either a chance to purge the species itself, often leading to a superior human, or an opportunity to establish a better future. A few science fiction writers directly addressed the problem of finding meaning in the light of a scientific apocalypse. In Ray Bradbury's *The Martian Chronicles* (1946), one character offers the following analysis:

[The Martians] knew how to live with nature and get along with nature. They didn't try too hard to be all men and no animal. That's the mistake we made when Darwin showed up. We embraced him and Huxley and Freud, all smiles. And then we discovered that Darwin and our religions didn't mix. Or at least we didn't think they did. We were fools. We tried to budge Darwin and Huxley and Freud. They wouldn't move very well. So, like idiots, we tried knocking down religion. We succeeded pretty well. We lost our faith and went around wondering what life was for. . . . We were and still are a lost people.⁶³

If in the late 1940s it appeared to writers like Bradbury that humanity had given up on faith, in the 1950s and 1960s, American writers more often suggested that the problem of nuclear war itself was too big for God. In Philip Wylie's 1955 *The Answer*, both the Americans and Russians accidentally shoot down an angel during an atom bomb test who fails in his mission to tell each side to "love one another." In 1967, Harlan Ellison published Damon Knight's short story that another publisher had suggested only the *Atheist Journal* in Moscow would publish. In "Shall the Dust Praise Thee?" the Day

⁶³Ray Bradbury, *The Martian Chronicles* (Garden City, NY: Doubleday & Company, Inc., 1958), 86.

of Judgment arrives complete with the angels carrying their vials, but God and his angels find no sign of human life. They realize that a nuclear war has extinguished humanity. God only finds a sign that reads, ‘WE WERE HERE. WHERE WERE YOU?’⁶⁴

Whether humanity had lost faith before the creation of the nuclear bomb or the nuclear bomb had caused humanity to lose faith, scientific apocalypticists tried to find meaning and purpose in the face of nuclear apocalypse. In doing so, they imagined scenarios—a sinful humanity passing through a trial by fire—that were similar to those of premillennialists. As a scientific apocalypse became an unrelenting threat, scientific apocalypticists became more likely to echo the language and formulas of premillennialists.

While scientific apocalypticists tried to make sense out of an existence threatened by nuclear annihilation, conservative evangelicals easily incorporated the atomic bomb into their visions of the end, concluding that it was yet another sign that Christ would be returning soon. Premillennialists did not really respond to the use of the atomic bomb in Japan. Only one conservative evangelical publication, the *Christian Herald*, edited by Methodist and evangelical minister Daniel Poling, printed an article on the atomic attack on Japan and not until four years afterward. This article by a Methodist pastor in Hiroshima titled “I Went Through Hiroshima’s Hell” merely emphasized that God could work even through such a horrible weapon as the atomic bomb.⁶⁵

Conservative evangelicals did, however, almost immediately consider the significance of the bomb for their apocalyptic beliefs. Boyer has analyzed the connection between Bible prophecy and nuclear warfare in *When Time Shall Be No More: Prophecy*

⁶⁴Damon Knight, “Shall the Dust Praise Thee?” in *Dangerous Visions*, ed. Harlan Ellison (New York: Simon & Schuster, Inc., 2002), 343.

⁶⁵Kiyoshi Tanimoto, “I Went Through Hiroshima’s Hell,” *Christian Herald* 72, no. 2 (February 1949): 17.

Belief in Modern American Culture (1992). According to Boyer, right after the first explosion of the bomb, many became convinced that Armageddon had to be near—seeing in the destructive power of the bomb the fate of the world as predicted in the Bible.⁶⁶ After these initial post-Hiroshima prophetic musings, in Boyer’s account a second wave of prophecy writing occurred in the mid-fifties, coinciding with the testing of the hydrogen bomb. Boyer describes the evidence that these writers offered: they “interlaced their discussions of the nuclear threat with a stock set of proof texts: the vision of a melting earth in II Peter; the crescendo of catastrophes in John’s Apocalypse; the all-consuming conflagration and terrifying astronomical events woven through the book of John’s three short chapters[;] . . . and the prophet Zechariah’s terrifying description of Jehovah’s judgment on Israel’s enemies.”⁶⁷ These passages, with details of worldwide destruction and human suffering as a result of the final battle of Armageddon, lent themselves to nuclear comparisons. Some prophecy writers, certain of the fate of the world, did not support governmental policies either of building up nuclear weapons to face down the communists or the idea of potential benefits from nuclear power.⁶⁸ Unlike scientific apocalypticists who struggled with how to interpret the seeming certainty of nuclear war, nuclear destruction, for conservative evangelicals, was both a terrible and marvelous fate: humanity could not avoid Armageddon because it was necessary to usher in the millennium.

While the atomic bomb suggested to many conservative evangelicals that Christ's return was imminent, premillennialists initially seemed more concerned with continuing

⁶⁶ Paul Boyer, *When Time Shall Be No More: Prophecy Belief in Modern American Culture* (Cambridge, MA: Harvard University Press, 1994), 115-118.

⁶⁷ Boyer, *Time*, 123.

⁶⁸ Boyer, *Time*, 124-125.

their project of using new scientific discoveries to argue for Bible prophecy's continued relevance than with worrying over the nature of nuclear war. Sam Swain, a non-denominational pastor in Akron and Nashville, wrote what seems to be the earliest attempt to correlate the findings of nuclear physicists with apocalyptic passages in the Bible. In *The Atomic Bomb and The World's End* (1946) Swain actually begins his analysis with Genesis: “‘The earth was without form and void.’ If we understand rightly the nature of atoms, as literal bullets of energy, it will be readily seen that God spoke the atomic world into being, or existence. . . . **When man discovered how to release the power, or the energy of the atom, he literally discovered the secret of the universe, and touched the hem of God’s garment.**”⁶⁹ Swain respected the opinions of scientists:

Scientists tell us, ‘that the time must surely come, when the last erg of energy has spent itself. Then, whatsoever active life may be left in the universe at that time, must immediately cease.’ The declaration of Isaiah 51:6, as well as many other Biblical statements that, the only progress of the universe, including the inhabitants, is to the grave, is amply vindicated in the observations and conclusions of modern science.⁷⁰

In Swain’s view, the discovery of nuclear fission “is a monument to the patience, skill and intellectual keenness, with which men have probed into the hidden secrets of God’s atoms. As a result of their studies and researches, we know vastly more about the amazing intricacies of the universe which God made.”⁷¹ Swain did not see nuclear energy as necessarily evil, even if the Antichrist, according to Swain, will undoubtedly use atomic weapons. Swain claimed the conflagration described in chapter 8 of

⁶⁹ Sam Swain, *The Atomic Bomb and The World's End* (Akron, OH: National Spiritual Defense Crusade, 1946), 11. Emphasis is Swain's.

⁷⁰ *Ibid.*, 22.

⁷¹ *Ibid.*, 43.

Revelation must be the result of an atomic bomb.⁷² God's kingdom on Earth during the millennium that follows the Tribulation period, Swain argued, will benefit from the "blessings of atomic energy."⁷³ When God destroys the earth at the end of the millennium, he too will use atomic power in Swain's account: "Peter says, 'That it melts with fervent heat, that all these things are dissolved.' Dissolved! How scientific is the New Testament after all!"⁷⁴

Proving that the New Testament was "scientific" was not Swain's concern alone. *This Atomic Age and the Word of God* (1948) by Wilbur M. Smith, a neo-evangelical Presbyterian preacher and faculty member variously at Moody Bible Institute, Fuller Theological Seminary, and Trinity Evangelical Divinity School, also alluded to nuclear physics. Swain believed that atomic energy was so significant that it could explain God's awesome power. Smith also emphasized the importance of the bomb but saw its advent as a critical crossroads for humanity since it was now easier to eradicate human life.⁷⁵ The biblical passage in 2 Peter 7, 10-14 that suggests the end of the world shall occur by fire only confirmed that humanity was teetering on the edge of oblivion in Smith's account.⁷⁶ Smith thought it described the effects of the bomb, arguing like Swain that Peter's prediction regarding the "dissolution of elements" (elements being atoms in Smith's analysis) invokes the principle of nuclear fission.⁷⁷ Smith also devoted a short chapter to a verse in Revelation that states that men shall hide in caves and in the

⁷² Ibid., 47.

⁷³ Ibid., 51.

⁷⁴ Ibid., 59.

⁷⁵ Wilbur M. Smith, *This Atomic Age and the Word of God* (Boston: W. A. Wilde Company, 1948), 41.

⁷⁶ As quoted in Smith, 126: "But the heavens that are now, and the earth, by the same word have been stored up for fire, being reserved against the day of judgment and destruction of ungodly men. . . . But the day of the Lord will come as a thief; in which the heavens shall pass away with a great noise, and the elements shall be dissolved with fervent heat, and the earth and the works that are therein shall be burned up."

⁷⁷ Ibid., 132.

mountains, remarking that some believe that underground may be the only place humans can survive an atomic blast.⁷⁸

Swain's and Smith's interpretation of passages in 2 Peter and Revelation as presaging the bomb became standard in Bible prophecy. Billy Graham, who during this period became a leading neo-evangelical voice, effectively incorporated anti-communist and apocalyptic fears along the lines of Swain and Smith into a series of revivals in 1949 that solidified his reputation as a powerful and effective evangelist. In 1950, six sermons Graham preached at revivals were published; these sermons show how he was able to use both anti-communism and images of Armageddon to encourage his audience to repent.⁷⁹ Addressing an audience in Los Angeles, he cited both communism and the threat of atomic war among the reasons America needed a revival. He thundered, "Communism . . . has decided against God, against Christ, against the Bible, and against all religion," adding that it is "a religion that is inspired, directed and motivated by the Devil himself who has declared war against the Almighty God."⁸⁰ He preached that the Russians were against the United States just as much as against God. That they have the bomb, Graham asserted, suggests that Christ must be returning soon. He inserted an apocalyptic moment in one sermon to make more meaningful his call to conversion: "[n]ow for the first time in the history of the world we have the weapon with which to destroy ourselves—the atomic bomb. I am persuaded that time is desperately short! . . ." For Graham this meant that "[w]e need a Holy Ghost, heaven-sent revival!"⁸¹ Graham was more interested in saving souls than explaining Biblical passages in the light of modern

⁷⁸ Ibid., 271-282, 313-322.

⁷⁹ "Revival in Our Time," in *The Early Billy Graham Sermon and Revival Accounts*, ed. Joel A. Carpenter (New York: Garland Publishing, 1988), 55.

⁸⁰ Ibid.

⁸¹ Ibid.

science. The little attention he paid to the bomb was short-lived among conservative evangelicals; the fear of communism and what it was doing to society came to overshadow everything else.

While scientific apocalypticists spent the 1950s obsessing about nuclear weapons, during the same decade, religious apocalypticists did not continue to use new developments in nuclear science—the advent of the H-bomb and the “discovery” of fallout—to strengthen Bible prophecy. Communism was a greater concern for conservative evangelicals during the fifties. In the 1960s, however, conservative evangelicals again addressed the atomic bomb alongside communism. At this time, many of the most popular scientific apocalyptic works about the bomb were published or filmed. Boyer suggests that concerns over fallout revitalized Bible prophecy, but the fear that communist gains were hastening the appearance of Antichrist may have been more responsible for animating premillennialists.

In the sixties, premillennialists particularly fretted over the possibility of allowing the communists to get ahead in building nuclear weapons and continued to caution against accepting communist peace overtures. Earlier, nuclear war had seemed inevitable because of the likely use of nuclear weapons in the battle of Armageddon. Now it was much more important to oppose anything that the Antichrist might support. In the dispensational premillennialist interpretation of Revelation, the Antichrist will usher in world government, world religion, and world peace, so disarmament became a more significant sign of the impending apocalypse than did armament for some Christians. For instance, Carl McIntire (founder in 1941 of the American Council of Churches) distributed a pamphlet in July 1961 on a Christian “Communist peace conference” that

had been held in Prague, Czechoslovakia the previous month. According to McIntire, the conference argued for the “Commie line which Khrushchev has been promoting— ‘peaceful co-existence,’ ‘complete disarmament.’”⁸² The conference called for disarmament and an end to testing of nuclear weapons and advocated that “the colonial powers” spend the money that they have been expending on armaments on ending world social ills like poverty.⁸³ Denouncing nuclear war as “irresponsible,” the statement issued at the conference also suggested that the use of nuclear weapons would be “a sin against God.”⁸⁴ McIntire cited the conference’s released statement as “one of the most important developments in the over-all Communist promotion and use of religion.”⁸⁵

This fear regarding communist gains in atomic weaponry extended to the debate over testing. In 1962 some evangelicals entered the public debate over nuclear tests, prompted by a moratorium on atmospheric testing (which culminated in the Test Ban Treaty the following year). In March of that year, a group of conservative Protestant ministers in San Francisco sent President Kennedy a telegram pledging their support of resuming atmospheric testing “because the issue in today’s world is clearly between a free world and a slave world, and because the freedom of mankind is in a very real sense dependent upon the military security of the United States of America.”⁸⁶ Gabriel Courier of the *Christian Herald* in the following month warned in a small news brief that if only the U.S.S.R. had the bomb, peace would certainly not rule the day. He cautioned, “there

⁸² Carl McIntire, “A Communist Peace Conference,” 20th Century Reformation Hour, (July 1961), 1.

⁸³ “Christian World Peace Meeting,” *The Witness* 46, no. 24 (13 July 1961), 2. Distributed as part of McIntire’s pamphlet cited above.

⁸⁴ “Peace Assembly Holds War ‘Irresponsible’ in Atomic Age,” *Ecumenical Press Service* (23 June 1961), 4. Distributed as part of McIntire’s pamphlet cited above.

⁸⁵ *Ibid.*, 5.

⁸⁶ Press release, “Ministers of the Gospel of Christ in Support of Nuclear Test Resumption,” March 28, 1962.

are things more dangerous than testing, and not testing is one of them.”⁸⁷ Like McIntire, these Christians thought having nuclear weapons would be important in the future fight against the godless forces of the Antichrist.

Aside from fears that the end to testing would be giving in to communist peace overtures, conservative Christians also struggled over the issue of how to remain Christian in the aftermath of a nuclear war. A number of conservative evangelicals accepted the idea being popularized in science fiction that nuclear war would not necessarily mean the end of the world. While the reality was that few Americans were building shelters—over 90% not building shelters or accumulating supplies according to a Gall-up poll—the image of a family fighting off others from entering their shelter, built only to support a few, entered popular culture.⁸⁸ Frank's *Alas Babylon* featured a character who concluded in the aftermath, “[w]ith the use of the hydrogen bomb, the Christian era was dead, and with it must die the tradition of the Good Samaritan.”⁸⁹ This pronouncement of the death of the Christian era was what some Christians feared would actually happen after a nuclear attack during the 1960s.

The fundamentalist *Moody Monthly* dramatically addressed these fears in two articles in February and April of 1962 on how the Christian should respond to nuclear war. The author of these two articles, evangelist Robert A. Cook asserted that Christ had predicted “wars and rumors of wars” up until he returned.⁹⁰ That nuclear war will occur is a fact with which Christians must contend, according to Cook. “World evangelization,” Cook pronounced, is the only purpose a Christian should have in

⁸⁷ Gabriel Courier, “Gabriel Courier Interprets the News: ‘Atom Bomb Tests,’” *Christian Herald* (April 1962): 6.

⁸⁸ J. Ronald Oakley, *God's Country: America in the Fifties* (New York: Dembner Books, 1986), 368.

⁸⁹ Frank, *Alas Babylon*, 98.

⁹⁰ Robert A. Cook, “Why Do You Want to Live Through?” *Moody Monthly* (February 1962): 21.

attempting to survive an atomic blast. In Cook's view, only the selfish would want to die and lose the opportunity to continue to spread the word of God to survivors. Far from Randy Bragg's lamentation that nuclear war mean the Christian era was over, in Cook's analysis, nuclear war was an opportunity to show the world what Christianity was all about. The implication was that while terrible, nuclear war would not necessarily be the end of the world. Christians would still have work to do in preparing the world for Christ's return.

The late 1960s and 1970s witnessed a virtual explosion of Bible prophecy interest; often these prophecy books addressed the possibility of nuclear war. Israel had always been at the center of prophecy belief, especially with the establishment (or re-establishment depending on the perspective) of the nation in 1948, which seemed to be foretold in the Bible. The 1967 Six Days' War in which Israel captured Jerusalem and expanded its boundaries considerably seemed to promise a future in which the old temple could be rebuilt, an event that many fundamentalists felt was necessary for Christ to return. Additionally, as the 1960s wore on, many conservatives felt that society was decaying; drug use was increasing, women were taking the Pill and engaging in premarital sex, protests and riots pervaded the cities, and secularism seemingly had taken hold of the country as the Supreme Court ruled against the Lord's Prayer in schools in 1963. These social changes suggested to Bible prophecy believers that the decay of society that was to occur before the Second Coming was already transpiring. America's failure to smash the communist threat in Vietnam added further fuel to the fire. Nixon followed a policy of *détente*, which entailed a soothing of relations with the Soviet Union through actions like signing the SALT I treaty in 1972 that, among other things, froze the

number of missiles each country had. This policy had the whiff of giving in to communist peace overtures, against which figures like Smith and McIntire had warned.

During this period the production of scientific apocalypticism surrounding nuclear weapons waned, but as this was an exciting time for Bible prophecy believers, nuclear weapons were once again incorporated into premillennialist visions of the end. The new prophecy writings differed from the earlier works by Swain and Smith. Geopolitical events were followed carefully and described as straight out of the Bible. These writers seemed to have little hope for American society, which literally seemed to be falling apart and approaching judgment from God. Nuclear war was an inevitable part of the last battle of Armageddon, and no more articles appeared on bomb-shelter ethics.

Lehman Strauss, a Baptist minister and a graduate of the Dallas Theological Seminary, wrote two works in 1965 and 1967 that addressed the role of the bomb in Armageddon. In *God's Plan for the Future* (1965), he saw in recent scientific accomplishments signs of the apocalypse: "While there will doubtlessly be newer and more astounding scientific discoveries if Christ does not come soon, man's attempt to invade and take over other planets will be halted by God. And I am inclined toward the belief that this divine intervention will be executed through the Second Coming of Christ."⁹¹ Citing the development of weapons that could allow humanity to destroy itself, Strauss asserted:

We are witnessing, in this twentieth century, the collapse of civilization. It is obvious that we are advancing toward the end of the world. Science can offer no hope for the future blessing and security of humanity, but instead it has produced devastating and deadly results which threaten to lead us toward a new Dark Age.⁹²

⁹¹ Lehman Strauss, *God's Plan for the Future* (Grand Rapids, MI: Zondervan Publishing House, 1975), 20.

⁹² *Ibid.*, 173, 186.

In his 1967 *The End of This Present World*, Strauss cited the belief of 1960s writers that the Antichrist will use the atom bomb to control the world.⁹³ He made a similar assertion as Smith and Swain: “Man may have discovered how to harness and use God’s atom, but not until Armageddon will the earth know the full strength of fire from heaven. The Apostle Peter gave to us a prophecy concerning a final conflagration on the earth when the elements shall melt with fervent heat (II Peter 3:7-14).”⁹⁴ Using science to support his interpretation of Revelation and 2 Peter made sense to Strauss since “[t]rue science is never out of harmony with what the Bible teaches. When the truth of God’s Word on this subject escapes the notice of a scientist so-called, it is because he wants it to do so.”⁹⁵

Two prolific writers on Bible prophecy, Salem Kirban and Hal Lindsey, detailed the signs that suggest the Second Coming is imminent. While Kirban, like many writers before him, emphasized in *Guide to Survival* (1968) that the mere existence of nuclear weapons suggested an approaching apocalypse,⁹⁶ Lindsey's *The Late Great Planet Earth* (1970) went further in detailing the events he believed would happen during the Tribulation period, including nuclear war. He predicted a geopolitical alteration in the international balance of power: “[a] definite realignment of nations into four spheres of political power had to occur in the same era as this rebirth of Israel.”⁹⁷ Lindsey wrote that these four spheres of power will be involved in Israel somehow and will help to start the last war—“Armageddon”—which will nearly destroy the earth before the divine

⁹³ Lehman Strauss, *The End of This Present World* (Grand Rapids, MI: Zondervan Publishing House, 1976), 49.

⁹⁴ *Ibid.*, 93.

⁹⁵ *Ibid.*, 121.

⁹⁶ Salem Kirban, *Guide to Survival* (Huntingdon Valley, PA: Salem Kirban Inc., 1968), 40, 83, 172.

⁹⁷ Hal Lindsey, *The Late Great Planet Earth* (Grand Rapids, MI; Zondervan Publishing House, 1970), 42.

intervention at the climax of the Tribulation. Nuclear war will occur in his scenario, but just as humanity has almost extinguished itself, Christ will return, rout the satanic forces, judge all of humanity, and establish one thousand years of peace under his reign.⁹⁸

Lindsey, in describing the final battle of Armageddon, repeatedly suggested that God's judgment would take the form of nuclear war. He expanded upon the interpretations of earlier prophecy interpreters. For instance, according to Lindsey, in Ezekiel it is said that Gog will have fire rained upon it—Lindsey predicted that this would be in the form of nuclear missiles.⁹⁹ Revelation, he recounted, tells of entire cities being destroyed; most likely, in his estimation, it will be by nuclear weapons.¹⁰⁰ Lindsey, at the end of *The Late Great Planet Earth*, warned his readers to “[l]ook for some limited use of modern nuclear weapons somewhere in the world that will so terrify people of the horrors of war that when the anti-Christ comes they will immediately respond to his ingenious proposal for bringing world peace and security from war.”¹⁰¹ Lindsey's book was the best-selling non-fiction book of the 1970s, and subsequent Bible prophecy writers had trouble ignoring his interpretations.

Salem Kirban's next book, *666* (1970), was a fictional description of the Tribulation and Second Coming of Christ. As in Lindsey's account, Armageddon is fought with nuclear weapons: for instance, the Chinese-Russian army nukes Europe.¹⁰² Kirban also offered a complicated scientific explanation for the upheavals the Earth will

⁹⁸ Ibid., 146-168. The role of the Antichrist in bringing about worldwide peace is one reason why fundamentalists who subscribe to such prophecy beliefs are suspicious of any sort of overtures of peace especially if those who attempt to instate it have dubious political sensibilities. For instance, some rewarded Henry Kissinger for his *realpolitik* tactics in the Middle East during the early 1970s by intimating that he was the Antichrist. See, Boyer, *Time*, 207.

⁹⁹ Ibid., 161.

¹⁰⁰ Ibid., 166.

¹⁰¹ Ibid., 185.

¹⁰² Salem Kirban, *666* (Wheaton, IL: Tyndale House Publishers, 1970), 237.

experience during the Tribulation, attributing the catastrophes to both nuclear explosions and pollution. A character warns the Antichrist:

recent nuclear explosions combined with air pollutants have caused some sort of cosmic chaos. The moon's rotational period is now matching that of the earth and this is eliminating the tidal drag....The *sun* is continuing to exert tidal pull, further slowing down the earth. The sun also may cause the moon to reverse direction and move closer to the earth until the moon is torn apart at a distance of 10,000 miles. Earthquakes, enormous tides will result...but even more catastrophic, the expansion of the sun in its dying throes will cast off an intense heat...a heat so intense that it might kill everything on earth.¹⁰³

Kirban was not alone in his creativity. In *Before the Last Battle—Armageddon* (1971), Arthur E. Bloomfield, a Methodist minister, wrote that Habakkuk 1:10 reveals that the Antichrist will have a superior weapon to nuclear bombs that will enable him to take control of the world:

'He [the Antichrist] will heap UP dust and take it. He will take a stronghold by throwing dust at it! The best the commentators can do with that is to say that he will throw up a pile of dust and hide behind it. But the commentaries were written before anybody knew anything about radio active dust . . . Dust is his weapon of conquest. Today scientists could tell us the exact nature of that dust.'¹⁰⁴

Bloomfield suggested that "fallout" is described as destroying Babylon in Jeremiah: "we do not know who these Medes are that are used to destroy Babylon. They evidently will have some kind of atomic power because Revelation indicates a 'fall-out.'"¹⁰⁵

Bloomfield, however willing he was to apply scientific causes to events during the last days, did not go as far as Swain and Smith in their initial elation over the power of the atomic bomb: "[t]he Day of the Lord is no ordinary judgment. It is not a calamity that comes as a result of natural causes, or the acts of men. It is not, for instance, the atomic

¹⁰³ Ibid., 257.

¹⁰⁴ Arthur E. Bloomfield, *Before the Last Battle—Armageddon* (Minneapolis: Bethany Fellowship, Inc., 1971), 134.

¹⁰⁵ Ibid., 160.

bomb. It is not even divine retribution on a wicked generation. It is the consummation of redemption.”¹⁰⁶

Tim LaHaye, a pastor who trained at Western Theological Seminary in Michigan, similarly backed away from the idea that nuclear war would necessarily be the manner of humanity's judgment in *The Beginning of the End* (1972). LaHaye reported:

I am frequently asked at prophecy conferences, ‘Will this world be destroyed by an atomic holocaust?’ Naturally, this question is motivated by fear for one’s personal safety. Let me put you at ease immediately. Although this world will be destroyed some day (and perhaps by a gigantic nuclear explosion—see 2 Peter 3:10-16), it will not be accomplished by man, but by God himself. Furthermore, the earth will not be destroyed until after Jesus Christ comes back to this earth. In fact, the complete destruction of this world won’t take place for over 1,000 years after he comes. (See Revelation 19:11-20:10).¹⁰⁷

Despite these misgivings, two more fictional accounts of the Tribulation period and the battle of Armageddon took the use of nuclear weapons to fulfill Bible prophecy for granted and sought other ways to use science to explain events that will occur during the end times. Gary G. Cohen, a converted Jew and a theological professor at a conservative evangelical seminary, described the worldwide conflict in *Civilization’s Last Hurrah* (1974) that enables the Antichrist to take power as arising from Israel's anger over pollution from Jordan’s nuclear power reactor. As plagues besiege mankind, Cohen explained scientifically what is normally supernatural events in other accounts:¹⁰⁸ a meteorite turns the oceans red,¹⁰⁹ the killer locusts are just a mutant form—*Melanoplus*

¹⁰⁶ Ibid., 160.

¹⁰⁷ Tim LaHaye, *The Beginning of the End* (Wheaton, IL: Tyndale House Publishers, 1972), 9.

¹⁰⁸ See, for instance, Ernest Angley, *Raptured* (Akron, OH: Winston Press, 1950); Leon O Stewart, *Too Late!* (Franklin Springs, GA: Advocate Press, 1958).

¹⁰⁹ Gary G. Cohen, *Civilization’s Last Hurrah: A Futuristic Novel about the End* (Chicago: Moody Press, 1974), 101.

Gargantuous,¹¹⁰ and the Antichrist is able to be resurrected because he is cryogenically frozen.¹¹¹ At the end, Christ appears amidst a meteor shower.¹¹²

Carol Balizet, a conservative Catholic, also proffered new scientific explanations for events in *The Seven Last Years* (1978). As atomic war threatened towards the end, the effects of the bomb explain several of the plagues:

It was the U.S.E. [United States of Europe] which first employed nuclear weapons. They hit the Russian homeland with annihilating effect on April 17 and 18 and thus started a chain reaction of atomic bombing. The Chinese, although they had not been hit by atomic weapons, launched thermonuclear bombs against the North American continent and against western Europe. The atmosphere was polluted, water unpotable in most places. The fear of so many seemed at last realized: the earth had been abused beyond her ability to recover. The protective atmospheric blanket was torn and ragged, and the heat and light of solar radiation blasted through in killing amounts. The only relief came with the swirling clouds of contaminated pollutants from the bombings, large black clouds of radioactive particles that came between the earth and the sun blocking its rays, bringing a darkness that was not restful.¹¹³

The resurgence of Bible prophecy writing seemed to make even more sense as the 1970s wore on, with further crisis in the Middle East, the center stage for apocalyptic events. In the 1973 Yom Kippur War, Israel once again stood victorious against Egypt and Syria. The Organization of Petroleum Exporting Countries (OPEC) raised oil prices while Saudi Arabia imposed an oil embargo on the United States (because of its support of Israel), showing how challenging the Arab nations could be when united. The U.S. economy took a nosedive, in part due to the high oil prices, in part due to the high cost of the Vietnam War, and in part due to various agricultural shortages. The Watergate scandal, in which operatives of President Nixon's re-election campaign broke into

¹¹⁰ Ibid., 107.

¹¹¹ Ibid., 131.

¹¹² Ibid., 205.

¹¹³ Carol Balizet, *The Seven Last Years* (Lincoln, VA: Chosen Books, 1978), 352.

Democratic headquarters in order to tap their phones and discover their campaign secrets, resulted in Nixon's resignation in 1974. But, this resignation came only after Americans had read transcripts of tape recordings of Nixon in the Oval Room, peppered with the phrase "expletive deleted." When Jimmy Carter assumed the presidency in 1977, he was met by a jaded public, which had suffered through a long war only to lose it and which was repeatedly lied to by the President who had promised to end it.

Events during Carter's presidency contributed to the end of détente. The 1979 Soviet invasion of Afghanistan, which was experiencing internal conflicts that the Russians felt were a security threat, thwarted Congressional passage of SALT II that would have limited the nuclear arsenals of the two countries even further. These tensions culminated in the U.S. boycott of the 1980 Olympic games in Moscow, bringing an end to the period of détente that had begun under Nixon. The end of détente coupled with new public concern over the ecological effects of nuclear energy resulted in the re-emergence of fears over nuclear destruction in the 1980s.

From 1945 to 1979, scientific and religious apocalypticists strove to make sense of the bomb. While scientific apocalypticists were initially at a loss as to how to understand a weapon that could destroy all life, by the 1970s they had articulated a full-fledged apocalyptic complete with visions of judgment, followed by a secular millennium. While hopeless visions of nuclear war eradicating humanity made appearances throughout this period, more prevalent were stories of how nuclear war could purge humanity's innate failings. Despite the role of scientists in creating the bomb, Americans largely retained their faith in science during this period. This was true of religious apocalypticists, as represented by dispensational premillennialists, during this

period as well. Premillennialists embarked on a different project after the advent of the bomb. They had been living with the threat of the end for a long time. Premillennialists did not have to struggle with finding meaning and purpose in a fragile existence; the bomb presented the opportunity to make Bible prophecy relevant to modern life. Despite these differences, the atomic bomb revolutionized both apocalypics. Nuclear war satisfied the desire to give Darwin's creation story an endpoint, either hastening or ending man's evolution. It invigorated the religious apocalyptic by making it undeniably applicable to modern life. Though one urged continued faith in science and technology to escape the nuclear threat and the other advised faith in Christ, both helped Americans come to terms with an ever-present threat of annihilation.

Chapter 4

Environmental Disasters and the Judgment of Humanity

Historian Donald Worster says that “[t]he Age of Ecology began on the desert outside Alamogordo, New Mexico on July 16, 1945, with a dazzling fireball of light and a swelling mushroom cloud of radioactive gases.”¹ Worster is correct in pointing to the invention of the atomic bomb as a turning point in how Americans approached the environment. Suddenly worldwide and manmade destruction of people and their surroundings became possible. While the potential damage to the ecosystem from nuclear testing did not become an issue until the late 1950s, the bomb nevertheless conditioned how conservation-minded Americans approached ecological issues. With “one world or none” rhetoric in the background, local concerns over land use transmuted into broad concerns over how American technology was affecting the nation as a whole, and by the 1960s, the entire world. Struggling with the apocalyptic significance of the bomb was the immediate concern of scientific and religious apocalypticists after 1945; by the early 1960s, however, the apparent environmental crisis seemed just as looming as a nuclear war.

While many Americans became aware of the interconnectedness of humans and nature in the wake of the bomb, most historians locate the roots of the modern environmental movement in the late nineteenth century when more narrow concerns over the fate of land in the West appeared. As the West was settled in the 1800s—with the official end of the frontier in 1890 according to the U.S. census—visitors and new residents began to write of the beauty they saw there, seeing it as an “unspoiled”

¹ Donald Worster, *Nature's Economy: The Roots of Ecology* (San Francisco: Sierra Club Books, 1977), 339.

wilderness that needed to be protected from urbanization and industrialization. Explorers like George Catlin wrote of their journeys across the plains in the 1830s before any major settlement of the West—Catlin in particular painting and writing of Native Americans. Meanwhile, figures like Ralph Waldo Emerson and Henry David Thoreau were frontrunners of the American Romantic movement, depicting nature and wilderness as spiritual places where humans could go to rejuvenate their souls. As Americans pushed west, the fate of the natural beauty of the last frontier began to concern some Americans.

The first major American book to call attention to what human action was doing to the environment was *Man and Nature; or, Physical Geography as Modified by Human Action*. Personal experience with destructive agricultural practices in Vermont inspired George Perkins Marsh, a lawyer and scholar with a love for nature, to write this book describing the environmental impact of humans in America, Europe, and Asia.² Published in 1864, *Man and Nature* suggested that the environment was becoming more degraded as humans pursued economic and technological “progress”: “Purely untutored humanity, it is true, interferes comparatively little with the arrangements of nature, and the destructive agency of man becomes more and more energetic and unsparing as he advances in civilization, until the impoverishment, with which his exhaustion of the natural resources of the soil is threatening him, at last awakens him to the necessity of preserving what is left, if not of restoring what has been wantonly wasted.”³

² Philip Shabecoff, *A Fierce Green Fire: The American Environmental Movement* (New York: Hill and Wang, 1993), 55-59.

³ George Perkins Marsh, *Man and Nature; or, Physical Geography as Modified by Human Action*, (New York, C. Scribner, 1864), 39-41, [http://memory.loc.gov/cgi-bin/query/r?ammem/consrv:@field\(DOCID+@lit\(amrvvgv07\)\):@@@\\$REF\\$](http://memory.loc.gov/cgi-bin/query/r?ammem/consrv:@field(DOCID+@lit(amrvvgv07)):@@@REF) (accessed 24 April 2008).

Marsh's conviction that humans changed everything they touched was at the heart of the debate between two rival groups over the fate of the West.⁴ Known in historical literature as the conservationists and preservationists, both agreed that the government should intervene before Americans developed all of the lands in the West. John Muir, a naturalist who helped found the Sierra Club in 1892, led the preservationist movement, lobbying the federal government to set aside lands in the West to be protected from human activity. No less concerned with the misuse of land were those who wanted to protect the land, but not as a pristine wilderness. Conservationists believed the government should take steps to ensure the rational, scientific use of Western lands for the benefit of humanity. Their goals conflicted with those of preservationists as they pursued projects such as the Hetch Hetchy Dam, which flooded a scenic valley in Yosemite National Park. Despite preservationist attempts to block the dam, conservationists won the day, with Congress passing a bill in support of the project in 1913. To Muir the dam would destroy one of "God's temples"; to Chief Forester Gifford Pinchot under President Theodore Roosevelt, the dam was representative of using natural resources responsibly for human betterment.⁵

In spite of their differences, the conservation and preservation movements were both optimistic, thinking it was not too late to save the wilderness from human encroachment. Conservationists in particular believed in the technological advancement of the United States, albeit in an orderly fashion. Historian Samuel P. Hays in *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (1959) argues that

⁴ See Shabecoff, 57.

⁵ Benjamin Kline, *First Along the River: A Brief History of the U.S. Environmental Movement*, 2d ed. (Lanham, MD: Rowman & Littlefield Publishers, Inc., 2000), 58-59.

[c]onservation, above all, was a scientific movement, and its role in history arises from the implications of science and technology in modern society....They [conservationists] emphasized expansion, not retrenchment; possibilities, not limitation. True, they expressed some fear that diminishing resources would create critical shortages in the future. But they were not Malthusian prophets of despair and gloom.⁶

According to Hays, when Pinchot and others tried to win the public over to the conservationist cause, “[t]hose who came to the support of conservation in 1908 and 1909, however, were prone to look upon all commercial development as mere materialism, and upon conservation as an attempt to save resources from use rather than to use them wisely. The problem, to them, was moral rather than economic.”⁷ The moralistic approach to saving the nation’s resources had a more lasting impact on the environmental movement than did the conservationist emphasis on using scientific methods to save U.S. natural resources.

