isms—not for the sake of their own health, but to avoid inadvertently killing other living beings. Less extreme practitioners are strict vegetarians and own few material possessions. The Jains are bidding for global leadership in environmental ethics. Their low-on-the-food-chain and low-level-of-consumption lifestyle is held up as a model of ecological right livelihood (Chappel 1990). And the author of the *Jain Declaration on Nature* claims that the central Jain moral precept of *ahimsa* "is nothing but environmentalism" (Singhvi n.d.).

Though now virtually extinct in its native India, Buddhism has flourished for many hundreds of years elsewhere in Asia. Its founder, Siddhartha Gautama, first followed the path of meditation to experience the oneness of *Atman-Brahman*, and then the path of extreme asceticism in order to free his soul from his body—all to little effect. Then he realized that his frustration, including his spiritual frustration, was the result of desire. Not by obtaining what one desires—which only leads one to desire something more—but by stilling desire itself can one achieve enlightenment and liberation. Further, desire distorts one's perceptions, exaggerating the importance of some things and diminishing the importance of others. When one overcomes desire, one can appreciate each thing for what it is.

When the Buddha realized all this, he was filled with a sense of joy, and he radiated loving-kindness toward the world around him. He shared his enlightenment with others, and formulated a code of moral conduct for his followers. Many Buddhists believe that all living beings are in the same predicament: we are driven by desire to a life of continuous frustration, and all can be liberated if all can attain enlightenment. Thus Buddhists can regard other living beings as companions on the path to Buddhahood and *nirvana*.

Buddhists, no less than Jains and Christians, are assuming a leadership role in the global conservation movement. Perhaps most notably, the Dalai Lama of Tibet is the foremost conservationist among world religious leaders. In 1985, the Buddhist Perception of Nature Project was launched to extract and collate the many environmentally relevant passages from Buddhist scriptures and secondary literature. Thus, the relevance of Buddhism to contemporary conservation concerns could be demonstrated, and the level of conservation consciousness and conscience in Buddhist monasteries, schools, colleges, and other institutions could be raised (Davies 1987). Bodhi (n.d.) provides a succinct summary of Buddhist environmental ethics: "With its philosophic insight into the interconnectedness and thoroughgoing interdependence of all conditioned things, with its thesis that happiness is to be found through the restraint of desire, with its goal of enlightenment through renunciation and contemplation and its ethic of noninjury and boundless loving-kindness for all beings, Buddhism provides all the essential elements for a relationship to the natural world characterized by respect, care, and compassion."

One-fourth of the world's population is Chinese. Fortunately, traditional Chinese thought provides excellent conceptual resources for a conservation ethic. The Chinese word *tao* means *way* or *road*. The Taoists believe that there is a *Tao*, a Way, of nature. That is, natural processes occur not only in an orderly but also in a harmonious fashion. Human beings can discern the *Tao*, the natural well-orchestrated flow of things. And human activities can either be well adapted to the *Tao*, or they can buck it. In the former case, human goals are accomplished with ease and grace and without disturbing the natural environment; but in the latter they are accomplished, if at all, with difficulty and at the price of considerable disruption of neighboring social and natural systems. Capital-intensive Western technology,—such as nuclear power plants and industrial agriculture,—is very "un-Taoist" in esprit and motif.

Modern conservationists find in Taoism an ancient analogue of today's countermovement toward appropriate technology and sustainable development. The great Mississippi Valley flood of 1993 is a case in point. The river system was not managed in accordance with the *Tao*. Thus, levees and flood walls only exacerbated the big flood when it finally came. Better to locate cities and towns outside the floodplain and allow the mighty Mississippi River occasionally to overflow. The rich alluvial soils in the river's floodplains could be farmed in dryer years, but no permanent structures should be located there. That way, the floodwaters could periodically spread over the land, enriching the soil and replenishing wetlands for wildlife, and the human dwellings on higher ground could remain safe and secure. Perhaps the officers of the U.S. Corps of Engineers should study Taoism. We can only hope that their counterparts in China will abandon newfangled Maoism for old-fashioned Taoism before trying to contain, rather than cooperate with, the Yangtze River.

