CHAPTER 2

Creating Ecology: Protestants and the Moral Community of Creation

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One of the most famous passages in American nature writing is Aldo Leopold's "Land Ethic," from his 1949 classic, *A Sand County Almanac*. In it, he used the ecological concept of plant and animal "communities" to argue that, just as ethics apply to humans living in an interdependent society, so too we should extend a "land ethic" to the broader land community of which we should see ourselves an interdependent member. Using such ecological ideas as the food pyramid and energy flow through the food chain, Leopold tied humans into the web of ecological interrelations. "In short," he wrote,

> a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such. (Leopold 1966, 240)

Leopold's use of ecology to support the concept of the land ethic grew out of the model of "community." "Pyramids," energy "flows," food "chains," and "webs" have no ethical implications, but "community"

certainly does. This is no accident. From the time the field of ecology coalesced in the 1890s, the vocabulary and conceptual framework of its theory was rife with moral implication. Ecology's creators repeatedly saw moral consequences in either the interrelationships of the natural world or the natural world as a model for human society. Furthermore, that moralistic view of nature took shape within the moralistic Protestant worldview that all the leading founders of the field shared.

Coined to make a scientific study out of the older concept of the "economy" of nature, "ecology" refers to investigation into nature's management of her "household" (Greek *oîkos*). However, the foundational ecological studies of the 1880s and 1890s conceived of nature not in terms of a "household," but of a "community," which as metaphors have rather different implications. Indeed, the biologists who began seeing grasses, shrubs, trees, insects, birds, reptiles, fish, and mammals as members of a "community" went beyond bare scientific analysis in their conclusions. A forest can be cleared or a prairie plowed, but if one views nature as individual organisms and species living together as a community, the forest or prairie community has been disrupted or destroyed. A *moral* act has occurred.

Community hence implies morality, and moral judgment implies religion. The simultaneous appearance in the United States of ecology, sociology, and the social gospel as organized movements in widely separated fields of life science, social science, and religion bespeaks common roots, as well as common concerns and perhaps common goals (McIntosh 1985, chap. 1, esp. 21–27). Indeed, early ecologists, as well as sociologists and social gospel advocates, shared a common religious heritage (Crunden 1982). They, along with virtually all founding ecologists, the theorists of the communities of nature, had Protestant backgrounds. Prior to the Second World War, American and European Protestants very nearly monopolized ecological theory: first German and Scandinavian Lutherans, then Swiss Reformed, English Anglicans, and American Protestants. American Protestants from only certain denominations participated in developing this new field: ecology as a science crystallized mainly out of the Calvinist Puritan tradition that planted Congregationalism and Presbyterianism in America. Within the general attitudes and doctrines of these and their daughter churches, and not within the much larger Catholic, Methodist, and Southern Baptist denominations, lay the taproot of modern American ecological science.

Community and Ecology

"Community" was much on the minds of American Protestants in the last quarter of the nineteenth century and the first quarter of the twentieth. As Cittadino (chapter 3, this volume) suggests, the scientific study of natural and human communities, ecology and sociology, arose as self-conscious fields at the same moment—the early 1890s—in the same area of the country—the Midwest—and with the same university—the University of Chicago—playing a major role. In 1889 the University of Kansas created a department of history and sociology, but Albion Small founded the first department of sociology proper at the University of Chicago in 1892. One year later, Midwestern botanists at the Madison Botanical Congress were the first body of scientists to officially adopt the word "ecology." Participants in the congress included Charles Bessey, chair of botany of the University of Nebraska since 1884, and John Merle Coulter, at that moment organizing the new department of botany at the University of Chicago (Tobey 1981, 2).

A century later the close relationship between American ecological and social thought continued. To give a prominent case in point, the current popularity of the term "biodiversity" has its social counterpart in the idea of cultural, ethnic, and racial "diversity." The concept of animal and plant "diversity" first appeared in titles in library catalogues in the early 1960s, followed within a few years by "biological diversity." After 1965, as racial integration efforts made significant headway, social thinkers began to speak of ethnic and racial "diversity." Both expressions came suddenly into extraordinary vogue after the mid-1980s, presumably at least partially in response to the Reagan administration's conservative social and environmental policies. Ethnic "diversity" and its handmaiden "multiculturalism" became a political shibboleth at the very same moment that biologists coined "biodiversity," which in turn immediately turned environmental and ecological shibboleth. The few hundred books with references to either ethnic or biological diversity in their titles published in the 1980s exploded into thousands in the 1990s.[1] "Diversity" as a cultural value affected the development of two disparate areas of science by providing natural and human "communities" an ideal against which they should be measured.

