CATRIN GERSDORF
JULIANE BRAUN (Eds.)

America After Nature

Democracy, Culture, Environment

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To Eva Hedrich
and all the other invisible
brains and hands behind projects like this.

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Introduction

CATRIN GERSDORF & JULIANE BRAUN

Democracy after Nature: National Legacies, Global Futures

The year 1989 marked a crucial moment in the history of nature and democracy. The fall of the Berlin Wall in November of that year confirmed the power of democracy to topple dictatorial regimes. In hindsight, it also heralded the end of the Cold War and the beginning of the era of globalization. Earlier that same year, American environmentalist Bill McKibben brought attention to another challenge of the time, one that had, in fact, played no small part in the erosion of the ossified ideology and practice of *Realsozialismus* (real socialism): the ecological crisis caused by the production of carbon dioxide and other greenhouse gases. McKibben was convinced that the particles and substances, the fumes and the smog "we" produce "in our pursuit of a better life" (n. pag.) and insert into the atmospheric and geological systems of planet Earth had brought about *The End of Nature*—at least of nature as an independent force. "When I say that we have ended nature," he writes,

> I don't mean, obviously, that natural processes have ceased—there is still sunshine and still wind, still growth, still decay. Photosynthesis continues, as does respiration. But we have ended the thing that has, at least in modern times, defined nature for us—its separation from human society. (McKibben n. pag.)

This definition of nature as the material reality shaped by biochemical, physical, and atmospheric processes on the one hand, and as an entity separate from human society on the other hand reveals McKibben's intellectual debt to a tradition that can be traced back in American thought to Ralph Waldo Emerson.

In 1836, Emerson had defined nature in similar terms, even using a similar language. Philosophically, nature was "all that is separate from us," all that is distinguished in theory "as the NOT ME" (3-4). In contrast, "*Nature* in the common sense, refers to essences unchanged by man; space, the air, the river, the leaf" (4; emphasis in the original). Writing in the early nineteenth century, under the influence of Romanticism and at the dawn of the industrial age, Emerson recognizes the transformative power of art—both in the sense of artisanship and of imaginative creativity—when he writes about the "mixture" of human will with material nature embodied in "a house, a canal, a statue, a picture" (4). Yet on the grand canvas of the natural world, these "operations" remained "insignificant" (4), an almost invisible scratch in an otherwise unblemished picture. In the closing sentence of "Nature," Emerson seems to strike a rather different tone when he conjures up "the kingdom of man over nature, which cometh not with observation" (39). Is this a call for the large-scale transformation of nature into culture? A call to Americans to embrace the Herculean task of appropriating nature's vast domains in this, the New World by mixing their will with the material nature? Whatever the answer, and whatever the critical position that answer reveals, it is obvious that Emerson privileged nature over history as the source that would build and nourish a genuinely American character, both on the individual and the communal, or national level.

We find echoes of that precept—the significance of a force that is more powerful than history, tradition, and convention—in Henry David Thoreau's celebration of (natural) wildness as an antidote against the individual's domestication in the shops and offices of modern America. "I prefer not to," Bartleby's monotone rejection of the demands of a monotone office job, is the remnant of the nonconformist wild in the domesticated grid of the modern city. It breathes the spirit of freedom in an environment ruled by law, social convention, and economic necessity. Similarly, Walt Whitman perceived "the lessons of variety and freedom" as "the greatest lessons of Nature through the universe" (953). In the opening thoughts of *Democratic Vistas*, the text that is Whitman's response to the devastating experience of the Civil War and its aftermath, the poet draws on the authority of the laws of nature—and on an intellectual tradition that found expression in the text of the Declaration of Independence but reaches back to the era of classical antiquity, more

specifically, to ideas first formulated by the Greek philosopher Epicurus and later versified by Roman poet Lucretius.

Based on the Epicurean valorization of pleasure and joy, rather than pain and fear, as the most natural of all human pursuits, Lucretius promoted an ethics of independence and of freedom from despotism and superstition. An advocate of atomism, he saw nature first and foremost as matter in motion, not as an expression of divine providence or retribution. In *De rerum natura* (*The Nature of Things*) he wrote: "Nature is her own mistress and is exempt from the oppression of arrogant despots, accomplishing everything by herself spontaneously and independently and free from the jurisdiction of gods" (qtd. in Johnson and Wilson, 131). The emancipatory potential of Epicurean thought as expressed in metaphors and images like the ones just quoted is obvious: The idea that gods play no part in the doings of nature[1] provided a model for philosophical and political ideas of independence. Epicurean thought provided a blueprint for articulating doubts about the raison d'être of established social hierarchies and political orders while at the same time, it established the inherent equality of all things material, including human bodies. As Duke law professor Jedediah Purdy summarized the position: "all people were made of the same matter and had the same life spans and appetites" (59).

What Purdy calls "the equality of appetite" (60) refers to a crucial component of Epicureanism that reemerges in seventeenth and eighteenth-century natural rights philosophy and, ultimately, in the United States Declaration of Independence: the physiological relationship of all humans, their equality as 'natural' beings which legitimizes their legal and political equality.[2] With the Declaration of Independence, and the

[1] A. E. Stallings's more recent translation suggested this paraphrase of the passage quoted above: "If you possess a firm grasp of these tenets [of physics expounded in Book II: "The Dance of the Atoms"], you will see / That Nature, rid of harsh taskmasters, all at once is free, / And everything she does, does on her own, so that gods play / No part" (Lucretius 2007, 68).

[2] In his *Leviathan* (1651), Thomas Hobbes defined the law of nature (*lex naturalis*) as "a precept, or general rule, found out by reason, by which a man is forbidden to do, that, which is destructive of his life, or taketh away the means of preserving the same" (86). In contrast, the right of nature (*jus naturale*) "is the liberty each man hath, to use his own power, as he will himself,

political pamphlets, essays, and declarations that prepared it, Epicurean nature, filtered through the poetry of Lucretius and the philosophical work of European thinkers such as Michel de Montaigne, Francis Bacon, Thomas Hobbes, and John Locke, becomes the foundation for the conceptual architecture of the twin pillars of modern democracy and America.[3] We find emulations and modifications of this architecture everywhere in the literature of the early Republic and in the lectures, essays, autobiographies, poems, and novels of the nineteenth century. And we have learned to read the work of American transcendentalists, all of whom were fascinated by the idea as well as the experience of nature, as invaluable contributions to the development of the nation's cultural and political independence.[4]

Late twentieth-century Americanist revisions of the era Matthiessen had dubbed the American Renaissance de-emphasized the significance of nature, instead focusing on the political and ideological substructure of that era's canon and on its participation in, or resistance against, the construction of race and gender hierarchies. Nature was no longer seen as a liberatory instrument but, rather, as a concept complicit in legitimizing regimes based on the ideologies of racism and sexism. As Jonathan Dollimore pointed out in a different context, any political philosophy or movement that draws on nature needs to be aware "that much reaction-

for the preservation of his own nature; that is to say, of his own life" (86). Because the law of nature applies to all men equally, all have the same right to stave off threats against their lives. This is not a call for violence and war. For Hobbes, "the first, and fundamental law of nature . . . is *to seek peace, and follow it.*" The "sum of the right of nature; which is, *by all means we can, to defend ourselves*" (87; emphasis in the original) is second only to the fundamental *lex naturalis*. In order to prevent unnecessary violence and war, human societies need to be regulated by contracts, or, as Hobbes called it, a "Pact, or Covennant" (89).

3 For an extended discussion of the links between Epicureanism and the real story of America's philosophical origins" see Stewart, ch. 3 "Epicurus's Dangerous Idea." For further references to the influence of Epicureanism on the development of ideas and concepts of democracy see also Purdy, esp. 65-69; Zuckert, 87-89.