While the pro-business orientation of the government in the 1920s led to the setting aside of conservationism, an ecological disaster in the 1930s prompted President Franklin D. Roosevelt to include environmental policies in the New Deal. This manmade disaster, the Dust Bowl, was in Worster’s opinion “the most severe environmental catastrophe in the entire history of the white man on this continent.”⁸ While Worster writes that the Dust Bowl was the result of “dominating and exploiting the land for all it was worth,” those who suffered from its effects experienced it as an uncontrollable act of God.⁹ In Topeka, at least one resident saw in the Dust Bowl a sign of the impending return of Christ: “Watch for the Second Coming of Christ. . . . God is wrathful.”

⁶ Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920*, 1st Atheneum ed. (New York: Atheneum, 1969), 2.

⁷ Hays, *Conservation*, 141.

⁸ Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979), 24.

⁹ Worster, *Dust Bowl*, 4.

Signs held on the sides of streets announced that the end was near.¹⁰ The U.S. government in the guise of the Soil Conservation Service, an agency created by the New Deal, aided the harried farmers and tried to end the abuse of the plains lands by encouraging farmers to stop growing crops and establishing guidelines for using public lands in the plains for grazing cattle. The government also purchased the worst affected lands with the intention of restoring their integrity, which had been lost by the removal of its native grasses.¹¹ Worster not only sees the Dust Bowl as significant in its severity but also in the effect it had on the conservation movement: “[b]ut in the 1930s, largely as a direct consequence of the Dust Bowl experience, conservation began to move toward a more inclusive, coordinated, ecological perspective. A concern for synthesis and for maintaining the whole community of life in stable equilibrium with its habitat emerged.”¹²

The Dust Bowl may have shown Americans that abuse of the environment could lead to disaster, but the bomb introduced Americans to the threat of a far more severe, worldwide environmental disaster. Eventually, Worster argues, the bomb led to the

beginnings of widespread, popular ecological concern around the globe. . . . The devastation of Bikini atoll, the poisoning of the atmosphere with strontium-90, and the threat of irreversible genetic damage struck the public consciousness with an impact that dust storms and predator deaths could never had had. Here was no local problem or easily ignored issue; it was a question of the elemental survival of living things, man included, everywhere in the world.¹³

The surge of interest in environmental issues after World War II was not only due to the influence of the bomb. Hays suggests that Americans became interested in the condition

¹⁰*Kansas City Star*, 21 March 1935; *Kansas City Times*, 20 March 1935; *Topeka Journal*, 20, 23, March 1935. Quoted in Worster, *Dust Bowl*, 17.

¹¹ Worster, *Nature's Economy*, 230. See also Shabecoff, 81-82.

¹² Worster, *Nature's Economy*, 232.

¹³ Worster, *Nature's Economy*, 340.

of their surroundings as part of a general rise in living standards. Clean air and water became another “amenity” for the postwar affluent to pursue.¹⁴ The first works to express concern over the environment after World War II, however, were in the tradition of conservationism.

Aldo Leopold, who served in the U.S. Forest Service and pioneered the field of game management at the University of Wisconsin, wrote one such book. In speeches and writings during the 1930s and early 1940s, Leopold expressed the idea that a scientific viewpoint alone was not enough to save the wilderness from human interference: “Let no man jump to the conclusion that [he] must take his Ph.D. in ecology before he can ‘see’ his country. On the contrary, the Ph.D. may become as callous as an undertaker to the mysteries at which he officiates.”¹⁵ Although Leopold died in 1948 from a heart attack, his posthumous *A Sand County Almanac and Sketches Here and There* (1949), called by one historian a “sacred text” of the 1960s environmental movement, rejected the idea that economics should dictate the way humans use the land, setting the stage for a flurry of postwar books that questioned the effect humans were having on their environment.¹⁶ Calling for a “land ethic,” Leopold asked Americans to recognize that the concept of land as property to be exploited is “wrong.” Rather, out of a love and respect for the nature that sustained humanity, Americans should include the land and everything on it in their idea of “community.”¹⁷

¹⁴ Samuel Hays, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985* (Cambridge, MA: Cambridge University Press, 1987), 4.

¹⁵ Aldo Leopold, “Conservation Ethic,” *Birdlore* 40, no. 2 (1938): 107. Quoted in Curt D. Mein, “Moving Mountains: Aldo Leopold & ‘A Sand County Almanac,’” *Wildlife Society Bulletin* 25, no. 4 (Winter 1998): 700.

¹⁶ On the importance of Leopold to conservationists, see Shabecoff, 90.

¹⁷ Aldo Leopold, *A Sand County Almanac: With Essays on Conservation*, 1st Ballantine Books ed. (New York: Ballantine Books, 1970), 238-239.

Leopold's *A Sand County Almanac* was the culmination of his conservation work in the interwar years, successfully bridging the gap between the conservation and preservation movements by arguing that land had an aesthetic value but could be responsibly used. Two other writers in 1948 moved even further away from conservationist rhetoric than did Leopold by outright asserting that humanity was having a deleterious effect on the environment. In particular, both William Vogt in *Road to Survival* (1948) and Fairfield Osborn in *Our Plundered Planet* (1948) expressed concern over a growing world population and the indiscriminate use of natural resources. Each came to the issue from studying animals; Vogt was an ornithologist who had edited the Audubon Society magazine, while Osborn was a businessman who became the head of the New York Zoological Society. Resorting to apocalyptic language to describe the problem of overpopulation, Vogt wrote: "There are too many people in the world for its limited resources to provide a high standard of living. By use of the machine, by exploitation of the world's resources on a purely extractive basis, we have postponed the meeting at the ecological judgment seat. The handwriting on the wall of five continents now tells us that the Day of Judgment is at hand."¹⁸

Osborn also expressed alarm over the number of people in relation to the amount of cultivable land but added to the list of potential environmental problems chemicals like DDT. His theory of the underlying problem was akin to the concept of ecology developed later in the twentieth century; Osborn declared, "[b]lind to the need to cooperating with nature, man is destroying the sources of his life. Another century like the last and civilization will be facing its final crisis."¹⁹ Nevertheless, Osborn, as a

¹⁸ William Vogt, *Road to Survival* (New York: William Sloane Associates, Inc., 1948), 78.

¹⁹ Fairfield Osborn, *Our Plundered Planet* (Boston: Little, Brown and Company, 1948), 37.

businessman, had more hope than Vogt that capitalism could rectify the abuses that resulted in environmental deterioration.²⁰

In the shadow of the atomic bomb, postwar writers like Vogt and Osborn may have felt compelled to compare the degradation of the environment to the effects of the atomic bomb. Vogt compared abuse of the environment to the bombing of Hiroshima: “Where human populations are so large that available land cannot decently feed, clothe, and shelter them, man’s destructive methods of exploitation mushroom like the atomic cloud over Hiroshima.”²¹ Osborn, on the other hand, suggested that environmental deterioration was possibly even worse than the threat of nuclear war. He wrote that in the midst of World War II he became concerned about the neglect of “[t]he other war, the silent war, eventually the most deadly war, [which] was one in which man has indulged for a long time, blindly and unknowingly. . . . It contains potentialities of ultimate disaster greater even than would follow the misuse of atomic power. This other war is man’s conflict with nature.”²² By the late 1960s, the idea that Americans, and humanity in general, were destroying their environment was accepted, and writers no longer needed to justify their concern with the environment when the seemingly more immediate threat of nuclear destruction was looming over every American.

Writers addressing environmental issues during the 1940s and 1950s tended to stress the problems of overpopulation and depletion of resources over issues like pollution.²³ Even so, as early as the 1940s, two incidents in the United States highlighted

²⁰ Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington, D.C.: Island Press, 1993), 36-37.

²¹ Vogt, 31.

²² Osborn, *Plundered Planet*, vii.

²³ One notable exception was K. William Kapp, *The Social Costs of Private Enterprise* (Cambridge, MA: Harvard University Press, 1950). However, historians of environmentalism tend to not emphasize this work as an important book for the burgeoning environmental movement. Kapp’s book was not entirely

the problem with air pollution. The first major smog incident in the United States was in Los Angeles in 1943; a similar air inversion occurred in the small industrial town of Donora, Pennsylvania, five years later. Still, these concerns remained local in the first two decades after the war. Population continued to be at the forefront of 1950s books that considered the impact of humanity on the environment. For instance, Osborn published another book, *The Limits of the Earth* (1953), which argued for a balance between the amount of resources and population while a geneticist, Karl Sax, in *Standing Room Only* (1955) suggested that humanity's goal should be a population level that permits a "decent life" for all.²⁴

These early works, however, did not come close to having the impact of Rachel Carson's *Silent Spring* (1962), which moved beyond overpopulation and brought another issue to the forefront of the environmental movement. A marine biologist and a previously best-selling author, Carson wrote a readable and engaging tract on the threat of pesticide use to the environment. The result was a *New York Times* bestseller for thirty-one weeks. Most historians date the modern environmental movement to the publication of Carson's 1962 book, which seemed to awaken environmental concerns beyond ones like the traditional use of resources, overpopulation, and protection of wilderness.²⁵ Indeed, Worster attributes to Carson the origins of "the literature of ecological apocalypse."²⁶

concerned with environmental issues; his work was largely a criticism of capitalism for making its effects such as industrial accidents and the exploitation of natural resources the responsibility of society, resulting in an inaccurate report of the total costs of production.

²⁴ Fairfield Osborn, *The Limits of the Earth* (Boston: Little, Brown and Company, 1953), 225.

²⁵ See, for instance, Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962-1992* (New York: Hill and Wang, 1993), 3.

²⁶ Worster, *Nature's Economy*, 23.

Her book began with an apocalyptic vision, a fictional portrait of a town where, presumably, DDT had been liberally used:

[s]ome evil spell had settled in the community: mysterious maladies swept the flocks of chickens; the cattle and sheep sickened and died. Everywhere was a shadow of death. The farmers spoke of much illness among their families....No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves.²⁷

Like Vogt and Osborn before her, Carson used the fear of the bomb to drive home the point that pesticides like DDT were dangerous substances:

Strontium 90, released through nuclear explosions into the air, comes to earth in rain or drifts down as fallout, lodges in soil, enters into the grass or corn or wheat grown there, and in time takes up its abode in the bones of a human being, there to remain until his death. Similarly, chemicals sprayed on croplands or forests or gardens lie long in soil, entering into living organisms, passing from one to another in a chain of poisoning and death.²⁸

After Carson, however, environmentalist writers no longer couched ecological threats in nuclear terms. This was in part due to the success of her book in bringing environmental issues to the public but also because of political developments that dampened nuclear fears. In 1963 Kennedy and Khrushchev signed the Limited Test Ban Treaty, which forbade atmospheric testing of nuclear weapons in response to the fear of fallout from these tests. That same year, according to Washington University professor of biology Barry Commoner, the St. Louis Committee for Nuclear Information became the St. Louis Committee for Environmental Information.²⁹ With nuclear tests gone underground (and the easing of Cold War tensions after the 1962 Cuban Missile Crisis), the apparent environmental crisis overwhelmed the fear of fallout.

²⁷ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Company, 1962), 2-3.

²⁸ Carson, 6.

²⁹ Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Alfred A. Knopf, 1971), 200.

Post-Carson, scholars and journalists published a flurry of books and articles on the environmental “crisis,” offering analyses of its causes and possible solutions. Commoner was one of the first to move away from seeing overpopulation as the cause of environmental ills. In *Science and Survival* (1966), he asked “[c]ould we cure these difficulties by calling a halt to science and new technologies?”³⁰ Despite Commoner’s attempt to change the subject, a book on overpopulation, entomologist Paul Ehrlich’s *The Population Bomb* (1968), was the only other environmental book of the 1960s as influential as Carson’s. With three million copies sold in its first decade, Ehrlich’s book is the most popular book on the environment to date.³¹ In Ehrlich’s estimation, overpopulation was the cause of water pollution and air pollution, and would also lead to potential climate change and nuclear war over dwindling land and resources. He suggested drastic solutions such as forced birth control; his solutions were the source of much criticism. Ehrlich was one of the first to place the blame for the condition of the world environmental crisis on Americans: “We have decided that we are the chosen people to steal all we can get of our planet’s gradually stored and limited resources. To hell with future generations, and to hell with our fellow human beings today! We’ll fly high now—hopefully they’ll pay later.”³²

After Carson and Ehrlich, popular writers on the environment no longer had to persuade readers that the environment was in danger. Two articles appeared in the influential journal *Science* in 1967 and 1968 that took the environmental crisis as a given and analyzed its root causes. Lynn White, Jr., in a 1967 article, pointed to Protestantism’s influence on the way Americans related to nature; Genesis resulted in

³⁰ Barry Commoner, *Science and Survival* (New York: The Viking Press, 1966), 24.

³¹ Sale, 22.

³² Paul R. Ehrlich, *The Population Bomb* (New York: Ballantine Books, Inc., 1970), 150.

Westerners taking God's command to "subdue" the earth in Genesis literally.³³ Meanwhile, Garrett Hardin in "The Tragedy of the Commons" (1968) explained the problem of overpopulation through a lively metaphor about the destruction of a common pasture through the selfish actions of individuals who overgraze their own cattle at the expense of the entire community.³⁴ With *Science* granting environmental concerns credibility and Carson and Ehrlich energizing the public, Richard Nixon found to his surprise upon taking office in 1969 that environmental issues had suddenly captured widespread support. John C. Whitaker, his secretary of interior, said later that Nixon's administration was taken aback by the sudden demand for action on environmental issues.³⁵

In addition to the success of popularizers like Carson and Ehrlich, several well-publicized incidents in the 1960s emphasized that Americans needed to make changes in the way they treated their surroundings. Episodes such as the death of eighty people due to smog in New York during the summer of 1966, oil spills in the English Channel and near Santa Barbara in 1967 and 1969 respectively, the burning of the Cuyahoga River in Ohio in 1969, and the media coverage of the dying of Lake Erie in 1969 seemed to verify the apprehensions of scientists like Carson and Ehrlich.³⁶ Historians like Worster also point to the influence of the pictures of Earth astronauts took while orbiting the moon in 1969: "The lonely planet, we now understood in a way no previous epoch of man could have shared, was a terribly fragile place."³⁷

³³ Lynn Townsend White, Jr, "The Historical Roots of Our Ecologic Crisis," *Science*, 155, no. 3767 (10 March 1967): 1203-1207.

³⁴ Garrett Hardin "The Tragedy of the Commons," *Science*, 162, no. 3859 (13 Dec. 1968): 1243-1248.

³⁵ Kline, 80.

³⁶ Gottlieb, 96; Sale, 18-19; Shabecoff, 111.

³⁷ Worster, *Nature's Economy*, 341.

The furor over environmental issues culminated in 1970 when Americans celebrated the first nationwide Earth Day on April 22. Teach-ins on the Vietnam War inspired Gaylord Nelson, a senator from Wisconsin, to hold a similar event on the environment. Despite little funding, the event took on mammoth proportions as the idea inspired grassroots organizing.³⁸ A reporter who has written on the history of the environmental movement, Philip Shabecoff, described it as “chiefly and surprisingly lighthearted. Participants picked up litter, planted trees, and adorned themselves with flowers.”³⁹ Corporations like Dow Chemical, Ford Motor Company, and Commonwealth Edison became involved too; they provided money for speakers, created advertisements touting their environmental consciousness, and gave contributions in support of Earth Day events.⁴⁰ Those were the “officially” sanctioned activities by Nelson’s office. Others, inspired by the tactics of the New Left, took a more activist approach. For instance, one group gave the Atomic Energy Commission an award for “Colorado Environmental Rapist of the Year.”⁴¹

Even if most activities on Earth Day were “lighthearted” as Shabecoff describes, the flurry of works on the environment that appeared in the midst of the planning for Earth Day and in its wake were not. Concern that irreversible damage was being done to the environment seemed to increase. Environmental writers stressed the idea that the combination of pollution, overpopulation, and resource depletion meant that humanity was close to causing its own extinction. In an article originally published in *Harper’s* towards the end of 1969 and reprinted in a book of essays published in preparation for

³⁸ Kline, 81; Shabecoff, 112-117.

³⁹ Shabecoff, 113.

⁴⁰ Gottlieb, 110.

⁴¹ Gottlieb, 111.

Earth Day, journalist John Fischer wrote that the problem of human survival could provide coherence to liberal arts programs, which he saw as floundering without an overarching system of beliefs. Fischer outright suggested that the end of humanity could be close: “[f]or the first time in history, the future of the human race is now in serious question. This fact is hard to believe, or even to think about—yet it is the message a growing number of scientists are trying, almost frantically, to get across to us.”⁴² Barry Commoner also suggested a potential coming doomsday for humanity in *The Closing Circle* (1971): “The environmental crisis is a sign that the ecosphere is now so heavily strained that its continued stability is threatened. It is a warning that we must discover the source of this suicidal drive and master it before it destroys the environment—and ourselves.”⁴³

That same year, the apocalyptic tone of environmentalists had become so pronounced that Barry Weisberg in *Beyond Repair* (1971) complained: “The apocalyptic tone of the environmental crusade is itself a major expression of the social order responsible for biological imbalance. The restoration of natural balance depends today upon the destruction of that social order and the birth of a new poetry of human relations.”⁴⁴ Predictions of doom had seemingly become so prominent that Weisberg, whose book argued that capitalism had led to the current environmental conditions, could see environmental apocalypticism as being so mainstream as to be a part of the “system.”

However apocalyptic the tone of environmental writers became, from the point of view of inspiring legislation, the environmental movement was rather successful in the

⁴² John Fischer, “Survival U: Prospectus For A Really Relevant University” in *The Environmental Handbook: Prepared for the First National Environmental Teach-In*, ed. Garrett de Bell (New York: Ballantine Books, 1970), 138.

⁴³ Commoner, *Closing Circle*, 112.

⁴⁴ Barry Weisberg, *Beyond Repair* (Boston: Beacon Press, 1971), 7.

1970s. As a result of popular agitation on behalf of environmental issues, President Nixon created the Environmental Protection Agency (EPA) by reorganizing other existing departments. The EPA banned DDT in 1972 and spent most of the rest of the decade attempting to regulate pollution. Despite Nixon's decision to bypass Congress in order to create the EPA, legislators passed eighteen environmental acts during the decade of the 1970s, including laws to control air and water pollution and to protect (and define) endangered species.⁴⁵

Even as the environmental movement made progress in cleaning up pollution, scientists began debating whether human pollution could cause even greater distress to the environment other than producing filthy air and water. Investigation into the effects of pollution from supersonic jets led to the proposal that their exhaust was hurting the ozone layer. Two scientists in 1973 looked into the effect of other chemicals, including chlorofluorocarbons (CFC). Used in aerosol sprays, CFCs eventually drifted into the stratosphere, where ultraviolet light breaks the compounds down into its constituent molecules, including chlorine, which destroys ozone. The media alerted the public, and the ensuing pressure convinced the U.S. Congress to give the EPA the power to ban CFCs from aerosol cans in 1977.⁴⁶

As scientists concluded that human activity could deplete the ozone layer, climatologists in the 1970s began to warn of the possibility of a new ice age, citing previous instances of climate change as Spencer Weart, a physicist and historian, describes in *The Discovery of Global Warming* (2003). But, it would not necessarily result from a natural cycle because, as Weart explains, the specter of fallout and the new

⁴⁵ Sale, 36-37.

⁴⁶ Spencer Weart, *The Discovery of Global Warming* (Cambridge, MA: Harvard University Press, 2003), 127.

attention to pollution in the 1960s raised the possibility that humans could affect something so complex as the climate.⁴⁷ Scientists published several popular works in the 1970s on the threat of global cooling even as the debate over whether industrial emissions would cause cooling or warming wore on.⁴⁸

These popular works contained no real solutions to the problem of climate change, nor did they argue definitively that the forthcoming ice age would be manmade. Stephen Schneider, a climatologist who would later become an expert on global warming, published *The Genesis Strategy: Climate and Global Survival* (1976) along with a writer from the National Center for Atmospheric Research in Boulder, Colorado. They pointed to historical instances of climate change, contending that the world needs to plan for future shortages in agricultural production.⁴⁹ Similarly, Reid A. Bryson's and Thomas J. Murray's *Climates of Hunger: Mankind and the World's Changing Weather* (1977) warned that in the past, ice ages had led to drought. Such climate change could recur rapidly, the two meteorologists argued, leading to mass starvation.⁵⁰ They directly repudiated the idea of a "greenhouse effect," caused by pumping carbon dioxide into the atmosphere, writing, "Carbon dioxide does not change the amount of energy coming from the sun, and it does not reflect the sun's energy back to space. Therefore it can't change the average temperature of the whole system—can't make it warmer."⁵¹ While ice ages may be cyclical, they also pointed to the effect that solid particles in the atmosphere

⁴⁷ Weart, 41-42.

⁴⁸ Weart, 115.

⁴⁹ Stephen Schneider, *The Genesis Strategy: Climate and Global Survival* (New York: Plenum Press, 1976). See also Lowell Ponte, *The Cooling* (Englewood Cliffs, NJ: Prentice-Hall, 1976).

⁵⁰ Reid A. Bryson and Thomas J. Murray, *Climates of Hunger: Mankind and the World's Changing Weather* (Madison, WI: University of Wisconsin Press, 1977), 123-124.

⁵¹ Bryson and Murray, 144.

could play in depressing temperatures.⁵² Their advice was to limit population and be more wary of the human impact on the environment.

Despite books like these, Weart argues that the issue of climate change barely penetrated the public consciousness until the 1980s, when scientists reached a consensus that the planet's climate was actually experiencing a warming.⁵³ But, the brief period of debate over cooling versus warming had a lasting impact, as critics of global warming pointed to the initial confusion over whether temperatures were rising or falling from human action.⁵⁴ Critics of the environmental movement began emerging in greater numbers toward the late 1970s in reaction to the popularity of the environmental movement. For instance, epidemiologist Melvin A. Bernarde in *Our Precarious Habitat* (1970) asserted: "No one would argue that air pollution, radioactive fallout, or chemical insecticides washed into a water supply, to take a few example, are beneficial; but I would suggest that the physiological effects of these environmental pollutants are not so well established that the popular purveyors of gloom and gloom can write about them with such lack of impunity."⁵⁵

The criticism of the environmental movement during the 1970s was related to the increasingly contested nature of science. Historian Charles E. Rosenberg in *No Other Gods: On Science and American Social Thought* (1976) considers the impact of Thomas Kuhn's *The Structure of Scientific Revolutions*, which appeared the same year as Carson's warning that indiscriminate use of DDT would lead to a "silent spring." After

⁵² Bryson and Murray, 148-149.

⁵³ Weart, 92.

⁵⁴ See, for instance, Lawrence Solomon, *The Deniers: The World-Renowned Scientists Who Stood Up Against Global Warming Hysteria, Political Persecution, and Fraud* (Minneapolis, MN: Richard Vigilante Books, 2008), 88.

⁵⁵ Melvin A. Bernarde, *Our Precarious Habitat* (New York: W.W. Norton & Co., Inc., 1970), 21-22.

Kuhn, Rosenberg explains, “science was routinely seen as a source of ideology, legitimating existing hierarchies—a previously unindicted coconspirator in a world of hegemony and exploitation—as well as an even more precise body of knowledge about the natural world.”⁵⁶ Rosenberg clarifies how the postmodern evaluation of science and the environmental movement were related: “Ecological and life-style critics commented on science in ways emotionally and chronologically consistent with this mode of analysis; Rachel Carson and Thomas Kuhn were—unwittingly—part of the same political discourse.”⁵⁷ The result was a growing number of questions about science's role in creating policy and in crafting an improved life for Americans.⁵⁸

If the general American population did not reach a consensus on the need to clean up the environment until 1970, the same cannot be said for science fiction writers who, beginning in the late 1940s, addressed issues like man's attempts to control nature, overpopulation, and resource depletion. *Greener Than You Think* (1947), a satirical apocalyptic tale by Ward Moore, an American writer, is remarkable for ending with the extinction of humanity. Moore's novel is about the invention of a chemical called “Metamorphizer,” which speeds the growth of all types of grass. Grass starts growing uncontrollably, taking over first the United States where a female scientist had invented and marketed the chemical, then North America, and finally, conquering the rest of the world. Despite attempts to staunch its growth, including the use of atomic bombs, only grass remains at the end. Just as prior fiction and non-fiction authors had connected the potential extinction of the human race to the vagaries of evolution, one character notes:

⁵⁶ Charles E. Rosenberg, *No Other Gods: On Science and American Social Thought*, updated and expanded ed. (Baltimore: Johns Hopkins University Press, 1997), xii.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

“Man, they said, could not adapt himself to the Grass . . . but insects had, fishes didn’t need to, and birds, especially those who nested above the snowline, might possibly be able to. Undoubtedly these orders could in time produce a creature equal if not superior to *Homo sapiens* and the march of progress stood a chance to continue after an hiatus of a few million years or so.”⁵⁹

Other early examples include a short story by American novelist Kurt Vonnegut, Jr., “Tomorrow and Tomorrow and Tomorrow” (1950). Vonnegut’s portrait of a world of twelve billion people—with longevity a factor in overpopulation—is notable as an early fictional extrapolation of society if it continued to grow unchecked. An elderly character in the story asks her husband: “Remember how the stores used to fight to get our folks to buy something? You didn’t have to wait for somebody to die to get a bed or chairs or a stove or anything like that. Just went in—bing!—and bought whatever you wanted. Gee whiz, that was nice, before they used up all the raw materials.”⁶⁰

While most scientific apocalyptic fiction in the 1950s concerned nuclear war, American science fiction writer Frank Herbert in *The Dragon in the Sea* (1955) envisioned a decade-long conflict between the U.S. and the U.S.S.R over dwindling supplies of oil. While these works by Vonnegut and Herbert did not imagine the destruction of civilization or the end of *Homo sapiens*, they were notable for depicting the “end of the world as we know it” because of overpopulation and resource scarcity before most other science fiction writers.

⁵⁹ Ward Moore, *Greener Than You Think*, Classics of Modern Science Fiction, vol. 10 (New York: Crown Publishers, Inc., 1985), 299.

⁶⁰ Kurt Vonnegut, Jr., “Tomorrow and Tomorrow and Tomorrow” in *Eco-Fiction*, ed. John Stadler (New York: Washington Square Press, 1971), 123. The biochemist Isaac Asimov (as Paul French) in *David Starr, Space Ranger* (1952) depicted a world of five billion people depending on colonies in space for its supply of food. See Isaac Asimov (as Paul French), *Lucky Starr Book 1: David Starr, Space Ranger and Lucky Starr and the Pirates of the Asteroids* (New York: Bantam Books, 1993), 17.

In the 1960s works again appeared that showed Earth struggling with overpopulation, but in these works overpopulation required stricter measures. A little known writer, Alice Glaser, wrote “The Tunnel Ahead” (1961), which imagined a population so great that the government resorts to a policy known as “Depopulation without Discrimination.” The policy is that the tunnel into Manhattan fills with cyanide gas ten times a week, and all who are caught inside are killed.⁶¹ Harry Harrison, an American comic book illustrator cum writer, was responsible for *Make Room! Make Room!* (1966), which inspired the Charlton Heston film *Soylent Green* (1973).⁶² *Make Room! Make Room!* anticipated Ehrlich’s popular 1968 work *The Population Bomb*. One character links overpopulation, pollution, and resource scarcity in an angry monologue:

So mankind gobbled in a century all the world’s resources that had taken millions of years to store up, and no one on the top gave a damn or listened to all the voices that were trying to warn them, they just let us overproduce and overconsume, until now the oil is gone, the topsoil depleted and washed away, the trees chopped down, the animals extinct, the earth poisoned, and all we have to show for this is seven billion fighting over the scraps that are left, living a miserable existence—and still breeding without control.”⁶³

Other science fiction writers explored the theme of overpopulation prior to 1968, but none were quite so apocalyptic in their visions as Harrison.⁶⁴

Even as some futurist writers anticipated environmental issues that would become popular by the end of the 1960s, other writers clearly took their lead from Rachel

⁶¹ Alice Glaser, “The Tunnel Ahead” in *As Tomorrow Becomes Today*, ed. Charles William Sullivan (Englewood Cliffs, NJ: Prentice-Hall, 1974), 445-452.

⁶² Although characters ate protein cakes in *Make Room! Make Room!*, the primary revelation of the film *Soylent Green*—that the protein cakes known as “Soylent Green” are people—was not in the book.

⁶³ Harry Harrison, *Make Room! Make Room!* (New York: Doubleday, 1966; reprint, Boston: Gregg Press, 1979), 169.

⁶⁴ See James Blish and Norman L. Knight, *A Torrent of Faces* (Garden City, NY: Doubleday & Company, 1967); Philip K. Dick, *The Unteleported Man* (New York: Berkley Books, 1966); William F. Nolan and George Clayton Johnson, *Logan’s Run* (New York: Dial Press, 1967); Robert Silverberg, *To Open the Sky* (Boston: Gregg Press, 1967).

Carson's *Silent Spring*.⁶⁵ An example of this is Frank Herbert's *The Green Brain* (1966). In it an unnamed but deadly pesticide (an implicit reference to DDT) is being used in South America to combat insects; "Carsonite" literature has been declared subversive in Brazil. Insects, however, respond to the policy of extermination by attempting to communicate with humanity. Millions of beetles work in concert to create an ersatz human body. Known as the "Brain," this entity warns humans:

Without substances produced by...*insects*, and other forms of life, your kind of life would perish. Sometimes just a faint trace of the substance is needed, such as the special copper produced by arachnids. Sometimes the substance must pass through many valences, subtly changed each time, before it can be used by a life form at the end of the chain. Break the chain and all die. The more different forms of life there are, the more life the greenhouse can support.⁶⁶

American writer George Alec Effinger offered an even gloomier vision in 1971 based on Carson's warnings about pesticide use. Titled "Wednesday, November 15, 1967," the short story is in the form of the notebook of the last man on Earth. He attributes the end of *Homo sapiens* to various environmental crises such as pollution and the widespread use of pesticides. Musing that the world will be left to the insects, the protagonist remembers an ominous conversation he had with a neighbor when he was a child:

"Sounds like that bug killer your dad ordered kills off more'n just bugs. Seems like it kills off all the stuff that ought to be eatin' the bugs natural, like birds. And then the bugs start breedin' so fast, why, if any of 'em don't mind the poison then in a little while you got millions of 'em that don't mind it. But that don't bring the birds back."⁶⁷

⁶⁵ I have only found work of science fiction that directly cites Ehrlich; this is William Walling's short story "Triage," which imagines a UN committee that aims for zero population growth. It accomplishes this by denying aid to communities in dire need. A character quotes Ehrlich in the story. See William Walling, "Triage" in *No Room for Man: Population and the Future Through Science Fiction*, ed. Ralph S. Clem, Martin Harry Greenberg, and Joseph D. Olander (Totowa, N.J.: Littlefield, Adams & Co., 1979), 234-235.

⁶⁶ Frank Herbert, *The Green Brain* (Thetford, England: The Thetford Press Ltd., 1966), 157.

⁶⁷ George Alec Effinger, "Wednesday, November 15, 1967" in *The Ruins of the Earth: An Anthology of Stories of the Immediate Future*, ed. Thomas M. Disch (New York: G. P. Putnam's Sons, 1971), 128-129.

An American writer, poet, and sometime theatre critic named Thomas M. Disch similarly showed an influence from Carson, but in his work *The Genocides* (1978), humanity itself is the equivalent of annoying insects to an alien race that displaces Earth's flora and fauna in favor of its own plants. A character reflects on the seemingly simple defeat of *Homo sapiens*: "It wounded his pride to think that his race, his species, his world was being defeated with such apparent ease. What was worse, what he could not endure was the suspicion that it all meant nothing, that the process of their annihilation was something quite mechanical: that mankind's destroyers were not, in other words, fighting a war but merely spraying the garden."⁶⁸ Later the same character directly echoes Carson when he notes: "Except for the noise of the leaves snapping open (and that was over in a day), it was a silent spring. There were no birds to sing."⁶⁹

As the novels and stories that Carson's work inspired attest, by the end of the 1960s, just as non-fiction about environmental problems became gloomier so did fictional portraits of environmental disasters become outright apocalyptic. No longer did pollution and overpopulation simply threaten to end the world as we know it, it threatened to end all life on Earth. James Blish, an American science fiction writer who briefly trained as a biologist, wrote "We All Died Naked" (1969) in which pollution is so severe that everyone must wear gas masks. In the story, the end of all life on Earth from uncontrolled pollution is projected to be within 10 years.⁷⁰ Similarly journalist turned science fiction writer Frank Robinson describes the end of the world through excessive

⁶⁸ Thomas M. Disch, *The Genocides* (Boston: Gregg Press, 1978), 70-71.

⁶⁹ *Ibid.*, 116.

⁷⁰ James Blish, "We All Die Naked" in *Three for Tomorrow: Three Original Novellas of Science Fiction* (New York: Meredith Press, 1969), 158.

pollution leading to a worldwide smog crisis in “East Wind, West Wind” (1970).⁷¹ American science fiction author Philip Wylie wrote *The End of the Dream* (1972) in which a general environmental collapse overtakes the world by 2010. The narrator reports: “the population of the world was perishing rapidly, owing to the terrible fact that the darkling daylight was now often swept by storms in which toxins were concentrated at deadly levels. Complete body cover and independent breathing tanks were essential for all outdoor movement. These ‘suits’ had warning monitors that rang bells when the air was likely to become unbreathable.”⁷² Similarly, killer smog eradicates humanity in comic book writer and occasional science fiction writer Dennis O’Neil’s “Noonday Devil” (1973).⁷³

Nuclear apocalyptic fiction often imagined humanity being displaced by another, more worthy species. This rarely happened in environmental apocalyptic fiction because pollution manages to kill all life on Earth instead of inspiring mutations. The only way anyone could survive would be to relocate to another planet. Like Blish, Robinson, Wylie, and O’Neil, Chad Oliver, an anthropologist, wrote a story, “King of the Hill” (1971), about mankind destroying itself through pollution and overpopulation. A character reflects:

Man had come, mighty man. Oh, he was smart, he was clever. He had turned the seas into cesspools, the air into sludge, the mountains into shrieking cities. Someone had once said that one chimpanzee was no chimpanzee. It was true; they were social animals. But how about ten thousand chimpanzees caged in a square mile? That was no chimpanzee also—that was crazy meat on a funny

⁷¹ Frank M. Robinson, “East Wind, West Wind” in *No Room for Man: Population and the Future Through Science Fiction*, ed. Ralph S. Clem, Martin Harry Greenberg, and Joseph D. Olander (Totowa, N.J.: Littlefield, Adams & Co., 1979), 168.

⁷² Philip Wylie, *The End of the Dream* (New York: Daw Books, Inc., 1973), 202.

⁷³ Dennis O’Neil, “Noonday Devil” in *Saving Worlds*, ed. Roger Elwood and Virginia Kidd (Garden City, NY: Doubleday & Company, Inc., 1973), 105-115.

farm. Oh, man was clever. He raped a world until he could not live with it, and then he screamed for help.⁷⁴

In the end, the main character, realizing the impending end of Earth, sends animals, including raccoons and dogs, to Titan because the earth can no longer support life. Similar to the theme of humans being replaced by other species so rampant in nuclear fiction, raccoons, without the inhibiting presence of man, learn to use tools and discover fire within twenty generations. Dogs get a new best friend in the raccoon.

Another theme popular in nuclear fiction was that of humans escaping to other planets. This theme made fewer appearances in eco-disaster fiction. In Ethan I. Shedley's *Earth Ship and Star Song* (1979), humanity leaves Earth because of global warming resulting from pollution, which leads to "an ecological spiral that will eventually make the Earth as barren and hostile as Venus. To live we must consume more energy—for breathable air, for food, for bearable temperatures—and the more energy we consume the worse the situation gets."⁷⁵ When testing an interstellar drive based on the controlled creation of black holes, humans destroy an alien telepathic species, which sends a message throughout the galaxy to avenge their destruction against *Homo sapiens*. Humans are hunted throughout the galaxy as they try to find a world where they can settle. Just as in nuclear fiction, there seems to be some innate flaw in humanity that leads to them to destroy everything in their reach.