The concept of "community," therefore, bridged ecological and social thought; both fields analyzed aggregates of individuals and their interre-

lationships (Mitman 1992, 1). Students of both ecology and sociology also believed firmly in the intrinsic *value* of the subjects they studied (the natural world and society, respectively)—as opposed to studying them solely for their economic or social utility—which surely also played a role in attracting scholars to these areas in the first place. In their works or autobiographies, ecologists, for example, often describe an ardent love of the outdoors and deep sympathy for the plants and animals they study. Belief in intrinsic value introduces subjective value judgment and lends itself to perception of injustice when the respective objects of study are abused, endangered, or seriously disrupted. Community therefore implies morality, which leads to moral judgments and thence to political activism, visible in the common social activism of social scientists and environmental activism of ecologists from Charles Bessey, active in numerous parks and conservation organizations, to E. O. Wilson, defender of biodiversity. The Odum family, father and sons, form a perfect example: the father, Howard, was a social scientist and defender of black rights in the segregated South, while the sons, H. T. and particularly Eugene, were prominent ecologists as well as environmental advocates.

Ecology's Theological Roots: Natural Theology and Neoplatonism

Protestant theology and thought incorporated many strands that would later appear in the theoretical and moral framework of ecology and prepared the foundations of the new science by gradually developing in proto-ecological directions. Proto-ecological concepts developed within the traditions of Protestant natural theology and the closely related Protestant revival of Neoplatonism. An ancient Christian tradition, natural theology deals with the evidences in the natural world of God and his attributes. Within the English-speaking world and, later, Protestant Germany, it enjoyed a huge popularity in the two centuries before Darwin. Long influential in Christian theology, Neoplatonism emerged with particular energy in the late seventeenth century, notably among the so-called Cambridge Platonists, and flowered among nineteenth-century Protestant Romantics like Friedrich von Schelling, Samuel Taylor Coleridge, and Ralph Waldo Emerson. Intertwined with natural theology,

Neoplatonic thought pervaded nineteenth-century Protestant intellectual activity and continues to have its echoes today.

Natural theology lay much of the groundwork for European natural science in general and ecology in particular, and justified and encouraged the study of nature as a religious activity. Many passages of the Bible, most explicitly in St. Paul's Epistle to the Romans 1:20, describe how the knowledge of the Creator is available in Creation, which shows his existence, power, wisdom, and goodness. Since this knowledge complemented and logically must agree with knowledge of God given in the revealed Book of the Bible, churchmen and theologians referred to creation as a "Book of Nature" open to all to read and understand. In the seventeenth century, as a century of bloody religious warfare wound down, Europeans increasingly regarded the interpretation of the Book of Nature as much less contentious than interpretation of God's revealed Book, and indeed as grounds for universal religious belief. Because a basic principle of Protestantism was *sola Scriptura,* the Bible alone as the basis for religious truth, Protestants were already predisposed to view close study of a book as essential to religious knowledge and consequently lay particularly heavy emphasis on the importance of the Bible's complementary Book of Nature (Webb 1915; Glacken 1967; Harrison 1998).

The question of how the Spirit of God pervaded and created the natural world had found an answer in a Protestant revival of Christian Neoplatonism. Plotinus, the third-century founder of pagan Neoplatonism, taught that a tripartite World Soul animates and constantly creates the natural world, much as the human soul inhabits and animates the body. Creation emanates from the Spirit like light from a candle. Like the human body, the universe therefore exhibits a unity in its diversity, an organic holism, in that all parts of the world function together analogously to the various organs and limbs of the body. Plotinus's organic holism has clear ecological implications, if saturated with mysticism. Plotinus taught that meditation on the beauty of the natural world would lead the contemplative soul back first to the Spirit that created it; thence to the Divine Mind from which Spirit itself emanated, and wherein the Platonic idea of perfect beauty resided; and finally to mystical union with the divine One from which all ultimately emanated. Christianity incorporated Neoplatonism primarily through writings of many leaders of the early church who found it easy to adapt to Christian theology (the three-in-one of the Neoplatonic One-Mind-Spirit conveniently paralleled the Christian

trinity). Indeed, a number of church fathers, St. Augustine among them, were themselves former Neoplatonists (Craig 1980; Glacken 1967; Harris 1976; Lovejoy 1936; Santmire 1985; Stoll 1997, 12–21).