4 See the seminal contributions to the American Studies project by F. O. Matthiessen and Perry Miller.

ary thought will return on the backs" of that concept (qtd. in Soper, 119). Or as Jedediah Purdy formulates it: "Treating humanity as just 'part of nature' has fostered racism, imperialism, and fascism, which imagined social life through a corrupted Darwinian triumphalism" (279). Making a similar (Foucauldian) argument, Paul Outka criticizes the classificatory systems of nineteenth-century ethnography for "[emplacing] various 'racial' groups according to their distance from the bestial, the 'Anglo-Saxon' or 'Teutonic,' or 'Aryan' almost always occupied the top and the African the bottom, the place nearest the animal" (7). As important as critical interventions like Outka's are because they emphasize African Americans' complex, often traumatic experience of nature, they often neglect the strategic use of the concept in the rhetoric of emancipation and nineteenth-century African American liberation. For example, a brief look at Frederick Douglass's *The Heroic Slave* (1853) will demonstrate how at least one African American writer employs some of the strategies of nineteenth-century nature writing for narrating Black emancipatory ideas. In his novella, Douglass stages the Kantian *Anschauung der Natur*, the observation of nature and animals, as the precept of self-emancipation. In a crucial scene, the protagonist enacts the role of the naturalist (or scientist) who registers concrete natural phenomena and, subsequently, extrapolates 'truths' about the human condition, or rather about the situation of the Black subject under the condition of chattel slavery.[5] By articulating the abolitionist claim for African American participation in the democratic project of the United States through images of nature, Douglass also participated in a tradition that arguably went into hiatus toward the end of the nineteenth century: the rhetorical and ideological imbrication of nature, democracy, and America.

One of the last texts that addressed the philosophical and imaginative codependence of these three concepts is Whitman's *Democratic Vistas*. In this prose piece, Whitman modernizes the political tenets of natural rights philosophy by affiliating them with the Darwinian idea of natural variety while at the same time reminding his fellow Americans of their

[5] I make a more detailed argument, based on a close reading of Douglass's novella in a yet unpublished conference paper on "Risk and Nature in the Work of Frederick Douglass." CG

national purpose and of the ideas and principles on which their nation was founded. In a historically crucial moment, when the rift that divided the nation along racial and regional lines was still in need of being mended, he implored his American readers to continue the work on "our experiment of democracy" (960). Whitman uses "the words America and democracy as convertible terms" (954); he holds that "democracy too is law," and that "law is the unshakable order of the universe forever" (972). In calling upon nature and the universe as models for the political and cultural constitution of the nation, Whitman disentangles the democratic experiment of America from the nadir of its most recent history where it had almost been choked to death by the ethical and social vices of slavery and war. At the same time, he redefines democracy as part of the "unshakable order of the universe," a rhetorical move that presupposes a concept of nature as an entity that remains unaffected by (and, ultimately, separate from) human history and society. Which brings us back to the beginning of this introduction, to Bill McKibben's anxieties about the end of nature, and the project we pursued with the 61st Annual Conference of the German Association for American Studies and the publication of this volume on *America After Nature*.

The following questions have guided both the papers presented at the conference and the essays in this volume: What is the State of the Union, what the state of US-American culture and politics at this point in time, a decade and a half into the twenty-first century and under the condition of the current environmental crisis? If America, the imaginative core of the United States' cultural and political identity, shares much of its conceptual history with nature and democracy, then what happens when the material reality named by one of the concepts—nature—changes its character as we knew it? In *Nach der Natur: Das Artensterben und die moderne Kultur* Ursula K. Heise observes that nature currently undergoes a "massive Umstrukturierung" (9), a massive ecological and geological restructuring that will not remain without consequences for the political, social, economic, and aesthetic constitution of modern culture(s). Heise's concern is not that different from McKibben's grim prophecy of the end of nature as "we" know it. Yet while McKibben's lament about the end of nature may be dismissed as the problem of just another "Great White Dude," a figure Andrew Ross identified as "angry white men" who "have found an accommodating haven under the big tent of environmentalist science, where they are not

automatically required to address questions about race, class, gender, and sexuality" (174), it could also be interpreted more sympathetically, as a concern about the future of democracy. "We have deprived nature of its independence, and that is fatal to its meaning," McKibben writes. "Nature's independence *is* its meaning; without it there is nothing but us" (n. pag.; emphasis in the original). In 1989, the word Anthropocene, describing the new epoch in which the human species emerges "as a globally potent biogeophysical force, capable of leaving a durable imprint in the geological record" (Revkin n. pag.), did not yet enjoy the same critical currency as it does today.[6] But McKibbens's was one of the first voices that addressed the cultural, political, social, and psychological challenges of the Anthropocene.

The questions and problems outlined above offer a historical and intellectual frame for reading the individual chapters in this volume. The essays collected in the first section, KEYNOTES, are based on four plenary lectures that provided the conference participants with the general parameters for discussions in the workshops. FRANK ZELKO echoes Bruno Latour's claim that "we have never been modern" when he takes issue with the Weberian thesis of modernity as a disenchanted mode of existence. In Zelko's historical account, ecological holism appears as a transnational body of thought that "helped to mitigate the spiritual and existential disorientation of modernity." Far from being merely an esoteric, or even necrophilic celebration of nature, ecological holism recognizes "the ineluctable logic of science and reason" as one, but not the only way modern humans relate to the natural world. It is, as Zelko writes, "a form of disenchanted enchantment." Worried about the public inaction on climate change, JOHN MEYER investigates how the debates on climate and sustainability are framed, asking to what degree that determines if people can be moved to action. Meyer acknowledges the problematic us-versus-them divide—i.e., the divide between *us*, the concerned and responsible environmentalists and *them*, the larger populace of ignorant and selfish individuals—as one impediment to the popu-

[6] Paul J. Crutzen and Eugene F. Stoermer's pivotal essay on "The 'Anthropocene'" that introduced the term to a larger public was published in the year 2000.

larization of environmentalist activism in the United States. However, the much greater problem is what he calls the "resonance dilemma," the priority of more immediate and individual concerns such as jobs and job security, education, and the cost of living. Meyer offers what he calls an "environmentalism of everyday life" as a form to address the resonance dilemma. One way of linking larger issues such as global climate change and sustainability with local, regional, or national expressions of everyday life is through matters of justice, a topic picked up in JULIE SZE's contribution. Discussing a number of art projects concerned with "issues of environmental inequality," Sze seeks to draw attention to race, class, and geographical location as factors that determine the degree to which people are affected by the "catastrophe of climate change." At the same time, Sze questions the viability of the Anthropocene as a category for addressing the current ecological crisis. The assumption of *human*-induced changes in the discourse of the Anthropocene often fails to take into account "inequalities of agency, responsibility, impacts and vulnerabilities." Not all people, societies, and cultures are equally responsible for nature's massive restructuring. Like Meyer and Sze, SYLVIA MAYER is concerned with questions of climate change representation and communication. Focusing on the political, historical, and cultural context of the US, she traces the emergent genre of the climate change novel and explores its contributions to the larger discourse on global risk. In Mayer's account, narrative fiction emerges as a cultural tool for imaginatively experiencing the individual, social, and emotional as well as the ecological consequences of the sensually elusive phenomena of climate change and risk.