The other ancient Chinese religious worldview is Confucianism. To most people, Asian and Western alike, Confucianism connotes conservatism, adherence to custom and social forms, filial piety, and resignation to feudal inequality. Hence, it seems to hold little promise as an intellectual soil in which to cultivate a conservation ethic. Ames (1992), however, contradicts the received view: "There is a common ground shared by the teachings of classical Confucianism and Taoism . . . Both express a 'this-worldly' concern for the concrete details of immediate experience rather than . . . grand abstractions and ideals. Both acknowledge the uniqueness, importance, and primacy of particular persons and their contributions to the world, while at the same time expressing the ecological interrelatedness and interdependence of this person with his context."

From a Confucian point of view, a person is not a separate immortal soul temporarily residing in a physical body; a person is, rather, the unique center of a network of relationships. Because his or her identity is constituted by these relationships, the destruction of one's social and environmental context is equivalent to self-destruction. Biocide, in other words, is tantamount to suicide.

In the West, because individuals are not ordinarily conceived to be robustly related to and dependent upon their context—not only for their existence but for their very identity—it is possible to imagine that they can remain themselves and be "better off" at the expense of both their social and natural environments. But from a Confucian point of view, it is impossible to abstract persons from their contexts. Thus, if *context* is expanded from its classic social to its current environmental connotation, Confucianism offers a very firm foundation upon which to build a contemporary Chinese conservation ethic.

The tenets and conservation implications of these various non-Western religions are summarized in Table 2.3. Essay 2B by Susan Bratton further explores the role of religion in conservation.

Biocentrism

Before the advent of environmental ethics, moral philosophers in the Western tradition granted moral standing to human beings and human beings alone, not by appeal to a mystical property, such as the image of God, but by appeal to observable traits, such as rationality or linguistic ability. Because only people, they argued, can reason or speak, only people are worthy of ethical treatment. In the 18th century, Immanuel Kant (1959), for example, argued that human beings are intrinsically valuable ends because we are rational, while animals (and other forms of life) are only instrumentally valuable means because they are not. Contemporary environmental philosophers have attempted to con-

Table 2.3
A Comparison of Traditional Non-Western Conservation Ethics

Characteristic	Islam	Hinduism	Jainism	Buddhism	Taoism	Confucianism
Source of value in nature	External; *Allah* (God)	Internal; *Atman-Brahman*	Internal; soul (*jiva*)	Internal; Buddha-nature	Emergent; the *Tao* (Way)	Emergent; relational
Human attitude toward nature	Respect for creation is respect for Creator	Identification; self-realization	*Ahimsa* (noninjury)	Loving-kindness; solidarity	Harmony; cooperation	Interrelated; interdependent
Conservation practice	Conserve resources for future generations	Conserve trees and other beings that manifest *Atman-Brahman*	Low on the food chain; low level of consumption	Still desires; reduce consumption; contemplate nature	Adapt human economy to nature's economy	Conserve nature to preserve human society

struct a nonanthropocentric environmental ethic without appeal to mystical religious concepts, such as God, the *Tao*, or the universal Buddha-nature. Some have done so by arguing that reason and linguistic ability are inappropriate qualifications for moral standing, and that other observable traits are more appropriate.

Singer (1975) and Regan (1983) exposed classic Western anthropocentric ethics to the following dilemma: if the qualification for ethical standing—or "criterion for moral considerability" as it is more technically called—is pitched high enough to exclude nonhuman beings, then it will exclude as well those human beings who also fail to measure up. Human infants, the severely retarded, and the profoundly senile are not rational. If, following Kant, we make rationality the criterion of moral considerability, then these human "marginal cases" may be treated just as we treat nonhuman beings who fail to meet it. They may become, for example, unwilling subjects of painful medical tests and experiments; they may be hunted for sport; or they may be made into dog

ESSAY 2B

Monks, Temples, and Trees

The Spirit of Diversity

Susan P. Bratton, University of North Texas

A Buddhist monk bends over and carefully waters a small seedling in the temple garden. Others of its kind are nearby. Older, taller trees shade the sanctuary paths with their fan-shaped leaves, and produce a crop of edible nuts each year. The monk looks at the little ginkgo and reflects that he never has seen one growing on its own in the surrounding mountains. Only in the temple gardens and their environs has the ginkgo survived, at least in his region of China.