Natural theology's long career took an abrupt turn after the Reformation. In its fight against the spread of Protestantism, the Catholic Church emphasized obedience to the religious authority of the Church. This emphasis worked against theologies based on sources outside the church, like nature, which might lead to independent, suspect, or heretical conclusions. (The rise of Deism in seventeenth-century England was but one instance that proved Catholic suspicions valid.) Moreover, the basis of the Church's religious authority in the operation of the Holy Spirit through the community of believers also effectively deflected discussion of the Holy Spirit's presence in nature. This operation of the Spirit in the body of the Church ensured inerrant doctrine and obviated need for the heavy stress on the Bible or the Book of Nature as sources of religious truth that was utterly foundational to Protestant theology (Stoll 2004).

For their part, having rejected the authority of the institutional Church for that of *sola Scriptura,* Protestant theologians and intellectuals proclaimed all the more loudly that the Book of Nature supported the authority of the Bible and hence the truth of Protestantism. Protestants of all social levels typically battled religious doubt by reasoning from the evidence of God in nature back to the truth of Protestantism (Stoll 1997). Similarly, the Westminster Confession of Faith, which Puritans and Presbyterians wrote in the 1640s, began with a paraphrase of Romans 1:20, the evidence of God in nature. In contrast, Catholics reasoned their way from doubt to orthodoxy on the basis of the Church's authority or such evidence as miracles. The Protestant tenet of *sola fide* further undermined the influence of institutional churches by making the Holy Spirit operate directly on individuals rather than through the mystical body of the faithful. Thus Protestantism fostered varieties of spiritual individualism and encouraged believers to search for the spirit of God in nature.

Calvinists above all found themselves theologically driven to put significant emphasis on the theological roles of nature and the human relation to it. Calvinism's distinctive tenets of the total sovereignty of God and each person's predestination to salvation or damnation had interesting implications for creation. While humans *deserved* damnation due to their innate sinfulness, Calvinists regarded nature as the pure, ongoing creation of God, whose innocence was a foil to human corruption. Thus they gave nature a sort of moral standing. As the Book of Nature, the

natural world was also an appropriately pious subject for study. In addition, John Calvin first formulated the modern notion of stewardship of the earth (Stoll 1997, 25–26). Obsession with the fall of Adam, which forever cut humanity off from innocence, bliss, and harmony with creation, also focused nostalgic attention on Eden, lost forever due to human sin. Appropriately, the great Puritan epic was John Milton's *Paradise Lost,* whose hold on Protestant imagination did not begin to fade until the end of the nineteenth century (Abrams 1971). The great American Puritan divine Jonathan Edwards expressed these notions in his famous sermon, "Sinners in the Hands of an Angry God," in a passage that rolls together God's sovereignty, man's vile corruption, earth's goodness, and stewardship:

> Were it not that so is the sovereign pleasure of God, the earth would not bear you one moment. For you are a burden to it; the creation groans with you; the creation is made subject to the bondage of your corruption, not willingly; the sun don't willingly shine upon you, to give light to serve sin and Satan; the earth don't willingly yield her increase to satisfy your lusts. . . . God's creatures are good, and were made for men to serve God with, and don't willingly subserve to any other purpose, and groan when they are abused to purposes so directly contrary to their nature and end. And the world would spue you out, were it not for the sovereign hand of him who hath subjected it in hope.[2]

The astonishing celerity, destructiveness, and waste of American civilization's nineteenth-century advance into the last remnants of wild country worried the Puritans' descendants that humankind's sinful actions were destroying Eden once again.