If humanity is essentially doomed, then only a leap in evolution can save the species, at least in the opinion of some science fiction writers during this period. Popular interest in telepathy and other psychic powers in the seventies appeared in science fiction

⁷⁴ Chad Oliver, "King of the Hill" in *Again, Dangerous Visions*, ed. Harlan Ellison (Garden City, NY: Doubleday, 1972), 188.

⁷⁵ Ethan I. Shedley, *Earth Ship and Star Song* (New York: The Viking Press, 1979), 7-8.

as potential evolutionary advancements that could allow humans to save themselves. In Canadian-American writer Gordon R. Dickson's *The Pritcher Mass* (1972), humans collectively try to use telepathic power to search the galaxy for a new world to escape a "sick and polluted Earth."⁷⁶ Similarly, in William Jon Watkins and E.V. Snyder's *Ecodeath* (1972), two men who have the power to teleport themselves in both space and time help a remnant of humanity to escape from a killer organism that evolved in a sewage plant; the two transport this remnant to a time in the future when the organism was dead and the earth was purged of pollution.⁷⁷ In H.M. Hoover's *Children of Morrow* (1973), telepathy does not save the human race, but those humans who managed to escape killer pollution and climate change by retreating underground develop telepathy, leading to kinder and gentler relationships with nature and with each other.

While more than a few American science fiction writers suggested that something was inherently wrong with human beings, few science fiction writers who wrote environmental disaster novels placed the blame on the U.S. as the world's primary polluter. In Englishman John Brunner's work, however, the U.S. is clearly to blame for the world's environmental crisis. Though Brunner was English, when writing an eco-disaster novel he located the book's events in the United States. A character in *The Sheep Look Up* (1972) tells a talk show host: "We can just about restore the balance of the ecology, the biosphere, and so on—in other words we can live within our means instead of on an unrepayable overdraft, as we've been doing for the past half century—if we

⁷⁶ Gordon R. Dickson, *The Pritcher Mass* (Garden City, NY: Doubleday & Company, Inc., 1972), 5-6.

⁷⁷ William Jon Watkins and E.V. Snyder, *Ecodeath* (Garden City, NY: Doubleday & Company, Inc., 1972), 2.

exterminate the two hundred million most extravagant and wasteful of our species.”⁷⁸

Americans fail to change their ways, leading to the end of the world at the novel’s finish.

Like nuclear fiction writers, science fiction writers who envisaged eco-disaster saw themselves as prophets. John Stadler wrote in the preface to *Eco-Fiction* (1971):

The dimensions of the problem can be simply stated: it is a simple matter of life—or death. We live in one eco-system, on one planet; each of our actions affects that life system. Our spaceship cannot function if we expect the other fellow to conserve its raw materials, control its population, keep its air and waters clean. . . . Beyond entertaining the reader, which I hope this collection will do, I hope this anthology will encourage some serious thinking.⁷⁹

Thomas Disch, in discussing the environmental crisis, went even further in his introduction to *The Ruins of the Earth: An Anthology of Stories of the Immediate Future* (1971). Science fiction writers, Disch avowed, “have played a significant part in the very urgent business of saving the world. Not just because they have illuminated, in their stories here and there, central aspects of the crisis now upon us, but because for two decades, while most of us listened, enraptured, to the siren-songs of Technology, they have never ceased to warn of the reefs awaiting us on the other side of the song.”⁸⁰

Similarly, John Brunner wrote in a 1973 introduction to Wylie’s *The End of the Dream* (1972), “[b]ut what you have here is a prophecy in the most ancient sense of all: not a prediction of what certainly will come to pass, but a description of what is likely to come to pass unless people mend their ways. You can’t define Wylie as ‘a voice crying in the

⁷⁸ John Brunner, *The Sheep Look Up*, (New York: Ballantine Books, 1972), 456.

⁷⁹ John Stadler, preface to *Eco-Fiction*, ed. John Stadler (New York: Washington Square Press, 1971), x.

⁸⁰ Thomas M. Disch, “Introduction: On Saving the World” in *The Ruins of the Earth: An Anthology of Stories of the Immediate Future*, ed. Thomas M. Disch (New York: G. P. Putnam’s Sons, 1971), 6.

wilderness' because—hell, where's the wilderness? It's been logged off and used as a dump.”⁸¹

While many of these "prophets" did not have faith that technology could prevent an eco-disaster, some exceptions existed. One exception was Kate Wilhelm's *Where Late the Sweet Birds Sang* (1976). Clones preserve the human race when pollution and radiation combine to end the fertility of humanity.⁸² Another novelist, Arthur Herzog, published *Heat* in 1977 about a "runaway greenhouse effect" that threatens to make Earth into a Venus-like planet.⁸³ A sociologist in the novel lectures about the apathy of the public: "If you're relying on the help of the general public to conserve energy and reduce thermal pollution, I don't think you'll get it....The people's attitude is 'Show me.' They won't take the word of scientists that a calamity impends. They will not reduce their standard of living to cut down energy consumption—not willingly, at least. Certainly they won't surrender for the sake of future generations.”⁸⁴ In the end, a technological solution is found with mirrors being used to redirect heat into space. Unlike Wilhelm and Herzog, most writers of eco-disaster novels and stories questioned the effect that unconstrained scientific and technological advancement had on the environment just as nuclear fiction writers criticized scientists for pursuing nuclear research without regard for consequences in the 1950s and 1960s. In the 1980s and 1990s, this mistrust of technology would lead to both non-fiction and fiction writers concluding that only a spiritual transformation within humanity could resolve the environmental crisis.

⁸¹John Brunner, introduction to Philip Wylie, *The End of the Dream* (New York: Daw Books, Inc., 1973), 6.

⁸²Kate Wilhelm, *Where Late the Sweet Birds Sang* (New York: Harper & Row, Publishers, 1976), 11-12.

⁸³Arthur Herzog, *Heat* (New York: Simon and Schuster, 1977), 127. Science fiction mirrored the debate over whether the planet was warming or cooling. See Poul Anderson, *The Winter of the World* (Garden City, NY: Doubleday, 1975) for a portrait of a future Earth in the throes of an ice age.

⁸⁴Herzog, 158.

Science fiction writers were not the only ones to question the idea that technological and scientific advancement led necessarily to societal progress. One scientist, Barry Commoner, expressed dismay with the uses of science. Commoner's *Science and Survival* (1966) and *The Closing Circle* (1971) both conclude that an unquestioning acceptance of technology and overspecialization by scientists caused the environmental problems of the United States. Commoner asked, "Is it possible that we do not know the full consequences of the new power grids and the new bombs? Are we really in control of the vast new powers that science has given us, or is there a danger that science is getting out of hand?"⁸⁵ The way humans use science was not the only problem, in Commoner's analysis. Scientists themselves were too isolated from one another:

There is, indeed, a specific fault in our system of science, and in the resultant understanding of the natural world, which, I believe, helps to explain the ecological failure of technology. This fault is reductionism, the view that effective understanding of a complex system can be achieved by investigating the properties of its isolated parts. The reductionist methodology, which is so characteristic of much of modern research, is not an effective means of analyzing the vast natural systems that are threatened by degradation.⁸⁶

Conservative and fundamentalist Protestants shared this willingness to critique the role of scientists and technologists in creating environmental problems. The problem in their view, however, was not a lack of ecological understanding. When conservative evangelicals began to consider environmental issues in the late 1960s and early 1970s, they suggested that a Christian worldview that stressed stewardship could serve as a counterweight to the exploitative attitudes that have accompanied technological growth. For instance, a creationist professor of natural science at Concordia College, John W.

⁸⁵ Commoner, *Science and Survival*, 8.

⁸⁶ Commoner, *Closing Circle*, 189.

Klotz, in *Ecology Crisis: God's Creation and Man's Pollution* (1971), condemned Lynn White, Jr.'s charge that Protestantism was responsible for Americans' treatment of the environment; White, according to Klotz, was misreading the Bible. Rather, it is science itself that is to blame: "Science lacks the standards God's Word provides—standards which we shall discuss shortly. It has only one criterion for the good, and that is 'Does it work?' Such a criterion leaves a great deal of room for the man who argues he can profit by exploiting the environment at the expense of others and of future generations."⁸⁷

Premillennialists, however, did not so much concern themselves with finding a philosophical solution to the environmental crisis. Rather, they seized on overpopulation and pollution as harbingers of the Second Coming. Salem Kirban, an independent fundamentalist evangelist, wrote *Guide to Survival* in 1968. His dedication thanked Ehrlich and two authors of a book on pollution for their insights: "To Dr. Paul R. Ehrlich, whose book THE POPULATION BOMB brought to sharp focus one of the critical problems the world now faces. To Edward Edelson and Fred Warshofsky, whose book POISONS IN THE AIR, made me aware of the growing danger air pollution is bringing to our country."⁸⁸ Kirban did not merely list pollution and overpopulation as signs of the apocalypse; in the fashion of environmental non-fiction writers, he discusses their causes and speaks of their future effects. For instance, he proposed that air pollution could lead to a cooling trend because of the amount of dust clouding sunlight.⁸⁹ He criticized people who did not take environmental issues seriously: "Some falsely believe that the sky is unlimited. They believe because of the vast amount of space up there that

⁸⁷ John W. Klotz, *Ecology Crisis: God's Creation and Man's Pollution* (St. Louis: Concordia Publishing House, 1971), 159.

⁸⁸ Salem Kirban, *Guide to Survival* (Huntingdon Valley, PA: Salem Kirban Inc., 1971), 4. Emphasis is his.

⁸⁹ *Ibid.*, 48.

pollution will never have an irreversible trend or represent a danger to the world. . . . The earth is basically a closed system. The waste-disposal process we have produced clearly has limits.”⁹⁰ Kirban even made predictions about famines and the depletion of resources, pointing out that the United States uses a disproportionately large amount of natural resources.⁹¹ Such an observation would lead a non-fiction writer to warn humanity to change its ways or perish. Kirban, however, offered these remarks as evidence that Christ must be coming soon, having no hope that humanity could change.

Kirban’s book seems to be the earliest attempt to view environmental issues in the light of Bible prophecy. But, 1970, the year of Earth Day, saw conservative evangelicals addressing environmental issues along with the mainstream media, a trend which continued into the mid-1970s.⁹² Lynn White’s thesis of 1968 preoccupied many of these writers, all of whom concluded that White misinterpreted the Bible, failing to see that God charged man to care for the earth. For instance, an editorial in *Christianity Today* titled “Fulfilling God’s Cultural Mandate” (1970) defensively mentioned stewardship even while suggesting that God will undoubtedly prevent humans from killing themselves: “And even though we believe Christ will return before man can utterly destroy himself, future generations have as much right to enjoy this world—and make it

⁹⁰ Ibid., 51.

⁹¹ Ibid., 60-61.

⁹² See “A Necessary Jolt,” *Christianity Today*, 17, no. 9 (2 Feb. 1970): 26; “Christians and Ecology” *Moody Monthly* 71, no. 1 (September 1970): 8; James Hefley, “Christians and the Pollution Crisis” *Moody Monthly* 71, no. 1 (September 1970): 20; Harold B. Kuhn, “Environmental Stewardship,” *Christianity Today* 14, no. 16 (8 May 1970): 46-47; “Living Better With Less,” *Christianity Today* 18, no. 15 (26 April 1974): 29; Martin LaBar, “A Message to Polluters From the Bible,” *Christianity Today* 18, no. 21 (26 July 1974): 12; Carl H. Reidel, “Christianity and the Environmental Crisis,” *Christianity Today* 15, no. 15 (23 April 1971): 4; “Religion: At Sixes and Sevens In the Sixties and Seventies,” *Christianity Today* 14, no. 16 (8 May 1970): 26; “To Live Is To Pollute,” *Christianity Today* 18, no. 25 (27 September 1974): 38; “Where Is Tomorrow’s Food?,” *Christianity Today* 18, no. 24 (13 September 1974): 53.

fruitful—as we. Christians must ensure this right and so fulfill the biblical commission to subdue and replenish the earth.”⁹³

The pre-eminent popularizer of Bible prophecy in the 1970s, Hal Lindsey, also accepted the idea of an environmental crisis. In *The Late Great Planet Earth* (1970), Lindsey, like Kirban, used environmentalists’ predictions of a dire future to suggest that Armageddon is near. He wrote at the beginning of his book:

Scientists tell us today that we are approaching a time when the ocean may not be able to sustain life anymore. The Secretary General of the UN recently told us that man has perhaps ten years to solve the problem of survival. He pointed out the three great crises which are unique to this generation—the problem of nuclear weapons, the problem of over-population, the population explosion, the problem of pollution of our air and water.⁹⁴

While Kirban was content to simply point to environmental deterioration as a sign of the end-times, Lindsey read into biblical verses possible descriptions of environmental damage. Lindsey interpreted Revelation 9:18: “A terrifying prophecy is made about the destiny of this Asia horde. They will wipe out a third of the earth’s population (Revelation 9:18). The phenomena by which this destruction of life will take place is given: it will be by fire, smoke (or air pollution), and brimstone (or melted earth).”⁹⁵ Elsewhere, in explaining a passage in Isaiah, Lindsey again read air pollution into the Bible: “Isaiah predicts in Chapter 24 concerning this time: ‘Behold, the Lord will lay waste the earth and make it desolate, and he will twist its surface and scatter its inhabitants.’ ‘The earth lies polluted under its inhabitants.’ (Perhaps this refers in part to water and air pollution.)”⁹⁶ Like Kirban, Lindsey also used Ehrlich as an authority on overpopulation, quoting Ehrlich as suggesting that humanity “may be facing its final

⁹³ “Fulfilling God’s Cultural Mandate,” *Christianity Today* 14, no. 11 (27 February 1970): 25.

⁹⁴ Hal Lindsey, *The Late Great Planet Earth* (Grand Rapids, MI: Zondervan Publishing House, 1970), 4.

⁹⁵ *Ibid.*, 82.

⁹⁶ *Ibid.*, 166.

crisis. No action that we can take at this late date can prevent a great deal of future misery from starvation and environmental deterioration.”⁹⁷

The same year that Lindsey’s landmark Bible prophecy book appeared, Kirban offered a fictional portrait of the Rapture and the Tribulation period in *666* (1970). His work reads like a science fiction novel, describing pollution and overpopulation problems. Like the characters in *Make Room! Make Room!*, Kirban’s characters subsist on hard-to-get protein cakes. After one character asks the blessing over a meal of protein cakes, another responds: “Good food! What good food? Thankful for blessings? You have the nerve to thank God for this trash? If God were God would he let us starve and eat junk they call food that’s made from crude oil? Would he let us overpopulate so greatly that we live in horrible square cubes two and three hundred stories high?”⁹⁸ Though overpopulation was the most prominent environmental theme in *666*, Kirban also depicted global cooling caused by dust from drought and air pollution.⁹⁹

After 1970, the number of premillennialist writers including environmental discussions in their books rose. Baptist writer Joe T. Odle in *Is Christ Coming Soon?* (1971) relied upon Ehrlich as an expert as Kirban and Lindsey had, agreeing with Ehrlich’s conclusion that overpopulation and pollution are related.¹⁰⁰ Lindsey continued to discuss pollution in his Bible prophecy works, albeit to a lesser degree, in *Satan Is Alive and Well On Planet Earth* (1972) and *The Terminal Generation* (1976).¹⁰¹ Tim LaHaye, a fundamentalist preacher who in the 1990s would become known for a best-

⁹⁷ Ibid., 102.

⁹⁸ Salem Kirban, *666* (Wheaton, IL: Tyndale House Publishers, 1970), 99.

⁹⁹ Ibid., 142.

¹⁰⁰ Joe T. Odle, *Is Christ Coming Soon?* (Nashville, TN: Broadman Press, 1971), 99-101.

¹⁰¹ Hal Lindsey, *Satan Is Alive and Well On Planet Earth* (Grand Rapids, MI: Zondervan Publishing House, 1972), 99; Hal Lindsey with C. C. Carlson, *The Terminal Generation* (Old Tappan, NJ: Fleming H. Revell Company, 1976), 62.

selling Christian apocalyptic fiction series, also took environmental problems seriously in *The Beginning of the End* (1972). He quoted the president of the World Bank on the population explosion and cautioned that pollution “will smother earth life.”¹⁰² As result of its treatment of the environment, LaHaye concluded, “mankind is on such a runaway course that portends the end of this age.”¹⁰³

Bible prophecy writers Willard Cantelon and Chuck Smith also included discussions of pollution, overpopulation, and resource depletion. Both, however, offered new interpretations of Biblical prophecy in the light of environmental issues. Cantelon in *The Day the Dollar Dies* (1973) read a particular passage of Revelation as predicting climate change: “In Revelation 8:7, he [John] spoke of a third part of the trees on earth dying: The third part of trees was burnt up. An astronaut predicted in 10 years’ time the sun’s rays would be diminished by 50% if man continued to pour into the heavens his ceaseless clouds of poison.”¹⁰⁴ Again, Cantelon referenced global cooling in an interpretation of Amos: “An astronaut ventured to declare that already 50% of the valuable rays of the sun were being denied to Mother Earth by an ugly specter named pollution. Could it be purely accidental that the prophet Amos long ago wrote concerning this day and said, I darken the earth in the clear day. (Amos 8:9) Could it be mere chance that he added in the next breath, I will send a famine in the land. (Amos 8:11).”¹⁰⁵

¹⁰² Time LaHaye, *The Beginning of the End* (Wheaton, IL: Tyndale House Publishers, 1972), 172.

¹⁰³ *Ibid.*, 173.

¹⁰⁴ Willard Cantelon, *The Day the Dollar Dies* (Plainfield, NJ: Logos International, 1973), 83.

¹⁰⁵ *Ibid.*, 86.

Chuck Smith agreed with the interpretations of Lindsey, Odle, and Cantelon of the Bible's prophetic books in *What the World Is Coming To* (1977). He too offered new interpretations of Biblical passages. Referring to Rev. 8:8-9, Smith wrote

[t]his great mountain of fire falling into the sea sounds like pollution. The earth will be so polluted that the trees will be dying. That is happening now. The strontium 90 from an atomic fallout in the atmosphere affects vegetation and greatly endangers our lives. That's why the atmosphere testing of atomic weapons was stopped. If an atomic war breaks out, the by-product of radioactive fallout will do tremendous damage to crops and the earth. It would become possible that the sea will become polluted, and the third part of the creatures die, and the third part of the ships be destroyed.¹⁰⁶

Smith also believed Rev. 8:10-11 was an affirmation of environmentalists' anxiety over water pollution.¹⁰⁷ In addition to climate change and pollution, he also discussed damage to the ozone layer even before that issue became a widespread concern; Smith saw ozone depletion predicted in Revelation. In his examination of Rev. 16:8-11, when the fourth angel's vial is opened, Smith referred to the belief that supersonic transport and CFCs might be damaging the ozone layer: "Some scientists estimate that in about eight years this ozone blanket will be depleted to the extent that stepping outdoors will be dangerous. Any exposure to the sun would cause extreme burns and 'scorch men.'"¹⁰⁸

Just as the scientific apocalyptic was articulated in fiction and non-fiction, conservative evangelicals also used fiction to reach new audiences. This became increasingly true in the 1970s, when writers other than Kirban began to explore Bible prophecy through fiction. These fictional treatments depicted environmental disasters during the Tribulation period. An evangelical and converted Jew, Gary G. Cohen, began his novel, *Civilization's Last Hurrah* (1974) with the scenario of a nuclear reactor in

¹⁰⁶ Chuck Smith, *What The World Is Coming To* (Costa Mesa, CA: The Word For Today, 1993), 87.

¹⁰⁷ *Ibid.*, 88.

¹⁰⁸ *Ibid.*, 152.

Jordan polluting the Dead Sea, fertilizers from which the world needs: “It’s immoral to contaminate the Dead Sea’s fertilizer minerals when a starving, overpopulated world is crying for food.”¹⁰⁹ Cohen used environmental issues in a particularly creative way. Premillennialist non-fiction and fiction depicted the Antichrist as requiring a literal mark or tattoo—the 666 mark or the mark of the beast—to buy and exchange goods. When, as many premillennialists believe, the 666 marks become painful in the days leading up to Christ’s return, Cohen offers a novel explanation for the condition: “They claim that a heavy ozone isotope, an ecological pollutant, is chemically attacking the black light dyes now imbedded within the skin of all those marked with the 666. By means of some fantastically complicated chemical reaction that has apparently taken months and years to germinate . . . people are suffering intense pain.”¹¹⁰

Premillennialists accepted that the environment was degraded, but they also believed that when Christ returned, ushering in the millennium, he would restore the world to a pristine state. Kirban, in his work of fiction about the millennium, *1000* (1973), portrayed the dissipation of pollution as soon as Christ returns.¹¹¹ Another evangelical writer and speaker, George Otis, wrote a non-fiction book speculating about life during the millennium for Christians. *Millennium Man* (1974) cited the Club of Rome, a group of scholars concerned about the future of the world: “Recently the C.O.R. [Club of Rome] undertook a penetrating study of mankind’s odds for survival in view of five global threats: RUNAWAY POPULATION, ENVIRONMENT POISONING, DEPLETION OF ENERGY, RAW MATERIALS AND FOOD. After inserting all exponential growth data on these into a computer, the C.O.R. experts concluded that

¹⁰⁹ Gary G. Cohen, *Civilization’s Last Hurrah* (Chicago: Moody Press, 1974), 13.

¹¹⁰ *Ibid.*, 186.

¹¹¹ Kirban, *1000*, 67.

Earth simply can't support its projected life in the near future.”¹¹² Otis wrote rapturously of the millennium: “You can almost see the clear waters, brilliant skies, singing hills, exploding greenery and brilliant Millennium flowers. No more choking weeds; no devouring insects; no more killing droughts.”¹¹³ The implication of Otis's beliefs was that Christians do not have to take the threat of resource scarcity and pollution seriously: “Before all of earth's gears lock up for want of lubrication, this age will close. The oil supplies which God placed in the planet will prove adequate to squeak through this era.”¹¹⁴

While premillennialist Christians responded to the surge of interest in environmental issues by incorporating the various problems of pollution, overpopulation, and resource scarcity into their visions of the end, in general conservative evangelical interest in environmentalism waned towards the middle of the 1970s. Articles in *Christianity Today* and *Moody Monthly* on environmental topics became scarce. A fictional work that appeared in 1978 presaged the skepticism that conservative evangelicals began have towards environmental issues in the 1980s. Donald L. Moore in *Mirrors of the Apocalypse* (1978) represented population control as a policy of the Antichrist. Most children are aborted, and a population control magazine is called *666*, because the optimal number of “immortals” was 660 million.¹¹⁵

During the 1980s and 1990s, more premillennialists would argue that the Antichrist would use environmental problems as a pretext to seize power. The decreased concern with environmental issues themselves (as opposed to the uses they might be put

¹¹² George Otis, *Millennium Man* (Van Nuys, CA: Bible Voice, Inc., 1975), 35. Emphasis is his.

¹¹³ *Ibid.*, 46.

¹¹⁴ *Ibid.*, 67.

¹¹⁵ Donald L. Moore, *Mirrors of the Apocalypse* (Nashville, TN: Charter House, 1978), 22.

to) is apparent from the premillennialist reaction to the Three Mile Island incident. When the Three Mile Island reactor came close to meltdown in 1979, there was little response from conservative evangelicals. Nancy M. Tischler, an evangelical woman who was in the area of “Three Mile Island,” wrote a brief article describing her experience for *Christianity Today*. She was not angry nor moved to anxiety about the safety of nuclear energy. Rather, she concluded that “Three Mile Island can only hurt our bodies; it never threatened our immortal souls....Then let us offer a prayer of thanks that the power of Three Mile Island cannot compare to the power of the Holy Ghost.”¹¹⁶

A conservative Methodist, David L. McKenna, offered his thoughts on Three Mile Island in the same issue of *Christianity Today*. While he brought up old fears of resource depletion, McKenna concluded that “[d]eeper down than nuclear plans of technological dreams, the philosophy of unquestioned scientific authority died at Three Mile Island.”¹¹⁷ At the beginning of the decade, conservative evangelicals accepted the pronouncements of scientists that overpopulation and pollution were threats, often citing them as experts and content to use their scientific conclusions to support their own interpretations of the Bible. By 1979, *Christianity Today* and *Moody Monthly* had largely stopped publishing articles about the environmental crisis. McKenna’s celebration of the death of “scientific authority” was a precursor of the skepticism that conservative evangelicals would bring to environmental issues in the 1980s. The change came about as environmentalism, in the wake of legislative success and popular acceptance in the early 1970s, became more politicized, often regarded by conservatives as a plot to undermine capitalism based upon sketchy scientific evidence.

¹¹⁶ Nancy M. Tischler, “Three Mile Island,” *Christianity Today* 23, no. 15 (4 May 1979): 15.

¹¹⁷ David L. McKenna, “Science Says ‘Excuse Me’ After the Radioactive Burp,” *Christianity Today* 23, no. 22, (21 September 1970): 13.

In a 1971 book review in *Christianity Today*, the reviewer, Wilbur L. Bullock, criticized liberal Christians who wrote about the environmental crisis for failing to realize that environmental problems could mean Christ is returning:

Secular writers on the problems often tend to be apocalyptic in their assessment of pollution, overpopulation, and famine. Some even quote Revelation, Jeremiah, Lamentations, and other ominous-sounding portions of Scripture. But neither [Francis] Schaeffer nor [H. Paul] Santmire considers a possible relation between the current crises and apocalyptic judgment. . . . I do not mean to encourage date-setting. But isn't it just possible that the end times predicted in Scripture and the catastrophes we are being warned of by the ecologically oriented may have something in common?¹¹⁸

Bullock's review emphasized the shared concerns of scientific and religious apocalypticists in the post-war period. Liberal Christians were no less concerned with the environment, but they avoided apocalyptic conclusions, feeling hopeful that popularizing a Christian attitude towards the environment could help people reject an exploitative view of nature. Premillennialists live in an ever-present era of crisis; the world has been doomed since the fall of Adam and Eve. When scientists agreed that the world was falling apart, it was easy for religious apocalypticists to incorporate these concerns into their visions of the coming end. Environmental issues buttressed the argument that Christ was the only salvation from the problems dogging society.

Environmentalists similarly used apocalyptic language to win converts; telling people that the world was in crisis and that famines, energy shortages, and illnesses from chemicals were inevitable was a way of urging action. Salvation was implied in writers' proffered solutions. The world would fall apart *unless* DDT was banned, *unless* population control was implemented, and *unless* society accepted ecological concepts. This is not to argue that environmentalists cynically invoked the apocalypse to achieve

¹¹⁸ Wilbur L. Bullock, "Ecology and Apocalypse," *Christianity Today* 15, no. 15 (23 April 1971): 24.

their goals. The sense of crisis was real. Scientific apocalypticists unwittingly used similar tactics as religious apocalypticists, whose sense of crisis, while immanent, was no less real.

While Bible prophecy fiction and non-fiction presented a consistent interpretation of the books of Revelation and Daniel and were often written by the same author, the apocalypses of non-fiction science writers contrasted sharply with those of science fiction writers. Non-fiction writers generally presented the problems and argued that they were so many and so severe that the world was on the edge of collapse, but they offered readers the hope for salvation at the end if only the reader would change her ways (or force the government to change its ways). Fiction writers tended to be more pessimistic. Individual action was rarely enough to save humanity from a manmade environmental doom. Rather, an evolutionary leap was needed to rescue humanity from its demise. Science fiction writers also began to lose faith in the power of technology to redeem the human species. Some speculative fiction writers offered no hope at all, imagining the end of all life due to accumulating environmental problems. For science fiction writers approaching environmental issues, humanity was an inherently destructive species, perhaps not even worthy of saving.

The reason for these differences lies partly in methodology. While a number of science fiction writers had a science background, e.g., Isaac Asimov and James Blish, most were writers with a layman's interest in science. They were not obliged to offer solutions, and in their self-assigned roles as prophets, the gloomier the vision, the more likely their work would have an impact on their readers. That fiction could work a conversion was apparent to non-fiction writers like Carson and Ehrlich, both of whom

wrote fictional scenarios of the end of the world as we know it if environmental problems were not resolved.

If scientific apocalypticists who wrote non-fiction offered salvation to humanity, the scientific apocalypticists who wrote fiction sat in judgment of mankind. Like conservative evangelicals who emphasized the inherent sinfulness of every individual (which could be the cause of pollution), science fiction writers concluded from the behavior of humans that *Homo sapiens* was innately degenerate. Their almost mystical faith in the power of evolution to create a new, superior species of man was akin to religious apocalypticists' belief that acceptance of Christ could change an individual's behavior. In both cases, humans were unable to save themselves on their own. If non-fiction writers unconsciously emulated the style of the religious apocalyptic, science fiction writers unconsciously accepted very similar philosophical premises to premillennialist writers. Combined, fiction and non-fiction writers of the scientific apocalyptic offered an analogous apocalyptic vision to that of religious apocalypticists.

While scientific apocalypticists would have found the concerns of premillennialists unrelated to their own, religious apocalypticists seized on the works of scientific apocalypticists as environmental issues became mainstream to bolster their biblical interpretations. Using the conclusions of scientists was a way to legitimize the Bible in a modern society by showing how the events in Revelation were possible. This enterprise was not confined to Bible prophecy alone; conservative evangelicals also became interested in "creation science" in the 1970s, employing science to prove that a literal interpretation of the Bible could be true. Whereas Bible prophecy was not a threat to a scientific worldview on its own, using science to support Creationism meant that

conservative Christians had to challenge what scientists would consider to be fact, such as the age of the earth. The result was a view of science, not as an objective pursuit of the truth through experimentation, but rather as subject to interpretation. This was a noxious notion to scientists, but the issues raised by environmentalists and anti-nuclear activists helped undermine the supposedly objective authority of science. It was scientists who created the bomb and invented pesticides and combustion engines while failing to anticipate the consequences.

As a result of the changing view of how conservative evangelicals should use science, the wholesale acceptance of the environmental crisis by religious apocalypticists fractured as the conclusions of scientists were questioned. Religious apocalypticists did not stop using science to bolster their interpretations, but no longer would they unthinkingly rely on “mainstream” authorities either.

The end of the 1970s saw nuclear and environmental concerns become interlaced. People started protesting nuclear reactors, fearing the release of radioactivity, after anxiety over nuclear reactors became widespread following Three Mile Island. Radioactive contamination joined the list of environmental pollutants threatening human health. When, in the early 1980s, scientists popularized the idea of “nuclear winter” (the idea that nuclear war could completely destroy the ecosystem), the merging of the two issues became complete. This occurred even as environmentalism, which even a conservative president like Nixon had embraced, became a “liberal” issue. As a result, both scientific and religious apocalypticists re-evaluated environmental problems like overpopulation and pollution that had seemed such obvious threats in the 1970s.

Chapter Five

Converging Apocalyptic Fears: The Eighties

Nuclear and environmental fears converged in the early 1980s as scientists became concerned that human activity could dramatically change the earth's climate. At a 1983 conference in Washington, D.C., scientists including astronomer Carl Sagan and Paul Ehrlich presented their findings that a nuclear war could significantly cool the earth's surface and destroy the ozone layer. That same year a panel appointed by the U.S. Academy of Sciences cautiously reported the possibility of carbon dioxide emissions leading to global warming. The EPA confirmed the findings in a separate report.¹ Although scientists had warned of the possibility of climate change in the 1970s, these organizations' official statements dramatically changed the tenor of the environmental and anti-nuclear movements.

While scientific apocalypticists discovered more reasons to support nuclear and environmental reforms, conservative Christian apocalypticists found new reasons to be suspicious of such reforms. Conservative evangelicals and fundamentalists became politicized during the 1980s as a response to the cultural changes of the 1960s and 1970s. Fundamentalists like Jerry Falwell and Pat Robertson became involved in politics, eschewing fundamentalists' traditional isolation from society. Jerry Falwell established the Moral Majority, a conservative lobbying group, in 1979, and Pat Robertson, founder of the Christian Broadcasting Network, ran for president in 1988. The result was that some Bible prophecy writers not only suggested that scripture predicted nuclear war but also argued for support of Reagan's policies.

¹ Spencer Weart, *The Discovery of Global Warming* (Cambridge, MA: Harvard University Press, 2003), 145-146.

There were differences, however, between secular and religious conservatives in this period. While political conservatives opposed the anti-nuclear movement on grounds it would weaken the U.S. and worried about the economic impact of the environmental protection laws, conservative evangelicals expressed different fears. Since the 1960s, they had been worrying that the anti-nuclear movement (and any peaceful overtures toward the Soviet Union) might help bring the Antichrist to power; in the 1980s premillennial dispensationalists feared that the reforms required to save the environment would help the Antichrist to seize power.

Worsening relations with the Soviet Union affected scientific and religious apocalypticism. The détente of the 1970s had mollified fears about a devastating nuclear war, but détente had ended by the time Reagan entered office in 1981. Reagan promised to make America great again; his vision for America included taking a strong stance on the Soviet Union, which he believed was still bent on world domination. Shortly after he was sworn in, Reagan told the press that the Soviets, in pursuit of this empire, “have openly and publicly declared that the only morality they recognize is what will further their cause, meaning they reserve unto themselves the right to commit any crime, to lie, to cheat in order to obtain that [goal]. . . .”² The first half of Reagan’s first term “was a period that seemed at the time—and still seems—the most dangerous one in Soviet-American relations since the Cuban missile crisis,” according to historian John Lewis Gaddis.³

² Bernard Gwertzman, “President Sharply Assails Kremlin; Haig Warning on Poland Disclosed,” *The New York Times*, 20 January 1981, Sec. 1, p. 1, Col. 4, *Lexis-Nexis Academic* (accessed: 11 January 2009).

³ John Lewis Gaddis, *Strategies of Containment: A Critical Appraisal of American National Security Policy During the Cold War* (New York: Oxford University Press, 2005), 357.

In his first term, Reagan accelerated the arms race by building up the nuclear arsenal, pushing an anti-ballistic missile system called the Strategic Defense Initiative (SDI) or “Star Wars.” He employed strong rhetoric regarding the Soviet Union, calling it the “evil empire” in 1983 during a speech to the National Association of Evangelicals. Publicly Reagan intimated that nuclear war was “winnable” (SDI was his attempt to make this a reality)—an idea that undermined mutual assured destruction (MAD).⁴ When the media reported statements Reagan made about nuclear weapons being used in the final battle of Armageddon, the news coverage heightened the perception that Reagan might start a nuclear war.

The “nuclear freeze” movement of the early 1980s that advocated a halt to nuclear weapons construction in the early 1980s was a reaction on the part of Americans to their government’s newly militant attitude. In June 1982, protestors held a nuclear freeze rally at Central Park in which between 500,000 and 750,000 participated.⁵ Although the decade of the eighties began with renewed anxiety over nuclear war, by the end of the 1980s, Reagan’s series of summits with Gorbachev that resulted in arms reductions by 1987 aided in quelling nuclear fears. With the fall of the Berlin Wall in 1989 and the disintegration of the Soviet Union in 1991, apprehensions about nuclear war once again ebbed.

⁴ In fact, Reagan’s proposal of SDI was not meant to worsen the arms race. Reagan dreamed of a shield that would be made available to the entire world and would eradicate nuclear war. However, the public did not recognize that SDI was an expression of Reagan’s idealism. See Edmund Morris, *Dutch* (New York: Random House, 1999), 562.

⁵ Gil Troy, *Morning in America: How Ronald Reagan Invented the 1980s* (Princeton University Press, 2005), 138. Troy reports 700,000 participated, but the police at the time estimated 500,000 were at the rally while another 250,000 participated in other events related to the rally. See also Ward Morehouse III, “Will US Warm to a Nuclear ‘Freeze?’” *Christian Science Monitor*, June 14, 1982, Monday, Midwestern Edition, p.1, *Lexis-Nexis Academic Universe* (accessed: 12/31/08).

