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CONTEMPORARY MORAL ISSUES

Diversity and Consensus

LAWRENCE M. HINMAN

Contemporary Moral Issues

DIVERSITY AND CONSENSUS

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THE ARGUMENTS

Carolyn Merchant
"Environmental Ethics and Political Conflict: A View from California"

Carolyn Merchant is professor of environmental history, philosophy, and ethics at the University of California, Berkeley. She is the author of The Death of Nature: Women, Ecology, and the Scientific Revolution; Radical Ecology: The Search for a Livable World, *and, most recently,* Earthcare: Women and the Environment.

Merchant examines three approaches to environmental ethics and illustrates them with examples from California. An egocentric ethic *is grounded in the self and based on the assumption that what is good for the individual is good for society. A* homocentric ethic *is grounded in society and is based on the assumption that policies should reflect the greatest good for the greatest number of people and that, as stewards of the natural world, humans should conserve and protect nature for human benefit. An* ecocentric ethic *is grounded in the cosmos, or whole environment, and is based on the assignment of intrinsic value to nonhuman nature. This threefold taxonomy may be useful in identifying underlying ethical assumptions in cases where ethical dilemmas and conflicts of interest develop among entrepreneurs, government agencies, and environmentalists.*

As You Read, Consider This:

1. Note Merchant's objections to each of these approaches. Do you think that there are any advantages to egocentric or homocentric ethics that she neglects or underestimates? Do you think that there any any liabilities to ecocentric approaches that she doesn't appreciate?
2. Merchant discusses the ways in which different worldviews underlie different approaches to environmental ethics. As you read, note some of these connections. Also observe the connections between these ethics and religious traditions.

Introduction

In his *Nichomachean Ethics,* Aristotle noted that "all knowledge and every pursuit aims at some good."[1] But whether this is an individual, social, or environmental good lies at the basis of many real world ethical dilemmas. Here I offer a taxonomy of ethical approaches—egocentric, homocentric, and ecocentric—that often underlie the political positions of various interest groups engaged in struggles over land and natural resource uses. Conflicts of interest among private individuals and corporations, government agencies, and environmentalists often reflect these ethical approaches. Because they are the culmination of sets of associated political, religious, and ethical

Carolyn Merchant, "Environmental Ethics and Political Conflict: A View from California," *Environmental Ethics* 12, no. 1 (Spring 1990).

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trends developing in Western culture since the seventeenth century, they may be illustrated through examples from the history of environmental and natural resource problems in California

Egocentric Ethics

An egocentric ethic is grounded in the self. It is based on an individual ought focused on individual good. In its applied form, it involves the claim that what is good for the individual will benefit society. The individual good is thus prior to the social good which follows from it as a necessary consequence. An egocentric ethic's orientation does not derive from selfishness or narcissism, but rather is based on a philosophy that treats individuals (or private corporations) as separate, but equal social atoms. Historically, the egocentric ethic rose to dominance in Western culture during the seventeenth century. As the classic ethic of liberalism and laissez faire capitalism, in the United States it has been the guiding ethic of private entrepreneurs and corporations whose primary goal is the maximization of profit from the development of natural resources. Only the "silken bands of mild government," as Hector St. John de Crevecoeur put it in 1782, inhibit individual actions. Industry is "unfettered and unrestrained, because each person works for himself."[2]

Environmentally, an egocentric ethic permits individuals (or corporations) to extract and use natural resources to enhance their own lives and those of other members of society, limited only by the effects on their neighbors. Traditionally, the use of fire, common water sources, and rivers were regulated by laws. Under common law during the American colonial period, for example, one could not obstruct a river with a dam because it would interfere with its natural course and reduce the privileges of others living along it. By the late eighteenth century, however, individual privileges increasingly prevailed when profits were at stake. Entrepreneurs could erect dams on the grounds that "the public whose advantage is always to be regarded, would be deprived of the benefit which always attends competition and rivalry."[3]

Egocentric ethics often reflects the Protestant ethic. An individual is responsible for his or her own salvation through good actions. During the seventeenth century, American Christianity moved away from the doctrine of the early Puritans that only the elect would be saved toward the Arminian doctrine that any individual could assure his or her own salvation by leading an ethical life.[4] In the seventeenth century, the Protestant ethic dovetailed with the Judeo-Christian mandate of Genesis 1:28: "Be fruitful and multiply, and replenish the earth and subdue it." From an environmental perspective, as University of California historian Lynn White, Jr., argues, the Judeo-Christian ethic legitimated the domination of nature.[5] Early economic development in America was reinforced by this biblical framework. As the Arabella, bearing the first Puritan settlers of the Massachusetts Bay colony, left England for the New World in 1629, John Winthrop quoted the Genesis 1 passage.[6] In justifying American expansion into Oregon in 1846, John Quincy Adams asserted that the objectives of the U.S. were to "make the wilderness blossom as the rose; to establish laws, to increase, multiply, and subdue the earth, which we are commanded to do by the first behest of the God Almighty."[7] Likewise, Thomas Hart Benton that same year, in his famous address to the Twenty-ninth Congress, insisted that the white race had "alone received the divine command to subdue and replenish the earth: for it is the only race that . . . hunts out new and distant lands, and even a New World, to subdue and replenish. . . ."[8] Similar biblical passages reinforced God's command to transform nature from a wilderness into a civilization. Reverend Dr.

Dwinell's sermon, commemorating the joining of the Central Pacific and Union Pacific railroads in 1869, quoted the Bible as a sanction for human alteration of the natural landscape. "Prepare ye the way of the Lord, make straight in the desert a highway before our God. Every valley shall be exalted, and every mountain and hill shall be made low and the crooked shall be made straight and the rough places plain. . . ."[9]

Egocentric ethics as a basis for environmental policy is rooted in the philosophy of seventeenth-century political philosopher Thomas Hobbes. In turn, Hobbes' approach forms the foundation for the environmental ethic of University of California ecologist Garrett Hardin, whose "Tragedy of the Commons" influenced environmental policy in the 1970s.[10] For Hobbes, humans are basically competitive. In *Leviathan* Hobbes asserts that people are by nature unfriendly, hostile, and violent. In the state of nature, everyone has an equal right to everything, for "Nature has given all to all." But for Hobbes, nature is not a garden of Eden or a utopia in which everyone shares its fruits as earlier communal theories of society held. Instead, everyone is competing for the same natural resources. In *De Cive* he wrote, "For although any man might say of every thing, this is mine, yet he could not enjoy it, by reason of his neighbor, who having equal right and equal power, would pretend the same thing to be his."[11] Thus, because of competitive self-interest, the commons could not be shared, but must be fought over.

By Hobbes' time, the English commons were losing their traditional role as shared sources of life-giving grass, water, and wood to be used by all peasants as had been the case in feudal Europe. Instead they could be owned and enclosed by individual landlords who could use them to graze sheep for the expanding wool market. In fact, if lords did not compete, they could lose their lands and fortunes and be ridiculed by their peers. "For he that should be modest and tractable and perform all he promises," wrote Hobbes, " . . . should but make himself a prey to others and procure his own certain ruin."[12]

The commons was thus like a marketplace or a battleground in need of law and order. The solution to the disorder that prevailed in the state of nature was the social contract. By common consent, people gave up their freedom to fight and kill and out of fear accepted governance by a sovereign. Through the rational acceptance by each citizen of a set of rules for individual ethical conduct, social order, peace, and control could be maintained. The state was thus an artificial ordering of individual parts, a Leviathan, "to which we owe . . . our peace and defense."[13] Hobbes' egocentric ethic therefore was based on the assumption that human beings, as rational agents, could overcome their "natural" instincts to fight over property.