Theology also had thoroughly mixed with science. As natural theology thrived on the one hand, natural science became a religious occupation on the other, and even clerics pursued scientific studies, among them American Puritans Cotton Mather and Edwards, the Calvinist and later Unitarian minister Joseph Priestly, and Anglican clergyman Gilbert White. Dissenters disproportionately filled the ranks of the Royal Society and of natural science generally. Cambridge Platonist and former Puritan Henry More thought that the evidences of the Divine in nature constituted *An Antidote against Atheism,* and his fellow Platonist and former Puritan Ralph Cudworth supported this point with his *True Intellectual*

System of the Universe. An admirer of More, Puritan naturalist John Ray published in 1691 the influential book *The Wisdom of God Manifested in the Works of the Creation,* while Anglican clergyman William Derham produced *Physico-Theology* in 1713. Edwards read the Cambridge Platonists at Yale University and later composed the heavily Neoplatonic "Dissertation Concerning the End for Which God Created the World." Emerson's *Nature* of 1836 was almost pure Neoplatonism, and in its first edition carried an epigraph by Plotinus. The great capstone works of natural theology were Anglican Archdeacon William Paley's *Natural Theology; or, Evidences of the Existence and Attributes of the Deity Collected from the Appearances of Nature of 1803*, and the *Bridgewater Treatises* of the 1830s. Paley, in fact, was required reading for many early-nineteenth-century undergraduate students, including Emerson at Harvard (Coslett 1984; Gillispie 1951; Howe 1989; Stoll 1997; Thomas 1983; Worster 1994).

God in Nature

The nineteenth century represented an important watershed as the modern scientific disciplines developed in an atmosphere redolent of pervasive Neoplatonic nature mysticism and its German counterpart, *Naturphilosophie*. Nature absolutely fascinated the nineteenth-century mind. Spiritually minded Romantics like William Wordsworth or Emerson or John Muir perceived the currents of Universal Being while walking through the woods. Landscape painting enjoyed an unprecedented vogue in Germany, Scandinavia, the Netherlands, Britain, and the United States. Protestant Romantic artists like Caspar David Friedrich or the painters of the Hudson River School or, later, photographer Ansel Adams depicted the spiritual aspects of wild nature (Adams 1992; Beierwaltes 1972; Novak 1980).

Scientific and mystical visions of the interconnection of the world continued to evolve in tandem. Scientific-minded Protestants from Alexander von Humboldt to Asa Gray investigated the interconnections of the natural world as a spiritual exercise to gain knowledge of the Creator. In his popular nature writings, John Muir, for example, frequently alluded to the Book of Nature and referred to his geological studies of the Sierra as reading "the glacial manuscripts of God" (Badè 1924, 1:358), and

John Coulter, first chair of the University of Chicago's Botany Department and son of Presbyterian missionaries, often wrote about the presence of God in nature and the harmony of science and religion. Romantic Neoplatonic ideas shaped the ecological holism of such early botanists and ecologists as Goethe, Humboldt, Ernst Haeckel, and Frederic Clements. Alfred North Whitehead's process philosophy is a form of Neoplatonism adapted to twentieth-century science; in the form of the process theology of Charles Hartshorne and John Cobb, Jr., in which God participates continuously in the evolution of an organically interrelated universe, Whitehead's philosophy keeps Neoplatonism relevant for contemporary environmentally minded Protestants. Moreover, there is more than a little of a secularized Plotinian system in James Lovelock's recent "Gaia hypothesis." Lovelock proposed that the living beings of earth worked together to make the earth suitable for life. Their organic interdependence so resembled a single living entity that he has given it the name of the ancient Greek earth goddess. However, humans had so disrupted the system that humanity resembled a global pathogen making Gaia ill—echoing Edwards's colorful personification that the nauseated world might "spue you out." While Lovelock as a scientist kept his system entirely secular, others adopted its concepts enthusiastically with the added spiritual element that pushes it closer to Plotinus's original conception (Barbour 1990; Harris 1976; Lovelock 1979; Tobey 1981, 88–98).

From Religion to Science

Secularization of the study of the interrelationships of nature accelerated throughout the nineteenth century, and the explicit religious meanings of scientific endeavor grew ever more implicit. Archaeology, geology, and higher criticism eroded the authority of the Bible by raising troubling questions about the reliability, authorship, intent, and history of the text. As the authority of *sola Scriptura* ebbed, educated Protestants turned to a sort of *sola Natura,* God's other, less problematic "Book," and drifted out of orthodox churches and into Unitarianism, Transcendentalism, or agnosticism. Yet always the religious aspect remained, though often shorn of its explicit Christianity, and earth scientists in general and biologists in particular saw themselves as "priests" of Nature (Hovenkamp 1978; Mitman 1992, 12).