The essays in section two, THE POLITICS OF NATURE, explore political and policy issues related to the environment and reveal how these issues shape social, ecological, and teaching practices in the postnatural world. SASCHA PÖHLMANN investigates how the characteristics, rules, and principles of nature can productively inform the creation of political and social concepts. Analyzing Walt Whitman's "Crossing Brooklyn Ferry," Pöhlmann examines the poem's construction of time, arguing that poetic performances of the future ultimately help Whitman envision a transtemporal democracy. In "Pesticides and the Transformation of the National Audubon Society," MICHELLE MART traces the US government's policies on the use of chemical pesticides and explores how one of the US's most prominent conservationist organizations positioned

itself toward this environmental threat. Mart contends that it was the 1962 publication of Rachel Carson's *Silent Spring* that caused a shift in the Audubon Society's stance toward pesticide use and ultimately inspired the organization to strategically recommend moderation, rather than condemning pesticide use outright. This policy of restraint, Mart argues, ensured Audubon's long-term success and established the organization as a powerful force in American environmental debates. GESA MACKENTHUN's contribution considers the status of Native Americans in current debates surrounding ecology and the environment. Dismantling both the myth of the ecological Indian and the myth of the unecological Indian, Mackenthun's essay argues for an in-depth analysis of the cultural work myths perform and, even more importantly, for the close scrutiny of those who benefit from the creation and dissemination of such myths. Exploring current trends in the EFL classroom, LAURENZ VOLKMANN calls for the inclusion of ecocritical and ecodidactic perspectives in the discipline's recent turn to transcultural and globalized learning. Volkmann contends that ecological concerns should not simply be addressed as isolated phenomena, but can also productively inform classroom discussions of other issues, such as migration, multiculturalism, and the world economy. Recognizing the versatility and importance of ecodidactics for the EFL classroom, Volkmann suggests, will help negotiate the politics of curricula and textbook development.

The essays in the third section, ECOLOGY AND URBAN ENVIRONMENTS, uncover the ways in which questions of ecology are discussed in urban environments. BORIS VORMANN's article critiques the current discourse on sustainability in the city. He exposes the inadequacy of technology-based approaches as a possible solution to the problems of urban centers, while also pointing to the shortcomings of strategies that focus solely on the improvement of social interaction. Vormann instead proposes a third perspective, one that advocates for the creation of sustainable urban infrastructures, and argues that only a dual focus on human interaction and technology will allow cities to thrive. In "Artistic Negotiations of the Right to the City," EMMANUEL TRISTAN KUGLAND explores the idea of the commons and applies it to his analysis of Brian Wood's comic book series *DMZ*. Kugland identifies intellectual property and ecology as important catalysts for political dissent, while also arguing that *DMZ*'s narratological strategy undermines the very engagement with ecology and politics that the series' thematic focus had

seemingly called for. Integrating rural and urban environments, FRANK MEHRING's reading of *Walden* elucidates the relevance of Thoreau's 1854 book for today's city dwellers. Routing his own analysis of the visual elements in *Walden* through John Cage's musical interpretation of the work, Mehring develops the concept of the "Walden State of Mind," a way of actively and mindfully perceiving one's environment that allows busy urbanites to leave the stresses of the city behind. In "Hip-Hop Life Writing and African American Urban Ecology," NASSIM W. BALESTRINI also explores the role of music in urban environments and examines its centrality in African American artistic expression. Carefully unpacking the metropoetics and multimedia practices emerging from Jay Z's autobiography *Decoded*, Balestrini's essay reveals the impact and reach of hip hop life writing as an art form for a variety of audiences while underscoring the critical importance of a black perspective on urban ecologies.

The fourth section, VISUALIZING NATURE, investigates how photographs, dioramas, collages, and literary works that use graphic elements engage with questions of ecology, the making (or un-making) of disaster, and the potential for a greener future. In "Nature, Media Culture, and the Transcendentalist Quest for the Real," HEIKE SCHÄFER analyzes the influence of early photography on the writings of Emerson and Whitman and offers one example of how new technologies affect literary practice. Schäfer suggests that by providing a critical vocabulary and a material window into the immediate representation of nature, photography led both writers to develop a nuanced theory of perception and signification that powerfully informed their works and led them to ultimately rethink the spiritual, cultural, and political function of literature. J. JESSE RAMÍREZ also considers the role of photography for the representation of environmental realities. Examining the works of diorama artist Lori Nix and George Stewart's novel *Earth Abides*, Ramírez interrogates the critical purchase of a concept he terms "apocalyptic jouissance" and argues for its transformative powers in the post-national and post-ecological United States. In "A Photo Album of History: Ekphrasis in Jamaica Kincaid's *My Garden (Book)*:," ANTONIA PURK focuses on the relationship between verbal and visual representations of the garden in Kincaid's work. Purk reads the garden as a kind of palimpsest that, upon close investigation, reveals issues of colonization, representation, and visuality. Purk argues that, through her use of ekphrasis in particu-

lar, Kincaid visualizes verbal descriptions and allows us to conceive of *My Garden (Book):* as a photo album that guides us through Kincaid's personal memories and through a collective history of colonization. Applying the concept of the "anthropocenic sublime" to her analysis of Masumi Hayashi's EPA Superfund Site photo collages, INGRID GESSNER productively combines ideas from the environmental humanities with critical perspectives from visual culture studies. Gessner emphasizes art's dual function as aesthetic object and agent of political and social critique while also teasing out how Hayashi's collages critically engage the viewer.

The essays in the final section on RISK, POSTHUMANISM, AND DIGITAL CULTURES most directly address the problems of a world "after nature." Supplementing Sylvia Mayer's thoughts on risk and climate change fiction, MICHAELA CASTELLANOS reads *Star Trek IV: The Voyage Home* as one of the earliest cinematic articulations of anxieties about global environmental risks. Yet unlike many narratives of climate change, *Star Trek IV* does not equate risk with impending destruction but also stages it as opportunity. Taking the work of theorists such as Cary Wolfe, Donna Haraway, and Brian Massumi as his starting point, WOJCIECH MAŁECKI proposes to turn to Richard Rorty and the philosophical tradition of American pragmatism in order to develop a posthumanist ethics, one that uses narrative as an important vehicle "for bringing us closer" to environments and bodies that "we have thus far avoided or neglected." Posthumanism and the posthuman are also at the center of JAMES DORSON's critical attention. More specifically, he investigates the conceptual history of posthuman subjectivity against the foil of Taylorism. Based on a close reading of David Foster Wallace's story "Mister Squishy," Dorson argues that posthumanism's romance with the postnatural cyborg tends to obscure a key problem: technological enhancement is not synonymous with the subject's liberation from the physiological constraints of the natural body but a form of control that, ultimately, creates a truly "post human economy" in which "human workers" are disposed for lack of efficiency. Issues of disposal, obsolescence, and detritus are also the subject of the two chapters that conclude this volume. Interested in both the material and aesthetic dimensions of obsolescence, BABETTE B. TISCHLEDER investigates the representation of trash in Pixar's computer-animated film *WALL-E*. Taking one of her cues from Heather Rogers's account of "the hidden life of garbage,"

Tischleder approaches "garbage as the American consumer society's true legacy" and sheds a critical light on *WALL-E*'s failure to articulate a more radical ecological critique of modern American culture's wasteful consumption of natural resources. With her essay on Flarf, arguably the first avant-garde literary movement of the twenty-first century, MARY-ANN SNYDER-KÖRBER enters the postnatural space of the world wide web. Based on a highly productive synthesis of Jakob von Uexküll's definition of *Umwelt* (environment) as a "subjectively angled" spatial phenomenon and Marcella Durand's proposal to develop an ecopoetic theory that pays attention to the organic *and* the inorganic, the natural *and* the artificial components of our environments, Snyder-Körber reads Flarf "as an analytical category able to launch a productively expanded ecopoetics." As a movement whose agents recycle, reuse, and reappropriate "e-detritus," Flarf is undergirded by an anti-Romantic, postnatural aesthetic, and as such, perhaps the most authentic literary expression of America after nature.