Hardin's "Tragedy of the Commons" and his "lifeboat ethics" are both grounded in this egocentric ethic. Like Hobbes, Hardin's (unstated) underlying assumptions are that people are naturally competitive, that capitalism is the "natural" form of economic life, and that the commons is like a marketplace. In his "Tragedy of the Commons," Hardin argues that individuals tended to graze more and more sheep on the commons because the economic gain was +1 for each sheep. On the other hand, the cost of overgrazing (environmental deterioration) was much less than −1 because the costs were shared equally by all. Thus there was no incentive to reduce herds. In the modern analogy, the seas and air are a global commons. Resource depletion and environmental pollution of the commons are shared by all; hence there is no incentive for individuals or nations to control their own exploitation. The costs of acid rain and chloroflourocarbons in the air, oil spills and plastics in the oceans, and the depletion of fish, whales, and seals are shared equally by all who fish, breathe, and live. The so-

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lution, for Hardin as for Hobbes, is mutual coercion, mutually agreed upon. People, corporations, and nation states voluntarily consent to rational regulation of resources.[14]

Similarly Hardin's "Living on a Lifeboat" is an egocentric ethic.[15] When an overloaded boat capsizes, there will be insufficient lifeboats to save all. Those individuals who are saved are those who are strong enough to help themselves. When a population outstrips its food resources, some individual nations will institute population control policies and some will not. These nations can at best be selectively helped through a policy of triage such as that developed for wartime injury victims.[16] Under triage, limited wartime medical resources are used first to help those with severe injuries who can survive only with aid and second to those with moderate injuries who would survive anyway. Those with massive fatal injuries who would die despite medical aid are not helped beyond pain reduction. Analogously, developed nations with food surpluses should help developing nations which voluntarily agree to control population growth. Those who cannot or will not agree to population control policies should not receive assistance. The lifeboat ethic is thus an egocentric ethic of individual choice based on human reason. Nations, like individual atoms, are rational decision makers who can decide whether or not to save themselves. Having arrived at that choice through reason, they either voluntarily submit to coercion, i.e., population control, in order to save their countries or accept catastrophe.

Egocentric ethics is rooted in the mechanistic science of the seventeenth century.[17] Mechanism is based on several underlying assumptions that are consistent with liberal social theory. First, mechanistic science is based on the assumption that matter is made up of individual parts. Atoms are the real components of nature, just as individual humans are the real components of society. Second, the whole is equal to the sum of the individual parts. The law of identity in logic, or $a = a$, is the basis for the mathematical description of nature. Likewise, society is the sum of individual rational agents, as in Hobbes' depiction of the body of the sword-carrying sovereign as made up of the sum of the individual humans who have submitted themselves to his rule. Third, mechanism involves the assumption that external causes act on inert parts. In accordance with Newton's first law of mechanics, a body remains at rest or in motion in a straight line unless acted on by an external force. Similarly, in society, rules and laws handed down by a sovereign or representative governing body are obeyed by a passive populace. Fourth, change occurs by the rearrangement of parts. In the billiard-ball universe of mechanistic scientists, the initial amount of motion (or energy) introduced into the universe by God at its creation is conserved and simply redistributed among the parts as they come together or separate to form the bodies of the phenomenal world. In much the same way, individuals in society associate and dissociate in corporate bodies or business ventures. Fifth, mechanistic science is often dualistic. Philosophers such as René Descartes and scientists such as Robert Boyle and Isaac Newton posited a world of spirit separate from that of matter. Nature, the human body, and animals could all be described, repaired, and controlled, as could the parts of a machine, by a separate human mind acting according to rational laws. Similarly, in the rhetoric of the founders of the American Constitution, democratic society is a balance of powers as in a pendulum clock, and government operates as do the well-oiled wheels and gears of a machine controlled by human reason. Mind is separate from and superior to body; human society and culture are separate from and superior to nonhuman nature. Just as mechanistic science gives primacy to the individual parts that make up a corporeal body, so egocentric ethics gives primacy to the individual humans that make up the social whole.

How has egocentric ethics been actuated with respect to the California environment? In *The Fisherman's Problem,* environmental historian Arthur McEvoy describes the management of the California fisheries in terms of the problem of the depletion of the commons. After the settlement of California by Euro-Americans in the eighteenth and nineteenth centuries, exploitation of river and ocean fish by individuals superseded the communal management of fishing by native American groups. Fish, like gold nuggets, were commodities to be extracted from the state of nature and turned into profits. As in the tragedy of the commons, "American authorities recognized . . . that pollution and overharvesting could degrade inland fisheries. But the problem was that those forces were so diffused over society, every individual contributing a negligible share, as to be legally uncontrollable." By the late nineteenth century, depletion of the rivers made it essential that fishing be regulated through laws and managed by government agencies—the "mutual coercion mutually agreed upon" of Hobbes and Hardin. The law as a form of rational human cognition regulated exploitation. Conflict of interest cases resulted in the curtailing of fishing by minority groups such as the Chinese. The newly created federal fishing agency and the state board of fish commissioners studied the problem scientifically and restocked the rivers with exotic fish.[18]

A more recent example of the environmental effects of the egocentric ethic in California is the Santa Barbara oil spill. Union Oil Company of California, part of a consortium that had leased the rights from the federal government to drill for oil in a tract off the Santa Barbara coast, experienced a blowout of one of its deep water wells on 28 January 1969. Union's development reflected an egocentric ethic of self-interest. A corporation founded in the Santa Barbara area having assets of $2.4 billion, its directors sought to maximize profits and to elevate it from the eleventh largest oil company in the United States to a place among the Big Ten. Its oil drilling, petrochemical, tanker, and manufacturing operations made it an industrial giant. The blowout caused a large oil slick which spread toward Santa Barbara invading the commons of water, air, and public beaches. Ecological effects included the damaging of barnacles, surf grass, California sea lions, and thousands of birds including grebes, loons, murres, cormorants, brown pelicans, and sea gulls, as well as introducing aromatic hydrocarbons into the food chain. Hardin's analysis applies to this "tragedy of the commons." First, the advantage to Union Oil in using the ocean commons to drill for oil was +1, while the environmental consequences to them of polluting the commons were much less than −1 because the costs were shared by other oil companies and the public. Second, the oil spill resulted in stricter controls and fines on environmental pollution, the development of a growing body of environmental law—Hardin's "mutual coercion, mutually agreed upon,"—and a "Declaration of Environmental Rights" that includes the statement, "We must extend ethics beyond social relations to govern man's contact with all life forms and with the environment itself."[19]

An egocentric ethic underlies the actions of private developers in current environmental disputes in which the goals of entrepreneurs dedicated to promoting their individual good conflict with those of government agencies charged with preserving the public good, and with those of environmentalists defending the good of nonhuman nature. For example, discharges of toxic chemicals by computer chip manufacturers in "Silicon Valley" on the San Francisco peninsula conflict with the regulatory mandates of water quality control agencies protecting ground water quality. Likewise, the efforts of Dow Chemical Corporation to locate a chemical processing plant in the Suisuin Marsh area of the San Francisco Bay conflict with the public interest ethics of air and water quality control boards and with the ethics of environmentalists who wish to preserve the marsh as habitat for the endangered salt marsh harvest mouse.

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From an environmental point of view, the egocentric ethic that legitimates laissez faire capitalism has a number of limitations. Because egocentric ethics is based on the assumption that the individual good is the highest good, the collective behavior of human groups or business corporations is not a legitimate subject of investigation. Second, because it includes the assumption that humans are "by nature" competitive and capitalism is the "natural" form of economics, ecological effects are external to human economics and cannot be adjudicated. In the nineteenth century, however, the first of these problems was dealt with through a new form of environmental ethics—the homocentric or utilitarian ethic. In the twentieth century, the problem of internalizing ecological externalities was addressed through the development of ecocentric ethics.