In the last decades of the nineteenth century, organic holism shaded ever more from religious mysticism into secular science. Ecology emerged and took shape, first in Lutheran Germany and Denmark, where biologists originally began imagining animals and plants as "communities." In 1866 Ernst Haeckel, a religious youth but an adult advocate of secular holism, coined the word "*Oekologie,*" although a quarter century would pass before it acquired a specific scientific definition. Deeply influenced by Humboldt's vision of the phenomena of nature interconnected in a cosmic unity, German Karl Möbius was the first to popularize the community concept in his study of the biological "community" of an oyster bank. In 1877 he described this community by coining the term "biocoenosis" (or *Lebensgemeinde*), from the Greek roots for "life-sharing" but intriguingly close to the word "coenobios," the term for a religious community—literally "common life"—and source of the English "cenobite" (König 1981; Kölmel 1981). Building on Humboldt's pioneering insights into plant geography, German Oscar Drude focused on the geographical distribution of plants in his "phytogeography," which inspired Clements's first significant research project in Nebraska. Studies of plant "societies" led German botanists to conceptualize their ecological studies as plant "sociology." This line of study later culminated in the taxonomy of plant societies of Swiss Protestant botanist Josias Braun-Blanquet, whose important *Plant Sociology* of 1931 relied heavily on social metaphors. Braun-Blanquet worked in Montpellier, France, whose university under the Huguenots had become a center of botanical study in Europe contained Europe's oldest scientific botanical garden,[3] and had historical connections with Linnaeus in Sweden; Montpellier, Switzerland, and Sweden would become the European centers of the plant sociology model of ecological theory (Von Rath 1998; Van der Windt 1995, 80–84; Grove 1995; Matagne 1999). Son of a Danish Lutheran minister and closely related to four more, Eugenius Warming spoke of the coastal landscape of his youth with deep feeling and rather mystical reverence. His investigation of plant communities led in 1895 to the influential and oft-translated *Plantesamfund: Grundträk af den Ökologiska Plantegeografi* ("Plant Community: Introduction to Ecological Plant Geography"). As the first textbook with "ecological" in the title, Warming's book thus pointed from community[4] to ecological studies (Prytz 1984; reverence: e.g., 12, 102–3; ministers: 10, 188).[5]

Ecology as a Puritan Science

Already in the 1890s Americans were assuming the leadership of the nascent science of ecology. Nearly all early American ecologists had roots in churches that descended from the Puritan tradition, which included, among others, the Congregational, Unitarian, American (Northern) Baptist, Presbyterian, and Quaker denominations, which in the Puritan diaspora of the nineteenth century had firmly established themselves in the upper Midwest. There the first American ecologists arose, inserting into their science the Puritan elements of organic holism and moralistic suspicion about what the sons of Adam were doing in the landscape. As a young Congregationalist, an admirer of Puritan Jonathan Edwards, and a Unitarian as an adult, Illinois professor Stephen Forbes introduced Möbius's idea of the biological community to America (Croker 2001, 15, 64, 105, 126). Forbes's holistic study of a lake, which he called a "microcosm," was a founding paper in the new science of ecology. To Forbes, if the environment was an organism, ecology was the equivalent to physiology, and his own practical role as a biologist was like a physician's in healing his "patient." "Human interference with the natural order of plant and animal life gives rise to reactions which correspond closely to those of bodily disease," he wrote (Croker 2001, 112), repeating the metaphor of humans as global disease. Warming inspired another Congregationalist, Henry Chandler Cowles, to study the plant communities in the extensive sand dunes near Chicago. Cowles developed a theory of plant succession that used organic analogies and terminology to describe the development of a dune plant community from an embryo to maturity to death (Hagen 1992, 16–20). Cowles's student, Presbyterian Victor Shelford, influentially developed the concept of animal communities (Croker 1991, 50, 103).