The United States is still a major agent in global politics. But twenty-first-century American attitudes about nature and wilderness, about global warming and the consequences of climate change, about energy production and consumption, and large-scale food production will have to compete with those of other global players, with big ones such as China, Russia, and the European Union, and small ones such as the national islands and archipelagos in the Caribbean, and the Pacific and Indian Oceans that form the Alliance of Small Island States (AOSIS). Yet for the foreseeable future, American ideas about nature and its relationship to culture will continue to shape the institutions and structures that define and enact environmental policies world-wide. Democracy is the only form of government based on ethical and legal principles that hold the promise of equality and justice for all. As Cornel West suggests, the realization of the democratic project depends on overcoming the "fear to engage the world and learn from others" (77). With this volume we trace the American contours and the global dimensions of an ongoing experiment in democracy in a postnatural world.

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Keynotes

FRANK ZELKO

Natural Wonders: Ecological Enchantment in a Secular Age

The idea that the modern world is disenchanted—that it has been stripped of the magic and wonder that characterized the mythological and religious cosmologies of the past—has a long pedigree. *Die Entzauberung der Welt*, Max Weber wistfully proclaimed in 1917, was the inevitable result of the rational, scientific, and bureaucratic mindset that characterized the rise of modernity. In principle, the entire world had become calculable; there were no more mysterious, wondrous forces shaping our lives—just natural phenomena awaiting scientific explanation. "This means," Weber told a Munich audience, "that the world is disenchanted" (139). Regardless of whether it was true or not, Weber's pronouncement cast a long shadow over twentieth-century intellectual life. In recent years, however, an emerging body of scholarship has challenged the very idea that modernity is disenchanted. Enchantment, these scholars argue, remains pervasive even among the most secular and rational denizens of modernity. It survives in the form of astrology, mass spectator sports, magic shows and other phenomena that allow people to experience wonder and delight without delusion. Such experiences are as constitutive of modernity as reductive science, instrumental reason and secularism.[1]

The notion that modern enchantment is reflexive and ironic is certainly compelling and offers some useful insights into how people have coped with the psychological upheaval of modernity. However, it is hard

[1] Prominent examples of this scholarship include Saler, *As If*, Landy and Saler, Cook, Owen, Hanegraaff, Lazier, and Munroe. For a useful historiographical overview, see Saler, "Modernity and Enchantment."

to avoid the oxymoron that lies at its core: can people experience the world as enchanted by engaging in forms of lucid self-delusion? Michael Saler posits "modernity remains enchanted in a disenchanted way, rendering the imagination compatible with reason, the spiritual with secular trends" (Saler, *As If* 13). But can this experience meaningfully be described as enchantment? After all, if enchantment is a mood or an emotion, it must, like other moods and emotions, be rooted in our biology. In fact, it is almost certainly linked to our species' predisposition toward the supernatural.[2] Therefore, to suggest that it can be fully satisfied through self-conscious mental trickery is like arguing that hunger can be satisfied by eating wafers and pretending they are steaks. Beyond whatever biological imperatives enchantment may involve, the notion of a 'disenchanted enchantment' also overlooks the fact that many have found durable, satisfying, and pervasive forms of enchantment that speak in the register of science and which do not infringe upon the central tenets of a secular modern worldview. In fact, since such forms of enchantment do not require self-reflexivity and ironic distance, they offer a more genuine and fully realized form of modern secular enchantment. Most notable among these are the holistic ecological views of nature held by certain scientists and intellectuals. Far from remaining the preserve of elites, such views have also shaped the thoughts and actions of numerous popular movements, particularly environmentalism. Such holistic views challenge what their proponents believe to be the

[2] Neuroscientist Michael Persinger, a pioneer in the field of 'neurotheology', has shown that stimulating people's brains with complex magnetic waves (via a so-called 'God helmet') can produce the sensation of a 'felt presence' that probably lies at the root of our tendency to believe in the supernatural. For a recent example of his provocative research, see Persinger, Saroka, Koren, and St-Pierre. For recent work on the evolutionary origins of the universal human predisposition toward the supernatural, see Boyer, Wade, and Wilson. Richard Dawkins views enchantment as an instinctive response to unexpected stimuli: "it is as if the nervous system is tuned at successive hierarchical levels to respond strongly to the unexpected, weakly or not at all to the expected" (*Unweaving* 264). Historians have barely begun to contemplate what the neuroscience revolution of the past quarter of a century might mean for the study of history. For a sophisticated discussion, see Smail.

disenchanting dualistic and reductive worldview that dominates modern thought.

Those of us who came of intellectual age in the era of Barthes and Derrida may find the essentializing tendencies of holism naïve and problematic. Nevertheless, it has exerted a profound influence on various strands of twentieth-century thought. To those who fully embrace a holistic worldview, nature contains intrinsic wonders that offer a wholly satisfying form of 'rational enchantment' that is entirely compatible with—indeed, is in large part derived from—a science-based cosmology.[3] After briefly reviewing some of the recent literature on enchantment, this article will examine how the rise of ecological holism in Europe and North America throughout the twentieth century helped mitigate the spiritual and existential disorientation of modernity. It will do so by focusing on some of the key individuals and movements that contributed to and reflected this holistic ecological discourse, a swirling and amorphous transnational community of thought that indelibly shaped our understanding of nature. In the process it will argue that among a segment of educated, non-theistic, scientifically literate Westerners, the locus of enchantment shifted from the supernatural to the natural.

Throughout the twentieth century, numerous intellectuals on both sides of the Atlantic have recapitulated Weber's disenchantment thesis in various forms.[4] The political philosopher Jane Bennett provides us with a compact summary of this disenchantment narrative:

> There was once a time when Nature was purposive, God was active in the details of human affairs, human and other creatures were defined by a preexisting web of relations, social life was characterized by face-to-face relations, and political order took the form of organic community. Then, this premodern world gave way to forces of scientific and instru-

[3] The concept of 'rational enchantment' was developed by Anne Harrington in reference to Gestalt psychology, itself an important strand of twentieth-century holism. It offered "the possibility of retaining a place for human significance in nature but without sacrificing rigorous experimental standards of traditional natural science" (103).

[4] Prominent examples include: Horkheimer and Adorno, Lukács, Ellul, and Blumenberg. For a useful overview, see Germain.

> mental rationality, secularism, individualism, and the bureaucratic state—all of which, combined, disenchant the world. (*Enchantment* 7)

According to Bennett, Saler, and similarly minded scholars, Weberian disenchantment in its various guises has become a historical cliché in desperate need of deconstruction. Nobody denies that the discourse has been an influential phenomenon in twentieth-century life. Nevertheless, the skeptics argue, the disenchantment narrative constitutes "a performative discourse, bringing about the very effects it describes" (Saler, "Modernity and Enchantment" 693). In other words, those who follow Weber and suggest that the modern world is *actually* rather than merely rhetorically disenchanted have made a category error: they have confused the church with the religion, believing that the destruction of the former automatically entails the death of the latter. But the desire for enchantment is too much a part of our deep cultural past to be so easily obliterated by reductive science or instrumental reason. Weber and others failed to notice "that each time religion reluctantly withdrew from a particular area of experience, a new, thoroughly secular strategy for re-enchantment cheerfully emerged to fill the void" (Landy and Saler 1). The denizens of modernity, therefore, have not passively accepted the disenchantment of the world. Nor have they merely fallen for the kind of insidious re-enchantment described by Horkheimer and Adorno, in which capitalism tricks an unwitting population into investing modern media and markets with a mystical aura. Instead, they have engaged in "a variety of secular and conscious strategies for re-enchantment, held together by their common aim of filling a God-shaped void" (2).