At the beginning of the 1980s, the fear that Reagan was making nuclear war probable resulted in a new wave of non-fiction that explored the results of such a war. Two of these works, one by ecologist Bruce D. Clayton and another by journalist Jonathan Schell, illustrate the two different approaches to the topic. Clayton wrote in his preface to *Life After Doomsday: A Survivalist Guide to Nuclear War and Other Major Disasters* (1980): “I originally began to write this book because I was angry. While studying for my doctorate in ecology I had become interested in the effects that spilled radioactive materials could have on natural and man-made ecosystems.”⁶ A logical result of Clayton’s studies was that Clayton also became interested in how a nuclear war would impact ecosystems. Reviewing the scholarship, Clayton decided that too much of it was fatalistic and concluded that someone needed to write a book that offered practical advice for surviving a nuclear war. His rather optimistic work gave instructions on such practicalities as how to build a shelter or how to make a homemade fallout meter.

In *The Fate of the Earth* (1982), Schell echoed the arguments of earlier scientific apocalypticists by urging the world to dismantle its nuclear arsenals in order to prevent “the utterly meaningless and completely unjust destruction of mankind by men.”⁷ He also approached the topic from the standpoint of the ecological effects of a nuclear war, an approach that dominated discussion of nuclear war during the eighties. He maintained that “[t]he nuclear peril is usually seen in isolation from the threats to other forms of life and their ecosystems, but in fact it should be seen as the very center of the ecological

⁶ Bruce D. Clayton, *Life After Doomsday: A Survivalist Guide to Nuclear War and Other Major Disasters* rev. and expanded ed. (New York: The Dial Press, 1981).

⁷ Jonathan Schell, *The Fate of the Earth* (New York: Avon Books, 1982), 127. Schell’s book was the most popular book on nuclear war to be published since 1946 when John Hersey’s *Hiroshima* reported in detail the effects of the Hiroshima bombing. See Spencer Weart, *Nuclear Fear: A History of Images* (Cambridge, MA: Harvard University Press, 1988), 376.

crisis—as the cloud-covered Everest of which the more immediate, visible kinds of harm to environment are the mere foothills.”⁸ Believing that the threat of nuclear war was more important than any other problem facing humanity, Schell criticized Christians for imagining that God is in control of events and suggested that the popularity of science fiction was due to a desire to see in the stars a way to resolve the nuclear dilemma.⁹ Only humanity could save itself and the earth, he contended, implying that humans make life meaningful by choosing to unite in the face of such a threat.

Schell’s book anticipated Sagan’s announcement that a “nuclear winter” could follow a nuclear war by speaking of the possibility of cooling and the destruction of the ozone layer from a full-scale nuclear war.¹⁰ Until the 1983 conference that made it official, however, the potential of global cooling from a nuclear war was not widely recognized, even after Schell’s book. Erhlich wrote in 1983 of Schell’s work: “When many of us read Jonathan Schell’s book, *The Fate of the Earth*, we were very much impressed by the moving way in which he presented the case, but I suspect that most biologists, like myself, thought it was a little extreme to imagine that our species might actually disappear from the face of the planet. It did not seem plausible from what we knew then.”¹¹ For many Americans, Clayton’s survivalism became less plausible after “nuclear winter” was publicized. Schell’s book, on the other hand, portended the direction of nuclear war analyses during the 1980s.

⁸ Ibid., 111.

⁹ Ibid., 126-127.

¹⁰ Ibid., 20. The notion that the earth could cool from the dust thrown into the atmosphere was first proposed in 1956 in a study that the United States Weather Bureau did on request by the Atomic Energy Commission. Ralph Lapp and Barry Commoner also discussed this possibility in books published during the sixties. Historian Spencer Weart, however, argues that no one seriously thought that humanity could become extinct from this effect. See Spencer Weart, *Nuclear Fear*, 381-382.

¹¹ Paul R. Ehrlich, “The Biological Consequences of Nuclear War” in *The Cold and the Dark: The World after Nuclear War: The Conference on the Long-Term Worldwide Biological Consequences of Nuclear War* (New York: W.W. Norton & Company, 1984), 58.

Fictional treatments of nuclear war during the early 1980s before the publicizing of nuclear winter in 1983 were as pessimistic as Schell in their estimation of the effects of a nuclear war. Two American movies that came out in 1983 illustrate this pessimism. Both were released too soon after the Conference on the Long-Term Worldwide Biological Consequences of Nuclear War to incorporate its findings. At the beginning of November, *Testament* first appeared in theaters in New York, going into wide release the following month.¹² It showed the aftermath of a nuclear war by focusing on a family in a suburb of San Francisco. Slowly everyone in the small town dies of radiation, and though the mother and one of her children still live at the end, the film implies that they soon will die as well. This movie did not get the same attention as another nuclear war movie, *The Day After*, which aired on the ABC television network on November 20, 1983.¹³ The event garnered 100 million viewers and became a source of great controversy in the media.¹⁴ It depicted a group of individuals in Lawrence, Kansas, dealing with the consequences of a nuclear war. The movie included graphic scenes of injuries, deaths from radiation, and acts of violence on the part of scared survivors. Both films made it clear, as Schell had, that a nuclear war would be catastrophic and pointless, nullifying human accomplishment.

Directly after *The Day After*'s airing, ABC News had a special roundtable moderated by Ted Koppel that included former Secretary of State Henry Kissinger, conservative intellectual William F. Buckley, astronomer Carl Sagan, former Secretary of Defense Robert McNamara, author and Nobel Peace Prize winner Elie Wiesel, Reagan's

¹² *Testament*, dir. Lynne Littman, Hollywood, CA: Paramount Pictures, 1984, c1983, video recording.

¹³ *The Day After*, dir. Nicholas Meyer, Hollywood, CA: ABC Circle Films, 1983, digital video recording.

¹⁴ Tom Morganthau, "After 'The Day After,'" *Newsweek* (5 December 1983): 62, *Lexis-Nexis Academic Universe* (accessed: 12/15/08).

Secretary of State George Schultz, and former National Security Advisor Brent Scowcroft. The views of these men illustrated the controversy over U.S. nuclear policy and over the potential effects of a nuclear war. For instance, Sagan used the forum to announce that an actual nuclear war would be much worse, resulting in nuclear winter. Kissinger, in contrast, complained that the movie was simple-minded, while Buckley suggested that the point of the movie was “to launch an enterprise that seeks to debilitate the United States.”¹⁵

American science fiction during the early 1980s echoed *Testament's* and *The Day After's* pessimistic visions of nuclear war and rehashed themes that appeared in nuclear fiction between 1945 and 1979. For instance, the only reprieve for humanity lay in extraordinary circumstances, such as through the actions of aliens in Hilbert Schenck's *A Rose for Armageddon* (1982).¹⁶ Or, nuclear war merely paved the way for the evolution of a better human in David R. Palmer's short story “Emergence” (1980).¹⁷

While Schell thought only the rejection of divisive international politics would restore a purpose to the human enterprise, fiction writers continued to argue that humanity deserved a nuclear judgment during this period. In American Jewish novelist Bernard Malamud's novel, *God's Grace* (1982), humanity is wiped off the face of the earth completely with only one survivor, who conducts a revealing conversation with God. God tells this survivor that humanity deserved its fate: “The present Devastation, ending in smoke and dust, comes as a consequence of man's self-betrayal. . . . They have destroyed my handiwork, the conditions of their survival: the sweet air I gave them

¹⁵ “Day After: Perils of Nuclear War,” ABC News Special Presentation, 1991, c1983, video recording.

¹⁶ Hilbert Schenck, *A Rose for Armageddon* (New York: Pocket Books, 1982).

¹⁷ David R. Palmer, “Emergence” in *Children of the Future*, ed. Isaac Asimov and Martin Harry Greenberg (Milwaukee: Raintree Publishers, 1984).

to breathe; the fresh water I blessed them with, to drink and bathe in; the fertile green earth. They tore apart my ozone, carbonized my oxygen, acidified my refreshing rain. Now they affront my cosmos. How much shall the Lord endure?''¹⁸

Fiction also reiterated the ongoing debate over how destructive a nuclear war would be. Survivalist fare along the lines of Clayton's *Life After Doomsday* came in the form of Dean Ing's *Pulling Through* (1983), a novel that fellow science fiction writer Spider Robinson urged readers to keep in a safe and accessible place in case of nuclear war. After the concept of nuclear winter was broadly publicized, nuclear fiction dealt with the concept by imagining how humans could survive its effects. Depicting limited nuclear war, large enough to decimate civilization but small enough to avoid nuclear winter, became a popular way to approach nuclear war in fiction. Limited nuclear war devastated U.S. society in American books like Whitley Strieber's and James Kunetka's *Warday and the Journey Onward* (1984), Kim Stanley Robinson's *The Wild Shore* (1984), and Michael Armstrong's *After the Zap* (1987).¹⁹ In both *The Wild Shore* and *After the Zap*, characters suggest that the world is experiencing more snow than prior to the war, implying that a small version of nuclear winter had occurred even with a limited nuclear war.

Other novels and short stories depicted a full-scale nuclear winter.²⁰ Sometimes this led to the extinction or the near-extinction of humanity, as Sagan and Ehrlich warned

¹⁸ Bernard Malamud, *God's Grace* (New York: Farrar Straus Giroux, 1982), 4.

¹⁹ Michael Armstrong, *After the Zap* (New York: Warner Books, 1987); Kim Stanley Robinson, *The Wild Shore* 1st Orb ed. (New York: Tom Doherty Associates Book, 1995); Whitley Strieber and James Kunetka, *Warday and the Journey Onward* (Holt, Rinehart, and Winston, 1984). See also Greg Bear, *Eon* (New York: Bluejay Books, 1985); Richard Bowker, *Dover Beach* (New York: Bantam Books, 1987); Orson Scott Card, *The Folk of the Fringe* (New York: Tom Doherty Associates Book, 1989); Grace Chetwin, *The Atheling* (New York: Tom Doherty Associates, 1987).

²⁰ Not all were consistent with the conclusions of Sagan and the other scientists who proposed the concept. They emphasized that nuclear winter would only last for a few years—long enough to potentially starve

could happen, as in *This Is The Way The World Ends* (1986) by James Morrow, a mainstream author.²¹ In Morrow's novel, a nuclear war destroys all life on the planet, but six people are spared in order to answer for the crimes of their generation at a trial conducted by the future unborn (who will never have a chance to live). The theme is again one of nuclear war rendering all of human existence pointless; one of the unborn tells a defendant: "When you turn the human race into garbage, you also turn history into garbage. 'Why did we bother to invent writing?' they ask. 'Or spinning jennies? Why did we trouble ourselves with the cathedrals?'"²² Nuclear policy is an example of the irresponsibility of the generation that caused the extinction of humanity, the unborn argued; although they knew what was at stake, humanity had placed its hopes in MAD or criticized it without offering any other solution.²³ There is no secular millennium and no possibility that nuclear war might be a refining crisis for humanity in a work like Morrow's.²⁴

In other fictional scenarios, a small remnant of humanity survives in spite of nuclear winter.²⁵ For example, science fiction author Michael Armstrong's *Agviq: The Whale* (1990) takes place in Alaska where an anthropologist is working when an all-out nuclear results in an immediate nuclear winter. Claudia, the anthropologist, teaches the

humanity and other species but not so long as to constitute an ice age. Nevertheless, envisioning an ice age following upon a nuclear war appeared in works like Paul Edwards, "Primum Non Nocere" in *After Armageddon, There Will Be War*, vol. 9, ed. Jerry E. Pournelle (New York: Tom Doherty Associates, 1989), 160-174; Susan Torian Olan, *The Earth Remembers* (Lake Geneva, WI: TSR, Inc., 1989).

²¹ See also Mitch Berman's *Time Capsule* (1987); Octavia Butler, *Dawn* in *Lilith's Brood* (New York: Aspect, 2000); Claudia O'Keefe's *Black Snow Days* (New York: Ace Books, 1990); Joan Slonczewski, *The Wall Around Eden* (New York: William Morrow and Company, Inc., 1989).

²² James Morrow, *This Is The Way The World Ends*, 1st Harvest ed. (San Diego: Harcourt Brace, 1995), 146.

²³ *Ibid.*, 183.

²⁴ See Elizabeth Ann Scarborough, *Nothing Sacred* (New York: Doubleday, 1991) for an example of a small group of humans surviving nuclear winter because of a mystical intervention.

²⁵ See also David Brin, *The Postman* (New York: Bantam Books, 1985); F.G. Wyllis's "Only the Strong Survive" in *After Armageddon, There Will Be War*, vol. 9, ed. Jerry E. Pournelle (New York: Tom Doherty Associates, 1989), 68-75.

Inupiaq their old ways, which they have forgotten. The author asserts in the preface, “*Agviq* is written out of a deep respect for the Inupiaq people and as a warning against the things that threaten to destroy not only their culture, but all cultures.”²⁶ Despite this contention, the depiction of the Inupiaq as having lost most of their culture means that the war is an opportunity to restore the traditions that respect the earth, which also allow them to survive the harsh winter.

This idea that a nuclear war could be freeing for its survivors was a theme that had appeared repeatedly in American science fiction prior to the 1980s. Quite often, as in Ardath Mayhar’s *The World Ends in Hickory Hollow* (1985), nuclear war meant an escape from the drudgery of modern life. The characters in *The World Ends in Hickory Hollow* are hopeful, even happy at scraping a life together: “Zack and I had studied our *Mother Earth* for years and had adapted many of their scrounged-part, homemade methods for generation heat and electricity to our own needs. We distilled our own fuel alcohol, built pedal-powered tools. Our systems, as they were, could give us much of what we needed. With a bit of work they could supply far more energy than we were presently in the market for.”²⁷ A character encapsulates this plucky attitude to a new life when he says, “the world has ended, but we are just beginning.”²⁸ Despite the devastating effect a nuclear winter was theorized to have, American science fiction authors like Armstrong and Mayhar were still able to visualize a kind of millennium for a select few survivors following upon a nuclear war.

²⁶ Michael Armstrong, *Agviq: The Whale* (New York: Warner Books, Inc., 1990).

²⁷ Ardath Mayhar, *The World Ends in Hickory Hollow* (Garden City, NY: Doubleday & Company, Inc., 1985), 24.

²⁸ *Ibid.*, 182.

One conclusion scientific apocalyptic writers of fiction reached was that maybe the Soviet Union and United States would avoid using nuclear weapons altogether—after all, Sagan warned that if even only one side used enough weapons, it could be enough to commit suicide.²⁹ The implication was that nuclear weapons had become unusable, at least for leaders who were not suicidal. In Robert Silverberg’s *Tom O’Bedlam* (1985), the U.S.S.R. spreads radioactive dust over the United States. One character observes:

For a hundred years everyone worries about the horrors of atomic war, the flash of terrible light and the shattered cities and the melted flesh, and then the atomic war comes, not with bombs but very quietly, with its lethal radioactive dust, far less spectacular but a lot more insidious, great chunks of land made permanently unlivable overnight while life goes on in an ostensibly normal way outside the dusted places.³⁰

In Ben Bova’s short story, “Nuclear Autumn” (1985), the U.S.S.R. achieves the surrender of the United States merely by threatening to explode enough weapons to bring about nuclear winter.³¹

While non-fiction tended to use graphic descriptions of the end to raise awareness, thereby saving humanity from the threat of nuclear war, science fiction writers had always come up with novel circumstances in which humanity might destroy the earth and still survive. Solutions such as aliens stepping in to rescue humanity or missions to the stars resulting in space colonies that preserve a remnant continued to appear in the 1980s.³² Nuclear fiction, however, did undergo some changes. Books in

²⁹ Sagan, “The Atmospheric/Climatic Consequences...,” 33.

³⁰ Robert Silverberg, *Tom O’Bedlam* (New York: Donald I. Fine, 1985), 128.

³¹ Ben Bova, “Nuclear Autumn” in *After Armageddon, There Will Be War*, vol. 9, ed. Jerry E. Pournelle (New York: Tom Doherty Associates, 1989), 204-209.

³² Grace Chetwin, *The Atheling* (New York: Tom Doherty Associates, 1987); Ursula K. Le Guin, “Newton’s Sleep” in *Future Primitive: The New Ecotopias*, ed. Kim Stanley Robinson (New York: Tom Doherty Associates, 1994); Octavia Butler, *Dawn in Lilith’s Brood* (New York: Aspect, 2000); Joan Slonczewski, *The Wall Around Eden* (New York: William Morrow and Company, Inc., 1989). Other themes that continued to make an appearance include using nuclear war as a device to imagine a drastically different future society. See Sheri S. Tepper, *The Gate to Women’s Country* (New York:

the 1980s that portrayed nuclear war were more likely to show the United States as the aggressor. This may have been because of the perception of Reagan as especially aggressive toward the Soviet Union. A character in Luke Rhinehart's *Long Voyage Back* (1983) concludes that since the Dakotas were safe (South Dakota being a location for missiles), the U.S. president must have ordered a first strike "out of fear that the enemy was desperate enough to do it, so he'd better do it first."³³ In Mayhar's *The World Ends in Hickory Hollow* (1985), the United States makes a preemptive strike, and in return, the Russians hit the East Coast, Colorado, the Midwest, and Houston.

Even if the United States did not strike first, its actions in the world were represented as being provocative. An elder in Robinson's *The Wild Shore* (1984) explained: "We were eating up the world, boy, and that's why the world rose up and put an end to us. So I'm not contradicting myself. America was great like a whale—it was giant and majestic, but it stank and was a killer. Lots of fish died to make it so big."³⁴ A character in Mormon science fiction author Orson Scott Card's *The Folk of the Fringe* (1989) thinks back to the triumph of Apollo 11, the space mission that put the first man on the moon: "Couldn't those people back in 1969 see the cracks, feel the crumbling all around them? Not thirty years later it was all gone. NASA, the USA itself, all gone, all broken up....America was over. It grew two hundred years, feeding and devouring the

Bantam Books, 1988). Also, the theme of mutants continued to appear but tended to be confined to more superficial adventure type novels. See Jerry Earl Brown, *Earthfall* (New York: Ace Books, 1990); C.T. Westcott, *Silver Wings and Leather Jackets: The Autobiography of Colonel William T. Bucko, USFACT (Ret.)* (New York: Dell Publishing, 1989).

³³ Luke Rhinehart, *Long Voyage Back* (New York: Delacorte Press, 1983), 386.

³⁴ Kim Stanley Robinson, *The Wild Shore* 1st Orb ed. (New York: Tom Doherty Associates Book, 1995), 198.

world, even reaching out to touch the moon, and now the name was up for grabs. Nothing left but scraps and fragments.”³⁵

The U.S.S.R. received light treatment by comparison in American science fiction. In Ben Bova’s *Test of Fire* (1982), the U.S.S.R. starts a nuclear war but only accidentally. When a solar flare destroys the Eastern hemisphere, the Soviet Union, believing it to be a pre-emptive attack, unleashes ICBMs, and nuclear war devastates the planet. Likewise, in Paul Cook’s post-nuclear tale *Duende Meadow* (1985), Americans emerge from underground 600 years after a worldwide war and discover Russian survivors, who are not all that different from them, restoring the land.

Prior to the 1980s, scientific apocalyptic authors repeatedly suggested that humanity was innately corrupt and destined to destroy itself. In the 1980s writers of speculative fiction began to question this conclusion. Aliens leave a message that most intelligent species destroy themselves without help in Norman Spinrad’s *Songs from the Stars* (1980).³⁶ T.L. Sherred and Lloyd Biggle, Jr.’s *Alien Main* (1985) is about an alien species who purposely cause a nuclear war on Earth so that they can claim the world for their own purposes. Brin exonerates Americans (and by extension, all humans), suggesting that they did not deserve to perish in a nuclear war in *The Postman* (1985): “What were those people like, those Americans? You remember how they criticized themselves, often rightly. They were arrogant argumentative, often shortsighted . . . But they did not deserve what happened to them! They had begun to wield godlike

³⁵ Card, 211.

³⁶ Norman Spinrad, *Songs from the Stars* (New York: Simon and Schuster, 1980), 232.

powers—to create thinking machines, to give their bodies new strengths, and to mold Life itself—but it was not pride in their accomplishments that struck them down.”³⁷

The changes in nuclear fiction during the 1980s likely resulted from the political climate in which liberals feared that Reagan’s policies might lead to nuclear war. Science fiction writers still thought of themselves as performing a public service, warning Americans what would happen if a nuclear war were allowed to happen; incorporating nuclear winter into the scenarios they presented was part of the educator role they assumed for themselves.³⁸ For instance, science fiction author H. Bruce Franklin in a 1984 essay, “Nuclear War and Science Fiction,” said this of science fiction’s prophetic possibilities:

If the possibility of nuclear war is not the most important and distinctive feature of today's world, what is? We call upon imaginative literature to help us explore and cope with this overwhelming fact. Only science fiction can respond. For any imaginative literature projecting either nuclear war or an end to the nuclear threat is by definition science fiction.³⁹

Not all writers, however, were content to portray humanity as perishing without the hope of salvation in the service of educating the public. Even though nuclear winter meant that nuclear war was riskier, science fiction writers still found a way to conceptualize nuclear war as a refining crisis for the lucky survivors who often would go on to create a better world. The conclusion of some writers that humans were not

³⁷ Brin, 203.

³⁸ See Isaac Asimov, introduction to *Through Darkest America* by Neal Barrett, Jr. (New York: Congdon & Weed, Inc., 1986), vii; Gregory Benford, “Introduction” to *Nuclear War*, ed. Gregory Benford and Martin Harry Greenberg (New York: Ace Books, 1988), 4.; Harry Harrison, “Afterword: The End of War” in *There Won’t Be War*, ed. Harry Harrison and Bruce McAllister (New York: Tom Doherty Associates, 1991), 302-303, 309; Bruce McAllister, introduction to *There Won’t Be War*, ed. Harry Harrison and Bruce McAllister (New York: Tom Doherty Associates, 1991), 2 ; John Maclay, introduction to *Nukes: Four Horror Writers on the Ultimate Horror*, ed. John Maclay (Baltimore, MD: Maclay & Associates, Inc., 1986), 8. For a minority statement that science fiction could promote a more conservative viewpoint, e.g., that nuclear war was survivable, see Jerry Pournelle, “After Armageddon: New Beginnings” in *After Armageddon, There Will Be War*, vol. 9 (New York: Tom Doherty Associates, 1990), 4-5.

³⁹H. Bruce Franklin, “Nuclear War and Science Fiction” in *Countdown to Midnight: Twelve Great Stories About Nuclear War*, ed. H. Bruce Franklin (New York: Daw Books, Inc., 1984), 11.

especially deserving of species death expressed the feeling that nuclear weapons had gained a disproportionate power to destroy all life; it was no longer necessary to imagine a scenario where both sides in the Cold War rashly set off every bomb they had in order to envision the end of humanity. Science fiction writers also continued to link this end to the beginning, invoking evolution as compensating for the extinction of humanity. For instance, at the end of the 1988 film *Miracle Mile*, as soon as the bombs explode, the two main characters give up the fight to survive a helicopter crash into the ocean and let themselves drown, saying, “it’s the insects’ turn.”⁴⁰

In addition to nuclear winter, the 1980s saw the publicizing of climate change due to human industrial activity. In 1981, global warming, which scientists had been seriously exploring alongside global cooling since the 1970s, made the front page of the *New York Times* due to the efforts of Jim Hansen, a physicist at Goddard Institute for Space Studies in New York City. His research concluded that global warming would be apparent by the end of the millennium.⁴¹ The Academy’s and EPA’s separate reports followed in 1983, confirming the possibility of global warming and largely ending the scientific debate over whether global cooling or warming was more likely.

In the mid-1980s, there was renewed concern over the damage humans were causing to the ozone layer. Although CFCs had begun to be phased out in the 1970s, the head of the British Antarctic Survey, Joseph Farman, described seasonal ozone depletion over Antarctica in the May 1985 issue of *Nature*; the following year, a team of NASA

⁴⁰ *Miracle Mile*, dir. Steve de Jarnatt, Hemdale Film Corporation, 1988. See also David R. Palmer, “Emergence” in *Children of the Future*, ed. Isaac Asimov and Martin Harry Greenberg (Milwaukee: Raintree Publishers, 1984); Kurt Vonnegut, *Galapagos* (New York: Dell Publishing, 1985; reprint, New York: Delta Trade Paperbacks, 1999)

⁴¹ Walter Sullivan, “Study Finds Warming Trends that Could Raise Sea Levels,” *The New York Times*, 22 August 1981, sec. 1, col. 1, p. 1, *Lexis-Nexis Academic Universe* (accessed online: 1/1/09). See also Weart, *Discovery of Global Warming*, 143.

scientists confirmed his results.⁴² Some doubted whether humans could be causing this effect, but as journalists Seth Cagin and Philip Dray report: “others recalled [American astrophysicist] Michael Prather’s hypothesis that ozone depletion might not always be linear, that it would under certain conditions occur suddenly, with catastrophic effect, and they could not help but feel a chill, for they were reminded of the kind of total breakdown of a natural system that modern environmentalists like Rachel Carson had warned of for so long.”⁴³

In 1988, an unusually hot summer led to increased attention to the greenhouse effect. One hot summer may not have been clear evidence of global warming to scientists, but it made a compelling news story. High temperatures, droughts, and powerful hurricanes led to media stories about global warming, suggesting that the world could expect more of the same in the future. *Time* magazine chose Earth as “planet of the year” for 1988 in lieu of their usual “man of the year” cover article, explaining that the choice “had its origin in the scorching summer of 1988, when environmental disasters—droughts, floods, forest fires, polluted beaches—dominated the news.”⁴⁴ The accumulation of new environmental concerns led to a second Earth Day in 1990 in which 200 million people in 140 nations participated in activities.⁴⁵ Environmentalists grumbled that it was co-opted by corporations, who promoted themselves as being “green” in advertising.⁴⁶

⁴² Seth Cagin and Philip Dray, *Between Earth and Sky: How CFCs Changed Our World and Endangered the Ozone Layer* (New York: Pantheon Books, 1993), 282.

⁴³ *Ibid.*, 285.

⁴⁴ Robert L. Miller, “From the Publisher,” *Time*, 2 January 1989, <http://www.time.com/time/magazine/article/0,9171,956631,00.html> (accessed: 22 January 2009).

⁴⁵ Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington, D.C.: Island Press, 1993), 201.

⁴⁶ Benjamin Kline, *First Along the River: A Brief History of the U.S. Environmental Movement*, 2d ed. (Lanham, MD: Rowman & Littlefield Publishers, Inc., 2000), 109.

While the media spotlighted global warming and the depletion of the ozone layer, scientists added another issue to the list of global environmental problems during the 1980s—species extinction. Biologist E.O. Wilson edited a volume of articles on biodiversity in 1988 that had originated from a 1986 conference in Washington, D.C. Wilson wrote in “The Current State of Biological Destiny” that “[b]iological diversity must be treated more seriously as a global resource, to be indexed, used, and above all, preserved.”⁴⁷ He expressed concern over the fast rate of species extinction, suggesting that humans would miss out on the benefits of a diverse population of other species. Biologist David Challinor was more blunt in the epilogue to the volume about the possible impact of the loss of diversity:

[A]n immediate—as opposed to a geological—solution to the problem of maintaining global diversity seems to depend on the collective behaviors and perceptions of people toward their habitat. The Western world in particular has been out of harmony with its environment and through temporary technological superiority has imposed its destructive stands of affluence on the rest of the world. . . . To keep the Earth reasonably habitable for humans in the centuries to come, natural forces will have to lower the human population and reduce the indiscriminate exploitation of the natural world.⁴⁸

The notion that humanity had to change the way it thought about nature became more prevalent in the 1990s. Warning Americans and the rest of the world about what would happen if they did not institute particular policies no longer seemed sufficient to environmentalists; a complete conversion to a new way of thinking was required.

By the end of the 1980s, the looming environmental problems seemed to have overwhelmed the threat of nuclear war. Toward the end of the decade, environmentalist writer Bill McKibben published *The End of Nature* (1989), which detailed the mounting

⁴⁷ E. O. Wilson, *Biodiversity*, ed. E. O. Wilson (National Academy Press: Washington, D.C., 1988), 3.

⁴⁸ David Challinor, epilogue to *Biodiversity*, ed. E. O. Wilson (National Academy Press: Washington, D.C., 1988), 496.

environmental problems of climate change and depletion of the ozone layer as well as older concerns such as the effect of DDT and acid rain. McKibben wrote of these new global problems: “Man’s efforts, even at their mightiest, were tiny compared with the size of the planet—the Roman Empire meant nothing to the Arctic or the Amazon. But now, the way of life of one part of the world in one half-century is altering every inch and every hour of the globe.”⁴⁹ McKibben argued that it was already too late to avoid some consequences of damaging human activity toward the environment, saying “scientists agree that we have already pumped enough gas into the air so that a significant rise in temperature and a subsequent shift in weather are inevitable.”⁵⁰

McKibben questioned the ability of science to provide meaning in a world where humans have attained so much disproportionate power over their surroundings. He noted, “The hope that science could replace religion as a way for human beings to cope with the world, then, was really a hope that ‘nature’ could replace ‘God’ as a source of inspiration and understanding. . . . But nature, it turned out, was fragile: men could turn it on its head so that it was no longer ‘immutable’ and no longer ‘on the side of life.’”⁵¹ If a new understanding of the world was necessary to fix the problems humans had created, then McKibben suggested deep ecology, a concept of Arne Naess, a philosopher from Norway.⁵² In the 1970s, Naess argued for “a *substantial reorientation of our whole civilization*” instead of just shallow reform efforts aimed at fixing the

⁴⁹ Bill McKibben, *The End of Nature* (New York: Random House, 1989), 46.

⁵⁰ *Ibid.*, 67.

⁵¹ *Ibid.*, 82-83.

⁵² *Ibid.*, 186.

environment.⁵³ McKibben saw embracing Naess's philosophy as leading to a "humbler world" "where our desires are not the engine" that drive society.⁵⁴

Scientists like climatologist Stephen H. Schneider in *Global Warming: Are We Entering the Greenhouse Century?* (1989) still tended to place their faith in science. By beginning his book with a brief description of the future if global warming is allowed to go unchecked, Schneider followed the example of previous scientists like Leo Szilard and Rachel Carson who provided exhortative fictional portraits. In his future scenario, various disasters overwhelm the nation—drought, hurricanes, rising sea levels, smog, wildfires, and power failures.⁵⁵ By providing a glimpse into the future, Schneider believed he was fulfilling the role that he thought scientists should play in resolving the crisis he described, emphasizing education of the public using language and metaphors they could understand.⁵⁶ His book also strived to put this into effect by describing the science behind the greenhouse effect and the history of natural climate change.⁵⁷ The ultimate solution to global warming in Schneider's view was not, however, a comprehensive change in the way humans relate to nature; rather, governments need to invest in technologies that would cut down on CO₂ emissions, such as fuel efficiency and nuclear and solar power.⁵⁸

Despite Schneider's belief in technological solutions, other scientists shared McKibben's sense that something more than better policies or technological fixes need to

⁵³ Arne Naess, *Ecology, Community and Lifestyle*, trans. and ed. David Rothenberg (Cambridge: Cambridge University Press, 1989), 45. Quoted in *Beneath the Surface: Critical Essays in the Philosophy of Deep Ecology*, ed. Eric Katz, Andrew Light, and David Rothenberg (Cambridge, MA: MIT Press, 2000), ix.

⁵⁴ McKibben, 191.

⁵⁵ Stephen H. Schneider, *Global Warming: Are We Entering the Greenhouse Century?* (San Francisco: Sierra Club Books, 1989), 2-8.

⁵⁶ *Ibid.*, 237.

⁵⁷ *Ibid.*, 13-23, 36-65.

⁵⁸ *Ibid.*, 283-284.

be done to save the environment. Paul Ehrlich joined with psychologist Robert Ornstein in *New World, New Mind: Moving Toward Conscious Human Evolution* (1989) to ask why humans persist in actions that are clearly harmful to themselves and the environment.⁵⁹ They pinpointed the problem to the evolution of the species; in the past, survival was dependent on a swift reaction to short-term threats. Now that humanity is endangered by threats that build-up over a long period of time, humanity is unable to deal with the current threats, according to Ehrlich's and Ornstein's analysis.⁶⁰ They contended, "The time has come to take our own evolution into our hands and create a *new* evolutionary process, a process of conscious evolution."⁶¹ Doing so will allow humans to survive crises like the greenhouse effect or the ozone hole. This new evolutionary process should begin when children are in elementary school, Ehrlich and Ornstein asserted, and "*adapting to change must be the center of any new kind of teaching.*"⁶²

In spite of the claim in *New World, New Mind* that people need a drastic revision in the way they relate to the environmental crisis, Paul R. Ehrlich's and Anne H. Ehrlich's *The Population Explosion* (1990), an update of *The Population Bomb*, repeated the political solutions that Paul Ehrlich had offered in 1968. The two described myriad problems that could be attributed to overpopulation including global warming and ozone depletion. They argued that the new environmental problems simply indicated the humanity was even closer to disaster: "*Meanwhile, a largely prospective disaster has*

⁵⁹ Paul Ehrlich and Robert Ornstein, *New World, New Mind: Moving Toward Conscious Human Evolution* (New York: Doubleday, 1989), 2.

⁶⁰ *Ibid.*, 9-10.

⁶¹ *Ibid.*, 12.

⁶² *Ibid.*, 217. Emphasis is theirs.

turned into the real thing.”⁶³ Despite the approach of disaster, they accentuated population control as the best solution instead of repeating the assertions made in *New World, New Mind*.⁶⁴ Nevertheless, during the 1990s, more scientists and popular science writers would offer solutions more along the lines of *New World, New Mind* than *The Population Explosion*.

Whereas scientific apocalypticists grappled with the impact of new scientific discoveries, political conservatives attacked the costliness of environmental reform, often suggesting that the science of environmentalism was shaky. Reagan entered office in 1981 vowing to get rid of overregulation. The authors of a history of the debate over the ozone layer, *Between Earth and Sky: How CFCs Changed our World and Endangered the Ozone Layer* (1993), argued that Reagan was representative of a “Western” reaction to environmentalism: “The environmental movement of the 1970s had won clean-air and –water legislation; it had won wilderness designations and had helped ban the aerosol; it had seen the institution of thousands of regulations and a bureaucracy to enforce them; but it had also inspired a powerful and resentful antienvironmentalism that rose up out of the West.”⁶⁵

Assessments of environmentalism in the 1980s are varied. Reagan’s administration was not supportive of environmental causes, but membership in mainstream environmental organizations like the Sierra Club, Friends of the Earth, and National Wildlife Federation grew during the 1980s.⁶⁶ Kirkpatrick Sale, a prolific writer

⁶³ Paul R. Ehrlich and Anne H. Ehrlich, *The Population Explosion* (New York: Simon and Schuster, 1990), 10. Emphasis is theirs.

⁶⁴ *Ibid.*, *Population Explosion*, 59.

⁶⁵ Cagin and Dray, 228.