Frederick Clements of Lincoln, Nebraska, gave ecological organic holism its classic statement. A collaborator with Shelford and student of Bessey, who was yet another Congregationalist, Clements had the demeanor of a dour, puritanical minister. He stopped going to his Methodist church in Lincoln because he felt "hypocritical" church members were not pure enough, and soon became an agnostic.[6] Clements produced internationally influential works on ecological methodology and theory of plant succession in which he portrayed the plant community as a literal organism. As he wrote in his most important book, *Plant Succession:*

> The developmental study of vegetation necessarily rests upon the assumption that the unit or climax formation is an organic entity. As an organism the formation arises, grows, matures, and dies. . . . The life-history of a formation is a complex but definitive process, comparable in its chief features with the life-history of an individual plant. (Clements 1916, 3)

Like Forbes, but moving much further than he, Clements saw little place for Western civilization in the American wilderness, as its arrival severely disrupted succession and crippled the organism. In later years Clements's interest turned from biological to philosophical holism. Continental plant sociologists resisted his ideas, but Clements had wide influence in Anglo-American ecology, even if most ecologists took the "organism" of a community as an analogy, not a literal reality (Hagen 1992, 21, 23, 37–38, 47–48; Tobey 1981, 79–80).[7]

In the 1920s and '30s, British ecologists developed new aspects to Clementsian organic holism, but in its sense as a general principle rather than as a literal organism. Britons Charles Elton and G. Evelyn Hutchinson (who worked at Yale University) developed the idea that plant and animal communities, like organisms, had "metabolisms" (Hagen 1992, chap. 4). (Elton, by the way, whom Humboldt and Shelford deeply influenced, developed the notions of "food chains," "food webs," and biotic "pyramids.") Then in 1936 Briton Arthur Tansley coined and defined the term "ecosystem," which he based on the organismic idea but without certain logical difficulties of it in boundary and definition. The word also was free of holism's objectionable political implications on both the left (communism) and right (fascism) in the 1930s (Hagen 1992, 79–87). Yet this simple change in terminology preceded a major opening of ecological theory to additions from outside the Reformed world of its birth. After 1945, Eugene Odum, brought up in a staunch Southern Methodist family far from Midwestern Puritan culture, was among those who continued to promote holism.[8] However, the term "eco*system*" had mechanical rather than organic implications and with the addition after World War II of cybernetic metaphors and concepts, a rising number of non-Protestants began making significant contributions to ecological theory (Bergandi 1998).[9]

Nature's Moral Implications and Environmentalism

The heavy preponderance of Midwesterners of New England or Presbyterian background among early ecologists suggests the application of Calvinistic notions of nature's innocence and human depravity to awareness of the last vanishing remnants of pristine prairie before the pioneer's plow. Ecologists at the University of Chicago (which essentially was an American Baptist college inflated with Rockefeller money) were for years more concerned than those of other universities with preserving the natural world. Many early ecologists seemed to be working to preserve the last bits of Paradise. This is evident in Forbes's remark, "primeval nature . . . presents a settled harmony of interaction among organic groups which is in strong contrast with the many serious maladjustments of plants and animals found in countries occupied by man" (Forbes 1880, 5).[10] Cowles's idea of the climax community and Clements's theory of succession introduced a teleology that privileged the climax state as perfect, Edenic in fact, which man, especially capitalistic man, could only disturb. Clements's warnings about the "plow that broke the Plains" and the need to preserve the climax grassland ecology fit this paradigm.

Non-Calvinists would come at the same idea from other theological directions. Quaker by heritage with a Methodist preacher for a paternal grandfather, Shelford student Warder Clyde Allee's vision of nature seemed to be along the lines of the Peaceable Kingdom, either Edenic or millennial, like the Quaker painter Edward Hicks's famous series of paintings. As Clements's single-climax theory came under greater attack, Southern Methodists Eugene and H. T. Odum replaced it with a similar idea, ecosystem stability, which implicitly retained implications of the superiority of "natural" landscapes over those shaped by human presence.

There are few social implications of Romantic nature-Protestantism, based as it is on the individual mystical experience in nature, but it has strong moral consequences, particularly to highly moralistic and evangelical Puritans and Presbyterians. They and their descendants tended to view untouched nature as pure, whereas human economic activity there, and particularly in areas of natural beauty, was equivalent to Satan gaining entrance into Eden, another paradise lost. Concerned with rooting sin out of society and, as evangelicals, with converting society to a "right" view of nature's holiness, a significant wing of the American environmental movement consisted of descendants of Puritans and Presbyterians