The new scholarship on re-enchantment—let's call it the 'Antinomial School' for reasons that will soon be apparent—views the disenchantment narrative as a soul-searching, at times alarmist discourse propounded by Western cultural elites who feel that humanity is psychologically ill-equipped to deal with a world emptied of providential certainty and meaning; who find popular culture distasteful; and who despair at what they perceive as the destruction of older, putatively more organic and holistic mental and social structures. In contrast, the Antinomial School portrays a modern world rife with its own form of enchantment, albeit one with a distinctly postmodern tinge. Michael Saler, the School's chief historiographical expositor, suggests that there

> are forms of enchantment compatible with, and even dependent upon, those tenets of modernity usually seen as disenchanting the world, such as rationality and self-reflexivity. Modern enchantment often depends on its antinomial other, modern disenchantment, and a specifically modern enchantment might be defined as one that enchants and disenchants simultaneously: one that delights but does not delude. (Saler, "Modernity and Enchantment," 700)

From this perspective, modernity is best defined, not as a series of binary oppositions (instrumental reason vs. religion) or dialectical transformations (instrumental reason becomes a new religion, although without being recognized as one), but rather, as a series of "fruitful tensions between seemingly irreconcilable forces and ideas" and "unresolved contradictions and oppositions, or antinomies" (Saler, "Modernity and Enchantment" 702).

The idea that various forms of enchantment persist in—indeed, are constitutive of—the sensibilities of the modern West is a fresh and welcome approach to excavating the cultural history of secular modernity. Despite Weber's warning that the world had become entirely calculable, people continued to find wonder and surprise in all sorts of realms. From this perspective, cultural phenomena such as magic shows and detective fiction functioned, in Joshua Landy's reckoning, as "*training grounds for lucid self-delusion*, for the tenacious maintenance of fantasy in the face of facts. They are what makes possible the re-enchantment of the world" (Landy 129; italics in original). Thus various forms of delusion have continued to exist side-by-side with the very instruments that debunk them. Early nineteenth-century Europe, for example, experienced a wave of ghost story-debunking, while at the same time, and frequently among the same social milieu, there developed a craze for magic shows whose very fakeness was part of their appeal (Paige 165).

The French historian Robin Walz views the rise of 'rocambolesque' fiction—fantastically improbable adventure stories that became extremely popular as industrialization made mass publishing increasingly affordable during the nineteenth century—as another example of this distinctly modern form of 'delight without delusion': it functioned, and continues to function, as a 'mirror of the marvelous' animating a disenchanted modernity. "The rocambolesque revives an otherwise sterile

reality with irrepressible enchantments for popular audiences throughout the modern world" (148).[5] Modern spectator sports play a similar role. As Hans Ulrich Gumbrecht suggests, the process whereby superb athletes and legions of spectators become "lost in focused intensity" functions as a "strategy of secular re-enchantment"(150).[6]

The Antinomial School makes a strong case for the existence of a particularly modern form of enchantment: one that accepts science and rationalism as hegemonic ontologies, but nonetheless provides space within which people can cultivate wonder and surprise. Weber may have been correct in his assertion that there were no more mysteries and that the world was, in principle, entirely calculable, but his gloomy prognosis of a disenchanted world was unfounded. Numerous antinomies—the indigestible cultural morsels of modernity—keep disenchantment at bay. They ensure that mystery and a sense of enchantment can percolate through the tough crust of reductionist science and instrumental reason. For the Antinomial School, phenomena such as magic shows, the rocambolesque, mass sports and astrology are the methadone of modernity: they provide just enough of a high to stave off addiction to the purer opiate of pre-modern enchantment.

This is a clever analysis of certain trends in modern literature and popular culture, but is this form of re-enchantment, with its nudge-nudge, wink-wink sensibility, all there is to the story? After all, our need for enchantment likely shares the same root as our desire for transcendence and meaning, as well as our tendency to look to the supernatural to explain life's mysteries.[7] It is hard to imagine that such deep psycholog-

[5] For examples of similar forms of modern enchantments, see the other essays in Landy and Saler's collection, as well as the numerous books discussed by Saler in "Modernity and Enchantment."

[6] The philosophers Hubert Dreyfus and Sean Dorrance Kelly push this idea even further: "[t]here are moments in sport—either in the playing of them or in the witnessing of them—during which something so overpowering happens that it wells up before you as a palpable presence and carries you along as on a powerful wave. At that moment there is no question of ironic distance from the event. That is the moment when the sacred shines" (194).

[7] In a dauntingly erudite and magnificently speculative work of interdisciplinary synthesis, Iain McGilchrist has suggested that instrumentalism and reductionism are not merely cultural manifestations of a particular scientific

ical needs could be adequately satisfied by lucid self-delusion. Various forms of religious fundamentalism will do the trick. However, these are so at odds with the ontology of modernity that they are of limited appeal to those who have embraced, even if reluctantly, the ineluctable logic of science and reason. Not surprisingly, many denizens of secular modernity quickly found that there were deeper and more powerful forms of re-enchantment available: ones that went beyond 'delight without delusion.' Enchantment could be found in various holistic worldviews that suggested that there was more to the world than the mere sum of its parts. Wherever such views appeared, they always seemed to oppose the various forces of modernity that Weber and others viewed as disenchanting. Holistic ecology in particular offered a version of nature that was purposive, wondrous, and pregnant with enchantment. In this world, organisms cooperated for the greater good of the whole and with the ultimate goal of establishing balanced and durable environments, whether at the level of a small pond, a tropical rainforest or the entire planet. In such a world, maintaining the balance of nature became a sacred task. Where self-restraint and good deeds used to offer a ticket into heaven, they were now focused on the preservation of the only heaven we were ever likely to experience: the bounded, fragile space that constitutes our small blue planet. This worldview provided many disenchanted intellectuals and scientists—and eventually, a significant slice of the general population—with a satisfying form of enchantment that spoke in the register of science and was therefore fully 'modern.'

As a worldview, holism tends to be somewhat nebulous. Despite its elusiveness, however, the concept is no less real than similarly soft-edged terms such as republicanism, liberalism, and romanticism. So while it might not be the most concrete of phenomena, it has nonetheless played a significant historical role, and not just in some of the more

> worldview, but also products of our divided brain: the result of a kind of long-term wrestling match between the narrowly focused and instrumentalist left hemisphere and the more empathic and creative right hemisphere. There is thus a kind of positive feedback between the cultural conditions of modernity, with its need for ever greater precision, calculation, bureaucratization and reductionism, and the left hemisphere of the brain, which excels at such tasks. Western culture, therefore, is a predominantly left hemisphere culture and a re-enchanting holism is the right hemisphere's way of fighting back.

ethereal realms of philosophy and scientific theory. As Charles Rosenberg puts it: "particular individuals in the past accepted inclusive and integrative assumptions about nature and society, invoked them, [and] used them to justify ways of thinking about the world as it was and as it ought to be" (335). And such ways of thinking buttress many elements of quotidian life in the modern world. The fact that you practice yoga, for example, is probably the result of someone else's holistic thinking.[8]

At the most general level, holism is both a worldview and a sensibility. It insists that everything in the universe is interconnected and interdependent and that the world can be properly understood only by focusing on the way that its constitutive parts interact with the constituted whole. From a historian's perspective, as Christopher Lawrence and George Weisz usefully point out, "holism is essentially relational; it constitutes a rhetorical claim made in opposition to other approaches that are characterized as excessively narrow or reductionist in focus"(2). Holism has taken a variety of different forms depending on the academic discipline or social milieu that embraces it: it is sometimes metaphysical, tending toward spiritualism or vitalism, while at other times it is resolutely materialist and Darwinian. Mitchell Ash notes that skeptics sometimes portray holistic thought "as a wooly minded revolt against reason, an attempt to escape the constraints on both thought and action imposed by modern science" (ix). This characterization is demonstrably true in some cases. However, the more pervasive and influential forms of holism have been advanced by people seeking an enchantment compatible with and explanatory of secularism and science.[9]

Modern holism emerged in reaction to the mechanistic and reductionist scientific worldview that became increasingly prevalent throughout the nineteenth century. There were few better expressions of this development than the 1847 manifesto issued by a group of German

[8] In addition to Lawrence and Weisz above, other useful histories of holism include: Wood, Ash, Harrington, Alster, Golley, and Craige, *Laying Down the Ladder*.