⁶⁶ Philip Shabecoff, *A Fierce Green Fire: The American Environmental Movement* (New York: Hill and Wang, 1993), 227-233. Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962-1992* (New York: Hill and Wang, 1993), 69.

on environmental issues, in *The Green Revolution: The American Environmental Movement 1962-1992* and sociologist Riley E. Dunlap in *American Environmentalism: The U.S. Environmental Movement, 1970-1990* both assert that public support for environmental causes grew during the 1980s because of the anti-environmental bent of Reagan's administration.⁶⁷

Though facing challenges from conservatives, the momentum of the environmental movement did not slow in the 1980s. The continued discovery of new issues in addition to global warming and ozone depletion propelled the movement. While nuclear energy became less of an issue after Three Mile Island (because no new nuclear reactors were being built), local concerns over toxic waste became heightened after the discovery of hazardous waste in Love Canal, a community outside of Niagara Falls, New York. In the 1940s and 1950s, Love Canal was used as a dumping ground for toxic waste. In the mid-1950s, its owner, the Hooker Chemical Company, filled the site with dirt and then sold it to the city of Niagara Falls where an elementary school was built. In 1975 and 1976, the community received a lot of rain, and chemical odors began to permeate Love Canal as barrels of toxic waste rose to the surface. In 1979 the state agreed to purchase the homes of residents in Love Canal, and President Carter asked Congress for emergency aid. Congress created "Superfund" a year later, a 1.6 billion dollar package administered by the EPA, to clean up hazardous waste in the United States. The result of Love Canal was the birth of both the antitoxics movement and the

⁶⁷ Riley E. Dunlap, "Trends in Public Opinion Toward Environmental issues: 1965-1990" in *American Environmentalism: The U.S. Environmental Movement, 1970-1990*, ed. Riley E. Dunlap and Angela G. Mertig (Philadelphia: Taylor & Francis, 1992), 106. See also, Sale, *Green Revolution*, 69.

so-called “NIMBY” (not-in-my-backyard) movement.⁶⁸ Just as mainstream environmental organizations may have grown in the 1980s due to the anti-environmental disposition of Reagan’s administration, Sale theorizes that the reason the NIMBY sentiment was so strong in the 1980s was because of “the growing feeling that official Washington was unresponsive and environmental Washington preoccupied.”⁶⁹

Just as nuclear fiction writers responded to the theory of “nuclear winter,” so did environmental fiction react to new trends in environmental science. As in previous decades, the theme of humanity being displaced by another species was rare in environmental fiction (though abundant in nuclear fiction). However, the problems of climate change, ozone layer depletion, and pollution seemed so intractable that it required an extraordinary solution. For instance, only a more highly evolved version of *Homo sapiens* could deal with them in Whitley Strieber’s and James Kunetka’s *Nature’s End: The Consequences of the Twentieth Century* (1986). These two writers’ previous apocalyptic outing was *Warday*, a work of metafiction in which their alter-egos explored a post-nuclear United States. In *Warday*, there was hope for the future and belief that the United States could rebuild. In *Nature’s End*, a character stumbles upon a group of children with super-intelligence: “They consider themselves a new level of man, not a replacement. They are a protective mechanism, the species trying to create guides bright enough to extract us from the mess we are in. Fifty years ago, before we had these

⁶⁸ Lois Gibbs, a Love Canal housewife who helped organize the residents of Love Canal, also helped found a Citizens’ Clearinghouse for Hazardous Waste to help other groups around the country mount similar fights.

⁶⁹ Kirkpatrick, *Green Revolution*, 58.

terrible problems, we could have repaired the environment without the need for such brilliant minds. Now, however, they are going to be a great help.”⁷⁰

Climate change in the form of an ice age or the greenhouse effect made a lot of appearances in the 1980s. In Gregory Benford’s *Timescape* (1980), Brazilians cut back the jungle for sugar cane fields, carbon dioxide levels rise, and the climate changes.⁷¹

Anthropologist and science fiction writer Dakota James offered a novel, *Milwaukee the Beautiful* (1986), about global warming that features the city of Milwaukee as its own state where palm trees grow and it no longer snows.⁷²

Not all books pictured global warming as the only form of climate change. In the early 1980s, perhaps responding to the conclusions of scientists like Schneider in the prior decade that an ice age was imminent, science fiction authors like James Kahn in *World Enough, and Time* (1980) and William R. Forstchen in *Ice Prophet* (1983) pictured the effect of an ice age on civilization.⁷³ Toward the end of the 1990s, other authors inserted themselves into the debate over global warming by directly repudiating the concept. In science fiction writers Larry Niven, Jerry Pournelle, and Michael Flynn’s *Fallen Angels* (1991), cleaning up the environment brings on an ice age, which is described as the normal condition of Earth. Despite the onset of the ice age, in the novel,

⁷⁰ Whitley Strieber and James Kunetka, *Nature’s End: The Consequences of the Twentieth Century* (New York: Warner Books, 1986), 380.

⁷¹ Gregory Benford, *Timescape* (New York: Simon and Schuster, 1980), 103.

⁷² Dakota James, *Milwaukee the Beautiful* (New York: D.I. Fine, 1986), 76. See also Dakota James, *Greenhouse* (New York: Donald I. Fine, Inc., 1984); Leland E. Modesitt, Jr., *Dawn for a Distant Earth* (New York: Tom Doherty Associates, 1987); Marge Piercy, *He, She and It* (New York: Knopf, 1991); Strieber and Kunetka, *Nature’s End*; Walter Tevis, *The Steps of the Sun* (Garden City, NY: Doubleday & Company, Inc., 1983), 9; Paul Theroux, *O-Zone* (New York: G.P. Putnam’s Sons, 1986).

⁷³ James Kahn, *World Enough, and Time* (New York: Ballantine Books, 1982); William R. Forstchen, *Ice Prophet* (New York: Ballantine Books, 1983), 283. For more novels with global warming, see also, Dakota James, *Greenhouse* (New York: Donald I. Fine, Inc., 1984); Leland E. Modesitt, Jr., *Dawn for a Distant Earth* (1987); Marge Piercy, *He, She and It* (1991); Whitley Strieber and James Kunetka, *Nature’s End: The Consequences of the Twentieth Century* (New York: Warner Books, 1986); Walter Tevis, *The Steps of the Sun* (Garden City, NY: Doubleday & Company, Inc., 1983), 9; Paul Theroux, *O-Zone* (New York: G.P. Putnam’s Sons, 1986).

Earth First! has a police force that looks for environmental infractions.⁷⁴ In poet and literary critic John Blair's *Bright Angel* (1991), a geophysicist explains that cleaning up industry in the U.S., the Soviet Union, and China curtailed the "global warming scare."⁷⁵

In addition to responding to the publicity that global warming received in the eighties, writers placed ozone layer depletion was in the backdrop of several science fiction books. In Ben Bova's *Peacekeepers* (1988), the ozone layer has been destroyed by pollution. A character in David Brin's *Earth* (1990) "knew the UV danger was often overstated. Even a few days' sunbathing on a beach wouldn't appreciably shorten the average person's lifespan. The ozone layer wasn't that badly depleted yet."⁷⁶ The idea that the ozone hole over Antarctica could occur elsewhere forms the basis of the plot of *Fatal Exposure* (1991) by environmentalist writer Michael Tobias. A massive ozone hole floats over Seattle, decimating the city. At the end, there is a cover up, and despite warning that it could happen again, no drastic action is taken.⁷⁷ Unlike with global warming, these novels did not imagine that the world would end from ozone depletion.

A number of works depicted an accumulation of nuclear and environmental crises happening all at once.⁷⁸ In Spinrad's *Songs from the Stars* (1980), industrial activity is seen as just as destructive as the nuclear war that devastated society. A character laments:

⁷⁴ Larry Niven, Jerry Pournelle, and Michael Flynn, *Fallen Angels* (Riverdale, NY: Baen Books, 1991).

⁷⁵ John Blair, *Bright Angel* (New York: Ballantine Books, 1992), 49.

⁷⁶ David Brin, *Earth* (New York: Bantam Books, 1990), 152.

⁷⁷ See also Eleanor Arnason, *A Woman of the Iron People* (New York: William Morrow and Company, Inc., 1991), 445.

⁷⁸ For more examples, see Ben Bova, *Peacekeepers* (New York: Tom Doherty Associates, 1988); Ernest Callenbach, *Ecotopia Emerging* (Berkeley, CA: Banyan Tree Books, 1981); Dean Ing, *Systemic Shock* (New York: Tor, 1992); James Kahn, *World Enough, and Time* (New York: Ballantine Books, 1980); Michael P. Kube-McDowell, *Emprise* (1985); Paul Theroux, *O-Zone* (New York: G.P. Putnam's Sons, 1986); M.K. Wren, *A Gift Upon the Shore* (New York: Ballantine Books, 1990).

The black science of atomics had poisoned the vast continent beyond the Sierras and who knew how much of the rest of the world, and filled the air of the planet with carcinogens. Unnatural chemistry had killed the fish of the sea. And the burning of black coal and black petroleum rotted the lungs and made the air unfit to breathe. Every human on Earth was still paying for the sins of black science with a reduced life span, and the species itself might eventually pay for its folly with extinction.⁷⁹

Anderson's *Orion Shall Rise* (1983) tells of a nuclear war that has made the Maurai Federation (from the Māori in New Zealand) the new power in the world. They patrol the world, searching for technologies that destroy the environment. One Maurai Federation representative says, "Sometimes I wonder if the Downfall didn't come barely in time, to save the whole biosphere from what the old industry was doing to it."⁸⁰

Like their counterparts in apocalyptic non-fiction, some fiction writers concluded that the only way out of the environmental crisis was through a new relationship between mankind and nature. Writer and editor Ernest Callenbach's *Ecotopia Emerging* (1981), a prequel to his *Ecotopia* (1975), is one such example. *Ecotopia* chronicled an environmental utopia in California, which had seceded from the United States. *Ecotopia Emerging* tells the story of how this utopian society came into being, but this work is more pessimistic than its predecessor. In *Ecotopia Emerging* the prior work—*Ecotopia*—is merely a novel that exists in this fictional universe. That Californians will succeed in establishing a new society, which will represent mankind's best hope for the future, is not clear. The difference between the tones of the two novels is the threat of global warming. In *Ecotopia*, California is a utopia because of a new way of living, one more compatible with nature. By contrast, the narrator of *Ecotopia Emerging* lists a litany of ecological problems: overgrazing, chemical pollution, and most troubling, the

⁷⁹Norman Spinrad, *Songs from the Stars* (New York: Simon and Schuster, 1980), 22.

⁸⁰Poul Anderson, *Orion Shall Rise* (New York: Pocket Books, 1984), 42.

greenhouse effect.⁸¹ At the end of *Ecotopia Emerging*, California succeeds in gaining its independence, but the future of the rest of the world is by no means certain.

Similarly, science fiction and fantasy author Ursula K. Le Guin depicts a future society with a close connection to nature existing thousands of years in the future in *Always Coming Home* (1985). The world still shows scars from the industrial age, and the only way humanity has managed to survive is by establishing a new understanding of nature. The abuse of the land is something these ecologically-minded people cannot understand: “The people of the Valley did not conceive that such acts as they saw and felt much evidence of in their world—the permanent desolation of vast regions through release of radioactive and poisonous substances, the permanent genetic impairment from which they suffered most directly in the form of sterility, stillbirth, and congenital disease—had not been deliberate. In their view, human beings did not do things accidentally.”⁸²

Some underpinned this idea of relating to nature in a new way with theory. James Lovelock, a British scientist, published a book in 1979 discussing the earth’s remarkable tendency to maintain a stable temperature and atmosphere over millions of years. This propensity suggested a metaphor: Earth as a living being. Lovelock called his theory Gaia, after the Greek goddess who was born out of chaos.⁸³ Lovelock was criticized for his anthropomorphic language, and although he meant it as a metaphor, the idea of Earth as a living entity entered popular culture. Gaia theory’s influence on popular culture is reflected in three science fiction books that came out during this period.

⁸¹ Callenbach, *Ecotopia Emerging*, 2.

⁸² Ursula K. Le Guin, *Always Coming Home* (New York: Harper & Row, Publishers, 1985), 159.

⁸³ James Lovelock, *Gaia: A New Look at Life on Earth*, reissued (New York: Oxford University Press, 2000), vii.

In Anderson's *Orion Shall Rise* (1983), the Maurai Federation see a nuclear war as a Gaia-directed reprieve for Earth: "[t]he War of Judgment was not a plain human mistake, an unleashing of powers more vast and lethal than anyone had truly comprehended. It was a fever whereby Gaea freed Herself of a disease."⁸⁴ In Robert Froese's *The Hour of Blue* (1990), people come down with a mysterious illness that is eventually identified as emanating from the planet itself: "Or rather imagine ourselves as the disease, our effects accruing in the planetary bloodstream like toxins from some errant variety of cell. Requiring a response. Earth was making an adjustment--with a simple strand of RNA—initiating a return toward balance."⁸⁵ A writer of an ecological tome has conversations with Gaia through a computer in Tobias's *Voice of the Planet* (1990). Gaia details the problems of Earth caused by humans and complains: "Hiroshima wasn't bad enough. You confronted a profound juncture in 1945. But you didn't learn from that crossroad. You took the wrong path."⁸⁶ Gaia was a living entity in these novels, and took action to prevent humans from causing further damage to Earth.

While nuclear war fiction writers offered the same solutions to avoid an apocalyptic nuclear war during the eighties as they had in previous decades, they also became less prone to believe that humanity deserved such an end. By contrast, environmental writers continued to attribute environmental ills to the evil nature of humanity. Because a distant, vast bureaucracy controlled the nation's nuclear weapons, Americans felt they had little power over their government, especially after the revelation of Nixon's deceptions in the 1970s. This may have contributed to the sense that nuclear war might not be the result of innate human evil but could simply occur because of the

⁸⁴ Anderson, *Orion*, 81.

⁸⁵ Robert Froese, *The Hour of Blue* (Unity, ME: North Country Press, 1990), 246-247.

⁸⁶ Michael Tobias, *Voice of the Planet* (New York: Bantam Books, 1990), 316.

action of one misguided individual. Environmental problems presumably could still be traced to individual actions, or at least a societal desire for a certain standard of living.

Environmental fiction did not become more pessimistic or more prone to imagine the extinction of humanity during the 1980s; that thread had existed in previous decades, even if scientifically unlikely at that point. The difference in the 1980s lay in that global warming and ozone depletion made the end of the world, or “the end of the world as we know it,” due to environmental causes more realistic. When dread of nuclear war declined by the end of eighties, the threat of environmental apocalypse was still there. James’s *Milwaukee the Beautiful* (1986) suggested that if humanity did not perish in a nuclear war it would be because of the distraction of environmental problems: “There had been no nuclear war, but the reason was not that someone had invented a push-button device to shut down human wickedness, nor was it because geneticists had been able to engineer a pacific gene and flood the human gene pool with it. People had become preoccupied with other things.”⁸⁷ In Brin’s *Earth* (1990), a character similarly remarks: “No outside power can approach human destructiveness. So we managed not to fry ourselves in nuclear war? We only traded in that damoclean sword for others even worse.”⁸⁸

Scientific apocalypticists were quick to incorporate the new global threats in the 1980s, and premillennial dispensationalists responded in kind. The response of Bible prophecy proponents to nuclear weapons during the 1980s cannot be understood apart from Reagan’s policies and views on nuclear war. As some conservative evangelicals became more political during the 1980s, they made statements for or against U.S. foreign

⁸⁷ James, *Milwaukee*, 127.

⁸⁸ Brin, *Earth*, 366.

policy. Billy Graham, for instance, came out rather startlingly in 1979 against nuclear proliferation on “The CBS Evening News with Walter Cronkite” and in the liberal evangelical journal *Sojourners*. Jerry Falwell, meanwhile, threw his support behind Reagan, insisting throughout Reagan’s time in office that “peace through strength” was the most moral position on nuclear weapons. He put his energy behind SDI after Reagan announced it in 1983. A form letter in Falwell’s name sent to supporters in 1985 asked citizens to tell the President “we must not let the liberals bury President Reagan’s ‘Star War’ policy!”⁸⁹ The letter underscored Falwell’s belief that the U.S.S.R. was ahead militarily and suggested, “many military experts are saying that the Star Wars defense program is our only and last hope.”⁹⁰ The letter ended with the sentiment that “I firmly believe this is a matter of survival . . . and the Star Wars program is our best and last chance to survive.”⁹¹

Reagan and members of his administration also made public statements about Bible prophecy, putting media scrutiny to bear on premillennial beliefs.⁹² The media called Reagan’s beliefs “Armageddon theology.” Reagan, according to the Christic Institute, a public policy center, made at least eleven statements suggesting that Armageddon was near during his first term in office. Various, Reagan suggested that the U.S.S.R. is “the focus of evil in the modern empire” and that many of the prophecies

⁸⁹ Letter to public from Jerry Falwell, 16 May 1985. Obtained copy via Fundamentalism File, Bob Jones University.

⁹⁰ *Ibid.*

⁹¹ *Ibid.*

⁹² More Reagan comments appeared in a 1968 article in *Christian Life* which revealed he believed in the importance of the Six Days’ War—suggesting that at no other time had so many prophecies come true. Furthermore, in 1970, Reagan had a social gathering with Pat Boone and other evangelicals in which they discussed Bible prophecy. See Grace Halsell, *Prophecy and Politics: Militant Evangelists on the Road to Nuclear War* (Westport, CT: Lawrence Hill and Company, 1986), 42-43. James Mill, president of the Senate while Reagan was governor of California, said that during a private dinner with Reagan, Reagan said that Russia will attack Israel and be destroyed by nuclear weapons in return. See Lionel van Deerlin, “Mills Tells of Reagan’s Bible Belief,” *San Diego Union-Tribune*, 19 August 1985, sec. B, p. 7.

about the endtimes were coming true.⁹³ Liberal evangelical Jim Wallis called so-called “Armageddon theology” a “blasphemy, a theology to justify nuclear weapons” at a news conference assembled to discuss concerns of Christians and Jews about Reagan’s and the Religious Right’s eschatological beliefs.⁹⁴

The attention put conservative evangelicals on the defensive. Falwell refuted that he had ever said there would be nuclear war with the U.S.S.R.⁹⁵ The Christic Institute, however, contended otherwise, citing a 1981 interview in which he said that Russia would invade Israel and nuclear war would ensue. Like Falwell, Reagan backed away from his eschatological statements, saying, “I have never seriously warned and said we must plan according to Armageddon.”⁹⁶ John Walvoord, Sr., then president of Dallas Theological Seminary, when asked of his opinion of “Armageddon theology” mentioned the influence of Hal Lindsey, noting that Lindsey “goes beyond our teaching.” He continued, “The end-time war is a conventional war. I disagree with him that the Bible teaches nuclear war.”⁹⁷

Other members of Reagan’s administration subscribed to a prophetic worldview. Reagan’s secretary of defense, Caspar Weinberger, was quoted in 1983 as offering insight into the location of a final apocalyptic battle in Palestine (Mount of Hegiddo).⁹⁸ Meanwhile, his Secretary of the Interior, James Watt, said during a Congressional

⁹³ John Herbers, “Armageddon View Prompts a Debate,” *New York Times*, 24 October 1984, sec. A, p. 1, *Lexis-Nexis Academic Universe* (accessed: 15 April 2000).

⁹⁴ Herbers, A1.

⁹⁵ Ibid. See also “Critics Fear that Reagan is Swayed by Those Who Believe in a ‘Nuclear Armageddon,’” *Christianity Today* 28 (14 December 1984): 48-49.

⁹⁶ David E. Anderson, “President Reagan acknowledged . . . “ *United Press International* (21 October 1984).

⁹⁷ “Critics Fear that Reagan Is Swayed by Those Who Believe in a ‘Nuclear Armageddon,’” *Christianity Today* 28 (14 Dec. 1984): 48, 51. It should be noted that Walvoord was president of the Dallas Theological Seminary where Hal Lindsey received a degree emphasizing the study of Greek.

⁹⁸ Boyer, 141.

hearing in response to a question about preserving scenic resources for future generations: “I do not know how many future generations we can count on before the Lord returns, whatever it is we have to manage with a skill to have the resources need for future generations.”⁹⁹

Premillennial ideas became so prominent that they began to make appearances during the late 1970s and 1980s in popular culture. *The Omen* trilogy of films (1976-1981) told the story of the Antichrist from childhood to adulthood. With the debate over “Armageddon theology” playing out in the media during the early 1980s, scientific apocalyptic fiction writers often incorporated characters who were trying to hasten the Second Coming of Christ. A minister in James Morrow’s *This Is The Way The World Ends* (1986) declares that the Scriptures “urge the United States to regain nuclear superiority over the Soviet Union, a nation that the prophet Ezekiel calls Magog.”¹⁰⁰ Alan Rodgers’s *Fire* (1990) presents a caricature of Ronald Reagan: “Wednesday was the day that the president got on television and threatened to ‘nuke the Soviet Union into

⁹⁹U.S. House. Committee on interior and Insular Affairs. *Briefing by the Secretary of the Interior*. (HRG-1981-IIA-0001; Date: 5 February 1981), *LexisNexis @ Congressional Hearings Digital Collection*; (ccessed: 3 January 2009). This quote has often been cited in works as evidence of the anti-environmental bent of Reagan’s administration, but scholars and journalists usually omit the last part beginning, “whatever it is . . .” This has the effect of making it seem like Watt said that there was no point to environmental policies because of the impending Second Coming, when in fact he said the opposite. For examples see Boyer, 141; Dave Helvarg, *The War Against the Greens: The “Wise-Use” Movement, The New Right, and the Browning of America* (Madison, WI: Big Earth Publishing, 2004), 38; Robert Francis Kennedy, *Crimes Against Nature: How George W. Bush and His Corporate Pals are Plundering the Country and High-jacking Our Democracy*(New York: HarperCollins, 2004), 26; Ted Kerasote, *Return of the Wild: The Future of Our Natural Lands* (Washington: Island Press, 2001), 103; Shabecoff, 208; Jeffrey St. Clair, *Been Brown So Long it Looked Like Green to Me: The Politics of Nature* (Monroe, ME: Common Courage Press, 2004), 15.

¹⁰⁰ Morrow, 225. See John Kessel, *Good News from Outer Space* (New York: Tom Doherty Associates, 1989), a novel about millennial fever in which a prominent reverend predicts the Rapture by 1999, gives details about the role of Gog and Magog in the end-times, associates the wormwood mentioned in Revelation with Chernobyl, and expects the resurgence of the Roman empire according to Bible prophecy. See also Robert McCammon, *Swan Song* (New York: Pocket Books, 1987). A supernatural post-nuclear tale, it features a character who thinks the bombs are a sign of the rapture and a Lucifer-like figure who tries to convince the U.S. president to set off the rest of the bombs to throw the earth off its axis.

the Stone Age.”¹⁰¹ *Fire*’s president also is a strong believer in Bible prophecy: “Have you ever read your Bible? Have you noticed how much this nation—this whole damned world—is like the cities of Sodom and Gomorrah? This worlds needs cleansing, Perkins. The kind of cleansing that only the fire of righteousness can bring!”¹⁰² Ultimately in the hopes of bringing about the rapture, the president launches nuclear missiles at Russia.¹⁰³ By 1991, premillennial dispensationalist ideas were so mainstream that a major film production company—New Line Cinema—released a movie called *The Rapture*, which depicted the spiriting away of the “saved.”

Consistencies existed between the premillennialist approach to nuclear weapons in the 1980s and previous decades. Even if they were not attempting to bring about the end as the media implied and science fiction outright portrayed, premillennial Christians had become convinced right after 1945 that nuclear weapons were to be used in the final battle of Armageddon, which had been foretold in 2 Peter 3:10-13. By the 1960s, they were certain that the disarmament movement would be a way for the Antichrist to take power by promising to bring about peace and end the threat of nuclear war. When fears of nuclear anxiety resurged in the 1980s, these two themes were dominant but with some differences.¹⁰⁴ Prophecy journals and books did not engage in “bomb shelter ethics”

¹⁰¹ Alan Rodgers, *Fire* (New York: Bantam Books, 1990), 4.

¹⁰² Rodgers, 60.

¹⁰³ Rodgers, 75. Another character tries to genetically engineer “the beast” of Revelation to hasten the end. See Rodgers, 140.

¹⁰⁴ On the use of nuclear weapons in the final battle of Armageddon, particular as it applies to the 2 Peter 3 passage: Doug Clark, *Shockwaves of Armageddon* (Eugene, OR: Harvest House Publishers, 1982), 91. Dave Hunt, *Global Peace and the Rise of Antichrist* (Eugene, OR: Harvest House Publishers, 1990), 264; Texe Marrs, *Mega Forces: Signs and Wonders of the Coming Chaos* (Austin, TX: Living Truth Publishers, 1988), 6; Larry W. Poland, *How to Prepare for the Coming Persecution* (San Bernardino, CA: Here’s Life Publishers, Inc., 1990), 41. On the deceptiveness of peace without Christ: see Dunn, 14; Michael H. Heuer, “Should Christians Support a Nuclear Freeze?,” *Faith for the Family*, December 1983, 7; Hunt, *Peace*, 29; Texe Marrs, *Dark Secrets of the New Age: Satan’s Plan For a One World Religion* (Westchester, IL: Crossway Books, 1988), 23; Jerry Robeson, *Suddenly... One Was Taken!* (Woodburn, OR: Shiloh Publishing House, 1990), 4.

discussions, for instance. Far from imagining how Christians could remain faithful in the aftermath of a nuclear war, like scientific apocalypticists Bible prophecy writers argued that a nuclear war would be so devastating that nothing would be left. Hal Lindsey in *The 1980s: Countdown to Armageddon* (1980) sounded this alarm: “If that [nuclear] confrontation is indeed ‘all out,’ what are our chances for survival? We have none, it seems. The world’s superpowers now have enough nuclear ammunition to wipe out the entire human race.”¹⁰⁵ The corollary to Lindsey’s observation was Billy Graham’s assertion in 1981 during a Washington Cathedral sermon: “God is not going to allow the human race to destroy itself. . . . [if] man stands ready to throw his bombs at each other . . . God will intervene.”¹⁰⁶

If nuclear bombs are so destructive that they threaten all human life, then premillennialists could understand why people would crave peace. But, Bible prophecy writers argued in response to the nuclear freeze movement as G. Russell Evans did in *The Baptist Challenge* in 1983 that the Bible does not support pacifism.¹⁰⁷ Bruce Dunn, a pastor at Grace Presbyterian in Peoria, Illinois, in “The World Will End!” explained that “[s]cripture is clear that the world will never have lasting peace until Jesus Christ brings

¹⁰⁵ David Hocking, *The Coming World Leader: Understanding the Book of Revelation* (Portland, OR: Multnomah Press, 1988), 7; Dave Hunt and T.A. McMahon, *The Seduction of Christianity: Spiritual Discernment in the Last Days* (Eugene, OR: Harvest House Publishers, 1987), 37; Hal Lindsey, *The 1980s: Countdown to Armageddon* (New York: Bantam Books, 1982), 25.

¹⁰⁶ “Billy Graham: God Won’t Allow A-Holocaust,” *The Washington Post*, 14 Dec. 1981, Metro, D8, *Lexis-Nexis Academic Universe* (accessed: 5 July 2001). See also Bruce Dunn, “The World Will End!,” *Moody Monthly* (June 1983): 13; Frederick C. Rogers, “Fear and the Nuclear Threat: A Call to Faith and Courage in an Age of Apprehension,” *The Christian News* (5 November 1984): 9.

¹⁰⁷ G. Russell Evans, “Church Peacemakers Gloss Over Scriptural Commands,” *The Baptist Challenge* (July 1983): 8.

it.”¹⁰⁸ Similarly, in 1984 Reagan called Communism the “focus of evil in the modern world,” which meant that the nuclear freeze movement was a “dangerous fraud.”¹⁰⁹

Bible prophecy writers continued to find new interpretations of scripture in the light of nuclear weapons. The founder of the Institute for Creation Research in the 1970s and a doctor of engineering, Henry M. Morris in *The Revelation Record: A Scientific and Devotional Commentary on the Book of Revelation* (1983) pointed to Revelation 18:8 (about Babylon burning) as descriptive of nuclear fire: “The Scriptures do not describe the source of such a devastating fire, but it surely can be no ordinary fire. The buildings of Babylon will certainly be of fireproof construction, yet they will be completely incinerated. Possibly the earthquake belches fire and brimstone from the earth’s mantle. Possibly nuclear missiles stored in Babylon are somehow detonated. Perhaps it is all strictly supernatural fire from heaven.”¹¹⁰ Roland R. Hegstad, a Seventh-Day Adventist, in *Pretenders to the Throne* (1990) thought it was possible that Revelation 13, which says the second of two beasts will make fire come down from heaven, portrayed the action of ICBMs.¹¹¹

The publication of the “nuclear winter” theory further inspired new interpretations of prophetic passages in the Bible. For instance, journalist and evangelical writer Mike Evans in *The Return* (1986) said that ozone layer depletion from nuclear war is

¹⁰⁸ Bruce Dunn, “The World Will End!,” *Moody Monthly* (June 1983): 13.

¹⁰⁹ Charles Austin, “Divided Evangelicals Avoid a Policy Stand on Nuclear Freeze,” *The New York Times*, March 12 1984, sec. 1., col. 1, p.7, *Lexis-Nexis Academic Universe* (accessed 5 July 2001).

¹¹⁰ Henry M. Morris, *The Revelation Record: A Scientific and Devotional Commentary on the Book of Revelation* (Wheaton, IL: Tyndale House Publishers, Inc. and San Diego, CA: Creation-Life Publishers, 1988), 360. Jerry Falwell speaks of this possibility in *Dr. Jerry Falwell Teaches Bible Prophecy* (Lynchburg, VA: The Old-Time Gospel Hour, 1979), 51.

¹¹¹ Roland R. Hegstad, *Pretenders to the Throne* (Boise, ID: Pacific Press Publishing Association, 1990), 108.

reminiscent of passages in Revelation (8:5, 7-8, 12; 6:12, 14-17).¹¹² According to Evans, nuclear winter is consistent with “[t]he book of Revelation in Chapters 8 and 9 [that] describes a period of time when catastrophic changes will take place in the atmosphere and on the structure of the earth, and the sun and the moon will be darkened.”¹¹³ Another example comes in former NASA engineer and self-described Bible student Edgar Whisenant’s *On Borrowed Time* (1988). He attributed Revelation 11:6, which foretells that winds will stop blowing, to dark clouds blocking out the sun’s heat (nuclear winter).¹¹⁴

Even the fire at the nuclear reactor in Chernobyl in the Soviet Union that created the worst nuclear accident in world history prompted the new interpretation of a passage in Revelation. A nuclear engineer who converted to evangelical Christianity as an adult, Robert Faid, explained in *Gorbachev!: Has the Real Antichrist Come?* (1988):

In the Ukraine there grows an herb which is commonly called wormwood. The name for this herb in the Ukrainian language is CHERNOBYL. God is telling us, through this Soviet nuclear disaster, exactly what the star named Wormwood in Revelation really is—nuclear contamination from a nuclear war which will poison the third part of the earth’s drinking water. But this tells us something else. It shows this unbelieving generation that He has been in control all along and is still in complete control of the events of this world.¹¹⁵

At the same time that premillennial dispensationalists considered Bible prophecy in the light of new political and scientific developments related to nuclear weapons, they also paid attention to environmental issues in their analyses of Bible prophecy. In the

¹¹² See also, Robert W. Faid, *Gorbachev!: Has the Real Antichrist Come?* (Tulsa, OK: Victory House Publishers, 1988), 157.

¹¹³ Mike Evans, *The Return* (Nashville, TN: Thomas Nelson Publishers, 1986), 102; Faid, 154; Jerry Johnston, *The Last Days of Planet Earth* (Eugene, OR: Harvest House Publishers, 1991), 189; Marris, *Mega Forces*, 107; Texe Marris, *Rush to Armageddon* (Wheaton, IL: Tyndale House Publishers, Inc., 1987), 103; Robeson, 148, 171; Edgar Whisenant, *88 Reasons Why the Rapture Will Be in 1988* (Nashville, TN: World Bible Society, 1988), 56; Edgar Whisenant, *On Borrowed Time* (Nashville, TN: World Bible Society, 1988), 55.

¹¹⁴ Whisenant, *On Borrowed Time*, 36.

¹¹⁵ Faid, 210.

early 1980s, Bible prophecy that incorporated environmental themes read much as it did in the 1970s. These writers continued to pay attention to the trends within environmental science. Lindsey's *The 1980s: Countdown to Armageddon* (1980) repeated what he had said about overpopulation and pollution in earlier works as being signs of the endtimes.¹¹⁶ Morris in *The Revelation Record: A Scientific and Devotional Commentary on the Book of Revelation* (1983) discussed pollution as well as climate change.¹¹⁷ He wrote that Revelation 16:8 predicted the intense heat of sun would melt the ice sheets of Greenland and Antarctica, which will raise sea levels, suggesting that “[s]uch melting is imminent even under present environmental conditions, as the global greenhouse is being augmented by the burning of fossil fuels.”¹¹⁸

Others spoke more generally of various environmental problems as signs that Christ must be coming back soon. Evans in *The Return* (1986) listed Three Mile Island, Love Canal, and Times Beach (a Missouri town abandoned after it was found to be contaminated with dioxin in 1983) as signs of the end.¹¹⁹ In addition to pollution and toxic waste, Evans also pointed to overpopulation as a sign of Christ's imminent return, and mentioned the relatively new concerns of acid rain and global warming.¹²⁰ Faid's *Gorbachev!: Has the Real Antichrist Come?* (1988) discussed the potential of climate change, mentioning both global cooling and global warming, in a chapter about the “time

¹¹⁶ Hal Lindsey, *The 1980s: Countdown to Armageddon* (New York: Bantam Books, 1982), 26, 28. For a vague recital of ecological problems as foretelling the end, see also David Hocking, *The Coming World Leader: Understanding the Book of Revelation* (Portland, OR: Multnomah Press, 1988), 195.

¹¹⁷ On climate change, see, Morris, *Revelation Record*, 209.

¹¹⁸ Morris, *Revelation Record*, 304.

¹¹⁹ Evans, 43. See also Jeffrey, 210-11.

¹²⁰ *Ibid.*, 54-55.

of sorrows” that leads to the rule of the Antichrist.¹²¹ Faid also believed that the depletion of ozone layer was foretold in Revelation.¹²²

References to scientific apocalypticists also continued to make appearances in Bible prophecy writings. One Bible prophecy analyst included a summary of the Ehrlichs’ 1990 update of *The Population Bomb—The Population Explosion* (1990). Jerry Johnston, a Southern Baptist minister, *The Last Days of Planet Earth* (1991) listed overpopulation among the ills troubling the world.¹²³ He agreed with the Ehrlichs that population problems were behind problems like the greenhouse effect, acid rain, depletion of the ozone layer, disease, and pollution.¹²⁴ Johnston sounded more like an environmentalist than an evangelist when he wrote: “If the choice is made, for instance, to wait 10 years or more for definite research results on the greenhouse effect before making decisions on the allowed rate that greenhouse gases may be released into the atmosphere, there is a risk that the self-regulatory climatic system of the earth could, in the meantime, be irreversibly overwhelmed, with consequent catastrophic, global disturbances.”¹²⁵

Just as scientific apocalypticists increasingly questioned scientific solutions, the belief that science and technology had created the environmental crisis but could not solve it appeared in conservative evangelical writings. Anti-environmentalists denied the existence or questioned the severity of environmental problems; their arguments made surprisingly little headway among conservative evangelicals during the eighties. Fear of what environmentalism was doing to the economy did not concern premillennialist

¹²¹ Faid, 114-115

¹²² Ibid., 115-116.

¹²³ Johnston, 16-17.

¹²⁴ Ibid., 17.

¹²⁵ Ibid., 21.

Christians writing about Bible prophecy in the 1980s. Conservative evangelicals writing on Bible prophecy tended to acknowledge environmental ills but also expressed a concern that environmentalism had become intertwined with the New Age movement.

An American religion scholar, Sarah M. Pike, has written a study of the New Age and Neopagan movements in the United States. While Pike makes distinctions between the two—in their history and their emphases—Bible prophecy writers tended to conflate them. Pike says modern versions of the New Age movement and Neopaganism developed during the sixties, influenced by the countercultural and social movements of the decade, including environmentalism.¹²⁶ According to Pike, New Agers conceived of a special relationship between humans and nature: “Because they believe in interconnectedness and the unlimited potential of human consciousness, many New Agers think humans have special responsibility to the rest of the planet. Sometimes this view is accompanied by an understanding of the earth as a living being (called the Gaia hypothesis) put forth by scientists James Lovelock and Lynn Margulis.”¹²⁷

Pike observed that Neopagan ideas have appeared among environmentalists; they believe “nature is imbued with spirit, and this is what fuels their activism.”¹²⁸ She points to the millenarian nature of Neopagan beliefs: “Many New Agers and Neopagans believe that an ecologically viable relationship to the natural world will characterize the future age, when humans will live more harmoniously on Earth. Some also believe the earth itself, a living being that has been ill used by humanity, will bring about cataclysmic

¹²⁶ Sarah M. Pike, *New Age and Neopagan Religions in America* (New York: Columbia University Press, 2004), 15.

¹²⁷ *Ibid.*, 23.