Homocentric Ethics

A homocentric (or anthropocentric) ethic is grounded in society. A homocentric ethic underlies the social interest model of politics and the approach of environmental regulatory agencies that protect human health. According to the utilitarian ethics of Jeremy Bentham and John Stuart Mill, for example, a society ought to act in such a way as to insure the greatest good for the greatest number of people. The social good should be maximized, social evil minimized. For both Bentham and Mill, the utilitarian ethic has its origins in human sentience. Feelings of pleasure are good; those of pain are evil and are to be avoided. Because people have the capacity for suffering, society has an obligation to reduce suffering through policies that maximize social justice for all.[20]

Utility, according to Bentham, "is that property in any object whereby it tends to produce benefit, advantage, good, or happiness . . . or to prevent the happening of mischief, pain, evil, or unhappiness." For Bentham, the interest of the community is the "sum of the interests" of the individuals that compose it and actions are good in conformity with their tendency to "augment the happiness of the community." While Bentham spoke of the community and the sum of the individual interests that make up this "ficticious body," Mill cast his arguments in terms of the "general interests of society," "the interest of the whole," and "the good of the whole."[21] Each individual, he assumed, is endowed with feelings that promote the general good. "Utilitarian morality recognizes in humans the power of sacrificing their own greatest good for the good of others." Each person should associate his or her happiness with "the good of the whole." People therefore have primary duties and obligations to other humans, not just to themselves.[22] "Actions," he said, "are right in proportion as they tend to promote happiness; wrong as they tend to produce the reverse of happiness."[23]

In developing an ultimate sanction for the principle of utility, Mill went beyond the simple prohibitions against killing and robbery in the Mosaic decalogue and the Hobbesian idea that it is "natural" for individuals freely to kill each other unless they give up that right and receive protection from a sovereign. "I feel I am bound not to rob or murder, betray or deceive; but why am I bound to promote the general happiness?" he asked. The answer lies in education. The more "education and general cultivation," the more powerful is the enforcement. Moral feelings overcome selfish motives and create deeply rooted feelings of unity with other humans. These feelings are not innate, but acquired. Mill claimed that a sequence of ethical standards develops as "civilization" advances and mankind is "further removed from a state of savage independence." The spirit of the utilitarian ethic is expressed in the Golden Rule. "'To do as you would be done by,' and 'To

love your neighbor as yourself,'" Mill wrote, "constitute the ideal perfection of utilitarian morality." This sequence from an individually based egocentric to a socially based utilitarian or homocentric ethic was further extended by Wisconsin ecologist Aldo Leopold in the 1930s in his formulation of a land ethic enhanced through education.[24]

In the United States, the conservation movement of the late nineteenth and early twentieth centuries was sanctioned by a homocentric ethic that extended utilitarianism to the natural environment. Gifford Pinchot's conservation ethic is based on the principle that natural resources should be used wisely to create "the greatest good for the greatest number [of people] for the longest time." Progressive era conservation policy centralized the management of forests, rivers, grazing lands, and minerals in government agencies. The ground for decision making in these agencies is that society should be benefited through extending the lives of renewable natural resources and conserving nonrenewable resources. Leopold contrasts Pinchot's formulation of the utilitarian ethic as a conservation ethic with an ecological ethic in his discussion of the A-B cleavage—the land as commodity production versus the land as biota.[25]

As in egocentric ethics, the homocentric *ought* reflects a religious formulation. Humans are stewards and caretakers of the natural world. Scholars such as ecologist René Dubos and philosophers John Passmore and Robin Attfield have pointed out that the Bible contains numerous passages that countervene the stark domination ethic of Genesis 1.[26] In Genesis 2, thought to be derived from a different historical tradition than Genesis 1, the animals are helpmeets for humans. God, according to Dubos, "placed man in the Garden of Eden not as a master but rather in a spirit of stewardship."[27] Like egocentric ethics, stewardship ethics were enunciated by seventeenth-century scientists and theologians concerned about the atheistic implications of mechanism as formulated by Hobbes. John Ray and William Derham developed a theology of stewardship consistent with Newtonian science, human progress, and the management of nature for human benefit. They quote such New Testament passages as Matthew 25:14: "That these things are the gifts of God, they are so many talents entrusted with us by the infinite Lord of the world, a stewardship, a trust reposed in us; for which we must give an account at the day when our Lord shall call." Additionally, in Luke 16:2, God said to the unfaithful steward, "Give an account of thy stewardship, for thou mayest no longer be steward." In stewardship ethics, God as the wise conservator and superintendent of the natural world made humans caretakers and stewards in his image. Stewardship ethics, however, is fundamentally a homocentric ethic. Humans must manage nature for the benefit of the human species, not for the intrinsic benefit of other species.[28]

Like egocentric ethics, homocentric ethics are consistent with the assumptions of mechanistic science, especially as extended by nineteenth-century scientists to include the fields of thermodynamics, hydrology, and electricity and magnetism. Scientific experts could use these laws for the efficient management of natural resources. Yet certain assumptions that characterize later ecocentric ethics are melded with the homocentric. Both nature (as in Darwinian evolution) and society are described in terms of organic metaphors. As Supreme Court Justice Oliver Wendell Holmes, Jr., put it in 1903, "In modern societies, every part is so organically related to every other part that what affects any portion must be felt more or less by all the rest."[29]

How have homocentric ethics been actuated in California? A particularly salient example is the building of dams for water and hydraulic power for cities and states. The controversy in the early twentieth century over whether to dam Hetch Hetchy Valley in Yosemite National Park as a source for water and power for the city of San Francisco is a case in point. Pinchot, arguing for San

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Francisco, pointed out that a water supply for the city was a greater good for a greater number of people than leaving the valley in the state of nature for a few hikers and nature lovers. John Muir, on the other hand, viewed the valley as one of God's cathedrals and the proponents of the dam as temple destroyers, an ethic based on the valley's intrinsic right to remain as created. Today water control agencies such as the San Francisco Water Department or the Metropolitan Water District of Los Angeles are quite explicit in their claim that they must consider the greatest good for the greatest number of people in distributing water to their customers in time of shortages.[30]

The controversy over the damming of the Stanislaus River in the 1970s is another example. Federal officials wanted to provide flood control and water delivery for farmers, whereas environmentalists asserted that the river had a right to continue in its own state of nature as a wild river. The New Melones dam was proposed as part of the Bureau of Reclamation's Central Valley Project in the 1930s to control flooding and to recharge ground-water sources, and in 1962 the plans were expanded to include hydropower, irrigation, and recreation. Congressman John McFall, who fought for authorization to build the dam, adopted a utilitarian stance, arguing that a "larger project will bring more benefits for my people." After lengthy planning, review, and litigation involving public agencies such as the federal Bureau of Reclamation, the Army Corps of Engineers, and the State Water Resources Control Board and environmental groups such as the Environmental Defense Fund, the Friends of the River, and the Sierra Club, the dam was finally authorized and built, with high waters reaching and covering the white waters of the Stanislaus in the spring of 1983.