[9] For examples of such skepticism, see Lovejoy, Phillips, *Holistic Thought*, and Phillips, *The Truth of Ecology*. "The problem with holism," writes Dana Phillips with reference to ecology, "is that we can get along piecemeal just fine without it, and aren't able to move beyond the piecemeal with it. It is a burdensome ideology" (65-66).

physicists, among them some of the most influential scientists of the century, including Hermann von Helmholtz and Karl Ludwig:

> [N]o other forces than the common physical-chemical ones are active within the organism. In those cases which cannot be explained by these forces, one has either to find the specific way or form of their action by means of the physical mathematical method or to assume new forces equal in dignity to the chemical-physical forces inherent in matter, reducible to the force of attraction and repulsion. (qtd. in Harrington, *Re-enchanted Science* 7)

Such sentiments were echoed in 1858 by Rudolf Virchow, Germany's leading physician, who continued the revolt against vitalism: "There is no *spiritus rector*, no life-spirit, water-spirit, or fire-spirit [...] Everywhere there is mechanistic process only, with the unbreakable necessity of cause and effect" (qtd. in Harrington, *Re-enchanted Science* 7). [10]

It is not hard to see why such anti-vitalist sentiments became increasingly resonant. Technological breakthroughs allowed scientists to focus on and manipulate organisms at the cellular level. The reductionist science of the laboratory identified diseases and promised cures; it split apart and recombined molecules into useful new materials and products. Given their efficaciousness, it is not surprising that reductionist values and assumptions became increasingly pervasive to the point of seeming self-evident. In a time of rapid industrial expansion and growing consumerism, they offered a form of science that was on the one hand practical and result-oriented, but which also promised insight into the most fundamental levels of life and matter (Rosenberg 336).[11]

[10] Few scientists were as devoted to establishing the mechanistic conception of life as the German Jewish biologist, Jacques Loeb. A ruthless critic of all vitalist and animist tendencies in science, Loeb immigrated to the United States at the end of the nineteenth century, taking up a position at the University of Chicago. Among his most famous students were John B. Watson, the founder of behaviorist psychology, and Gregory Pincus, the developer of the birth control pill. See Pauly.

[11] Despite dismissing vitalism as untenable in modern science, the renowned evolutionary biologist Ernst Mayr was nonetheless sympathetic toward its earlier exponents, arguing that it was ahistorical to ridicule them. Instead, one

The backlash against reductionism was exemplified in the work of several renowned European scientists and philosophers such as Christian von Ehrenfels, Max Wertheimer and Jakob von Uexküll. Uexküll developed an influential model of animal behavior in which every organism and its environment was part of an integrated system he referred to as the *Umwelt*.[12] A conservative aristocrat, Uexküll was fearful of the social and political instability he felt would result from the deeply disenchanting mechanistic worldview that characterized early twentieth-century science. "With the destruction of Christianity and its God," he wrote in 1921, "the human being stops being human and becomes something worse than a beast: he becomes a machine" (qtd. in Harrington 65) For Uexküll, nature was not merely a mass of organic and inert parts; rather, it was part of what he called a *Bauplan*, or blueprint, which coordinated the lives of individuals into a harmonious and interconnected whole:

> We find that all characteristics of living things are integrated in a contrapuntal way with the characteristics of other unities. In this way, one gains the impression of an all-embracing harmonious Whole (*Ganzheit*), because even the characteristics of non-living things interweave in a contrapuntal way into the *Bauplan* of the living. (qtd. in Harrington 66).[13]

While Uexküll and his holistically minded colleagues philosophized a new scientific holism, others were busy creating an alternative culture that reflected this kind of holistic thought. Early twentieth-century Germany saw the rise of numerous organizations and movements that embodied what John Alexander Williams calls a 'naturist' ideology. These

should view vitalism as a natural and understandable reaction to crass mechanistic thinking.

[12] The English translation of *Umwelt* is 'environment', and the German word subsequently gained the same broad political meaning as its English equivalent. For a more detailed discussion of German efforts to combat the disenchantment of reductive science, including how such views were incorporated into Nazi thought, see Harrington.

[13] Many scholars view Uexküll as part of the same broad phenomenological tradition as Maurice Merleau-Ponty and Edmund Husserl. For example, see Buchanan.

groups were not predominantly interested in nature protection (although there were a good number of such organizations as well). Rather, they were concerned that the conditions of modernity—industrialization, urbanization, capitalism, reductionist science, philosophical nihilism and relativism—were debasing the body and soul of German citizens. The cure for this malaise lay in a reorientation toward a lifestyle that they perceived as more 'natural.' The result was the *Lebensreform* movement and its numerous offshoots, such as organic agriculture, *Freikörperkultur* (organized nudism), the *Wandervogel* and *Naturfreunde* hiking clubs, and Anthroposophy, Rudolph Steiner's blend of science and spiritualism that continues to live on in the form of hundreds of Waldorf schools worldwide (Williams).[14] Outside the *Lebensreform* mainstream were various radical nature cults such as the *Naturmenschen*, the longhaired, bearded, sandal and tunic-wearing dropouts whose nature worship reached monastic levels of asceticism. Inspired by Theosophy and Eastern religions, naturists believed that by deeply immersing themselves in nature's holistic *Bauplan*, they could experience the transcendent sense of wonder and enchantment that every healthy soul required.[15]

The United States had its own *Naturmensch*, one who was every bit the equal of his German counterparts. John Muir spent much of his life roaming the wilderness of the American West. The product of a deeply religious upbringing, Muir nonetheless accepted Darwinian evolution as the principle explanation for the functioning of life on the planet. Rather than dwelling on the pessimistic implications of evolutionary theory—the emphasis on randomness and brutal competition—Muir viewed it as a part of the enchanted process of creation, the result of which was a harmonic and balanced universe. Nature, he believed, had its own intrinsic worth that was independent of whatever value humans bestowed

[14] Although such cultural tendencies reached their apogee in *fin de siècle* Germany, they were by no means uniquely German. For an American perspective, see Jackson Lears. For Britain, see Marsh. On the connections between holistic thought, re-enchanted science, and organic agriculture, see DeGregori.

[15] For a general history of *Lebensreform*, see Barlösius. On the connection between *Lebensreform* and later German environmentalism, see Linse. Martin Green argues that these movements were vital precursors of the sixties counterculture.

upon it, and Muir's sense of wonder was illuminated by a holistic ecological worldview that was part pantheist, part transcendental. "When we try to pick out anything by itself," he wrote toward the end of his life, "we find it hitched to everything else in the Universe" (211). Muir was one of the founders of the Sierra Club, America's most venerable environmental organization, and his writing taught environmentalists, as Robert Fuller notes, "that learning to behold nature in a manner permeated by "rejoicing and wondering" is the important first step toward becoming a citizen of an ecologically healthy universe"(53).[16]

The Russian philosopher P. D. Ouspensky was another prominent holistic thinker whose influence runs through various currents of twentieth-century ecological thought. Like Steiner and others whose worldviews had been shaped by Theosophy, Ouspensky strongly resisted the reductionism that he believed downgraded the cosmic importance of consciousness and spirit in favor of mundane material processes. Thus Ouspensky claimed that all matter, regardless of its complexity or level of organization, was imbued with consciousness: that nature was, quite literally, alive and self-aware.[17] Aldo Leopold, among the most influential figures in the history of American environmental thought, found Ouspensky's mystical holism very convincing, and it came to permeate his own brand of holistic ecology. In "Some Fundamentals of Conservation in the Southwest" (1923) he wrote:

> Sometimes we vaguely feel an intense *life* manifesting itself in the phenomena of nature . . . There are days brimming with the marvelous and the mystic, days having each its own individual and unique conscious-

[16] For a comprehensive treatment of Muir's attitude to nature, see Worster, *Passion for Nature*.