¹²⁸ *Ibid.*, 33.

changes, while others expect a gradual dawning of enlightened consciousness among large numbers of people to usher in the New Age.”¹²⁹

Conservative evangelicals tended to interpret the New Age and Neopagan involvement in environmental causes as proof that environmentalism as a whole had become New Age. The New Age movement was not merely a problem because it was an alternative religion to Christianity that did not worship God. Bible prophecy writers believed that the New Age movement itself was ushering in the Antichrist, and the millenarian beliefs of New Agers that Pike describes seemed to confirm that suspicion.

Two books appeared in 1983 to alert conservative evangelicals to the dangers of the New Age movement. Written by a lawyer and Seventh-day Adventist, Constance Cumbey’s *The Hidden Dangers of the Rainbow: The New Age Movement and Our Coming Age of Barbarism* (1983) purported to expose the New Age menace. She listed Greenpeace, the Sierra Club, and Zero Population Growth as among New Age organizations. An accountant who began his own ministry in the 1970s, Dave Hunt, wrote a similar book that explained the relationship of the New Age movement to Bible Prophecy. *Peace, Prosperity and the Coming Holocaust: The New Age Movement in Prophecy* (1983) deemed pollution of the world’s hydrosphere and atmosphere a threat to the world, but more important was the possibility that such problems could lead to a one-world government.¹³⁰ Hunt did not deny the existence of environmental ills but believed

¹²⁹ Ibid., 145. See also Pike, 146 on the Age of Aquarius. Pike thinks the apocalyptic vision of New Agers and Neopaganists is similar to that of conservative evangelicals. In a discussion of Neale Donald Walsch’s “The Calm Before the Storm” in *Solstice Shift*, Pike notes: “a version of apocalyptic thinking that bears a striking resemblance to that of conservative Christians who believe the Rapture will remove true Christian believers from the tribulations of the earth, leaving everyone else behind to suffer, Walsch predicts that ‘there will be the planet of the ‘haves’ and the planet of the ‘have nots,’ the home of the hopeful and the home of the hopeless, the world of believers and the world of nonbelievers.’” (Pike, 150).

¹³⁰ Dave Hunt, *Peace, Prosperity and the Coming Holocaust: The New Age Movement in Prophecy* (Eugene, OR: Harvest House Publishers, 1983), 9, 23.

that they would be solved as part of the Antichrist's program of peace and prosperity.¹³¹ The implication was that working to solve environmental issues would be playing into the hands of Satan.

More Bible prophecy articles and books noting the connection between the New Age movement and environmentalism followed these two works during the 1980s. Like Cumbey and Hunt, these writers tended to argue that mainstream environmentalism had become entwined with the New Age movement.¹³² Furthermore, the argument went, Satan's plan was for the environmental crisis to mislead people into believing that only a one-world government could save the earth.¹³³ They did not deny the existence of environmental problems but asserted that only God would resolve the crisis when Christ returned and ushered in the millennium.¹³⁴

Dave Hunt wrote more books on the topic during the 1980s, including *America, the Sorcerer's New Apprentice: The Rise of New Age Shamanism* (1988) with T.A. McMahan, a member of Hunt's ministry. In *America*, Hunt and McMahan went so far as to accuse a particular scientist of having a relationship to the New Age movement:

In clear-cut terms, the Bible indicts those who, like popular astronomer Carl Sagan, worship the creation instead of its Creator. While Sagan would ridicule the suggestion that 'spirits' inhabit elements of nature and guide its development, he

¹³¹ Ibid., 36.

¹³² See, for example, "The Environmental Crisis: How Bible Prophecy Details Both the Crisis and the World's Reaction to It!," *The Omega-Letter* (April 1989): 13; James McKeever, "Father God and Mother Nature," *End-Times News Digest* (June 1990): 5. Patti Lalonde, "Earth Day: The Day the Earth Came to Life," *The Omega-Letter* (May 1990): 6-7; Peter Lalonde, *One World Under Anti-Christ: Globalism, Seducing Spirits and Secrets of the New World Order* (Eugene, OR: Harvest House Publishers, 1991), 17; Glenn E. Schicker, "Tending the Garden as God's Stewards" *Eternity* (September 1988): 68.

¹³³ See, for example, "The Environmental Crisis," 6, 13; Hunt, *Global Peace*, 164; Peter Lalonde, *One World Under Anti-Christ*, 129; McKeever, 5.

¹³⁴ See, for instance, Norm Bomer, "April 22 Will Be 'Earth Day': Even More, It's the Lord's Day," *Word*, (21 April 1990): 13; "The Environmental Crisis," 6; Hunt, *Global Peace*, 163-164, 288; Hunt and McMahan, *America*, 96; Hugh Pyle, "What God Says About the Earth, *The Sword of the Lord* (25 May 1990): 20, 22.

attributes the same spiritual qualities of intelligence and purpose to matter. This neopanthemism of academia is called ecotheology.¹³⁵

Shunning milder terms like pagan, Hunt and McMahon asserted, “Witchcraft is an important factor not only in ecological activism, as already mentioned but in other influential movements as well.”¹³⁶

If supporting environmental reform became impossible because of the potential for playing into the hands of the Antichrist, some concluded that environmental degradation was inevitable (and not amenable to reform) according to the Bible. “The Environmental Crisis: How Bible Prophecy Details Both the Crisis and the World’s Reaction to It!” (1989) in Peter Lalonde’s newsletter about Bible prophecy clarified: “You see, the environmental disasters taking place today are a direct fulfillment of Bible prophecy . . . the Bible does forewarn that this planet is reserved for fire and that it will suffer environmental degradation and disaster in the last days.”¹³⁷ Hunt in *Global Peace and the Rise of Antichrist* (1990) reached a similar conclusion:

In contrast to mankind’s belated ecological awareness, biblical prophecy anticipated this problem thousands of years ago and indicated that God’s judgment would fall as a result. A major purpose of the judgment to be poured out upon the earth, as John saw it in the vision recorded in Revelation, would be to ‘destroy them which destroy the earth’ (11:18). A number of God’s judgments are ecological in nature, devastating the grass and trees and polluting the oceans and rivers. The implication is that man has brought the dire consequences upon himself.¹³⁸

Earth Day in 1970 resulted in Christian evangelicals musing on the importance of environmental issues in publications like *Moody Monthly* and *Christianity Today*. In

¹³⁵ Dave Hunt and T.A. McMahon, *America, The Sorcerer’s New Apprentice: The Rise of New Age Shamanism* (Eugene, OR: Harvest House Publishers, 1988), 77. See also, Hunt, *Global Peace*, 170.

¹³⁶ *Ibid.*, 94.

¹³⁷ “The Environmental Crisis,” 6.

¹³⁸ Hunt, *Global Peace*, 163-164.

1990, Earth Day prompted articles expressing fear that Earth Day was indoctrinating people into the New Age movement and deceiving them into thinking that human action could solve the problems of this world. A 1990 editorial in *Foundation: A Magazine of Biblical Fundamentalism* warned Christians: “But the major result will be a further opening of the door to the indoctrination of unsuspecting people with spiritual poison which is far more dangerous than any physical pollution could ever be. The mixture of truth and error offered in the Earth Day programs can never bring benefit to either the earth or mankind no matter how many are led to believe otherwise.”¹³⁹ Patti Lalonde, an evangelist along with her husband Peter Lalonde, told her readers in “Earth Day: The Day the Earth Came to Life” (1990): “Let us remember that while this world is suffering an environmental crisis it is suffering a far worse sin crisis.”¹⁴⁰

The culmination of fears over New Age exploitation of environmental problems came at the end of the decade when Bible prophecy writers began suggesting that the Rapture would be blamed on aliens, conflating the New Age movement with UFO organizations. In the novel *Suddenly...One Was Taken!* (1990), written by Jerry Robeson, an evangelical missionary who produced numerous television and radio programs, the Rapture is attributed to aliens, who are trying to re-educate the Raptured.¹⁴¹ Hunt in his non-fiction *Global Peace and the Rise of Antichrist* (1990) showed how UFOs might be blamed:

Some UFO cult members have also received ‘revelations’ concerning an impending mass disappearance. The day is soon coming, according to various ‘transmissions,’ when the extraterrestrials who allegedly put mankind on this planet in the first place will take over to prevent ecological collapse or a nuclear

¹³⁹ Bomer, 13; Patti Lalonde, 5; Peter Lalonde, *One World*, 128; McKeever, 5; Pyle, 20; “What is Earth Day?,” *Foundation: a Magazine of Biblical Fundamentalism* (March-April 1990): 30.

¹⁴⁰ Patti Lalonde, 7.

¹⁴¹ Robeson, 15.

holocaust. At that time, when the ‘new world order’ is imposed, all those who are not willing to submit to it will be instantly beamed aboard a fleet of UFO’s. These rebels will be taken to a slave planet where their minds will be reprogrammed before they will be allowed back on earth.¹⁴²

Examples of Bible prophecy writers who denied the existence of environmental ills during the 1980s are scarce. In the following decade, some conservative evangelicals started adopting the arguments of the anti-environmental movement. In 1991 Peter Lalonde’s *One World Under Anti-Christ: Globalism, Seducing Spirits and Secrets of the New World Order*, he offered the usual analysis of the New Age movement’s relationship to environmentalism with one exception. Lalonde intimated that environmental problems are a fiction: “[an] example of a managed crisis is the environmental crisis. . . . The environmental movement was born in response to the Club of Rome’s ‘Mankind at the Turning Point’ report and has rapidly expanded due to a heavy media campaign in the past few years.”¹⁴³ James McKeever’s *End-Times News Digest* did so as well that same year. McKeever’s article “Socialists Use Environment” weighed in on the global warming debate, asserting “[y]et the heavily industrialized hemisphere of North America, which should heat up first, has experienced no mean hemispheric temperature change in the past 50 years.”¹⁴⁴ McKeever also maintained that environmentalists do not recognize the need for pesticides to grow enough food for humanity and argued that acid rain is a myth and CFCs are safer than any alternative products.¹⁴⁵ McKeever professed that he is not anti-environment: “We certainly are for eliminating the toxic pollution of our environment, recycling trash and the other things that are obvious. But we are equally concerned about the environmentalists brainwashing our children and our nation and

¹⁴² Hunt, *Global Peace*, 208.

¹⁴³ Lalonde, 128.

¹⁴⁴ “Socialists Use Environment,” *End-Times News Digest*, January 1991, 14.

¹⁴⁵ *Ibid.*, 14-15 . For a recitation of similar views, see also, James McKeever, 2.

using that call to arms ultimately to establish a one-world government.”¹⁴⁶ These two writers were at the vanguard of a growing tendency among conservative evangelicals in the 1990s to downplay environmental problems, suggesting that Satan’s forces were manufacturing (not exploiting) environmental crises to pave the way for the Antichrist.

Bible prophecy writers in speaking of the environment repeatedly referred to the concept of stewardship just as they did in the 1970s. By the late 1980s, however, Bible prophecy writers began to add a disclaimer to their discussion of stewardship.¹⁴⁷

Increasingly, premillennialist Christians argued that God’s will might not mesh with caring for the environment. David W. Cloud of Himalayan Baptist Outreach and Way of Life Literature, a book-publishing ministry, proclaimed that Christians should care about the environment while remembering that “this present world is under God’s curse. It is a dying world filled with dying men.”¹⁴⁸ McKeever argued in 1990, “[w]e need to be reasonable stewards. However, there will be times when God asks us to do something that may seem contrary to caring for the environment, and then His will must prevail.”¹⁴⁹ He added, “For example, the Lord may even want you to drive 100 miles to minister to a church or to an individual.”¹⁵⁰

But, even if views on environmental issues were changing, writers of Bible prophecy continued to use science to explain events in Revelation during the eighties. They employed naturalistic explanations for events in Revelation just as they had been

¹⁴⁶ Ibid., 15.

¹⁴⁷ Henry Morris responded to the charge that the Genesis injunction to subdue the earth was responsible for environmental abuses by complaining: “Evolutionists, however, have tried to blame this ecological catastrophe on Biblical creationism, even though the real cause was the attitude of Social Darwinism that prevailed during the post-Darwin century.” See Henry M. Morris, “No. 221 The Bible, Creation and Ecology,” *Impact* (November 1991): i.

¹⁴⁸ David W. Cloud, “Ecumenism and Ecology,” *Foundation: A Magazine of Biblical Fundamentalism* (April-June 1988): 5.

¹⁴⁹ McKeever, 2,6.

¹⁵⁰ Ibid., 6.

doing for decades and commented on how science could underpin an interpretation of Revelation and other prophetic books in the Bible.¹⁵¹ Morris's *The Revelation Record: A Scientific and Devotional Commentary on the Book of Revelation* (1983) was an attempt to examine Revelation from a scientific point of view: "Scientists do not often write expositions of Revelation, but the book is so full of allusions to natural phenomena that this lack of scientific attention is surprising. Consequently, what might seem at first to be an unlikely background [in engineering] may actually, I hope, be helpful toward fulfilling a real need."¹⁵² Prolific prophecy writer Texe Marrs said the same thing more plainly: "The principles of science—of empirical fact and reason—are friends to the Bible, not foes."¹⁵³ Whisenant in *On Borrowed Time* (1988) weighed in as well: "Scientific findings prove again and again the accuracy of bible prophecy."¹⁵⁴

While bible prophecy writers continued to hold that science was not inimical to the Bible, and in some cases, could help elucidate certain passages, Bible prophecy writers were less likely to mention scientific apocalypticists by name during the 1980s. There were a few exceptions, such as Johnston's *The Last Days of Planet Earth* (1991) citing the Ehrlichs, or Jeffrey in *Armageddon: Appointment with Destiny* (1988) relying on *The Fate of the Earth* in explaining how much overkill American and Soviet nuclear forces have.¹⁵⁵ Increasingly, rather than relying on the authority of particular scientists, writers laid the blame for ecological and nuclear problems at the feet of scientists.¹⁵⁶ Or,

¹⁵¹ For an example of a naturalistic explanation of end-times events during this period, see the discussion of angels' pouring out their vials in J. R. Church, *Hidden Prophecies in the Psalms* (Oklahoma City, OK: Prophecy Publications, 1986), 276.

¹⁵² Morris, *Revelation Record*, 13.

¹⁵³ Marrs, *Mega Forces*, 230.

¹⁵⁴ Whisenant, *On Borrowed Time*, 54.

¹⁵⁵ Jeffrey, 204. Evans in *The Return* commented on how *The Day After* depicts the amount of death that would result after a nuclear war. See Evans, 101.

¹⁵⁶ Hunt and McMahon, 10, 48; Marrs, *Mega Forces*, 26; Marrs, *Rush to Armageddon*, 18.

they alluded to the fallibility of science. For instance, Marris also wrote in the same book in which he said that science is a friend to the Bible: “They [scientists] are led to believe that their scientific theories are, in fact, divine revelations. But we know from studying the history of scientific development that scientific theories are never established as absolute truth, for they constantly undergo revision.”¹⁵⁷ Accompanying this doubt about science was a growing insistence on literalism in interpreting the Bible. Charles C. Ryrie, a professor at Dallas Theological Seminary, in *The Final Countdown* (1982) wrote on Rev. 8:7, “Fire and blood, here, are not symbols of something else. We are to take them literally. They will devastate vegetation on the earth and further add to the climatic disruptions.”¹⁵⁸ Instead of explaining the locusts that will attack unbelievers during the Tribulation period through radiation or genetic engineering, Ryrie said there is no explanation for them because they are supernatural.¹⁵⁹

Walvoord in *Every Prophecy of the Bible* (1990) similarly insisted on literalism. On Revelation 8:1-13 regarding one-third of the earth burning up, he averred: “These judgments on the earth can best be taken in their literal sense. It is not clear how the hail and fire could be mixed with blood, but in a supernatural event this was possible. The result was that a third of the earth, of the trees, and of the green grass were burned up”¹⁶⁰ Instead of relating the star Wormwood to a nuclear bomb, Walvoord maintained: “The best explanation again is to take it in its literal sense. The star falling from heaven was

¹⁵⁷ Marris, *Mega Forces*, 236.

¹⁵⁸ Charles C. Ryrie, *The Final Countdown* (Wheaton, IL: Victor Books, 1989), 105.

¹⁵⁹ *Ibid.*, 106.

¹⁶⁰ Walvoord, *Every Prophecy*, 563.

undoubtedly a large object naturally blazing as it entered the atmosphere and apparently having chemicals that made the water bitter.”¹⁶¹

Scientific apocalypticists shared the sentiment that society had relied too much upon science and was now paying the cost. As scientific conclusions became increasingly debated, Kirkpatrick Sale in *Dwellers in the Land: The Bioregional Vision* (1985) commented that scientific technology has put space between humanity and nature.¹⁶² He wrote:

But now that we see the terrible dimensions of that crisis, now that we know our science is capable of destroying the globe in any number of ways, it is incumbent upon us to rethink our blind acceptance of that scientific view. Not that we can pretend to eliminate Western science somehow, to erase the scientific methods or the scientific instruments developed over the last centuries; there is no way to put the genie back in the bottle even if we wished to. No, the task is not to extirpate science but to incorporate it, not to dismiss it but to contain it, not to ignore its means but to question the ends to which we have put it. The task is to put its undoubtedly useful tools to work in the service of a different purpose—in the service of the preservation rather than the domination of nature.¹⁶³

While Sale and others like McKibben still believed that science could be used to solve environmental problems, they argued that no more could humanity interact with nature in a cold, rationalistic way. As in environmental fiction, a new relationship with the environment was needed if the earth was to be saved.

Scientific apocalypticists continued to offer a type of secular millennialism, but in the 1980s the millennium was less likely to be brought about by science and technology or through a nuclear cleansing process than by re-imagining humanity’s place in nature.

The works in this period were gloomy, especially in fiction where humanity at times

¹⁶¹ Ibid., 564. See also, Nathan M. Meyer, *The Patmos Prediction* (Salem, VA: Prophecy Publications, 1989), 143-144. Meyer says that things that happen in Revelation need not be scientific because God is behind them.

¹⁶² Kirkpatrick Sale, *Dwellers in the Land* (San Francisco: Sierra Club Books, 1985), 22.

¹⁶³ Ibid., 23.

failed to find a solution to nuclear or environmental threats. Religious apocalypticism still incorporated insights from science, but the trend was toward rejecting its conclusions. The inclination toward a new relationship with nature among scientific apocalypticists, such as turning to Gaia, was repugnant to Christian apocalypticists, but Christian apocalypticists returned to a more supernatural reading of texts like Revelation.

These trends accelerated in the 1990s as the debate over global warming, even if largely settled among scientists, reached the American public. The Persian Gulf War of 1991 also introduced new elements into scientific and religious apocalypticism. The Middle East had always been central to Bible prophecy, and fundamentalist and conservative evangelical Christians wondered if Saddam Hussein was the Antichrist. For scientific apocalypticists, the Persian Gulf War was the first environmental war with the U.S. need for oil at the source.¹⁶⁴ The impact of scientific findings in the 1980s along with the 1991 war was noticeable in scientific and religious apocalyptic works during the nineties.

¹⁶⁴Isaac Asimov and Frederik Pohl, *Our Angry Earth* (New York: Tom Doherty Associates Book, 1991), 1.

Chapter Six

Approaching the Millennium

The end of the Cold War with the collapse of the Soviet Union in 1991 eased fears of a global nuclear war ending all life on Earth. The period between the end of the Cold War and September 11, 2001, turned out to be only a brief interregnum in which the U.S. was seemingly free from outside attack as the world's only superpower. While the Persian Gulf War in January 1991 briefly inspired apocalyptic fears among Americans, its quick and successful resolution generally solidified American confidence in the future.¹ Some American thinkers concluded during the 1990s that the entire world had entered a new epoch. Francis Fukuyama's *The End of History and the Last Man* (1992) argued that humanity had reached the pinnacle of its development with liberal democracy. Five years later, science journalist John Horgan in *The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age* (1996) proposed that "the great era of scientific discovery is over" and continued "research may yield no more great revelations or revolutions, but only incremental, diminishing returns."² In Horgan's view, science had already provided the discoveries that would frame the way man understands the universe for coming millennia. According to these two writers, humankind had reached a plateau: civilization would be in stasis for the foreseeable future.

Scientific apocalypticists did not subscribe to this view during the nineties. They warned that nuclear weapons still posed a threat and continued to write about the

¹ For a contemporary discussion of apocalyptic fears inspired by the Persian Gulf War, see John Elson, "Apocalypse Now?" *Time* (11 February 1991), <http://www.time.com/time/magazine/article/0,9171,972285,00.html> (accessed: 26 May 2009).

² John Horgan, *The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age*, 1st Broadway Books trade pbk. ed. (New York: Broadway Books, 1996), 6.

environmental problems that they feared threatened the earth. After the euphoria of “victory” wore off, instability in Russia became a growing concern in the 1990s among Americans; though a global showdown along the lines of the Cuban Missile Crisis (1962) was no longer considered a peril, increasingly analysts watching Russia feared a rogue military commander might seize nuclear weapons or terrorists might take advantage of faltering security at nuclear sites if Russia became too weak.

While the end of the Cold War had little impact on environmental issues, except possibly paving the way for increased cooperation among nations, the Persian Gulf War for environmentalists was a warning that such conflicts might become more common in a future where non-renewable resources were scarce. As Paul and Anne Ehrlich wrote that same year in *Healing the Planet: Strategies for Resolving the Environmental Crisis* (1991), “[t]he conflict in the Persian Gulf could all too easily be a harbinger of many bloody global battles over dwindling resources and deteriorating environments.”³

The global crises that scientists began warning about during the 1980s—global warming, the erosion of the ozone layer, and species extinction—continued to dominate environmentalist writings the following decade. During the 1990s, scientists made no new significant discoveries of forthcoming planet-wide crises; rather it was a decade in which environmentalists tried to raise public awareness and galvanize politicians to act. The results were mixed. In 1992, the United Nations held the Earth Summit in Rio de Janeiro, the first international gathering of its kind dedicated to environmental issues. The passage of the North American Free Trade Agreement (NAFTA) two years later highlighted, however, the lack of unity among various environmentalists in the United

³ Paul R. Ehrlich and Anne H. Ehrlich, *Healing the Planet: Strategies for Resolving the Environmental Crisis* (Reading, MA: Addison-Wesley Publishing Company, Inc., 1991), 284.

States; groups like the Environmental Defense Fund and the National Wildlife Federation felt it was better to support the agreement in the hopes of having a positive impact on Mexico in terms of environmental policy, while other groups like the Sierra Club and Friends of the Earth opposed it because they felt it did not offer enough environmental protection.⁴ Another setback to the environmental movement came in 1997 when the U.S. Senate rejected the Kyoto Protocol on Global Warming. The refusal of the Senate to accept the Kyoto restrictions on carbon dioxide emissions signaled to environmentalists that big energy still wielded too much power in the U.S.⁵

Scientific apocalypticists during the nineties continued to count older issues such as overpopulation and resource decline among the ills plaguing the planet. For instance, the Ehrlichs' *Healing the Planet* boasted a more optimistic title than Paul Ehrlich's famous 1968 work—*The Population Bomb*—but the Ehrlichs still maintained that disaster was imminent if nations did not work together to restrict population growth or, better yet, reduce the total population as they had in previous works.⁶ However, the global environmental problems that had become apparent in the 1980s served as the larger focus of scientific apocalypticists.

Far from reaching the end of history as Fukuyama phrased it, environmentalists argued that Western civilization had reached a crossroads because of threats like global warming. The Ehrlichs, for instance, believed that humanity needed to pay attention to the “harbingers of planetwide catastrophe.”⁷ Similar to a premillennialist's litany of

⁴ Lisa M. Benton and John Rennie Short, “A Case Study” in *Environmental Discourse and Practice*, abridged (Hoboken, NJ: Wiley-Blackwell, 1999), 187-190.

⁵ Bob Musil, “Focus on Health” in *Ignition: What You Can Do To Fight Global Warming and Spark a Movement* (Washington, D.C.: Island Press, 2007), 105-107.

⁶ *Ibid.*, 13.

⁷ *Ibid.*, xiii.

signs of the apocalypse, the Ehrlichs argued there were clear indications that humans were courting disaster; these signs included traffic congestion, smog, wars over natural resources (such as over water in the Six-Day War in 1967 and oil in the Persian Gulf War), erosion, the reduction of groundwater, carbon dioxide emissions, the hole in the ozone layer, and increasing number of hurricanes and spells of drought.⁸

In *The Third Chimpanzee: The Evolution and Future of the Human Animal*, physiologist Jared Diamond echoed the Ehrlichs' belief that humanity had reached its defining moment:

Our species is now at the pinnacle of its numbers, its geographic extent, its power, and the fraction of the Earth's productivity that it commands. . . . Our power threatens our own existence. We don't know whether we shall suddenly blow ourselves up before we would otherwise expire in a slow stew caused by global warming, pollution, habitat destruction, more mouths to feed, less food to feed those mouths, and extermination of other species that form our resource base.⁹

Ed Ayres, editor of the environmentalist publication *Worldwatch Magazine* until 2004, agreed that the signs of a potential ecological apocalypse were evident in *God's Last Offer: Negotiating for a Sustainable Future* (1999), writing, “[t]he weight of scientific evidence now makes it clear that what we do now . . . will largely determine whether human civilization can survive in the long term—and whether our own generation will meet its rising expectations or enter a time of deepening impoverishment and regret.”¹⁰

⁸ *Ibid.*, xiii.

⁹ Jared Diamond, *The Third Chimpanzee: The Evolution and Future of the Human Animal* (New York: Harper Collins Publishers, 1992), 311. For similar expressions that humanity has reached a crucial moment in the history of the species, see David Ehrenfeld, *Beginning Again: People and Nature in the New Millennium* (New York: Oxford University Press, 1993), vii; Ross Gelbspan, *The Heat Is On: The Climate Crisis, the Cover-up, the Prescription*, updated edition (New York: Basic Books, 1998), 193; Mark Hertsgaard, *Earth Odyssey: Around the World in Search of Our Environmental Future* (New York: Broadway Books, 1998), 308.

¹⁰ Ed Ayres, *God's Last Offer: Negotiating for a Sustainable Future* (New York: Four Walls Eight Windows, 1999), 10-11.

After detailing the signs of an environmental collapse, popular environmental writers usually offered a solution of some type as they had in prior decades. In the 1990s, scientists and popular science writers valued the importance of relating to the earth in a new way over investing in technological solutions. The conclusion was that this new outlook would lead to change and that change would not be possible without it. The Ehrlichs' solution was education and personal action, which in turn would transform society: "We think everyone should donate at least 10 percent of his or her time to learning about the world and acting on the knowledge—as we said in the Preface, to 'tithe' their time to society. Politicians and other 'leaders' aren't going to get the job done for us—especially if we don't communicate clear instructions. We have to take responsibility ourselves for a far-reaching transformation of our society."¹¹ The "World Scientists' Warning to Humanity" (1992), issued by the Union of Concerned Scientists, written by Nobel Prize-winning physicist Henry Kendall, and signed by over 1700 scientists, argued for "a new attitude towards discharging our responsibility for caring for ourselves and for the earth. . . . This ethic must motivate a great movement, convincing reluctant leaders and reluctant governments and reluctant peoples themselves to effect the needed changes."¹² Then U.S. Senator Al Gore in *Earth in the Balance: Ecology and the Human Spirit* (1992) offered a political solution—a "Global Marshall Plan"—but only after proposing that humans needed to recognize a moral component to the environmental crisis and close the gap between themselves and nature.¹³

¹¹ Ehrlich and Ehrlich, *Healing the Planet*, 283.

¹² "1992 World Scientists' Warning to Humanity," <http://www.ucsusa.org/about/1992-world-scientists.html> (accessed: 29 April 2009).

¹³ Al Gore, *Earth in the Balance: Ecology and the Human Spirit* (New York: Houghton Mifflin Company, 1992), 257. See also Ayres, 294 for the opinion that humans are too disconnected from nature.

Environmentalists during this period, as they had in the 1980s, asserted that while Western civilization was in trouble, the U.S. was its main troublemaker.¹⁴ Others stressed the bankruptcy of Western values. Biologist David Ehrenfeld, writing in 1993, placed the source of environmental troubles in the Western notion of progress and believed that the solution was a “transformation of the dream of progress from one of overweening hubris, love of quantity and consumption, waste, and the idiot’s goal of perpetual growth to one of honesty, resilience, appreciation of beauty and scale, and stability—based in part on the inventive imitation of nature.”¹⁵ Author and ecological activist Stephanie Mills implored readers of her *In Service of the Wild: Restoring and Reinhabiting Damaged Land* (1995), which told of efforts by herself and others at restoring tracts of land, to reject the Western notion of “dominance” and instead embrace values like “[c]ooperation, attentiveness, and partnership” that are more conducive to healing the planet.¹⁶

As a corollary to the notion that resolving the environmental crisis would require a transformation in our way of thinking about nature, many environmental apocalyptic writers tended to discount the saving graces of technology, instead laying the blame for environmental ills on its misuse. Gore lamented:

In discussions of the greenhouse effect, I have actually heard adult scientists suggest placing billions of strips of tin foil in orbit to reflect enough incoming sunlight away from the earth to offset the larger amount of heat now being trapped in the atmosphere. I have heard still others seriously propose a massive program to fertilize the oceans with iron to stimulate the photosynthesis by plankton that might absorb some of the excess greenhouse gases we are

¹⁴ Ehrlich and Ehrlich, *Healing the Planet*, xi; Jane Holtz Kay, *Asphalt Nation: How the Automobile Took Over American and How We Can Take It Back* (New York: Crown Publishers, Inc., 1997), 128.

¹⁵ Ehrenfeld, 192-193.

¹⁶ Stephanie Mills, *In Service of the Wild: Restoring and Reinhabiting Damaged Land* (Boston: Beacon Press, 1995), 26.

producing. Both of these proposals spring from the impulse to manipulate nature in an effort to counteract the harmful results of an earlier manipulation of nature.¹⁷

Theo Colborn, Dianne Dumanoski, and John Peterson Myers's *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?—A Scientific Detective Story* (1996), a book about the danger of endocrine disruptors used in pesticides and plastics, similarly explained that the roots of the environmental problems that threaten to overwhelm us, including the problem of artificial chemicals in our environment affecting our and other species' health, lay in heedless technological progress: "The postwar era was a time of Promethean optimism, when everyone from physicians to farmers rushed to embrace new 'miracle' technologies. [The artificial estrogen known as diethylstilbestrol or] DES was just one of many new synthetic chemicals that promised to give us control over the forces of nature. With a mixture of hubris and naiveté, advocates of progress imagined a world with unlimited potential for the mastery of life itself."¹⁸

Not all rejected technology as providing a solution to problems. In *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future* (1992), a sequel to *The Limits to Growth*, Donella H. Meadows, Dennis L. Meadows, and Jørgen Randers wrote "[t]echnical changes and efficiencies are possible and available, which can help maintain production of final goods and services while reducing greatly the burden on the planet."¹⁹ However, straightforward assertions of a technological solution were rare.

Similar to *Beyond the Limits*, journalist Ross Gelbspan's *The Heat Is On: The Climate Crisis, the Cover-up, the Prescription* (1998), in which he argued that energy

¹⁷ Gore, 279.

¹⁸ Theo Colborn, Dianne Dumanoski, and John Peterson Myers, *Our Stolen Future: Are We Threatening Our Fertility, intelligence, and Survival?—A Scientific Detective Story* (New York: Plume, 1997), 49.

¹⁹ Donella H. Meadows, Dennis L. Meadows, and Jørgen Randers, *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future* (Post Mills, VT: Chelsea Green Publishing Company, 1992), 8.

companies are undermining the effort to effect climate change, eschewed the language of moral and spiritual transformation. Gelbspan did not promote a technological solution; instead he spoke of the political implications of the environmental crisis that he felt was being made worse by corporate greed:

Finding solutions—given the fury with which the battle over climate change is being waged—will require a massive mobilization of our determination. It will mean putting aside, at least temporarily, many things that divide us. It will demand of us a huge leap in thinking—and mustering the collective will to force the changes our fevered atmosphere requires. The resistance will be that strong. Necessity for change and the requirements for our survival are that great.²⁰

Gelbspan was pessimistic about the future of civilization if the environmental crisis was not resolved. He maintained that democracy would not endure environmental disasters, especially in poorer nations, while developed nations would have to institute martial law and would become prey to terrorists from countries that suffered the greatest from climate change.²¹

At times the language of environmental authors in describing how humans should adopt a new environmental ethic appeared to have a New Age influence, just as conservative evangelicals had feared since the 1980s. Environmentalist writer William Kötke used terms like “awareness” and “consciousness” to describe how humans should embrace new modes of thought. In a vague paragraph of his *The Final Empire: The Collapse of Civilization and the Seed of the Future* (1993), a meandering book that covered the history of civilization from his personal point of view, he explained that humans “must start from here, from the point of our own awakening, not as a person socially defined but as a human ecologically defined. The reality of cosmic perspective—that is our awakening. Being here, in the real cosmos, we are not separate.

²⁰ Gelbspan, 32.

²¹ *Ibid.*, 12, 165.

This is our destiny, to awaken to the cosmic identity of Gaia.”²² Most scientific apocalypticists, however, neither had a connection to the New Age movement nor employed such language.

While science fiction writers had been debating since 1945 whether human destructiveness is inherent to *Homo sapiens*, environmentalist non-fiction writers did not ponder the same question until the 1990s. The increased participation of biologists in the environmental debate as topics like biodiversity became more prominent may have initiated this discussion. Diamond concluded that analogues to our destructive behavior toward each other and toward the environment existed in the animal world.²³ Humans differ from other animals in their behavior only in proportion, he avowed.²⁴ As some science fiction writers have concluded, Diamond believed that since our behavior differs from other species only in degree, then other intelligent life in the universe may suffer from similar problems as humans: “[w]hile Earth’s history thus offers little hope that radio civilizations exist elsewhere, it also suggests that any that might exist are short-lived. Other intelligent civilizations that rose elsewhere probably reversed their own progress overnight, just as we now risk doing.”²⁵

E. O. Wilson had a different take in his essay “Is Humanity Suicidal?” (1993). His argument was that the world would have been better off if humans had not been the species to become ascendant:

Darwin’s dice have rolled badly for Earth. It was a misfortune for the living world in particular, many scientists believe, that a carnivorous primate and not some more benign form of animal made the breakthrough. Our species retains hereditary traits that add greatly to our destructive impact. We are tribal and

²² Kötke, 310.

²³ Diamond, 311.

²⁴ *Ibid.*, 8-9.

²⁵ *Ibid.*, 213-214.

aggressively territorial, intent on private space beyond minimal requirements, and oriented by selfish sexual and reproductive drives. Cooperation beyond the family and tribal levels comes hard.²⁶

Kötke, not a scientist, offered a third opinion on the question of whether man is an especially destructive species. He did not think humans inflicted environmental ills because of innate characteristics of the human species. Rather, it is the nature of modern “civilized” man that is calamitous for the environment: “There was never a poison problem with the natural human family. Pollution, garbage, poisons, are specific to empire culture.”²⁷ According to Kötke, tribal society also controlled its population and made sure not to overuse its resources, such as available meat.²⁸ Most scientific apocalypticists would have agreed that the numbers of humanity led to its disproportionate impact, but most did not resort to glorifying the history of “primitive” man.

Environmental writers also observed that while humanity might commit suicide, the planet would go on as usual. Journalist Mark Hertsgaard informed his readers: “Of course, none of the ecological hazards in question threatened to end all life on Earth—just human life. Newspaper headlines notwithstanding, it is not a question of ‘saving the planet.’ It might take thousands or even millions of years for the earth to recover from such man-made catastrophes as runaway global warming or full-scale nuclear war, but that is barely the blink of an eye in geological time.”²⁹ An extension of this argument was Gelbspan’s conclusion that humanity might not be worthy of this planet: [a failure to stop

²⁶ E. O. Wilson, “Is Humanity Suicidal?” in *In Search of Nature* (Washington, D.C.: Island Press, 1997), 184-185.

²⁷ Wm. H. Kötke, *The Final Empire: The Collapse of Civilization and the Seed of the Future* (Portland, OR: Arrow Point Press, 1993), 94.