In his protest over the dam in 1979, environmentalist Mark Dubois chained himself to a rock to prevent the river, endangered wildlife, and the rocks from losing their rights to remain free. "All the life of this canyon, its wealth of archaeological and historical roots to our past, and its unique geological grandeur are enough reasons to protect this canyon just for itself," he wrote to the Army Corps of Engineers. "But in addition, all the spiritual values with which this canyon has filled tens of thousands of folks should prohibit us from committing the unconscionable act of wiping this place off the face of the earth." The controversy may be viewed as a conflict among interest groups with different underlying ethics. Here farmers and corporate agribusiness ventures, whose egocentric ethics promoted the individual's good, along with federal water control agencies, whose homocentric ethics saw water development as the greatest good for the greatest number, conflicted with the ecocentric ethics of those environmentalists who supported the river's intrinsic right to remain wild.[31]

This conflict points up one of the main problems of both egocentric and homocentric ethics—their failure to internalize ecological externalities. Ecological changes and their long-term effects are outside the human/society framework of these ethics. The effects of ecological changes such as salinity buildup in farming soils that use the dam's water or the loss of indigenous species when a valley is flooded are not part of the human-centered calculus of decision making. One approach offered by ethicists is to extend homocentric ethics to include other sentient species. Animal liberationists Peter Singer and Tom Regan, for example, extend the pleasure-pain principle of Bentham and Mill to animals, arguing that conditions for the well-being of animals should be maximized while conditions that lead to pain, such as overcrowded conditions, liquid diets, and cruel experimentation, should be minimized.[32] A similar extension of stewardship ethics to include nonhuman species and future human beings is made by Robin Attfield.[33] The alternative rejected by Attfield and the animal liberationists is to formulate a radically different form of environmental ethics—ecocentric ethics.

Ecocentric Ethics

An ecocentric ethic is grounded in the cosmos. The whole environment, including inanimate elements, rocks, and minerals along with animate plants and animals, is assigned intrinsic value. The eco-scientific form of this ethic draws its ought from the science of ecology. Recognizing that science can no longer be considered value free, as the logical positivists of the early twentieth century had insisted, proponents of ecocentric ethics look to ecology for guidelines on how to resolve ethical dilemmas. Maintenance of the balance of nature and retention of the unity, stability, diversity, and harmony of the ecosystem are its overarching goals. Of primary importance is the survival of all living and nonliving things as components of healthy ecosystems. All things in the cosmos as well as humans have moral considerability

Modern ecocentric ethics were first formulated by Leopold during the 1930s and 1940s and published as "The Land Ethic," the final chapter of his posthumous *A Sand County Almanac.* Some of Leopold's inspiration for the land ethic seems to have derived from Mill's *Utilitarianism.* Like Mill, who wrote about the "influences of advancing civilization," the "removal from the state of savage independence," and the utilitarian Golden Rule as superseding the basic prohibitions against robbing and murdering, Leopold thought ethics developed in sequence: "The first ethics," he wrote, "dealt with the relation between individuals; the Mosaic Decalogue is an example. Later accretions dealt with the relation between the individual and society. The Golden Rule tries to integrate the individual to society." The land ethic, he argued, extends the sequence a step further. It enlarges the bounds of the community to include "soils, waters, plants, and animals, or collectively, the land." It "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 itself."[34] In putting the land ethic into practice, Leopold urged that each question be judged according to what is both ethically and aesthetically right. Perhaps influenced by Mill's phraseology that "actions are right in proportion as they tend to promote happiness; wrong as they tend to produce the reverse of happiness," Leopold wrote: "A thing is right when it tends to preserve the integrity, beauty, and stability of the biotic community. It is wrong when it tends otherwise." Like Mill who argued for the importance of education in creating obligations toward other people, Leopold argued that in order to overcome economic self-interest, ethical obligations toward the land must be taught through conservation education.[35]

J. Baird Callicott has pointed out that Leopold's conception of community is derived from the community ecology of Frederic Clements and Charles Elton.[36] Clements conceptualized plant succession as the process through which a plant community changes from a young to a mature organism, just as a child grows into a mature adult. Elton included animals as well as plants in his community model of ecology. In an unpublished manuscript, written in the 1920s, Leopold discusses the concept espoused by the Russian philosopher Ouspensky that land is a living organism whose parts—soil, mountains, rivers, atmosphere, etc.—are like the organs of a coordinated whole. This whole has all the characteristics of a living thing, but because of its enormous size and the slowness of its life processes, people do not recognize it as such. "We cannot destroy the earth with moral impunity," Leopold admonished, " . . . the 'dead' earth is an organism possessing a certain kind and degree of life, which we intuitively respect as such."[37] In 1935, Arthur Tansley replaced Clements' and Elton's anthropomorphic language of the collective organism with the term *ecosystem.* By the time that Leopold completed *A Sand County Almanac,* his earlier earth ethic had be-

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come a land ethic and he had replaced the term *biology* with *ecology*. The organismic metaphor lingered, however, in what he called the A-B cleavage—his distinction between the utilitarian view of land as "slave and servant" versus the ecological concept of land as "collective organism."[38]

At the University of California, Santa Barbara, environmental historian Roderick Nash has elaborated Leopold's land ethic in an article "Do Rocks Have Rights?" Rocks are part of the pyramid of animate and inanimate things governed by the laws of ecology. Even though rocks are not sentient like animals, rocks as well as plants can be assigned interests that can be represented and adjudicated. Yet such a concept might still be used to protect rocks in the interest of humans. Pushing it further, Nash argues, we can "suppose that rocks, just like people, do have rights in and of themselves. It follows that it is the rock's interest, not the human interested in the rock, that is being protected." Other cultures such as Native Americans, Zen Buddhists, and Shintos, he points out, assume that rocks are alive—a mystical religious belief not usually held by Western philosophers and scientists.[39]

Ecocentric ethics are rooted in a holistic, rather than a mechanistic, metaphysics.[40] There are five basic assumptions implicit in this holistic perspective. (1) *Everything is connected to everything else.* The whole qualifies each part, conversely, a change in one of the parts changes the other parts and the whole. Ecologically, this has been illustrated by the idea that no part of an ecosystem can be removed without altering the dynamics of the cycle. If too many changes occur, an ecosystem collapses. Alternatively, to remove the parts from the environment for study in the laboratory may result in a distorted understanding of the ecological system as a whole.[41]

(2) *The whole is greater than the sum of the parts.* Unlike the concept of identity, in which the whole equals the sum of the parts, ecological systems experience synergy: the combined action of separate parts produce an effect greater than the sum of the individual effects. This can be exemplified by the dumping of organic sewage and industrial pollutants into lakes and rivers. The bacterial increases may cause those drinking or swimming in the water to become ill. But if the bottom of the lake is covered with metallic mercury, the overall hazard is more than doubled because the bacteria may also transform the metallic mercury into toxic methyl mercury which becomes concentrated in the food chain.[42]

(3) *Meaning is context dependent.* As opposed to the context independence assumption of mechanism, in holism each part at any instant takes its meaning from the whole. For example, in a hologram, produced by directing laser light through a half-silvered mirror, each part of the three-dimensional image contains information about the whole object. There are many-to-one and one-to-many relationships, rather than the point-to-point correspondences between object and image found in classical optics. Similarly, in perception, objects are integrated patterns. The whole is perceived first with an awareness of hidden aspects, background, and recognition of patterns, as when one views a tree or a house.[43]

(4) *Process has primacy over parts.* As opposed to the closed isolated equilibrium and near equilibrium systems studied in classical physics (such as the steam engine), biological and social systems are open. These are steady-state systems in which matter and energy are constantly being exchanged with the surroundings. Living things are dissipative structures, resulting from a continual flow of energy, just as a vortex in a stream is a structure arising from the continually changing water molecules swirling through it. Ilya Prigogene describes an open, far-from-equilibrium thermodynamics in which new order and organization can arise spontaneously. Nonlinear relationships occur in which small inputs can spontaneously produce large effects.[44] Continual change and

process are not only significant in ecology, but also are fundamental to the new physics. Physicist David Bohm in his book *Wholeness and the Implicate Order* describes process as originating from an undivided multidimensional wholeness called a holomovement. Within the holomovement is an implicate order that unfolds to become the explicate order of stable, recurring elements observed in the everyday world. The holomovement is life-implicit, the ground of both inanimate matter and of life.[45]

(5) *Humans and nonhuman nature are one.* In holism there is no nature/culture dualism: humans and nature are part of the same organic cosmological system. While theoretical ecologists often focus their research on natural areas removed from human impact, human (or political) ecologists study the mutual interactions between society and nonhuman nature.