attempting to protect the remnants of Eden from commercial exploitation and destruction by preaching a gospel of nature. Many of them, and not a few of the ecologists, transformed the language and methods of evangelism into a message of repentance of modern man from his modernity and salvation in the purity of untouched wilderness. A former Unitarian minister, Emerson, with his friend and follower Thoreau, for example, decried the materialism of Jacksonian America and defended the spiritual value of nature (Stoll 1997, 101–8; Worster 1994, part 2). Son of a preacher, Muir saw himself as a John the Baptist preaching salvation in God's mountains to over-civilized Americans. Helping to create the American national park system, he saw the parks as cathedrals built by God himself and founded the Sierra Club in 1892 to defend them against the schemes of "Satan and company." Both David Brower—charismatic president of the Sierra Club in the 1960s, raised Presbyterian—and Dave Foreman—a founder of Earth First! who as a teenager aspired to be a Churches of Christ preacher—had notably evangelical speaking styles and intensely moralistic worldviews, and worked to save "pristine" natural areas from greedy, self-interested, shortsighted capitalists (Stoll 2001). Presbyterians Rachel Carson, Edward Abbey, and Gary Snyder each in his or her own way sought to defend vulnerable nature from self-seeking, thoughtless modern industrial society and to spread appreciation for nature's beauty and wonder (Stoll 2005).

However, despite the individualism of Romantic nature mysticism, Neoplatonic organic holism has deep implications for society. As nature's "priests," American Protestant botanists hoped to discover in nature guidelines for human society. Organicism therefore was a model for people (Mitman 1993, chap. 1). The social counterpart of Neoplatonism teaches that the World Spirit directs not just change and growth of the natural world but the development and progress of humanity as well. This philosophy of social idealism was developed by Germans, most famously by Hegel, and appeared in America for example in Lester Frank Ward's *Dynamic Sociology,* from which Clements probably drew his fundamental term, "dynamic ecology." Another Midwesterner of Puritan ancestry, and grandson of a minister, Ward was the nation's first and leading sociologist (Tobey 1981, 83–85; Chugerman 1939, 23–24). One of the most salient examples of the desire to apply lessons from nature to society is Quaker pacifist Allee's attempt (quickened by the experience of the First World War) to find nature to be a peaceful, nonhierarchical, co-

operative world, with socially destructive individualistic competition controlled by concerns for the good of the whole (Mitman 1992, chaps. 2–4). Better known is Leopold's "land ethic." Forester and founder of the field of wildlife management, and of Midwestern German Lutheran heritage, Leopold used ecological concepts of the "community" literally to develop a basis for environmental ethics. To his mind, as members of the land "community," landowners have a responsibility to treat the plants and animals, who are our fellow "citizens," with ethical concern.[11] However, fear of totalitarianism led Americans to downplay organic metaphors after World War II, and cybernetic and mathematical models of ecosystems captured ecology (Mitman 1992, 5). The ecosystem idea represents an interesting shift from these Protestant ideas. Associated with "hard" science, mathematics, economics, and technology (Mitman 1992, 1; Hagen 1992, chap. 4), the concept of "system" lends itself much less readily to moral readings. A "system" is not a "community," much less an organism. No "ecosystem ethic" has achieved any influence. Because of the lack of moral implications, however, there are fears that the moral content of ecology will vanish completely, leaving none but practical or economic reasons to preserve species and ecosystems.

Protestant churches that were once established churches, such as the Episcopal and Methodist Churches (which share origins in the Church of England), the Congregational and Unitarian Churches (heirs of Puritan New England), the Presbyterian Church (Scotland), and the Lutheran Church (Germany and Scandinavia), also have a robust social ethic. Although probably weaker than that of the Roman Catholic Church, the paradigmatic established Western Christian church, this social ethic derives from an established church's responsibility for creating and maintaining a moral, just society based on religious principles. This may be the source of the idea of Protestant ecologists who expressed their holistic viewpoint in terms of "community," with all its religious and moral connotations. It is explicitly the root of the Odum brothers' environmental activism, particularly of the elder Eugene, who felt his father's moral beliefs most intensely. Biographers trace his moral views to his father's fight for a just Southern society in which the races would be treated fairly and work together in organic unity for the betterment of all. Through his popular textbook, *Fundamentals of Ecology,* which went through three editions between 1953 and 1971, and his classroom lectures, Eugene Odum sought to inspire students to see the social implications of ecology.