²⁸ *Ibid.*, 123.

²⁹ Mark Hertsgaard, *Earth Odyssey: Around the World in Search of Our Environmental Future* (New York: Broadway Books, 1998), 15-16.

global warming] would be a judgment on our adaptive capabilities as a species—that we have exhausted our intelligence and creativity and have instead become a collective infection on the planet.”³⁰

Although few scientific apocalyptic writers addressed the issue of nuclear weapons during the 1990s, some did point to the problem of an unstable regime in Russia overseeing a vast arsenal built up during the Cold War. Hertsgaard warned: “The collapse of the Russian economy magnifies the peril, for it is not just theft of nuclear materials by outsiders that poses a danger; an inside job, by workers impoverished and disgruntled after months without wages, would have the same effect.”³¹ Jonathan Schell, author of *The Fate of the Earth* (1982), revisited the topic of nuclear weapons in his 1998 *The Gift of Time: The Case for Abolishing Nuclear Weapons*. Despite the end of the Cold War, Schell contended that the nuclear peril had not gone away because of the vast numbers of nuclear weapons still extant.³² Society should promote the abolition of nuclear weapons now, in Schell’s opinion, instead of waiting for another period in which nuclear weapons are threatened to be used and even more prominent.³³

During the decade of the nineties, scientific apocalypticists responded to the criticism that they use “doom-and-gloom” tactics to get support for environmentalism.³⁴ Donella H. Meadows, Dennis L. Meadows, and Jørgen Randers complained in *Beyond the Limits* about the reception of their previous work, *The Limits to Growth*, that “[t]he book was interpreted by man as a prediction of doom, but it was not a prediction at all. It

³⁰ Gelbspan, 173.

³¹ Hertsgaard, 151.

³² Jonathan Schell, *The Gift of Time: The Case for Abolishing Nuclear Weapons* (New York: Metropolitan Books, 1998), 7.

³³ *Ibid.*

³⁴ See, for example, Edith Efron, *The Apocalypitics: Cancer and the Big Lie; How Environmental Politics Controls What We Know about Cancer* (New York: Simon and Schuster, 1984).

was not about a preordained future. It was about a choice. It contained a warning, to be sure, but also a message of promise.”³⁵ By contrast, journalist Gregg Easterbook remonstrated in *A Moment on the Earth: The Coming Age of Optimism* (1997) that humans simply do not have the power to destroy the earth that environmentalists believe that they do.³⁶

But, even if they became more conscious that they were employing the language and metaphors of religion to emphasize environmental threats, scientific apocalypticists did not stop warning that the world might end. They found it impossible to inform the public about the dangers they believe existed without alluding to the end of the world. The authors of *Our Stolen Future* tried to back away from predicting the end of humanity from endocrine disruptors but still reached a drastic conclusion about the future: “There is always a temptation to extrapolate worrisome trends into apocalyptic, worst-case scenarios, but it is hard to imagine that sperm counts will fall inexorably downward and reach a point that poses an imminent threat to human survival. Even so, humans do appear to be gambling with their ability to reproduce over the long term, which should be of grave concern. What we fear most immediately is not extinction, but the insidious erosion of the human species.”³⁷

Physicist Paul Halpern in *Countdown to Apocalypse: A Scientific Exploration of the End of the World* (1998) was honest about the use of apocalyptic language by environmentalists:

Though scientists often borrow nomenclature and imagery from the biblical account [of the apocalypse in Revelation,] they use them for purely secular purposes. They do so because the images from the book of Revelation are so

³⁵ Donella H. Meadows, Dennis L. Meadows, and Randers, xiii.

³⁶ Easterbrook, 25.

³⁷ Colborn, Dumanoski, and Myers, 234.

evocative that these pictures help us to fathom better the scope of possible global disaster. Thus, scientists freely employ expressions such as ‘nuclear armageddon’ and ‘ecological apocalypse’ in order to emphasize the horrors of the fate that we may someday bring upon ourselves.³⁸

In spite of criticisms from writers like Easterbrook, the threat of environmental collapse was so great to these writers that they believed apocalyptic language was warranted.

Ayres would have agreed with Halpern about the usefulness of apocalyptic language in bringing about change. He protested the charge made by Ehrlich’s detractors that *The Population Bomb* was unreasonably apocalyptic in its assessment of the world’s future. In Ayres’s view, Ehrlich helped prevent the events that he predicted would come about because of overpopulation: “In the 1980s, when that catastrophe turned out to have been mitigated (only tens of millions starved), groups that opposed policies to stabilize population attacked Ehrlich for being a ‘doomsayer’—despite the fact that it was warnings like his that helped spur the social and agricultural interventions that prevented that outcome from being realized.”³⁹

Colborn, Dumanoski, and Myers used the example of other environmental controversies to suggest that skepticism would ultimately be unfounded: “The study is still meeting with a skeptical response in parts of the medical community. This skepticism recalls similar disbelief at the first news in 1985 that a dramatic hole had developed in the Earth’s protective ozone layer over Antarctica.”⁴⁰ If Colborn, Dumanoski, and Mayers did sound apocalyptic, then they felt that there was good reason for it—Carson’s apocalyptic warning about the effects of DDT led to its decreased use,

³⁸ Halpern, 15-16.

³⁹ Ayres, 93.

⁴⁰ Colborn, Dumanoski, and Myers, 173.

and they felt that their work would do the same for the prevalence of endocrine-disruptors.⁴¹

Environmental problems seemed to be piling up during the 1990s, and the continual threat of overwhelming ecological disasters became routine in American science fiction. For instance, in the background of Neal Stephenson's cyberpunk novel *Snow Crash* (1992) are pollution and the greenhouse effect among other societal ills.⁴² The same is true of Damon Knight's *Why Do Birds* (1992). Though the novel ends with an apocalypse by a mysterious cause, overpopulation and pollution plague the world as depicted in the year 2002.⁴³

In spite of the end of the Cold War, novelists still played with the theme of nuclear war during the nineties, but scenarios of all life or even civilization ending because of it were rare. In Will Baker's *Shadow Hunter* (1993), countries in the northern hemisphere play out their conflicts in the southern hemisphere. A character describes the nuclear war that only eradicates one hemisphere: "The Great War breaks out. The big boom-boom, back and forth. Only down south of course, through proxies. Didn't want to blow up our *own* selves first. Then our great leaders see their mistake at the last second and pull back from the brink. We form the Fed [the world government]. We outlaw big boom-booms. We seal off the battlefield wasteland. Good folk up here, bad freako mutants down there. We're the Triumph of Civilization. What a load of *crap*."⁴⁴

⁴¹ Ibid., 210.

⁴² Neal Stephenson, *Snow Crash* (New York: Bantam Books, 1992; reprint, New York: Bantam Books, 2003), 293.

⁴³ For other examples of novels where environmental problems are in the background but are not the main plot, see Bart Kosko, *Nanotime* (New York: Avon Books, 1997), 1; Lance Olsen, *Burnt* (LA Grade, OR: Wordcraft of Oregon, 1996); Bruce Sterling, *Distraction* (New York: Bantam Books, 1998).

⁴⁴ Will Baker, *Shadow Hunter* (New York: Pocket Books, 1993), 53. See also James F. David, *Footprints of Thunder* (New York: Tom Doherty Associates, 1995) in which the atmospheric nuclear tests turn out to have unforeseen long-term consequences.

A series of novels about nuclear war called *Deathlands*, written by different people using the pen name James Axler, began in 1986 and continuing through 2009. This series was about a world devastated by nuclear war but more resembled escapist survivalist fare, featuring hand-to-hand combat against mutants, rather than any sort of sustained analysis of the effects of such a devastating war.⁴⁵

As they had in prior decades, science fiction writers continued to address whether humans were especially destructive, at least in relation to environmental practices. Keith Kirts's *The Devil's Drainpipe: A Nuclear Waste Comedy* (1992) suggested that other species would be better caretakers of the world than *Homo sapiens*. The yetis live unnoticed on a mountaintop in Kirts's novel, observing humanity's wasteful ways. One yeti wishes that a virus would wipe out mankind: "The aberrant white skins bred like mice. Soon they would overrun the mountain, all the mountains, simply because they had filled up the valleys. . . . Why didn't they recognize the elegance of the food chain like a normal species did? . . . At the very pinnacle of the food chain, stone men and all colors of star men lived with no built-in breeding control."⁴⁶

Unlike in prior decades, writers disagreed over whether or not humanity deserved to be judged. The increased public awareness of radical environmentalism beginning in the 1980s led to scientific apocalypticists defining themselves against that sort of extremism. Science fiction authors offered unsympathetic portrayals of environmental radicals as wanting to destroy humanity in order to save the planet. Tom Cool's *Infectress* (1997) concerns a terrorist named Arabella who attempts to design a supervirus

⁴⁵ Military novels continued to conceive of scenarios in which the U.S. comes close to nuclear war. See Eric L. Harry, *Arc Light* (New York: Simon & Schuster, 1994); Teretha G. Houston, *Armageddon at Defcon 1* (Stone Mountain, GA: Tyger Publishing, 1999).

⁴⁶ Keith Kirts, *The Devil's Drainpipe: A Nuclear Waste Comedy* (Santa Monica, CA: Synapse—Centurion, 1993), 137.

to solve the problem of overpopulation: [Arabella and her followers] think of themselves as a force of nature, a breed spawned in reaction to the imbalance caused by overpopulation . . . ⁴⁷ Similarly, an environmental terrorist named Charley Pascal in David Hewson's *Solstice* (1999) threatens to use a new technology that concentrates the power of sun to destroy governmental centers. She suggests that it is not only humanity's deep-seated problems but also that of the human male that has created the environmental crisis:

This cannot continue. You know this yourself. If you look in your heart of hearts, you understand this world, the world man has made, is unsustainable. We destroy a little more each and every day, and the cycle of that destruction increases each year. We extend our own lives upon the planet unnaturally, and destroy it as we do so. The world is soiled by our presence. We have squandered the gift that Gaia gave us, and for what reason? Greed. Insanity. The thrusting, covetous male principle that has come to live unchecked inside us. We are out of balance, and we have spread that imbalance to the earth.⁴⁸

The characters of Arabella and Pascal were crazed women whose personal issues caused them to seek a genocidal solution to environmental problems. A more favorable portrayal of environmental radicalism came in mainstream author T. Coraghessan Boyle's *Friend of the Earth* (2000), which tells the personal history of an ex-radical environmentalist. The main character, Tyrone O'Shaughnessy Tierwater, manages a menagerie of almost extinct animals such as hyenas, jackals, and lions for a pop star named Maclovio Pulchris in 2025, but in his youth, he was once part of a radical group called Earth Forever! (an allusion to Earth First!). In *Friend of the Earth*, the efforts of radical environmentalists have completely failed, but their predictions have come true: the world is an ecological mess. The world has not ended, but it is not a hospitable place:

⁴⁷ Tom Cool, *Infectress* (New York: Baen Books, 1997), 20. See also, Kim Stanley Robinson, *Antarctica* (New York: Bantam Books, 1998),

⁴⁸ David Hewson, *Solstice* (New York: Warner Books, 1999), 143.

“(And people thought the collapse of the biosphere would be the end of everything, but that’s not it at all. It’s just the opposite—more of everything, more sun, water, wind, dust, mud.)”⁴⁹ Though the main character dreams of the eradication of mankind, it is not hatred of humanity that drives his vision but rather the thought of enjoying the earth with his friends and family unencumbered by polluters.⁵⁰

A certain amount of continuity in environmental themes existed in American science fiction from the 1980s through the 1990s. For instance, writers continued to take creative license with environmental theory, such as the Gaia theory, much as they had in the 1980s.⁵¹ Authors still supposed that environmental problems could cause the end of civilization or the extinction of humanity but introduced variations into how they approached the theme.⁵² In the late 1980s, philosophers and computer scientists introduced the concept of posthumanism (or transhumanism), which was the idea that technology could be used to improve the human species. Posthumanism offered science fiction writers a new concept to play with when trying to envision a way out of the environmental morass. Norman Spinrad’s science fiction novel *Deus X* (1992) related a posthuman future, or a future in which humans are able to upload their consciousness into a computer, thereby earning immortality. This development is the only way humanity could survive its environmental problems: “They say these are the last days. Moma

⁴⁹ T. Coraghessan Boyle, *A Friend of the Earth* (New York: Viking, 2000), 8. For Boyle’s vision of an apocalypse through plague, see “After the Plague” in *After the Plague and Other Stories* by T.C. Boyle (New York: Viking Books, 2001), 281-303. This story also diverges from the approach of other writers; though the apocalypse is portrayed as an environmentalist’s dream, the plague is in fact the complete failure of humanity.

⁵⁰ Boyle, *A Friend*, 240.

⁵¹ Hugh B. Cave, *The Dawning* (New York: Leisure Books, 2000), 328; Jack McDevitt, *Eternity Road* (New York: HarperPrism, 1998), 401.

⁵² On the end of civilization see also Jean Hegland, *Into the Forest* (Corvallis, OR: Calyx Books, 1996); Octavia E. Butler, *Parable of the Sower*, Warner Books ed. (New York: Warner Books, 2000); Octavia E. Butler, *Parable of the Talents* (New York: Seven Stories Press, 1998).

Gaia's been murdered by her idiot children, reefs all coral corpses, ice still going, waters still arising, biosphere melting away in the supertropic sun like a big jellyfish beached on the Martian shore."⁵³ At the end, the posthuman entities in the net start shutting down things to save the biosphere.

Ernest Callenbach's short story "Chocco" (1994) approached the end of civilization due to environmental problems differently from his predecessors in science fiction. While other science fiction writers tended to see only disaster arising from the environmental crisis, Callenbach envisioned a better society emerging out of the environmental predicament. In "Chocco" the survivors of civilization's collapse live close to nature and have an oral history of a past civilization populated by the "Machine People," who are held as an example of an unbalanced society that emphasized material wealth and were ignorant of the way Gaia works. Resource depletion, global warming, and damage to the ozone layer resulted in the near-extinction of the human species, according to the legends told by a tribal historian, but this is not a bad result in his conclusion: "So we can say that the Die-Off was a terrible test provided by Gaia for the human species, to determine its fitness for survival. And only those who learned the lesson of that test have survived."⁵⁴ This was a unique point of view in environmental fiction, more in line with the assertions in nuclear fiction that the end could be a new beginning.

In some works of speculative fiction, the accumulation of so many environmental threats led to pessimism rather than the secular millennial perspective of Callenbach's story. Science fiction author Bruce Sterling's *Heavy Weather* (1994), about a group of

⁵³ Norman Spinrad, *Deus X* (New York: Bantam Books, 1993), 1.

⁵⁴ Ernest Callenbach, "Chocco," *Future Primitive: The New Ecotopias*, ed. Kim Stanley Robinson (New York: Tom Doherty Associates, 1994), 201.

storm chasers who take advantage of the powerful storms created by global warming, featured a character who suggests that the end of civilization could result from the consequences of global warming, in particular through “a giant, permanent vortex on the planet’s surface” that could kick up dust into the atmosphere and create conditions similar to nuclear winter.⁵⁵ Characters in the novel agree that the world has reached a point of no return, arguing over whether Americans had squandered their last opportunity to make a difference in the late 1960s, during the 1980s Congressional hearings on global warming, or at the end of the Cold War.⁵⁶ The conclusion the debaters reach is that “[t]here were a lot of ways out once, but there are no more alternatives now. Just people who will probably survive, and people probably won’t.”⁵⁷

This sort of pessimism inspired fiction writers to envisage extraordinary solutions to the environmental problem, such as creating a new species out of humanity. In Robert Silverberg’s *Hot Sky at Midnight* (1994), Earth is falling apart because of multiple ecological disasters, including the greenhouse effect, species extinction, mutations, rising sea levels, red tides, weather disturbances, out of control insects, desertification, and deforestation.⁵⁸ Since the environmental changes to the earth in this novel are considered irrevocable, a scientist concludes that the only way mankind can survive is to biologically change humans so they breathe carbon dioxide.⁵⁹ Like E. O. Wilson, a scientist in the novel marvels at the destructive capacity of the human species:

All that striving, all that arduous movement up from the ape, and where had it ended up? . . . A species so intelligent that it had invented a hundred brilliant ways of fouling up its own nest. And so—the grime, the pollution, the heat, the

⁵⁵ Bruce Sterling, *Heavy Weather* (New York: Bantam Books, 1994), 207.

⁵⁶ *Ibid.*, 243.

⁵⁷ *Ibid.*, 273.

⁵⁸ Robert Silverberg, *Hot Sky at Midnight* (New York: Bantam Books, 1994), 24.

⁵⁹ *Ibid.*, 38.

poisons in the air, the metals in the water, the holes in the ozone layer, the ruined garden that was the world—Shit! What a marvelous achievement it all was! For a single species of fancy ape to have wrecked an entire planet!⁶⁰

One character points out that while humanity is threatened, Earth will go on as usual.⁶¹

But, humans are successfully changed to be able to survive the conditions of the changed earth. They no longer appear to be human; however, this does not bother characters in the novel because humanity does not deserve Earth: “If we must be replaced on Earth by another kind of life, because we were such poor stewards of our domain, so be it.”⁶²

Like scientists and environmentalists who embraced the idea that humanity had to craft a new bond with nature, Ken Grimwood’s *Into the Deep* (1995) suggested that humanity will not be able to save itself, but that another species, one that is more in tune with the environment, could lead humanity to its salvation. This species is the dolphin, which steps in after an oil company drills into a volcano and threatens to warm the oceans to the point of melting the ice caps. The book satirized those who oppose even the most mainstream environmentalists: an oil rig worker refers to people who oppose drilling for oil in the ocean as “goddamn Goreheads.”⁶³ Dolphins teach humans how to live with the earth.⁶⁴ As a corollary to the notion that a new way of thinking was necessary to save the world, some science fiction authors expressed a suspicion of technological solutions to environmental problems just as non-fiction writers did. Kevin J. Anderson and Doug Beason’s novel *Ill Wind* (1995) detailed the use of a petroleum-eating virus to clean up a

⁶⁰ Ibid., 91.

⁶¹ Ibid., 85.

⁶² Ibid., 325.

⁶³ Ken Grimwood, *Into the Deep* (New York: William Morrow and Company, Inc., 1995), 82.

⁶⁴ Ibid., 347.

giant oil spill off San Francisco. The solution backfires, and the virus threatens everything petroleum-based, bringing the world to its knees.⁶⁵

Even if technological solutions no longer seemed efficacious, science fiction authors still believed fiction could be used as an educational and exhortative tool. In 1998 two separate novels appeared by authors who were sympathetic to the environmentalist cause but did not usually write fiction. Privileging information about the perceived environmental crisis over plot or character development, these works gave detailed information about the environmental problems plaguing the world. A lawyer and environmentalist, Kevin E. Ready, in *Gaia Weeps* (1998) portrayed a group of scientists who try to warn American politicians that they must take action on the environment immediately. A computer-modeling program named Gaia has revealed that the environmental problems are going to turn into outright disasters:

The results were that all of our worst nightmares regarding the greenhouse effect, global warming, pollution, ozone depletion, you name it, were really true. And many are coming at us like a freight train, quicker than even the gloomiest prediction could have guessed....The 'really bad news is that we appear to have crossed the line of no return on some problems and we are frighteningly close to the deadline for other things. The nightmare is already upon us.⁶⁶

The predictions of the computer program begin to come true, as the ozone hole expands from Antarctica, burning people in New Zealand, Tasmania, and South Australia.⁶⁷

Toward the end, a politico, Andy Knowles, gives a long speech, part of which excoriates Americans for their complacency:

We emasculated the clean water and air bills with regulatory exceptions for years. We laughed at do-gooders who cared about a silly little spotted owl. We looked the other way when Brazil, Indonesia and a dozen other countries denuded the

⁶⁵ Kevin J. Anderson and Doug Beason, *Ill Wind* (New York: Forge, 1995).

⁶⁶ Kevin E. Ready, *Gaia Weeps: The Crisis of Global Warming* (Prescott, AZ: Saint Gaudens Press, 1998), 37.

⁶⁷ *Ibid.*, 191.

rainforests that are the lungs of our planet. Our country was an obstruction at the Kyoto Conference instead of a leader in taking action on the environment. Hell, we weren't even serious enough about Kyoto to try and get the Global Warming Treaty ratified. We smiled all the way to the bank while our multi-national corporations shipped our poisons and pollution to the Third World, as though as polluting the planet doesn't matter if we can't see it happen at home."⁶⁸

At the end, the Ross Ice Shelf in Antarctica slides into the ocean, creating a giant tsunami and increasing sea levels, which floods the National Mall in Washington, D.C. Although the climate reaches a new equilibrium, the novel ended by warning that action was still necessary to forestall disaster.

Rock Brynner, the son of actor Yul Brynner and a historian who primarily wrote non-fiction, was even more sermonizing in his novel *Doomsday Report* (1998). A scientist falsifies a report on the environmental state of the world to galvanize the earth's governments into action, and long summaries of this fictional report pervade the novel:

The Belacqua Report shows that an irreversible cascade of extinctions has already begun, in which crucial species at the bottom of the food chain, especially marine and insect life, disappear, followed by species that feed upon them, collapsing the diversity critical to sustaining all the higher orders, ourselves included. In short, we have learned that the earth is dying: the process leading to the mass extinction of *Homo sapiens* over the next forty years, along with most other species, has already begun.⁶⁹

In addition to excerpts from the report, the scientist who wrote it gives long soliloquies to other characters about the environmental crisis.⁷⁰ Although the scientist's results are eventually revealed as false, the novel made it clear that all of the events the report describes could happen in the future if humanity does not change its ways; Brynner also included an appendix in which he exhorted readers to save the planet.⁷¹

⁶⁸ Ibid., 306-307.

⁶⁹ Rock Brynner, *The Doomsday Report* (New York: William Morrow and Company, Inc., 1998), 12.

⁷⁰ Ibid., 56, 62.

⁷¹ Ibid., 268-269.

In addition to assuming the role of a teacher, some writers of speculative fiction responded to specific instances of scientific research as they had in previous decades. Nancy Kress's *Maximum Light* (1998) showed a world if the predictions about the effects of endocrine-disruptors in *Our Stolen Future* were true. Fertility has declined worldwide by 80 percent, and a scientist tries to convince others that he knows the cause of this decline in fertility: "Over and over I point out the studies—there are more of them every month—telling us that human infertility is caused by all the cumulative endocrine disruptors we've put into the environment. . . . But most people preferred to look the other way. *Oh, it's mostly Africa*, they said, because that desperate continent had been the hardest hit, having used the most heavy chemicals in its futile attempts to control insects and crops and disease. But it wasn't mostly Africa. The majority of endocrine disruptors are wind-borne."⁷²

Some novels imagined a world beset by both nuclear war and environmental problems, but as the decade wore on, wars were more likely to result from environmental problems rather than to co-exist with them. In Will Bradley's *Ark Liberty* (1992), the end of the human species occurs in 2084 through the effects of global warming and the ensuing nuclear wars as countries fight for the remaining sources of the earth.⁷³ Arks are built—both on land and undersea—to ensure that some humans and other species of plants, animals and insects will survive. The arks start to repopulate the earth six hundred years later after the earth has healed, and humanity has a chance to start anew through the crisis.⁷⁴

⁷² Nancy Kress, *Maximum Light* (New York: Tom Doherty Associates, Inc., 1998), 100.

⁷³ Will Bradley, *Ark Liberty* (New York: Penguin Books, 1992), 15, 29.

⁷⁴ On the same theme, see also John Barnes, *Mother of Storms* (New York: Tom Doherty Associates, Inc., 1994).

Similar to Bradley's story of environmental problems leading to war, environmentalists interpreted the Persian Gulf War as a war over natural resources, a preview of the world to come if industrialized nations do not make changes. But, to those concerned about nuclear proliferation, it foreboded a future in which a dangerous madman might obtain a bomb and other countries might have to go to war to prevent him from using it.⁷⁵ In Teretha G. Houston's *Armageddon at Defcon 1* (1999), an Iraqi general bent on revenge for the Persian Gulf War conspires to humble the United States by bombing it. A genius military scientist designs an ABM system that ultimately thwarts the attack. But although the technological prowess of the United States is the solution to the nuclear crisis, the narrator criticizes Americans' false sense of security: "The United States believed that the threat of a nuclear attack was a thing of the past, something found only in history books in the chapter titled 'The Cold War.' And the world believed that the threat of a global nuclear ended when the first chip of the Berlin Wall hit the ground."⁷⁶

While novelists like Houston as well as nuclear activists believed that the Persian Gulf War presaged potential conflicts over nuclear proliferation, conservative evangelicals saw it as a harbinger of the war of Armageddon that would be situated in the Middle East.⁷⁷ In *One World: Biblical Prophecy and the New World Order* (1991), a discussion among Baptist minister and televangelist John Ankerberg, Dave Hunt, and independent minister David Breese concluded that the war, to the extent that it produced

⁷⁵ See, for example, R. J. Pineiro, *Ultimatum* (New York: Forge, 1994).

⁷⁶ Houston, 46.

⁷⁷ See, for example, John F. Walvoord, *Prophecy: 14 Essential Keys to Understanding the Final Drama* (Nashville, TN: Thomas Nelson Publishers, 1993), 1. Billy Graham's assertion that the war proved that nuclear war was still a threat was a minority opinion among conservative evangelicals, in keeping with his increasingly liberal take since the 1980s on issues like nuclear abolition. See Billy Graham, *Storm Warning* (Dallas: Word Publishing, 1992), 42-43.

environmental consequences (with oil fires), could lead to a world dictator who would come to power on the back of the environmental movement. Their discussion revealed how the three ministers believed that ecological problems were real, but that the Antichrist would use them to control the world. While Ankerberg asserted that “[t]he Gulf War produced the greatest environmental disaster of history,” Hunt countered that it was a sign of the impending world government that would be necessary to “enforce world ecology.”⁷⁸ Ankerberg invoked the predictions of a scientist in seeing the war as possibly leading to the rise of the Antichrist: “[i]f they don’t get a cap on these fires and one of Carl Sagan’s predictions is correct that it may wipe out the harvests of one of these eastern countries such as India, then you would have an illustration that would strengthen the ecological movement and add additional impetus to the peace movement.”⁷⁹

The idea that Saddam Hussein could help trigger Armageddon remained a powerful one among conservative evangelicals as well as scientific apocalypticists. As late as 1999, Tim LaHaye and Jerry B. Jenkins, evangelical co-writers of the *Left Behind* series, implied that Hussein might have grand ambitions toward the Middle East, suggesting that “[i]t is difficult to explain the bizarre behavior of Saddam Hussein without thinking him quite possibly demon-possessed.”⁸⁰

Despite the end of the Cold War and the seeming appearance of a new problem in the guise of Hussein, Russia was still believed to be the Magog that would move against Israel during the battle of Armageddon. Popular Bible prophecy experts correspondingly

⁷⁸ John Ankerberg and John Weldon, *One World: Biblical Prophecy and the New World Order* (Chicago: Moody Press, 1991), 70.

⁷⁹ *Ibid.*, 70.

⁸⁰ Tim LaHaye and Jerry B. Jenkins, *Are We Living in the End Times?* (Wheaton, IL: Tyndale House Publishers, Inc., 1999), 139-140.

argued that Russia was still a threat to the world.⁸¹ Billy Graham in *Storm Warning* (1992) noted, “Despite the talk of nuclear disarmament and the apparent end of the Soviet Union, the world is still very much under the threat of nuclear war and nuclear war accident.”⁸² Lindsey, who was virulently anti-communist in his earlier works, argued in *Planet Earth—2000 A.D.: Will Mankind Survive?* (1994) that “Russia still poses a real danger to the United States, with its modernized nuclear force which took decades to build aimed at our nation like a gun to our head.”⁸³

Since the threat of nuclear war still existed and would undoubtedly occur during the Tribulation period or during the final battle of Armageddon, nuclear winter continued to be used to explain particular judgments in Revelation. Writers described the effects of nuclear winter with darkened skies, falling temperatures, and the poisoning of the seas and freshwater sources.⁸⁴ Several writers, including psychiatrist and evangelical novelist Paul Meier, mentioned the possibility of the ozone layer being harmed in a nuclear war.⁸⁵ Nuclear war would explain verses that detail judgments in which the power of the sun is increased (the ozone layer), in which men are engulfed in darkness (nuclear winter) or are plagued by sores (radiation sickness), and in which the sun turns black and the moon turns red (atmospheric pollution from dust).⁸⁶

⁸¹ See for example, Grant R. Jeffrey, *Armageddon: Earth's Last Days*, rev. ed. (Wheaton, IL: Tyndale House Publishers, Inc., 1998), 102.

⁸² Billy Graham, *Storm Warning* (Dallas: Word Publishing, 1992), 42-43.

⁸³ Hal Lindsey, *Planet Earth—2000 A.D.: Will Mankind Survive?* (Palos Verdes, CA: Western Front, Ltd., 1994), 188.

⁸⁴ David Dolan, *The End of Days* (Grand Rapids, MI: Fleming H. Revell, 1997), 255; Paul Meier, *The Third Millennium* (Nashville, TN: Thomas Nelson Publishers, 1993), 166-167.

⁸⁵ Meier, *Third Millennium*, 166-167.

⁸⁶ Dolan, 255; Hal Lindsey, *Apocalypse Code* (Palos Verdes, CA: Western Front Lts., 1997), 112, 146; Meier, *Third Millennium*, 166-167; John Wheeler, Jr., *Earth's Two-Minute Warning: Today's Bible-Predicted Signs of the End Times* (North Canton, OH: The Leader Company, 1996), 174-175.

The seeming agreement among Bible prophecy experts on the significance of the Persian Gulf War and the continued threat from Russia did not extend to environmental issues during the nineties. More conservative evangelicals expressed skepticism over the claims of environmentalists with regard to issues like global warming than in previous decades, even as some Bible prophecy writers continued to incorporate environmental concerns into their visions of the end and promote Christian stewardship. Political scientists James L. Guth and Lyman A. Kellstedt report on the result of surveys they conducted in the late 1980s and early 1990s of how voters and the clergy viewed environmental issues, broken down by religious affiliation in “How Green Is My Pulpit?” (1996). They disclose that both evangelical ministers and laypeople were less concerned with the environment than Catholics or mainline Protestants.⁸⁷ According to their research, two factors predict whether a Christian will refuse to support environmentalism: “Premillennial eschatology, in particular, is strongly associated with suspicion of environmental causes, as is identification with fundamentalism.”⁸⁸ But, while most premillennialists did not support environmentalism, there was a great deal of disagreement as to whether the environmental problems propelling the movement were real or invented.

A number of Christian apocalypticists expressed concern over such global issues as global warming, depletion of the ozone layer, and mass species extinction while detailing the signs of the end times. Billy Graham in a 1992 book mentioned global warming, the weakening of the ozone layer, and decreasing biodiversity as environmental problems that society should be worried about, concluding: “There is no doubt the earth

⁸⁷ James. L Guth and Lyman A. Kellstedt, “How Green Is My Pulpit?,” *Books & Culture* (May/June 1996): 13.

⁸⁸ *Ibid.*, 13.

is in trouble.”⁸⁹ Hal Lindsey, as he had in earlier works, continued to list ecological crises as signs of the end in a 1994 book.⁹⁰ He included sections on overpopulation,⁹¹ the greenhouse effect,⁹² the ozone layer,⁹³ desertification,⁹⁴ the diminishing rain forests,⁹⁵ and pollution.⁹⁶ In his *Apocalypse Code* (1997), he also discussed environmental problems like global warming, suggesting, “No one seems to know why the Planet is experiencing so many radical shifts in ecology in such a short period of time.”⁹⁷

Although Lindsey believed the environment was in trouble, he did not hesitate to criticize environmentalists. While discussing Revelation 6:7-8, he suggested the passage reveals that one-fourth of the world’s population will be killed by wild beasts during the Tribulation period as part of God’s judgment. He saw a precedent to that judgment already occurring: “In Colorado, Montana and California there have been recent reports of bears eating people, destroying homes and attacking livestock. Why the change? Because, thanks to misguided environmentalism, bear hunting is a no-no.”⁹⁸ He chastised politicians for cooperating with the environmental movement, for instance, when “[i]n 1997 President Clinton designated millions of acres of national parkland in Utah as wilderness area, putting it off-limits to mining and even some tourism.” The problem that Lindsey saw with this was that “[a]ll this is merely part of the U.N.’s bigger picture—‘Agenda 21,’ a blueprint for global environmental dictatorship that calls for ‘re-wilding’ at least half the continental United States. The premise of the whole program is

⁸⁹ Graham, *Storm*, 244.

⁹⁰ Lindsey, *Planet Earth*, 93.

⁹¹ *Ibid.*, 94.

⁹² *Ibid.*, 91-92.

⁹³ *Ibid.*, 95.

⁹⁴ Jeffrey, *Armageddon*, 242.

⁹⁵ *Ibid.*, 244.

⁹⁶ *Ibid.*, 250.

⁹⁷ Hal Lindsey, *Apocalypse Code* (Palos Verdes, CA: Western Front Lts., 1997), 12.

⁹⁸ *Ibid.*, 91.

that human society is a cancer on the planet and that radical surgery is required to bring it under control.”⁹⁹

As American premillennialists had been arguing since the late nineteenth century, Bible prophecy scholars advanced the idea that scientists were continually making discoveries that could reveal how events in Revelation would take place.¹⁰⁰ The fact that scientists said the earth is in trouble was used as proof that the end was near, as Lindsey asserted: “In fact, if the Book of Revelation had never been written, some astute 20th century person might well predict these very catastrophes within this generation.”¹⁰¹

LaHaye in his foreword to John Wheeler, Jr.’s *Earth’s Two-Minute Warning: Today’s Bible-Predicted Signs of the End Times* (1996) also suggested that concern on the part of scientists is warranted—humanity would destroy itself if God did not step in.¹⁰²

But, while authors like LaHaye and Lindsey approvingly referenced scientists, many conservative evangelicals took exception with popular writers who addressed the same issues. Graham still held Jonathan Schell’s *The Fate of the Earth* (1982) to be an example of misguided popular clamoring for a world government to solve the problem of nuclear proliferation.¹⁰³ Gore’s *Earth in the Balance* (1992) inspired particular umbrage among conservative evangelical writers.¹⁰⁴ Gore’s discussion of Lovelock’s Gaia thesis

⁹⁹ Ibid., 104-105.

¹⁰⁰ The interpretations of scientists were not necessarily fair, however. Lindsey quotes E. O. Wilson’s essay, “Is Humanity Suicidal,” and says that Wilson concludes that aliens will have to save the human race from itself; Wilson says no such thing. See Lindsey, *Planet Earth*, 71.

¹⁰¹ Lindsey, *Apocalypse Code*, 137.

¹⁰² Tim LaHaye, foreword to John Wheeler, Jr., *Earth’s Two-Minute Warning: Today’s Bible-Predicted Signs of the End Times* (North Canton, OH: The Leader Company, 1996), xiii. A Canadian evangelist who traveled with Billy Graham, John Wesley White cited American science fiction author Isaac Asimov, “a noted secular humanist and probably the world’s most credible and widely read science writer[,]” as credibly explaining how the world would end unless God intervened. See John Wesley White, *Thinking the Unthinkable* (Lake Mary, FL: Creation House, 1992), 56.

¹⁰³ Graham, *Storm*, 296.