In California, the philosophical change from the dominant mechanistic worldview to an ecological worldview, or *deep ecology* (a term coined by Norwegian philosopher Arne Naess), is a subject investigated by sociologist Bill Devall of Humboldt State University in Arcata and philosopher George Sessions of Sierra College. Devall and Sessions put forward eight basic principles of deep ecology including the idea that "the well-being and flourishing of human and nonhuman Life on Earth have value in themselves (synonyms: intrinsic value, inherent value). These values are independent of the usefulness of the nonhuman world for human purposes." They argue that policies should be implemented that maintain the richness and diversity of life, while also allowing for the fulfillment of basic human needs.[46]

The shift from a mechanistic, atomistic paradigm to an ecological, holistic paradigm is the focus of investigations by the Elmwood Institute in Berkeley, founded by physicist Fritjof Capra. The institute engages in a continent-wide education program and reaches out to the international community in its efforts to connect the ecological paradigm with a new ecological ethic. A second organization devoted to the promotion of a new world view is the Center for the Study of the Postmodern World in Santa Barbara, directed by founder David Griffin. Together with the Center for Process Studies, affiliated with the School of Theology at Claremont, the Center for the Study of a Postmodern World sponsors lecture series, conferences, and a book series on constructive postmodern thought. A third organization devoted to the emergence of a new consciousness that broadens the boundaries of science is the Institute of Noetic Sciences in Sausalito, directed by Willis Harman, an engineer and University of California regent.[47]

Just as mechanism dovetailed with certain political assumptions, so holism has been seen to imply particular kinds of politics. Holism found favor among philosophers and ecologists during the 1920s. In the 1930s, however, its emphasis on the whole over and above the parts was viewed as being consistent with fascism. This contributed to the replacement of holistic and organismic assumptions in biology by mechanistic modes of description. In the 1960s and 1970s holistic ideas returned with the blossoming of small-scale back-to-the-land communes and households in which decision making was vested in the consensus of the whole group. Drawing on holistic assumptions, the bioregional movement in California emphasizes living within the resources of the local watershed and developing them to sustain the human and nonhuman community as an ecological whole. Recently the emergence of green politics has given rise to a California political movement dedicated to the establishment of an ecologically viable society. [48]

Three examples illustrate the application of the ecocentric ethic in California: (1) restoration ecology, (2) the biological control of insect pests, and (3) sustainable agriculture. Restoration is the process of restoring human-disturbed ecosystems to earlier pristine forms. Leopold initiated the

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An example of restoration in California is the replanting of the redwoods in Big Basin Redwoods State Park in the Santa Cruz mountains. The land where the park is today was set aside in 1902 after it had been scarred by heavy use, soil compaction, and erosion caused by lumber operations. As the old trees died new ones did not regenerate. In 1968, the Santa Cruz Lumber Company, which had held off cutting a stand of old-growth redwoods in what is now the park's interior core, went out of business and threatened to cut the timber if the state did not immediately exercise its option to purchase the land. Successful efforts to purchase and protect the threatened areas were followed by restoration. Guided by an implicit ecocentric ethic of management, restorers planted young trees, ferns, huckleberries, and ground cover, enriched the soil with redwood chips and removed old parking lots and remnants of lumber operations. Restoring the native plant species helped to establish the ecological conditions under which insect, mammal, and bird communities could also regenerate themselves. A new whole was created, helping to recreate the major elements of the presettlement ecosystem.[50]

Biological control is a second example of an ecocentric ethic of management. Using ecological guidelines, natural insect enemies are introduced into the ecosystem to control population levels of pests. The technique was pioneered by the Divisions of Biological Control of the University of California at Berkeley and at Riverside. One of the first successful uses of biological control in California occurred in 1888. The cottony-cushion scale introduced from Australia was destroying citrus groves in southern California. Acting on the inspiration of entomologist C. V. Riley, Albert Koebele traveled to Australia and brought back the vedalia, a lady beetle that fed on the scale. One thousand beetles soon cleared acres of orange groves, saving the industry. This ecological strategy was vindicated in the 1940s when DDT killed so many of the vedalia that a resurgence of the scale occurred.[51]

The assumptions that underlie biological control and its related strategy, integrated pest management (IPM), are ecologically grounded. According to Carl Huffaker of the University of California at Berkeley, the basis of IPM is that "biological control, together with plant resistance, forms nature's principal means of keeping phytophagous insects within bounds in environments otherwise favorable to them. They are the core around which pest control in crops and forests should be built."[52] Likewise, Ray Smith, also of the University of California at Berkeley, has noted that ecology provides the model for insect control strategies: "We cannot afford any longer to disregard the considerable capabilities of pest organisms for countering control efforts. . . . It is for this prudent reason that we must understand Nature's methods of regulating populations and maximize their application."[53] Biological control and IPM assume that humans are only one part of an

interrelated ecological complex and that insects and humans must coexist. This management strategy is based on the recognition that insect populations will not be totally obliterated, but their numbers can be controlled so that humans may harvest crops. Reservoirs of insect pests, however, will continue to exist. This ecological interdependence implies that all organic and inorganic parts of the ecosystem have intrinsic value. Biological control is based therefore on an ecocentric rather than an egocentric or homocentric ethic.

According to environmental historian John Perkins, the ecocentric assumptions underlying biological control and IPM contrast with the human-centered stewardship ethics of the chemical-control paradigm that relies on broad spectrum chemicals to manage insects. This latter paradigm assumes that humans are above nature and can legitimately use chemicals to obliterate populations of insects for human benefit. Humans are "stewards of the natural world and both [can] and should do what [is] needed to protect their interests."[54] Chemical control is thus based on a homocentric or utilitarian ethic in which humans are the most important parts of the complex social and natural world and their high status legitimates their manipulation of the world for the good of human society.

A third example of an ecocentric ethic is sustainable agriculture, an ecologically based form of farm management. This strategy has been developed as an alternative to the industrial approach to agriculture based on optimizing purchased inputs to produce outputs at the least cost. The "evolution from labor intensive to energy and capital intensive farming," writes Miguel Altieri of the University of California at Berkeley, "was not influenced by rational decisions based on ecological considerations, but mainly by the low cost of energy inputs." In contrast to this egocentric approach, aimed primarily at maximizing a farmer's profits, the ecological approach is based on principles that conserve the renewable resource base and reduce the need for external technological inputs. According to Gordon Douglass of Pomona College in southern California, its principles include "1) the optimization of farm output over a much longer time period than is usual in industrial farming activities; 2) the promotion and maintenance of diversified agroecosystems whose living components perform complementary functions; 3) the building up of soil fertility with organic matter and the protection of nutrients from leaching; 4) the promotion of continuous cover and the extensive use of legume-based rotations, cover crops, and green manures; and 5) the limiting of imported fertilizer applications and pesticide uses."[55]

Sustainable agriculture can be further extended to integrate the human community with the agroecosystem. "This holistic approach to farming communities," Douglass points out, "draws attention to interactions not only within Landl among farming families and other human member[s] of rural communities, but also between nonhuman components such as crops with crops, crops with animals, soil conditions and fertility with insects, and disease in crops and livestock." Sustainable agriculture is thus based on an ecocentric ethic of management in which the land is considered as a whole, its human components being only one element. Policy decisions must be based on considerations of what is best for the soil, vegetation, and animals (including humans) on the farm as well as outside sources of water, air, and energy. As a result, humans and the land are sustained together.[56]

Like egocentric and homocentric ethics, ecocentric ethics have a religious formulation. Whereas the eco-scientific form of the ethic is rooted in the science of ecology, the eco-religious form is based on the faith that all living and nonliving things have value. In California, one such