[17] Ouspensky was influenced by the Anglo-Canadian psychologist, Richard Bucke, whose *Cosmic Consciousness: A Study in the Evolution of the Human Mind* (1901) has continued to shape the ideas of various countercultural intellectuals and New Age writers throughout the past century. Bucke argued that a handful of humans—Jesus, Buddha, Dante, Whitman, himself—had reached a higher, more advanced stage of self-awareness and an ability to plug into a collective consciousness, and that this development prefigured an evolutionary leap in consciousness that would one day characterize our species as a whole. Ouspensky devotes a chapter of *Tertium Organum* to a discussion of *Cosmic Consciousness*.

> ness, its own emotions, its own thoughts. One may almost commune with these days. And they will tell you that they live a long, long time, perhaps eternally, and that they have known and seen many, many things . . . There can be nothing dead or mechanical in nature. If in general life and feeling exist, they must exist in all. (qtd. in Meine, 214-15)[18]

While Ouspensky was content to emphasize the mystical elements of holism at the expense of science, the former South African prime minister Jan Christian Smuts felt he had discovered the great cosmological convergence that melded science with spirit and evolution with consciousness. One of the most influential figures in the history of early twentieth-century holism, Smuts—an Afrikaner, Boer War hero, and lifelong advocate of apartheid—seems like an anomalous figure in our story of holism and re-enchantment But in addition to his military and political exploits, he was also a multi-lingual Cambridge-educated polymath with an interest in botany and evolutionary theory. Smuts was an avowed nature lover who would have felt a kinship with John Muir or the various metaphysical naturists in Germany. As unlikely as it may seem, until the mid-1920s, the venerable German word *Ganzheitlichkeit* did not have an English equivalent. It was Smuts who first came up with the term 'holism', although given his knowledge of German philosophy, it might more accurately be thought of as an act of translation than coinage. In his 1926 book, *Holism and Evolution*, he attempted nothing less than a synthesis of Darwinian evolutionary theory, Einstein's theory of relativity, and the philosophy of human consciousness and cognition. Such lofty ambition left little room for modesty. Smuts felt that in developing his concept of holism, he had discovered the "ultimate synthetic, ordering, organizing, regulative activity in the universe, which accounts for all the structural groupings and syntheses in it" (317). All reality, he concluded, was aggregative, contextual, and emergent: "the progressive development of the resulting wholes at all stages—from the

[18] Meine argues that Ouspensky was Leopold's strongest intellectual influence while he was developing his environmental ethic during the 1920s. Susan Flader, Leopold's other leading biographer, agrees (17).

most inchoate, imperfect, inorganic wholes to the most highly developed and most organized—is what we call Evolution" (99).[19]

Smuts's metaphysical holism was incorporated into American ecological thought by the influential Nebraskan botanist Frederic Clements. Clements formulated a scientific theory that purported to explain vegetation patterns throughout the world. After careful study of his native prairie biome, he came to the conclusion that a process of long-term coevolution created plant communities that were thoroughly interdependent and which tended toward a balanced state he referred to as 'climax.' When a savannah or a hardwood forest is disturbed by fire, for example, it will gradually return to the pre-disturbance species composition, a process Clements called 'succession.' The stages of succession are reasonably predictable, and without further disturbance, the community will once more arrive at its former balanced or 'climax' state. Clements's theory dominated ecological thought for a generation and continued to have cultural resonance long after it was displaced by theories that viewed nature as fundamentally chaotic rather than as cooperative and balanced (Worster, *Economy* ch. 11; Barbour; Tobey).[20]

As initially conceived, Clements's notion of climax was a thoroughly materialist, if inevitably teleological model of nature, with none of the metaphysical overtones found in the work of some of his contemporary natural scientists, such as Uexküll. However, in the 1930s, Clements fell under the spell of a charismatic young South African ecologist named John Phillips. At a time when Clements's work was under attack by skeptics such as Arthur Tansley and Henry Gleason, Phillips wrote a series of articles extolling Clementsian ecology, which had "become to me the deepest and most abiding reality, paradoxically both a starting point and a goal in the scientific study of communities" (qtd. in Hagen, *Bank* 83). Phillips, however, was a disciple of his South African compatriot, Jan Smuts, and felt that Clementsian ecology buttressed Smuts's all-encompassing and highly speculative holistic theory. As historian of

[19] For an analysis of Smuts's influence on ecological ideas in the early twentieth century, as well as how they fed into his views on apartheid, see Anker, ch. 2.

[20] For a critique of Clementsian 'balance-of-nature' ecology, see Kricher. For a recent attempt to downplay Clements's influence in the history of ecology, see Rumore.

science Joel Hagen points out, "on the face of it, Clements's mechanical-organic theory of succession fit uncomfortably with Smuts's passionately antimechanistic defense of emergent evolution" (Hagen, *Bank* 84). Nevertheless, by the mid-1930s, Clements was enthusiastically recommending Smuts's work to his colleagues and using Smuts's holism to buttress his own ecological theories. And ironically, even as Clementsian ecology fell out of favor among professional ecologists in the postwar era, its holistic language and sensibility continued to resonate with ecological activists, particularly those who embraced the sensibility of the 1960s counterculture.[21]

Among twentieth-century American ecologists, few had as much lasting impact as Eugene Odum, a professor at the University of Georgia for over half a century. Odum's undergraduate mentor and greatest intellectual influence was Victor Shelford, a renowned University of Illinois ecology professor who worked closely with Frederic Clements. Both Shelford and Clements were strongly influenced by Jan Smuts, whose pronouncements on holism they quoted approvingly in their 1939 text, *Bio-Ecology*:

> A whole is a synthesis or unity of parts, so close that it affects the activities and interactions of these parts, impresses on them a special character, and makes them different from what they would have been in a combination devoid of such unity or synthesis. … It is a complex of parts, but so close and intimate, so unified that the characters and relations and activities of the parts are affected and changed by the synthesis.

Ecology, according to Smuts, "was simply a recognition of the fact that all organisms feel the force and moulding effect of their environment as a whole" (Clements and Shelford 23. Originally in Smuts 122, 340). Shelford disdained reductionism in all its forms and dismissed scientists who opposed his holistic ecology as 'anti-ecological.' Thus Shelford and Clements, and by extension, Eugene Odum, were all linked together in the broad stream of holistic thought flowing through twentieth-century

[21] In addition to the books cited above by Hagen, Anker and Worster, other useful histories of ecological ideas include Kingsland, Bocking, Mitman, Golley, and Slack.

Western culture. This is not to say that holistic ecology was irreparably 'tainted' by the mystical, vitalist and organicist strains that ran through early twentieth century holism. It merely demonstrates the rather mundane reality that science cannot be easily separated from broader intellectual and cultural trends: that they are, in fact co-constitutive (Craige, *Laying* 24-25).[22]

Although Shelford's holistic ecology influenced Eugene Odum for the rest of his life, his conception of holism did not remain static. As an increasing number of critics began to expose the limitations of Shelford and Clements's ecology—their predilection for organicism and their tendency to examine biotic communities without due reference to their physical environment—Odum gravitated toward Arthur Tansley's ecosystem model, which he subsequently elaborated into an all-encompassing philosophy of nature and society. The natural world, Tansley argued, could best be understood as a series of interlocking ecosystems—a pond, a forest, the biosphere—each of which could be studied as a 'whole'. How could one understand these systems without resorting to reductionism? The key, according to the methodology developed by Odum, was to examine the energy circuits and material flows that connected biotic *and* abiotic phenomena into a single interacting entity. Such an approach also lent itself to the study of pollution, habitat destruction and other anthropogenic impacts, thereby providing ecologists with tools that would enable them to act as society's environmental problem solvers. In 1953, Odum published *Fundamentals of Ecology*, which would become the leading ecology textbook for the next two decades, thereby establishing ecosystem ecology as the dominant paradigm in the field. *Fundamentals* offered its readers a homeostatic model of nature in which ecosystems tended to evolve toward a state of equilibrium and harmony, constantly fending off and assimilating disturbances and fluctuating around a reasonably fixed ecological state. It was a model that reflected Odum's broader, teleological view that harmony was the goal toward which both nature and human society were constantly evolving (Craige, *Odum* 26, 43; Hagen, "Teaching" 706).