Like Allee, Odum saw the cooperative, mutualistic, interdependent aspects of natural communities. His textbook was the last major textbook to include a large section on the environmentalist responsibilities of the ecologist. All of part 3 was essentially a guidebook and call to environmental action for the ecologist: "Remember that what the world needs is more and better specialists who are knowledgeable about the ecological whole!" (Craige 2001, introduction, 2–9; E. Odum 1971, 407). Less successfully, H. T. Odum also attempted to apply ecosystem concepts to society, but in a less moralistic and more cybernetic way. His 1971 book *Environment, Power, and Society* generalized flowcharts that he developed for ecological systems to economics, politics, and even religion.

In a sense, ideas about nature have always mirrored ideas about society. The dominant premodern view of nature emphasized a hierarchy, the Great Chain of Being, which ranked all creatures from lowest to highest, very much as social thinkers ranked all humans as members of classes from the bottom to the top. All of this, the order of both nature and society, was ordained by God. Today a profoundly individualistic and democratic version of ecology holds sway, undermining old ideas of the harmony or balance of nature, a pristine climax state, or even of a stable ecosystem. In this every-species-for-itself ecology, moral implications may be difficult to infer. Nevertheless, former Southern Baptist E. O. Wilson, along with many others, implicitly build on the moral high ground that cultural and ethnic diversity currently commands to preach the moral imperative of preserving biodiversity (Stoll 2002). Very likely, the sharing of metaphor and paradigm between social and ecological sciences will continue hand-in-hand with moral critiques and political, social, and environmental activism.

Notes

1. Based on the author's bibliographical searches.

2. Jonathan Edwards, "Sinners in the Hands of an Angry God," in *Jonathan Edwards: Representative selections with introduction, bibliography, and notes,* ed. Clarence H. Faust and Thomas H. Johnson, (New York: American Book Company, 1935), 162–63. Edwards alludes to Romans 8:19–22 and Leviticus 18:28.

3. That is, as opposed to botanical gardens for purely medicinal plants, as at Padua.

4. An interesting short history of the fate of "community theory" is in McIntosh (1985, 263–67).

5. It is extraordinarily difficult to discover the religious beliefs or backgrounds of European scientists; their biographers apparently believe that religion could not be of interest to a modern scientist in "secular" Europe. I have inferred Braun-Blanquet's religious background from his birth in the Protestant city of Chur and other details of his biography. His predecessors and co-workers in the so-called Zurich-Montpellier school of ecology include Carl Schröter, Charles Flahaut, and others, of whose religious backgrounds I have thus far found no hint in historical literature, although the former is probably Protestant and the latter almost certainly Catholic. The descriptive and taxonomic emphasis of their studies of plant communities has no strong correlation with any particular religious tradition, unlike the aspects of ecology I focus on in the text. Cf. Sutter 1981. On the influence of Schöter and Flahaut on British botany, see Sheail 1987, Part 1.

6. I have discovered no record of Clements's religious upbringing. However, records indicate that his grandfather and two uncles were devout Methodists (Clements 2001; *Portrait and biographical album* 1889, 1152–54). I have inferred from this the denominational identity of the church he left.

7. One might also note the Calvinistic, predestinarian implications of Darwinism. In the survival of the fittest, heredity determines fitness. The individual is powerless to affect the destiny of its fit, or unfit, genetic material. Nature (as opposed to God) elects some for survival and condemns others to eternal extinction—"natural election," so to speak.

8. The twentieth-century debates between holism and reductionism are summarized in McIntosh (1985, 252–56).

9. Since the late nineteenth century, Russian ecologists have been active, but I do not have the information that would allow comparisons about their motivations or philosophical or moral assumptions with those of Western Protestant ecologists.

10. But, Croker writes, "Forbes took issue with those . . . who . . . considered human beings 'outside the natural system,' who considered primitive nature as an 'earthly paradise,' and civilized humans 'a kind of fiend,' whose entry into the ancient world 'had introduced . . . the germs of that fatal and frightfully contagious disease known as civilization'" (Croker 2001, 124).

11. Although *A Sand County Almanac* appeared in 1948, Leopold first conceived "The Land Ethic" section during the depths of the Depression, when reaction against individualism and faith in the community was at its height, although his ideas did not take final shape until around 1947. See Stoll (1997, 183–88) and Worster (1994, 284–90).

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