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formulation is the process theology developed by John Cobb, Jr., David Ray Griffin, and others of the Center for Process Studies at Claremont Graduate School in southern California. Process theology owes its origins to British philosopher Alfred North Whitehead who taught at Harvard University and to philosopher Charles Hartshorne, a teacher of Cobb at the University of Chicago. According to Cobb and Griffin, process philosophy asserts that "process is fundamental. It does not assert that everything is in process . . . but to be *actual is* to be a process." It substitutes a theory of internal relations, according to which entities are qualitatively changed in interactions, for the nineteenth-century billiard ball model of unilinear causation in which entities are independent and left unchanged, affecting each other only through external relations. According to its theology of nature, God created the world out of chaos (rather than *ex nihilo*) and each stage in the evolutionary process represents an increase in divine goodness. Each *individual* thing, whether a living organism or an atom, has intrinsic value and there is a continuity between human and nonhuman experience. One's attitude toward a dog, which is a compound individual, differs from that toward a plant, which is also a compound individual, but has no center of enjoyment, and toward a rock, which, as a mere aggregate, has no intrinsic value. All three, however, have instrumental value in supporting each other in the ecosystem.[57]

Process thought is consistent with an ecological attitude in two senses: (1) its proponents recognize the "interconnections among things, specifically between organisms and their total environments," and (2) it implies "respect or even reverence for, and perhaps a feeling of kinship with, the other creatures." Cobb and Griffin argue that process philosophy implies an ecological ethic and a policy of social justice and ecological sustainability. "The whole of nature participates in us and we in it. We are diminished not only by the misery of the Indian peasant but also by the slaughter of whales and porpoises, and even by the 'harvesting' of the giant redwoods. We are diminished still more when the imposition of temperate-zone technology onto tropical agriculture turns grasslands into desert that will support neither human nor animal life."[58]

Cobb's student Jay McDaniel argues that intrinsic value includes the entire physical world. Atoms as individual things have intrinsic value. Rocks express the energy inherent within their atoms. They too have intensity and intrinsic value, albeit less than that of living organisms. Outer form is an expression of inner energy. The assumption that rocks have intrinsic value, however, does not mean that rocks and sentient beings would necessarily have equal ethical value, but rather that they would all be treated with reverence. This could result in a new attitude by Christians toward the natural world, one that involves both objectivity and empathy.[59]

Susan Armstrong-Buck of Humboldt State University in Arcata also sees Whitehead's philosophy as providing an adequate foundation for an environmental ethic. She argues that the assignment of intrinsic value to nonhuman nature is an integral component of Whitehead's metaphysics. Process is the continuity of occasions or events that are internally related—each present occasion is an integration of all past occasions. Occasions, Whitehead wrote, are "drops of experience complex, and interdependent." The world is itself a process of fluent energy; actual entities are self-organizing wholes. Differences exist in the actual occasions that constitute each entity. Intrinsic value, according to Armstrong-Buck, is based not on an extension of self-interest to the rest of nature, but on the significance to the entity itself of each occasion and its entire interdependent past history. The basis for assigning preferences to biosystems will be based on the degree of diversity, stability freedom of adaptation, and integration of actual occasions inherent in each system.[60]

Despite the efforts of Leopold and others, ecocentric ethics, like egocentric and homocentric ethics, has a number of philosophical difficulties. Finding a philosophically adequate justification for the intrinsic value of nonhuman beings has been called by some environmental philosophers the central axiological problem of environmental ethics. In mainstream Western culture, only human beings have traditionally had inherent worth, while the rest of nature has been assigned instrumental value as a resource for humans. Thus within an egocentric or homocentric ethic, it is not *morally* wrong to kill or use the last of a species of animal, plant, or mineral when human survival is at stake. Within an ecological ethic, however, such a decision could depend on finding an adequate justification for the intrinsic value of the nonhuman species, as well as on the particular circumstances. At bottom, ecocentric ethics may have a homocentric justification.[61]

A second problem stems from the distinction between facts and values. The separation of observable facts from humanly assigned values, or is from *ought*, has been a mainstay of Western science since the work of David Hume in the eighteenth century. Can a property such as the goodness or richness of animals, rocks, or the biosphere be inferred through the senses as an objective, intrinsic characteristic of the entities in question? Can there properly be such a thing as an ecological ethic, when ecology is an objective science and ethics is a subjective value system? Environmental philosophers have proposed a number of answers to the question, but they remain "wicked" problems for them, i.e., ones that demand transdisciplinary analysis. One approach is to question the possibility that facts can be separated from values in science and philosophy. Another is to recognize that descriptions of what is can include intrinsic value, while questions of what one ought to do belong to a different category.[62]

A third difficulty with Leopold and Nash's formulation of ecocentric ethics lies in the validity of their supposition that ethics develops sequentially. The advancement of civilization does not necessarily imply the evolution of more sophisticated ethics. The assumption that the earliest ethics dealt with the relations between individuals imposes the assumptions of Hobbes' hypothetical "state of nature" and the individualism of laissez faire capitalism onto the earliest peoples. Critics argue that in fact the sequence may be exactly reversed. American Indian and other indigenous cultures seem to have developed an ecocentric ethic that treats animals, plants, and rocks as if they were animate, sensitive persons. Conversely, the narcissism of twentieth-century Americans is a reflection of an extreme form of individualism focusing primarily on the self.[63]

Despite these underlying difficulties, egocentric, homocentric, and ecocentric environmental ethics have all received attention and have been further developed since the environmental movement of the 1970s and 1980s. When conflicts of interest over environmental and quality of life issues are at stake, the above taxonomy may be useful in analyzing the implicit ethical positions assumed by interested parties. Such an understanding could in turn lead to the improved environmental policies that are needed if both people and nonhuman nature are successfully to thrive together in the next century.

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21. Bentham, *Principles of Morals and Legislation,* pp. 2–3. "An action . . . may be said to be conformable to the principle of utility, or for shortness sake, to utility (meaning with respect to the community at large), when the tendency it has to augment the happiness of the community is greater than any it has to diminish it" (p. 3). See also Mill, *Utilitarianism,* pp. 22–23.
22. Mill, *Utilitarianism,* p. 22. See also the following statements by Mill on the primacy of the good of the whole over that of the individual: "The happiness which forms the utilitarian standard of what is right in conduct is not the agent's own happiness but that of all concerned. As between his own happiness and that of others, utilitarianism requires him to be as strictly impartial as a disinterested and benevolent spectator" (p. 22). "Utility would enjoin first, that laws and social arrangements would place the happiness or the interest of every individual as nearly as possible in harmony with the interest of the whole" (p. 22). " . . . a direct impulse to promote the general good may be in every individual one of the habitual motives of action, and the sentiments connected therewith may fill a large and prominent place in every human being's sentient existence" (p. 23).
23. Ibid., p. 10.
24. Ibid., pp. 34, 36, 40, 22. Compare Aldo Leopold, *A Sand County Almanac* (London: Oxford University Press, 1949). *DD.,* pp. 202–203.
25. Gifford Pinchot, *Breaking New Ground* (New York: Harcourt Brace Jovanovich, 1947), p. 505: "Conservation is the foresighted utilization, preservation, and/or renewal of forests, waters, lands, and minerals, for the greatest good of the greatest number for the longest time." For a discussion of Pinchot's policies, see Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (New York: Atheneum, 1975). Leopold, *A Sand County Almanac,* pp. 221–223.
26. René Dubos, "Conservation, Stewardship, and the Human Heart," *Audubon Magazine,* September 1972, pp.