[22] For more on Smuts's influence on early scientific ecology, see Golley 25-27. There is a veritable library of books dealing with the social construction of science. For a useful introduction, see Latour.

Despite the popularity of *Fundamentals*, or perhaps because of it, some scientists found Odum's metaphors and concepts deeply problematic. Most evolutionary ecologists, for example, were convinced that individual fitness was the key to understanding how life functioned and evolved. They were thus deeply suspicious of the group adaptation theories embedded in Odum's ecosystem concept, as well as the notion that the elements of nature 'cooperated' in an effort to achieve a balanced state. Nevertheless, Odum's metaphors resonated with broader cultural trends. His insistence that even a spacecraft constituted an 'ecosystem', a self-contained 'life support system' in which everything needed for survival was contained in a single vessel, was a powerful image for a public that was fascinated with the space program and beginning to see the first photos of the earth taken from outer space. (Worster, *Economy* 366-67; Hagen, "Teaching" 705-06).[23] Furthermore, Odum was quite happy to see ecosystem ecology conflated with environmentalism; in fact, he actively promoted this conflation in numerous lectures and publications throughout the United States and the world, and his ecosystem evangelism resonated with students in particular. As his biographer Betty Jean Craige noted,

> the left-leaning students who believed that ecology would enable them to 'save the earth' liked Odum's environmentalist message, populist political posture, vision of nature as inherently orderly, and desire for a peaceful and harmonious society in which humans would cooperate with one another rather than compete. (*Odum* 123)

Odum's philosophy echoed that of Aldo Leopold, whom he greatly admired: "A thing is right," Leopold pontificated, "when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (*Almanac* 262). According to this logic, the indiscriminate use of pesticides was clearly 'wrong', threatening homeostatic ecosystems with fluctuations they could neither fend off nor

[23] The impact of *Fundamentals of Ecology* was not limited to North America: it was translated into twelve other languages. See Craige, *Odum* xii. For a superb study of the impact of early outer space photography on environmentalism, see Poole.

assimilate.[24] Widespread air and water pollution, forest clear-cutting and land degradation, oil spills, and other forms of environmental destruction that threatened entire ecosystems all fell into the same category. Human beings, under the imprimatur of a reductionist and mechanistic form of science, were now the primary threat to the natural order. Odum's holistic theories and metaphors implicitly criticized both radical individualism and laissez-faire capitalism. Given the rising number of reports of environmental destruction throughout the 1960s, it is little wonder that his holism appealed to a large number of progressive scientists and activists increasingly alarmed by the environmental problems caused by modern industrial society. As Karen Porter, one of his colleagues at the University of Georgia, noted: "Gene was a proselytizer of holism, and his message of interconnectivity inspired a generation of ecologists" (qtd. in Craige, *Odum* xii).

In addition to Odum, a shy biologist from Pennsylvania was another highly influential popularizer of holistic ecology during the 1960s. Rachel Carson was raised in a Presbyterian family, and while she may have abandoned traditional Christianity, she nonetheless remained faithful to its broader moral precepts. Carson's mother Maria was a fervent proponent of the Nature Study movement of the early twentieth century and raised Rachel according to its principles: children should be encouraged to explore the outdoors as much as possible; they should be educated about nature in a way that inspires a sense of wonder and enchantment; and they should be steeped in the movement's juvenile literature, a blend of moralistic, sentimental and frequently religious nature tales. It is clear that her immersion in nature study would have a life-long impact on the way Carson attended to the natural world (Sideris).[25] "The control of nature," Carson sermonized,

> is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man . . . It is our alarming misfortune that so primitive a sci-

[24] Although, perhaps somewhat self-servingly given his work with the Atomic Energy Commission, Odum never extended this criticism to nuclear energy. See Hagen, "Teaching" 708-09.

[25] For the influence of Nature Study on Carson's early life, as well as a broader history of the movement, see Armitage 209-11.

> ence has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth. (*Silent Spring* 279)

Humans, Carson warned, must adopt a more humble attitude toward the natural world: they must recognize their place *within* it rather than attempting to live as though they were separate from it.

Like Leopold, Muir, and other major figures in the history of holistic ecological thought, Carson was urging people to exercise ethical restraint and to cultivate a sense of enchantment with the natural world. Her mission was not simply to inform people about nature: it was to inculcate the general population with the feelings that nature study and holistic ecology had inspired in her. Carson, therefore, was among the foremost popularizers of holistic thought. In a sense, her broader project, like those of so many other holists, was one of re-enchantment. "If I had influence with the good fairy who is supposed to preside over the christening of all children," Carson wrote in a women's magazine,

> I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength. (*Wonder* 42-43).[26]

Carson's schoolmarmish plea continues to resonate. In the process, it has inspired twenty-first century versions of the Nature Study movement, such as Richard Louv's crusade to kick couch-bound kids outdoors so that they can experience the salubrious and wondrous qualities of nature.[27]

Carson and Odum's holism influenced Kenneth Boulding, one of the twentieth century's most influential, if unorthodox, economists and the progenitor of the relatively new discipline of ecological economics (Røpke). Born in Liverpool in 1910, Boulding was a devout Quaker and devoted peace activist. He immigrated to the United States in 1937,

[26] The original essay was titled "Help Your Child to Wonder," and was published in the *Woman's Home Companion* in July 1956.

[27] Louv and Teilhard de Chardin, *The Nature Principle*. In a similar vein, see Van Noy.

where he successfully fought a legal battle to gain US citizenship despite renouncing the oath to bear arms. Boulding was one of the few mid-twentieth-century economists to pay heed to the notion that there were ecological limits to economic growth. In one of his most well known essays, "The Economics of the Coming Spaceship Earth," he referred to capitalism as a "cowboy economy," a term he felt was "symbolic of the illimitable plains" and the "reckless, exploitative, romantic, and violent behavior, which is characteristic of open societies." A more apt model, he argued, would be a "spaceman economy," a closed system with finite resources and limited capacity for waste disposal. If humans were to adapt to the limits of such a system, they would have to find their "place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy" (Boulding 9).[28] Boulding was here drawing on Eugene Odum's ecosystem model, and Odum, in turn, was impressed with Boulding's ecological brand of economics and his Quaker commitment to pursuing a harmonious society. In a 1975 lecture at Yale, Odum quoted Boulding's description of an ecosystem model of history in which society progresses from an early stage of chaos and competition toward a 'mature' state of homeostasis:

> One might even have an optimistic image of the present period of human expansion as a kind of adolescence of the human race in which man has to devote a large portion of his energy to sheer physical growth. Hence we could regard the stationary state as a kind of maturity in which physical growth is no longer necessary and in which, therefore, human energies can be devoted to qualitative growth—knowledge, spirit and love. (qtd. in Craige, *Odum* 121)[29]

It is doubtful anyone saw it this way at the time, but Odum was effectively channeling Uexküll, Ouspensky, Smuts and Carson—a whole slew of twentieth-century holistic thinkers—into the minds of impressionable and enthusiastic young ecologists and environmental activists.

[28] Buckminster Fuller also adopted the spacecraft metaphor in *Operating Manual for Spaceship Earth*.

[29] Modern physics has also had a fling with enchanted holism, most notably through the work of Fritjof Capra and David Bohm.