¹⁰⁴ Joyce G. Bradshaw, “The Earth is the Lord’s,” *The Associate Reformed Presbyterian* (January 1993): 16; “The Emperor’s Closet,” *The Christian Conscience* (April 1995): 25; William A. Hoesch, “The Hyper-

led these writers to conclude that Gore was knee-deep in the New Age movement; he earned special enmity for calling himself a practicing Baptist. A contributor to a conservative Presbyterian journal, Joyce G. Bradshaw in her article “The Earth is the Lord’s” (1993) said that despite Gore’s professed religious affiliation, “Gore openly espouses an approach that incorporates a wide range of pagan ideologies....Rather than building his viewpoint on the sure foundation of Baptist (Christian) teaching, Gore looks to James Lovelock’s Gaia (Earth Mother) hypothesis to ‘find a way to understand our own connection to the Earth.’”¹⁰⁵ Texe Marrs was even less generous towards Gore, accusing him of being a “Mother Earth worshipper and closet occultist” who espouses a “satanic plan” to create a New World Order.¹⁰⁶

While some prophecy writers continued to use science to bolster their interpretations, others underscored that God controls the processes of science. J.E. Kirk in his novel *The Last Shall Be First* (1993) attributed some of the judgments of Revelation such as the death of the oceans and freshwater sources to the expiration of the sun. But, scientists did not detect it because “they were too preoccupied with proposing or modifying their theories dealing with the beginnings of the universe—theories that had no place for God as the Creator of it all. And because of their foolishness, God hid His truths from these men.”¹⁰⁷ At the end of the novel, the world is about to be destroyed in an all-out nuclear war but just as Christ returns, God takes control:

God’s angels had reprogrammed every rocket perfectly. They had replaced all of the previously designated targets with only one: the Valley of Megiddo, and the

Environmentalists,” *Foundation for Family and Nation*, no. 64 (April 1994): c.; Grant R. Jeffrey, *Apocalypse: The Coming Judgment of the Nations* (Toronto: Frontier Research Publications, 1992), 177.; Texe Marrs, *Circle of Intrigue: The Hidden Inner Circle of the Global Illuminati Conspiracy* (Austin, TX: Living Truth Publishers, 1995), 189.

¹⁰⁵ Bradshaw, 16.

¹⁰⁶ Marrs, *Circle of Intrigue*, 98.

¹⁰⁷ J.E. Kirk, *The Last Shall Be First* (Glendale, AZ: Apogee Arts Press, 1993), 15.

area immediately around it. And by doing so, they had spared the rest of the world the nightmare of blast, and burning, and radioactivity. One by one, the ninety-nine missiles fell out of the sky, deployed their individual thermonuclear bombs, then detonated. The hundreds of these powerful devices exploding over such a small target area not only incinerated all life forms but turned the earth itself into a lake of molten elements that flowed like wax.¹⁰⁸

Lindsey describes the four angels of Revelation 7 as having “been given authority over the weather conditions of the earth. Think about how even subtle changes in the world’s wind patterns would radically impact on the earth’s delicate ecological balance.”¹⁰⁹ In evangelical novelist (and meteorologist) Jonathan R. Cash’s novel *The Age of the Antichrist* (2000), nuclear war results in nuclear winter, but God sends an angel out to turn up the heat from the sun, which dries up the clouds.¹¹⁰

Dispensational premillennialists repeatedly claimed that just as politicians like Gore were misleading people with New Age ideas and talk of a united world, the Antichrist would likely come to power either by taking advantage of an ecological crisis or through the efforts of the environmentalist movement to unite to world politically.¹¹¹ In the 1990s, authors incorporated UFOs and aliens into their account of how the Antichrist would take power. *In His Image: Book One of the Christ Clone Trilogy* (1997) by James BeauSeigneur, a conservative evangelical author with a background in national security, showed the Antichrist promising a New Age to the post-Rapture world, aided by spirit masters (who are actually demons in the guise of aliens):

The New Age is not just some fad, some passing fancy. It is the result of a maturing, a ripening of the human species in preparation for the final and most glorious step in its evolution in preparation for the final and most glorious step in its evolution. Humanity is on the very threshold of an evolutionary stride which

¹⁰⁸Ibid., 100.

¹⁰⁹ Lindsey, *Apocalypse Code*, 123.

¹¹⁰ Jonathan R. Cash, *The Age of the Antichrist* (New Kensington, PA: Whitaker House, 2000), 389.

¹¹¹ See Cash, 170; Dolan, 180; Tim LaHaye and Jerry B. Jenkins, *Nicolae: The Rise of the Antichrist Assassins* (Wheaton, IL: Tyndale house Publishers, Inc., 1997), 132.

shall place us as far above what we are now, as we are now above the ants on the forest floor.¹¹²

Conservative evangelicals who still emphasized stewardship of the environment also stressed the obligation to reject New Age influence on the environmental movement.¹¹³ They pressed the point that Christians should be aware of a New Age influence on the environmentalist movement, charging that environmentalists worship nature and do not place the proper value on humanity.¹¹⁴ For instance, Graham, after listing the problems the environment is suffering, avowed:

One troubling aspect of the environmental debate is the pseudo-religious tone it has sometimes taken on. The language of ecology is apocalyptic and evangelical at the same time.... Supporters of the movement calling for ‘environmental stewardship’ often appear to worship, not the God of heaven, but the God of nature. This is a dangerous form of idolatry in itself. Furthermore, any time animal life becomes more sacred in our view than human life, we have lost sight of our proper priorities. Nevertheless, the possible death of our planet by some type of ecological suicide is not God’s will.¹¹⁵

Just as Graham alluded to God’s will, other writers suggested that God had employed in the past (and would employ in the future) ecological disasters to punish the sins of man. Hilbert Siegler, an occasional contributor to the *Creation Research Society Quarterly Journal*, wrote in an article on stewardship that “the utilization of our natural resources by the Christian has certain restraints that the evolutionist can ignore. As we

¹¹² James BeauSeigneur, *In His Image: Book One of the Christ Clone Trilogy* (Rockville, MD: SelectiveHouse Publishers, Inc., 2000), 347. See also James BeauSeigneur, *Birth of an Age: Book Two of the Christ Clone Trilogy* (Rockville, MD: SelectiveHouse Publishers, Inc., 2001), 13, 20, 24.

¹¹³ Robert Barkman, “Ecology and the Bible,” *The Baptist Examiner* 68, no. 10 (1 Oct. 1996): 1; Bradshaw, 16; Sydney L. Donahoe, “Caring for Creation,” *Charisma* (April 1992): 68-70; Ken S. Ewert, “All Who Hate Me Love Death: A Look at Popular Environmentalism,” *Chalcedon Report* (May 1996): 23; Ken S. Ewert, “Biblical Stewardship vs. Environmentalism,” *Chalcedon Report* (June 1996): 19; Jeffrey, *Apocalypse*, 252; Jeffrey, *Armageddon*, 287; Lindsey, *Planet Earth*, 33; Hilbert R. Siegler, “A Christian Environmental Ethic,” *Bible-Science News* 31, no. 2, (1993): 1.

¹¹⁴ Hoesch, a.; Texe Marrs, *Days of Hunger, Days of Chaos: The Coming Great Food Shortages in America* (Austin, TX: RiverCrest Publishing, 1999), 66.

¹¹⁵ Graham, *Storm*, 244.

page through the Bible, we cannot avoid seeing how these resources have been a gift with which God has blessed His children when they have obeyed Him. When His children sinned and left Him, these were taken away and the land was turned into desolation.”¹¹⁶

Lindsey made a similar point in *Planet Earth 2000 A.D.* regarding Hosea 4 in which God punishes the Israelites by making the land dry up.¹¹⁷

At times Lindsey even employed environmentalist language in his 1990s works. He called humans “suicidal,” saying that overpopulation shows that “Homo Sapiens have to be the most suicidal creatures on Earth.”¹¹⁸ He also used the metaphor of Earth as a spaceship so popular with environmentalists to make the point that humanity had to take care of its environment: “Let me give you an analogy of where the world is today. Suppose you were on a spaceship.”¹¹⁹ Lindsey nevertheless wanted his readers to know that despite his concern for the environment he had not become radicalized. He cautioned: “Now, I hope I don’t sound like a member of Earth First! Because my real concern is not for plants and animals and trees but for people. But the destruction of the environment has awesome consequences for man.”¹²⁰ He further claimed, “There is probably no one in the church that has done more than me in calling this fact to the attention of millions.”¹²¹ However astounding Lindsey’s declaration was, his statements show how conservative evangelicals delicately balanced their concerns over the New Age movement with a belief that the environmental disasters described by scientists reinforced their interpretations of the Bible.

¹¹⁶ Siegler, 2.

¹¹⁷ Lindsey, *Planet Earth*, 32.

¹¹⁸ *Ibid.*, 121.

¹¹⁹ *Ibid.*, 122.

¹²⁰ *Ibid.*, 123.

¹²¹ *Ibid.*, 32.

One persistent criticism of premillennialists was that their belief that the Earth would ultimately be destroyed after the millennium rendered caring for the environment pointless.¹²² An evangelical writer on environmental issues, Sydney L. Donahoe, in “Caring for Creation” (1992) admitted that current crises may simply be heralding what will happen at the end of the world: “For example, when Jeremiah saw that ‘the fruitful land was a desert’ (Jer. 4:26), was he foretelling the spread of desertification we see today? When the writer of Revelation painted a vivid picture of the sun’s scorching, destroying heat (see Rev. 16:8-9), was he describing the effects of global warming and ozone depletion?”¹²³ Nevertheless, Donahoe maintained, “Scripture has shown us that being a good caretaker is part of living a ‘holy and godly life.’ So the certainty of the earth’s destruction obviously doesn’t excuse us from our obligation to care for God’s creation.”¹²⁴ Still, accepting that the environment was in trouble did not necessarily lead Bible prophecy writers to propose that anything should be done about it. Lindsey implied that trying to ameliorate environmental problems was a hopeless endeavor: “Look for unprecedented environmental degradation—perhaps the result of nuclear fallout. But there’s nothing we as a people can do about it. It’s too late to reverse the adverse effects of industrialization.”¹²⁵

Despite the above authors who thought environmental degradation was predicted in the Bible, a growing number of conservative evangelicals rejected the science behind the environmental movement. The repeated refrain of evangelicals who contested

¹²² Writers continued to argue that Christ would restore the environment during the millennium. See Kirk, 209.

¹²³ Donahoe, 71.

¹²⁴ Ibid., 71. See also R. S. Beal, Jr., “Can a Premillennialist Consistently Entertain a Concern for the Environment? A Rejoinder to Al Truesdale,” *Perspectives on Science and Christian Faith* 46, no. 3 (September 1994): 177.

¹²⁵ Lindsey, *Planet Earth*, 309. See also Mark Hartwig, “Christianity and the Environment: A Primer,” *Bible-Science News*, vol. 32, no. 3 (1994): 3.

environmentalism was that scientists do not agree on the issues.¹²⁶ Similar arguments that fundamentalist Christians used to oppose evolution appeared—for instance, that global warming is merely a theory masquerading as fact. William A. Hoesch, an evangelical with a master’s degree in geology, explained the apparent dispute among scientists in a 1994 article: “For example, most people are not aware that there is no consensus yet existing in the scientific community that ‘global warming’ even has been determined to be real, much less to be a dangerous [sic].”¹²⁷ Hoesch thought it was likely that information was being withheld from the public, saying that there had been previous “scares” over the ozone layer.¹²⁸ What scientists need was hard data, according to Hoesch: “All this is based on an unproved theory which Greenies have been yelling will destroy mankind as we know it. But it does satisfy the global socialist call for ramping down the western economy.... The same goes for global warming, which is constantly being stated in the press as a proven fact.... What the public needs in the environmental arena are serious scientific facts; not hype.”¹²⁹

The language of conspiracy dominated charges that the environment was not in as bad shape as environmentalists argued. John F. McManus, the president of the conservative John Birch Society, saw an insidious motive in the actions of environmentalists:

Behind the seemingly innocuous environmental movement lurks a plan to destroy the industrialization that has led to marvelous machines, great comforts, better health, and a higher standard of living. Its leaders want neither personal freedom nor national independence. If they have their way, these neo-pagans will usher in

¹²⁶ “Global Warming: Fact or Fantasy?,” *National Liberty Journal* (January 1998): 4; Michael Sanera, “Facts, Not Fear,” *Focus on the Family* (August 1997): 10.

¹²⁷ William A. Hoesch, “The Hyper-Environmentalists,” *Foundation for Family and Nation*, no. 64 (April 1994), c.

¹²⁸ “The Emperor’s Closet, 26.

¹²⁹ *Ibid.*, 27.

a return to poverty, filth, heat in summer, cold in winter, and the misery of earlier centuries. And, make no mistake about it, like other tyrants past and present, the environmental radicals have gained the support of millions without telling them what their real goal happens to be.¹³⁰

Part of this conspiracy was a perceived attack on Christianity. The *Bible-Science News*, a creationist magazine published by an association of the same name, reported in 1992:

“The environmentalist movement is becoming more bold in its frontal attack on Christianity. It is also becoming more bold in openly admitting that its position grows out of a pagan, evolutionary interpretation of the universe.”¹³¹ Hoesch and others who disputed environmentalists speculated that environmentalists put forth global warming in order to bring about a world government and religion: “These hyper-environmentalists claim that because such problems as global warming and ozone depletion pose a clear and imminent threat, it will be only by the most concerted global effort, including the forging of a ‘new spirituality,’ that disaster is to be averted.”¹³² Marris took this notion even further, arguing that the Illuminati might decide to forcibly depopulate the world by releasing a virus.¹³³

Not all writers resorted to conspiracy theories to discredit the environmental movement. Lutheran Norwegian-American writer Berit Kjos in a more restrained analysis conceded, “Genuine concern for the environment is good and needful, for countless environmental abuses are painfully real.”¹³⁴ Even so, she suggested, “contrary to popular perceptions, most true environmental crises are local, not global.”¹³⁵

¹³⁰ McManus, 14. See also Ewert, “All Who Hate Me,” 26.

¹³¹ “Jane Fonda Says Christianity May Prevent Our Next Stage of Evolution,” *Bible-Science News* 30, no. 9 (1992): 13.

¹³² Hoesch, b-c. See also Marris, *Circle of Intrigue*, 104.

¹³³ Marris, *Circle of Intrigue*, 104.

¹³⁴ Berit Kjos, “Saving the Earth or Trashing the Truth?,” *The Christian Conscience* (April 1996): 9. See also Berit Kjos, *Under the Spell of Mother Earth* (Wheaton, IL: Victor Books, 1992).

¹³⁵ *Ibid.*

According to Kjos, the motivation of environmentalists is to create the perception of a crisis so as to get increased funding.¹³⁶

The arguments of anti-environmentalists made other inroads than just stimulating skepticism toward the reality of trends like global warming. Some conservative evangelicals argued that capitalism and private property are protected in the Bible. Lindsey repeatedly contended that socialist governments are much worse polluters than governments of capitalist countries.¹³⁷ Ken Ewert, a Christian businessman and writer, expressed his opinion in a 1996 article that God supports private property, which is better for the environment. Ewert wrote, “But while God has given men great freedom in ruling over His creation His laws also place definite limits on what man can do with it. . . . *Significantly, the Bible does not exhort us to take good care of ‘the environment,’ but rather to good care of our property, our piece of nature.*”¹³⁸

In addition to increased numbers of Bible prophecy writers expressing skepticism about issues like global warming, some also adhered to explanations of Biblical prophecies concerning the end that were supernatural.¹³⁹ A notable example of this was LaHaye and Jenkins’s fictional series *Left Behind* that began in 1995. Although a nuclear war occurs in the second book of the series, it is not used to explain any of the judgments. Judgments, which have been explained by other authors as being caused by a nuclear exchange or environmental crises, such as the poisoning of the oceans, the moon turning red, and non-Christians suffering from sores, are all supernatural events.¹⁴⁰ Even

¹³⁶ Ibid., 11.

¹³⁷ Ewert, “Biblical Stewardship,” 21; Lindsey, *Planet Earth*, 33, 47, 92-93.

¹³⁸ Ewert, “All Who Hate Me,” 20. See also Ewert, “Biblical Stewardship,” 23. Emphasis is his.

¹³⁹ Dave Hunt, *How Close Are We?: Compelling Evidence for the Soon Return of Christ* (Eugene, OR: Harvest House Publishers, 1993), 103.

¹⁴⁰ Tim LaHaye and Jerry B. Jenkins, *Soul Harvest: The World Takes Sides* (Wheaton, IL: Tyndale house Publishers, Inc., 1998), 34.

Wormwood, which has historically been interpreted by premillennialists as representing a meteor impact, was construed as supernatural (it is emphatically described as not being a meteor because of its unusual composition) in the series.¹⁴¹ The Antichrist relied on science to explain away incidents such as the temporary but debilitating darkness in *Apollyon* (1999) (caused by a supernova), but the narrative makes it clear that this is just posturing on the part of the character.¹⁴²

While LaHaye and Jenkins avoided using science to explain prophetic events in their fiction series, they did employ science in their non-fiction work, *Are We Living in the End Times?* (1999). In describing the opening of the seals, they make a distinction between judgments caused by man and judgments caused by God directly:

The first four seals described judgments largely inflicted by man; the sixth seal describes a judgment clearly supernatural in origin. John tells of an earthquake so massive that ‘every mountain and island was moved out of its place.’ Probably he also has in mind enormous volcanic activity, for he says ‘the sun became black as sackcloth of hair, and the moon became like blood.’ Particulate matter scattered in the atmosphere after a volcanic eruption has often turned the sky black and made the moon seem to turn red; recall the 1980 eruption of Mount St. Helens in Washington State or the gigantic explosion of Krakatau on August 27, 1883.¹⁴³

Although LaHaye and Jenkins did not decline to use science per se, their much more influential fiction series rejected scenarios that used nuclear war or environmental disasters to explain God’s judgments during the Tribulation.

Despite the rejection of such scenarios by the *Left Behind* authors, most Bible prophecy writers still incorporated the same interpretations of particular passages as

¹⁴¹ LaHaye and Jenkins, *Soul Harvest*, 417.

¹⁴² Tim LaHaye and Jerry B. Jenkins, *Apollyon: The Destroyer Is Unleashed* (Wheaton, IL: Tyndale House Publishers, Inc., 1999), 267-268.

¹⁴³ LaHaye and Jenkins, *Are We Living*, 186.

being the effects of nuclear weapons that had been appearing since 1945.¹⁴⁴ While conservative evangelicals could not agree on the relationship between environmental problems and their prophetic worldview during the 1990s, Bible prophecy writers continued to find passages that they felt described nuclear power or destruction. For instance, David Reagan, an evangelical minister, found in the book of Luke a description of the discovery of nuclear weapons: “Jesus said that in the end times one of the signs will be ‘men fainting from fear and the expectation of the things which are coming upon the world; for the powers of the heavens will be shaken’ (Luke 21:26). It sounds like the splitting of the atom to me—and the subsequent development of nuclear weapons.”¹⁴⁵ Lindsey offered a new interpretation of a passage that describes how God will punish nations that move against Israel (Zechariah 14:12), explaining, “This is exactly the way a neutron bomb works. A soldier is hit by a burst of radiation that leaves only a skeleton within a nanosecond.”¹⁴⁶

During the 1990s, the growth of computer technology offered entirely new ways for civilization and even humanity to end. In 1993 computer scientist and science fiction writer Vernor Vinge gave a talk at a conference called “The Coming Technological Singularity: How to Survive in the Post-Human Era.” This talk publicized his notion of the “technological singularity,” an idea he had put forth first in the early 1980s. The singularity refers to the point in time in which some sort of entity is created that surpasses human intelligence. This could happen through the creation of artificial

¹⁴⁴ For instance, on 2 Peter 3:10 (one of the first passages interpreted in the light of nuclear weapons), see Keith M. Bailey, *Christ's Coming and His Kingdom: A Study in Bible Prophecy* (Camp Hill, PA: Christian Publications, Inc., 1999), 177; Jeffrey, *Apocalypse*, 297; Wheeler, 174.

¹⁴⁵ David Reagan, *The Master Plan: Making Sense of the Controversies Surrounding Bible Prophecy Today* (Eugene, OR: Harvest House Publishers, 1993), 210-211.

¹⁴⁶ Lindsey, *Apocalypse Code*, 110-111. See also Pat Robertson, *The End of the Age* (Nashville, TN: Word Publishing, 1996), 397.

intelligence, through the promulgation of computer networks that connect and become a single vast intelligence, through the use of networked computers to extend human intelligence, or through the biological enhancement of humanity.¹⁴⁷ Vinge felt that it was impossible to make predictions as to humanity's future after this point is reached.

While Vinge admitted that the result of the singularity might be negative—it might even result in the extinction of *Homo sapiens*—the singularity is not necessarily a negative vision, like the *Terminator* movies of the 1980s in which robots try to eradicate their human creators. Vinge also noted, “It could be a golden age that also involved progress . . . Immortality (or at least a lifetime as long as we can make the universe survive) would be achievable.”¹⁴⁸ The singularity became a powerful idea in the 1990s, especially among computer experts who anticipated the future creation of artificial intelligence. A character in a book by Scottish novelist Ken MacLeod referred to the “technological singularity” as the “rapture for nerds,” which seems an apt analogy in terms of the possible benefits to humanity from a singularity that some anticipate.¹⁴⁹

Vinge emphasized the uncertainty of the future after the singularity in his own novels. In his *Marooned in Realtime* (1986), humanity reaches the singularity in the twenty-third century and disappears completely, with no clues for time travelers (who travel into the future by putting themselves into a type of stasis) as to where they went. It resembles the Rapture, in that humans disappeared suddenly, physically leaving the planet in the middle of everyday activities. But, in *A Deepness in the Sky* (1999), Vinge

¹⁴⁷ Vernor Vinge, “The Coming Technological Singularity: How to Survive in the Post-Human Era” (1993), <http://www-rohan.sdsu.edu/faculty/vinge/misc/singularity.html> (accessed: 30 May 2009). Vernor Vinge's essay has been reprinted on various internet sites. It was also published after his original talk in *Whole Earth Review* (Winter 1993).

¹⁴⁸ Ibid.

¹⁴⁹ Ken MacLeod, *The Cassini Division* (New York: Tom Doherty Associates, Inc., 1998), 115.

suggested that “[t]here were so many ways that an intelligent race could make itself extinct,” among them the singularity.¹⁵⁰ The idea of the singularity illustrates how scientific apocalypticism might continue to evolve in the future, incorporating new ideas as they appear. The “technological singularity” was yet another scientific way for some to look into the future of humanity and see salvation and meaning without recourse to traditional religion.

The growth of computer networks led more immediately to the Y2K scare at the end of the millennium. The decision of early computer scientists to encode a two-digit year instead of a four-digit year onto microchips might have caused systems to crash when the year rolled around to double zeros; the revelation put some Americans into survivalist mode. For instance, *The Complete Y2K Home Preparation Guide* stressed preparations like storing water and food as well as buying generators and ham radios. The authors, two software engineers, echoed a long line of scientific apocalypticists when they called the potential crisis of Y2K a “wake-up call,” praising “the good that could come out of this event.”¹⁵¹ Y2K turned out to be a non-event; the completely unexpected terrorist attacks on 9/11, not Y2K, ended the peaceful and prosperous period of the nineties for Americans, inspiring a new wave of anxiety over nuclear weapons.

During that period between the end of the Cold War and 9/11, environmental issues overshadowed nuclear weapons. Even though interpretations of the Bible regarding nuclear war, which were based on the observations of scientists like Sagan, remained stable, the growing ambivalence of Bible prophecy writers toward the

¹⁵⁰ Vernor Vinge, *A Deepness in the Sky* (New York: Tom Doherty Associates, Inc., 1999), 250. See also Vernor Vinge, *Fire Upon the Deep* (New York: Tom Doherty Associates, Inc., 1992).

¹⁵¹ Edward Yourdon and Robert A Roskind, *The Complete Y2K Home Preparation Guide* (Upper Saddle River, NJ: Prentice Hall, 1999), xxx.

environmental movement betrayed a fear that science could mislead people into accepting false conclusions. Clifford Goldstein, a Seventh-day Adventist, reached this conclusion in *The Day Evil Dies* (1999):

Satan has been especially effective through what the New Testament depicts as ‘science falsely so called’ (1 Timothy 6:20). While the passage primarily refers to ancient philosophical and religious concepts, it also applies to modern rationalistic science. Millions who believe that modern science is the ultimate arbiter of truth have lost faith in Scripture, because current scientific theories—which are liable to change at any time—often ignore or even oppose what the Bible teaches. Accepting the authority of modern secular science, such individuals reject the clear teaching of the Word at the peril of their own souls.¹⁵²

Conservative American Protestants were not alone in questioning science during this period. Astronomer Philip Plait in *Bad Astronomy: Misconceptions and Misuses Revealed, from Astrology to the Moon Landing “Hoax”* (2002) suggests that 10 to 25 million Americans believe that National Aeronautics and Space Administration (NASA) faked the moon landings of the late 1960s and early 1970s. Helped along by websites dedicated to the issue on the internet and a Fox network program in 2001 called *Conspiracy Theory: Did We Land on the Moon?*, this belief grew among Americans in the years around the millennium. Plait comments on the arguments made by those who believe the landings were a hoax: “In many cases they use simple physics and common sense to make their points. Usually their initial points make sense. However, they tend to misunderstand physics, and common sense may not apply on the airless surface of an alien world. Upon closer inspection, their arguments invariably fall apart.”¹⁵³

Popular belief in a fake moon landing revealed the loss of faith in the U.S. government. Additionally, however, the arguments of those who did not believe

¹⁵² Clifford Goldstein, *The Day Evil Dies* (Hagerstown, MD: Review and Herald Publishing Association, 1999), 93.

¹⁵³ Philip Plait, *Bad Astronomy: Misconceptions and Misuses Revealed, from Astrology to the Moon Landing “Hoax”* (New York: John Wiley & Sons, Inc., 2002), 172.

Americans landed on the moon showed the complicated nature of scientific issues. As Plait notes, their arguments appeared logical; non-scientists might find them hard to debunk. The climatologist Stephen Schneider addressed the issue of the public understanding complex scientific issues in his 1989 book on global warming:

If the public is to exercise its right to balance environmental, economic, and social values, then it must give informed advice to its political leaders. But how can any citizen send signals to politicians on complex issues neither understands very well? More generally, how can any nonspecialist deal with controversial scientific questions?¹⁵⁴

For Schneider, the complexities of issues like global warming meant that scientists had to assume public roles as educators. A decline in scientific authority, however, as the problem of nuclear weapons and the threat of environmental catastrophes loomed meant that in reality Americans were deciding complicated scientific issues less on the strength of the facts and argumentation behind them and more according to whether they meshed with their own sense of how the world worked.

Henry Bauer, a chemist who has written on scientific literacy, connects the contested nature of science during this period back to the postmodern criticism of science that emerged in the 1960s. Bauer says of scientific debates:

One has only to read of controversies over substance (radon, say) that are alleged, in trace amount, to cause cancer after cumulative exposure, or about the alleged effects of a nuclear war (Nuclear Winter), or about almost any of the many controversies about technical matters, to recognize that proponents and opponents try to push their cases beyond what existing scientific knowledge can legitimately support and, at the same time, continually cite the authority of science for their view. One who believes that science embodies certain knowledge can only be confused as equally qualified experts invoke the sanction of science in opposing ways.¹⁵⁵

¹⁵⁴ Stephen H. Schneider, *Global Warming: Are We Entering the Greenhouse Century?* (San Francisco: Sierra Club Books, 1989), x.

¹⁵⁵ Henry H. Bauer, *Scientific Literacy and the Myth of the Scientific Method* (Urbana, IL: University of Illinois Press, 1992), 10.

Americans have stopped viewing science as unquestionable; though they have not completely rejected science, they are more reluctant to throw money at scientific research and accept without pause the arguments of scientists.

Amidst growing doubts about science, it is not surprising that popular science writers, science fiction authors, and conservative evangelicals agreed that science and technology were not likely to see humanity out of its morass. For some science writers and science fiction authors, the solution was to promulgate a new philosophy that would make humans more connected to nature. For conservative evangelicals, the emphasis on God's ultimate control over the environment as well as rejecting the arguments of environmentalists outright began to seem more consistent with their understanding of the world. Scientific apocalypticists did not entirely embrace mysticism nor did religious apocalypticists become entirely anti-science or technology. However, just as the scientific and religious apocalypses had been dovetailing each other's concerns since the late nineteenth century, both responded to the sense that pure science could no longer explain or resolve the problems of humanity.

Epilogue

Scientific and religious apocalypticists in the United States did not pursue entirely separate lines of inquiry into how the world might end in the late nineteenth and twentieth centuries. A side-by-side examination of premillennialism and scientific apocalypticism during the twentieth century suggests that conservative evangelicals, far from waging a war on science, consistently respected scientists and their work, while scientists and science writers had difficulty warning Americans about impending crises without recourse to religious language and ideas. Scientific apocalypticism became increasingly compatible with religion, even with the conservative evangelicalism that many scientists believed was hostile to science.

The account of how humans were created in Genesis was matched by Darwin's account of evolution in the late nineteenth century. Wielding a naturalistic story of creation, scientists explored the apocalyptic implications of evolution, namely that humanity could go extinct just like any other species. The articulation of a scientific apocalyptic progressed slowly, driven largely by British and European authors of "scientific romances" such as H.G. Wells and scientists like Camille Flammarion. During this period, the scientific apocalyptic was more concerned with the implications of evolution than with questions like how to live in a world threatened by destruction—questions that would consume later scientific apocalypticists

As the scientific apocalyptic was being articulated, American ministers who adopted dispensational premillennialism, like Luther T. Townsend, argued that properly performed science would support the description of the end contained in Revelation. Believing that the world was irredeemable, premillennialists joined a minority of

Americans in rejecting the idea of progress. Following the lead of British and European authors, scientific apocalypticists in the U.S. also rejected the notion of progress and envisioned the end of civilization, the end of humanity, or even the destruction of earth without any help from God.

The bomb gave focus to the sporadic speculations of how the world could end naturally or by human hands. It also put Americans at the center of a scientific apocalyptic that stressed more than ever just how troubling the technological power of humanity had become. When scientists struggled with their moral responsibility after their invention of atomic weapons and science fiction authors explored all of the dimensions of nuclear war, they unconsciously evoked premillennial visions of the end. Like Bible prophecy proponents using the imminence of Christ's Second Coming to convert the unsaved, scientists like Leo Szilard and Linus Pauling believed that it was their duty to stress the potential of nuclear weapons to destroy all life on earth, invoking the threat of apocalypse to win supporters for policies such as a ban on atmospheric testing. Science fiction authors found ways to give meaning to human existence even in the face of such a threat. For instance, a nuclear war could grant freedom to a small remnant of survivors who would no longer have to deal with the banalities of modern life (like the "saved" who would escape God's final judgment) or would pave the way for the evolution of a worthier species; both possibilities could lead to a superior civilization or a secular millennium.

Dealing with the bomb was a different experience for American premillennialists. The apocalypse had always been a threat, making the bomb less of a novelty for American conservative evangelicals. Even so, they quickly incorporated accounts of its

effects into their interpretation of the end, contending that modern science unwittingly continued to reveal biblical truths. Although they disagreed on the effectiveness and morality of political solutions, premillennialists and science writers of fiction and non-fiction were all convinced that the onset of the atomic age meant that the end of the world was more likely than ever.

In the 1960s after the U.S. and the U.S.S.R. signed a treaty banning atmospheric nuclear testing, anxiety over what humans were doing to their surroundings became focused on other sources, such as pesticides in Rachel Carson's *Silent Spring*. Like the physicists who preceded them in raising public awareness through popular science works, biologists wrote that pesticide use, overpopulation, and depletion of natural resources could have catastrophic impacts on human society. As a result, books like *The Population Bomb* emphasized that present trends, when extrapolated into the future, would lead to the end of civilization or even human extinction. Like their counterparts in nuclear science, biologists like Paul Ehrlich told their readers that only drastic policy changes could spare humanity. Science fiction authors responded to the new perceived environmental threats, writing books that gloomily imagined pollution overwhelming humanity. Though they persisted in connecting the end to the beginning, stressing that another species deserved to rule the earth more than humans, they found it more difficult than in the past to see a purpose in environmental destruction, failing to envisage a new civilization emerging out of polluted, resource-depleted ruins.

The more despairing visions of the end fashioned by science fiction authors was similar to the conviction of Bible prophecy experts that the world was doomed no matter what; science only proved that. Premillennialists, just as they had with nuclear weapons,

followed the developments in the environmental movement, writing about overpopulation and pollution. Not only did these trends establish that the Second Coming was imminent, but they showed that Scripture had predicted these developments.

In the 1980s environmental and nuclear threats became more global in nature with Paul Sagan promoting the idea that even a small nuclear war could result in nuclear winter and Jim Hansen publicizing the threat of global warming due to carbon dioxide emissions. In the 1960s, scholars had proposed the idea that science was itself a cultural invention, no more descriptive of reality than, say, religion. In the 1980s and 1990s, the impact of this idea became apparent, as scientific apocalypticists wondered if science had all the answers, at times suggesting that a spiritual or religious orientation toward the earth might resolve the crises facing humanity better than a scientific orientation could. While scientists writing on the environment and the threat of nuclear war during this decade still advocated political solutions, some started to advance the idea that something more was needed to resolve these global threats, in particular, a new way of relating to nature. Science fiction authors, like scientists, offered the same solutions to the threat of extinction from nuclear or environmental problems, but some also depicted a future in which humanity is only saved because they accepted ideas like James Lovelock's Gaia theory. Like premillennialists who believed nuclear and environmental problems had only a spiritual resolution, scientific apocalypticists concluded that a conversion to believing in something greater than the power of technology was imperative.

The 1980s also witnessed more efforts to combat the conclusions of environmentalists. While premillennialists worried about the influence of the New Age movement on environmental causes, most did not echo the arguments of people opposed

to the environmental movement. They incorporated concepts like nuclear winter and global warming into their accounts of the end, still believing in the science behind such threats even if rejecting the solutions that scientists proposed.

The end of the Cold War led to a decline in nuclear anxiety during the decade leading up to 9/11. However, environmental concerns became central to the fears of scientific apocalypticists. They spent the 1990s participating in a growing public debate, fueled by the media, over whether global warming was actually occurring. The need for something more than a political solution became stronger as their arguments failed to convert the public to their cause. Rather, scientists like David Ehrenfeld argued that a lifestyle based on a respect for the environment would be the only way humanity could survive. As they had in prior decades, science fiction authors followed suit, with authors like Ken Grimwood imagining humans escaping the environmental nightmare they had created through the efforts of dolphins to teach humans the proper way to live. Science fiction writers went even further than scientists, however, in some cases, suggesting that humanity might survive only through a drastic post-human solution.

Premillennialists in this decade became more receptive to the arguments against environmental causes. Already fearing the influence of New Age ideas, some premillennialists concluded that the science behind concepts like climate change was shaky and worried that it was part of a sequence of events that would lead to the Antichrist assuming power. Bible prophecy writings during the 1990s were divided on whether modern science continued to reveal Biblical truths, and the immensely popular *Left Behind* series relied on supernatural explanations for judgments that had been explained by previous authors as nuclear or environmental in nature. Just as scientific

apocalypticists pushed more spiritual solutions to the crises they described, premillennialists became more likely to question the authority of science.

Scientific and religious apocalypticists had neither a simple give-and-take relationship nor a straightforward conflict over values. Dispensational premillennialists had no problem integrating new science into their Bible prophecy analyses up until the 1980s when they, along with others in society, asked if the opinions of scientists were as objective as once believed. Scientific apocalypticists, meanwhile, became more receptive to spiritual and even religious ways of viewing the world. This may have been true for scientists in general. For instance, physicists have increasingly been wondering if the universe has not been “fine-tuned” for life; change any number of characteristics about the universe—for instance, the force that maintains the stability of atoms or the amount of matter in the universe—and life would not have arisen.

Though scientific apocalypticists might find the comparison odious, the way they dealt with threat of total extinction from nuclear weapons was remarkably similar to a religious apocalyptic. Part-rhetorical strategy and part-deeply felt belief, scientific apocalypticists used lurid descriptions of how the world could end to win supporters to their cause. The ways humans could escape nuclear war and create meaningful lives was also startlingly similar to conservative evangelical visions of a chosen people spared from God’s judgment and going on to enjoy the millennium. Meanwhile, dispensational premillennialists paid attention to new scientific discoveries, believing that they only proved the accuracy of prophets like John in predicting such things. When some premillennialists moved away from using science in this way during the 1990s, it was alongside a move among scientific apocalypticists to look outside of the realms of

science and technology for salvation. Far from inhabiting separate spheres, both religious and scientific apocalypticists found purpose in warning that nuclear war and environmental disasters could effect the end of the world at any time, requiring action now.

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