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29. Oliver Wendell H
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30. Roderick Nash, "
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Francisco Chron.
31. Tim Palmer, *Star*
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33. Attfield, *Ethics o*
34. Mill, *Utilitariani*
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35. Mill, *Utilitarian*
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36. J. Baird Callicot
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37. Aldo Leopold, '
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38. Leopold, *A San*
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39. Roderick Nash,
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40. On holism see J.
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tember 1972, pp. 21–28; John Passmore, *Man's Responsibility for Nature* (New York: Scribner's, 1974), chap. 2, "Stewardship and Cooperation with Nature"; Robin Attfield, *The Ethics of Environmental Concern* (New York: Columbia University Press, 1983).

27. Dubos, "Conservation," p. 27.
28. Merchant, *Death of Nature,* pp. 246–252.
29. Oliver Wendell Holmes in *Diamond Glue Co.* v. *United States Glue Co.,* 1903, quoted in McEvoy, "Toward an Interactive Theory," p. 294.
30. Roderick Nash, "Hetch Hetchy," in *Wilderness and the American Mind* (New Haven: Yale University Press, 1977), chap. 10, pp. 161–181; Carolyn Merchant, "Women of the Progressive Conservation Movement, 1900–1916," *Environmental Review* 8 (1984), 76–80. On current water issues, see Carl Nolte, "Bay Area May Buy Water from Southern California," *San Francisco Chronicle,* 24 February 1989, p. A1.
31. Tim Palmer, *Stanislaus: The Struggle for a River* (Berkeley: University of California Press, 1982), pp. 53, 163; Palmer, *Endangered Rivers and the Conservation Movement* (Berkeley: University of California Press, 1986), pp. 125–128.
32. Peter Singer, *Animal Liberation: A New Ethics for Our Treatment of Animals* (New York: Avon Books, 1975); Tom Regan, *All That Dwell Therein—Essays on Animals Rights and Environmental Issues* (Berkeley: University of California Press, 1982). In *Utilitarianism,* Mill wrote, "The standard of morality . . . may accordingly be defined [as] 'the rules and precepts for human conduct' by the observance of which an existence such as has been described might be, to the greatest extent possible, secured to all mankind; and not to them only, but, so far as the nature of things admits, to the whole sentient creation" (p 16).
33. Attfield, *Ethics of Environmental Concern.*
34. Mill, *Utilitarianism,* pp. 40, 34, 22; see discussion above. Leopold, *A Sand County Almanac,* pp. 224–225.
35. Mill, *Utilitarianism,* p. 10; on education, see p. 35. Leopold, *A Sand County Almanac,* pp. 224–225; on education, see pp. 207–214.
36. J. Baird Callicott, ed., *Companion to A Sand County Almanac: Interpretative and Critical Essays* (Madison: University of Wisconsin Press, 1987), pp. 198ff.
37. Aldo Leopold, "Some Fundamentals of Conservation in the Southwest," *Environmental Ethics* I (1979), 131–141. For a discussion see Susan Flader, "Leopold's 'Some Fundamentals of Conservation': A Commentary," *Environmental Ethics* I (1979), 143–148 and Callicott, *Companion,* pp. 201–202.
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39. Roderick Nash, "Do Rocks Have Rights?" *The Center Magazine,* November/December 1977, p. 10.
40. On holism see J. C. Smuts, *Holism and Evolution* (New York: Macmillan, 1926). For a critique of holistic thinking, see D. C. Phillips, *Holistic Thought in Social Science* (Stanford: Stanford University Press, 1976).
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1972), pp. 29–35, 188. For a critique of Commoner's holism, see Don Howard, "Commoner on Reductionism," *Environmental Ethics* 1 (1979), 159–176.

42. Commoner, *Closing Circle,* pp. 221–223.
43. John P. Briggs and F. David Peat, *Looking Glass Universe: The Emergence of Wholeness* (New York: Simon & Schuster, 1984), pp. 249–252.
44. Ilya Pngogine and Isabelle Stengers, *Order out of Chaos: Man's New Dialogue with Nature* (New York: Bantam, 1984).
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47. Fritjof Capra, *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism* (Berkeley: Shambhala, 1975); idem., *The Turning Point: Science, Society and the Rising Culture* (New York: Simon & Schuster, 1982). David Griffin, ed., *The Reenchantment of Science: Postmodern Proposals* (Albany: State University of New York Press, 1988); idem., *Spirituality and Society: Postmodern Visions* (Albany: State University of New York Press, 1988); Willis Harman, *An Incomplete Guide to the Future* (New York: Norton, 1979). Other California authors whose books have addressed the shift to an ecological paradigm include John B. Cobb, Jr. (see n. 57); Theodore Roszak, *Where the Wasteland Ends: Politics and Transcendence in Postindustrial Society* (Garden City, NY: Doubleday, 1972); Ernest Callenbach, *Ecotopia* (Berkeley: Banyan Tree Books, 1977); Joseph W. Meeker, *Minding the Earth: Thinly Disguised Essays on Human Ecology* (Alameda, CA: Latham Foundation, 1988); Gary Snyder, *Turtle Island* (New York: New Directions, 1974); Gregory Bateson, *Steps to an Ecology of Mind* (New York: Chandler, 1972); Bateson, *Mind and Nature: A Necessary Unity* (New York: E. P. Dutton, 1979).
48. Donald Worster, *Nature's Economy: The Roots of Ecology* (San Francisco: Sierra Club Books, 1977), pp. 329–330, 339–348. Peter Berg, *Figures of Regulation: Guides for Re-Balancing Society with the Biosphere* (San Francisco: Planet Drum Foundation, n.d.); idem., ed., *Reinhabiting a Separate Country: A Bioregional Anthology of Northern California* (San Francisco: Planet Drum Foundation, 1978); Raymond Dasmann and Peter Berg, "Reinhabiting California," *The Ecologist* 7 (1980), 399–401; Raymond Dasmann, "Future Primitive: Ecosystem People versus Biosphere People," *Coevolution Quarterly* (Fall 1976), 26–31; idem., "Biogeographical Provinces," *Coevolution Quarterly* (Fall 1976), 32–37; Fritjof Capra and Charlene Spretnak, *Green Politics: The Global Promise* (New York: E. P. Dutton, 1984).
49. On the philosophy of restoration, see William R. Jordan, "Thoughts on Looking Back," *Restoration and Management Notes* 1, no. 3 (Winter 1983), 2; William R. Jordan "On Ecosystem Doctoring," *Restoration and Management Notes* 1, no. 4 (Fall 1983), 2; Carolyn Merchant "Restoration and Reunion with Nature," *Restoration and Management Notes* 4, no. 2 (Winter 1986), 68–70. On Leopold and restoration, see "Looking Back: A Pioneering Restoration Project Turns Fifty," *Restoration and Management Notes* 1, no. 3 (Winter 1983), 4–10. On the techniques of restoration, see John Cairns, Jr., "Restoration, Reclamation, and

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50. John J. Berger,
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51. Richard L. Doutt
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52. F. Wilson and C
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54. Perkins, *Insects,*
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57. John B. Cobb, J

Regeneration of Degraded or Destroyed Ecosystems," in Michael Soulé, ed., *Conservation Biology: The Science of Scarcity and Diversity* (Sunderland, MA: Sinauer, 1986), pp. 465–484. Restoration is not only used to reestablish natural areas such as parks and nature reserves, but also as mitigation in development. Thus, an airport may expand by filling in a marsh to construct an airstrip. As mitigation for the construction, the developer must artistically reconstruct another marsh in the vicinity. Here the ethical goals and guidelines are more consistent with homocentrism than ecocentrism.

50. John J. Berger, *Restoring the Earth* (New York: Knopf, 1985), pp. 69–78; see also pp. 155–171 on the restoration of falcons in California. For other examples of restoration projects see articles in *Restoration and Management Notes.*

51. Richard L. Doutt, "Vice, Virtue, and the Vedalia," *Bulletin of the Entomological Society of America* 4 (1958), 119–123; K. S. Hagen and J. M. Franz, "A History of Biological Control," *History of Entomology* (Palo Alto, CA: Annual Reviews, 1973), pp. 433–476, see pp. 433–435, 441–444; Richard L. Doutt, "A Tribute to Parasite Hunters," in Cynthia Westcott, ed., *Handbook on Biological Control of Insect Pests* (New York: Brooklyn Botanic Garden Record, Plants and Gardens, 1960), p. 51; Paul Debach, *Biological Control by Natural Enemies* (London: Cambridge University Press, 1974), pp. 92–100.

52. F. Wilson and C. B. Huffaker, "The Philosophy, Scope and Importance of Biological Control," in C. B. Huffaker and P. S. Messenger, eds., *Theory and Practice of Biological Control* (New York: Academic Press, 1976), p. 4.

53. R. F. Smith, J. L. Apple, and D. G. Bottrell, "The Origin of Integrated Pest Management Concepts for Agricultural Crops," in J. L. Apple and R. F. Smith, eds., *Integrated Pest Management* (New York: Plenum Press, 1976), p. 12.

54. Perkins, *Insects, Experts, and the Insecticide Crisis: The Quest for New Pest Management Strategies* (New York: Plenum Press, 1982), p. 184. For a critique of chemical controls by an advocate of biological control, see Robert van den Bosh, *The Pesticide Conspiracy* (New York: Doubleday Anchor, 1980).

55. Miguel Altieri, "Ecological Diversity and the Sustainability of California Agriculture," in *Sustainability of California Agriculture: A Symposium* (Davis: University of California Sustainability of California Agriculture Research and Education Program, 1985), p. 106; Gordon K. Douglass, "Sustainability of What? For Whom?" in *Sustainability of California Agriculture: A Symposium* (Davis: University of California Sustainability of California Agriculture Research and Education Program, 1985), p. 38. See the remainder of these proceedings for additional examples of sustainable agriculture in California; also Miguel Altieri, James Davis, and Kate Burroughs, "Some Agroecological and Socioeconomic Features of Organic Farming in California: A Preliminary Study," *Biological Agriculture and Horticulture* I (1983), 97–107. Sustainable agriculture could also be conceptualized as a homocentric ethic of stewardship oriented primarily to the good of human communities. See George E. Brown, Jr., "Stewardship in Agriculture," in Gordon K. Douglass, ed., *Agricultural Sustainability in a Changing World Order* (Boulder, CO: Westview Press, 1984), pp. 147–158.

56. Douglass, "Sustainability of What?" p. 40.

57. John B. Cobb, Jr., and David Ray Griffin, *Process Theology* (Philadelphia: Westminister

Press 1976), p. 14; see also 23, 65–67, 76, 79, 152–153; John B. Cobb, Jr., "Process Theology and an Ecological Model," in Philip N. Joranson and Ken Butigan, eds., *Cry of the Environment: Rebuilding the Christian Creation Tradition* (Santa Fe: Bear & Company, 1984), pp. 329–336; John B. Cobb Jr., "Ecology, Ethics, and Theology," in *Herman E. Daly*, ed., *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy* (San Francisco: W. H. Freeman, 1973), pp. 162–176; Charles Birch and John Cobb, Jr., *The Liberation of Life: From the Cell to the Community* (Cambridge: Cambridge University Press, 1981); Alfred North Whitehead, *Process and Reality,* ed. David Ray Griffin and Donald W. Sherburne (New York: Free Press, 1978). The Center for Ethics and Social Policy in Berkeley, California has also addressed the question of an ecological approach to Christian religion. See Joranson and Butigan, *Cry of the Environment.* Conrad Bonifazi of Humboldt State University in Arcata is the author of *The Soul of the World: An Account of the Inwardness of Things* (Lanham, MD: University Press of America, 1978).

58. Cobb and Griffin, *Process Theology,* pp. 76, 79, 155.
59. Jay McDaniel, "Physical Matter as Creative and Sentient," *Environmental Ethics* 5 (1983), 291–317; McDaniel, "Christian Spirituality as Openness to Fellow Creatures," *Environmental Ethics* 8 (1986), 33–46.
60. Susan Armstrong-Buck, "Whitehead's Metaphysical System as a Foundation for Environmental Ethics," *Environmental Ethics* 8 (1986), 243, 246.
61. On the problem of intrinsic value, see J. Baird Callicott, "Intrinsic Value, Quantum Theory, and Environmental Ethics," *Environmental Ethics* 7 (1985), 257–275.
62. On ecology and values, see Holmes Ralston III, "Is There an Ecological Ethic?" *Ethics* 85 (1975), 93–104. Wicked problems are a class of complex value-laden problems to which there are no solutions that are disciplinary in nature. Their resolution depends on new transdisciplinary methods of conceptualization.
63. Donald Worster, "Conservation and Environmentalist Movements in the U.S.: Comment on Nash and Hays," in Kendall E. Bailes, ed., *Environmental History: Critical Issues in Comparative Perspective* (Lanham, MD: University Press of America, 1985), p. 262. On ancient ideas of an animate earth and its ethical implications, see J. Donald Hughes, "Gaia: Environmental Problems in Chthonic Perspective," ibid., pp. 64–82 and Merchant, *Death of Nature,* p. 141. On the way in which the animate view of nature held by American Indian tribes regulated hunting and gathering, see Calvin Martin, *Keepers of the Game: Indian-Animal Relationships and the Fur Trade* (Berkeley: University of California Press, 1978) and G. Reichel-Dolmatoff, "Cosmology as Ecological Analysis: A View from the Rain Forest," *The Ecologist* 7, no. 1 (1977), 4–11.

Journal/Discussion Questions

✍ *Merchant recounts the story of Mark Dubois and his 1979 protest against a dam project. Discuss your reactions to Dubois' protest. Do you think he was right to do what he did?*

1. According to Merchant, what are the lim-

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approach? To the
What limitations
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2. Merchant discusse

Lynn Scarlett is vice
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As You Read, Consi

1. How, according
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On the one hand
focus on the moment,

Lynn Scarlett, "Clea
Public Policy from *Environ*
1994). Copyright 1994, Paci

itations of the egocentric approach to environmental issues? To the homeocentric approach? To the ecocentric approach? What limitations do *you* see in the ecocentric approach? Which approach most closely resembles your own?

2. Merchant discusses Roderick Nash's article, "Do Rocks Have Rights?" How would you answer Nash's question? Do you agree with Merchant's position on this issue?
3. What, according to Merchant, are the basic assumptions of holism? What is the opposite of holism?

Lynn Scarlett
"Clear Thinking about the Earth"

Lynn Scarlett is vice-president of research at the Reason Foundation in Los Angeles. The primary focus of her research is on environmental policy, including solid waste, recycling, and air emissions issues.

In this article, Scarlett explores the ways in which people's basic presuppositions—their worldviews—shape the ways in which they see the world and, more specificially, the ways in which they understand both the causes of environmental problems and their solutions. She argues that the basic presupposition underlying Vice President Al Gore's worldview is a deeply pessimistic and surprisingly static one; she contrasts this with a more optimistic, dynamic view of our relationship to the environment.

As You Read, Consider This:

1. How, according to Scarlett, does the static nature of Gore's worldview affect his views on natural resources? How does the dynamic nature of her own worldview affect Scarlett's views?

"Rashamon," a celebrated Japanese film, presents four witnesses observing a single crime. Each witness perceives the situation so differently that the audience experiences what appear to be four distinct events.

Current discourse on the environment raises a "Rashamon-like" specter of competing perceptions. The world presents us with a single reality; but expositors on the environment view that world and its workings through multiple and radically different lenses. Among this medley of lenses, two perspectives predominate.

On the one hand, we have what I will call the pessimists. They see a world in trouble. They focus on the moment, see despoliation, and predict doom. They believe we can evade doom, but