From a venerable lineage, datable to the lower Jurassic, *Ginkgo biloba* is the only known remaining species of an entire division of vascular plants, the Ginkgophyta. Often called a "living fossil," the modern shade tree is little different from the ginkgos of the early Cretaceous period. *Ginkgo* is also a taxon that may or may not exist in the wild. One of the largest "seminatural" populations, at Tian Mu Shan, is near the Kaishan temple, and thus may have been under partial human protection, if not management, for centuries. Over the last several thousand years, Buddhist monks have probably slowly replaced the ginkgo's natural dispersal agents, such as leopard cats (*Felis bengalensis*) and helped preserve the species for posterity (del Tredici et al. 1992).

Our contemporary technocratic and scientifically oriented society often mistakenly considers religion to be either uninterested or uninformed when it

comes to protection and management of the natural world. We also assume that if religion is interested, it is the more "primitive" religions and those that practice magic that attempt to relate to or manipulate wild nature, while the great religions of the world—particularly the "peoples of the book," Judaism, Christianity, and Islam—are too theological and otherworldly to concern themselves with the various small pieces that make up the cosmos. The truth is, religious values have often helped to protect natural diversity, and religion remains one of the most important wellsprings of human concern for other species. E. O. Wilson has suggested that science alone cannot protect biodiversity; other cultural values must be called on as well.

Science attempts to understand the world through objective comparison. The various elements in the environment become "other," or differentiated from the scientist, who makes a conscious effort to distance herself from the phenomena she is observing. Religion, in contrast, establishes relationship or identification with the "other." The shaman becomes an intermediary with nature and links the village with the surrounding forests and their creatures; the Buddhist monk works in the temple garden and increases his spiritual understanding of the cosmos as a whole; the Hebrew psalmist sees the glory of God in the diversity of the wild and praises divine wisdom for placing the stork in the cedars and for maintaining both birds and forests with water gushing from mountain springs. Religion has a freedom of symbolic and aesthetic expression inappropriate to science. Religion can speak with nature, science can only speak about it.

Religion forwards the preservation of natural diversity in several different ways. The first is by providing ethical and social models for living respectfully with nature. For most cultures, religion is a primary means of defining right and wrong. The Koyukon of Alaska, for example, do not separate the natural and the spiritual world, and explain the spiritual power residing in nature through Distant Time stories about the evolution of the cosmos. Since nature has spiritual power, it commands respect and is included in the religious code of morality and etiquette. The Koyukon avoid waste in food harvest and take only what they can use from their fragile far-northern lands. They do not kill female waterfowl preparing to nest, nor do they take young animals. They fear retribution in the form of bad luck if they violate taboos or are disrespectful of the animals they hunt, so their husbandry of natural resources is tightly tied to an animist worldview (Nelson 1983). Other religions with very different notions of the otherworldly may have rather similar rules. The Hebrew scriptures, with their one transcendent God, forbid removal of a mother bird from her nest.

Secondly, religion often provides direct protection for wild and cultivated plants and animals. Many cultures have holy places, including mountains, that humans may approach only for religious purposes, if at all. Rivers or forests may be sacred environs, where wildlife and vegetation are not to be disturbed. Sites are sometimes set aside specifically to protect taxa that have medicinal value or are utilized in religious ritual. Taboos or special religious significance can prevent the killing of individual wildlife species. Buddhism, one of the most abstract and philosophical of all religions, has protected numerous organisms, from ginkgos to cranes to monkeys, resident on the grounds of its temples. Some early Christian monks would not allow the native oak forests to be cleared from around their monasteries. St. Francis of Assisi instructed his followers to leave the borders of a cultivated garden unweeded to provide space for wildflowers, so that the blossoms, in their beauty, could praise the creator God. Even our contemporary wilderness areas in the United States are, among other purposes, supposed to preserve and protect "spiritual values."

Lastly, religion ties the nonhuman residents of the cosmos to the divine or to the overall meaning of human existence. This gives the biota a value that science alone cannot provide. The saffron-robed initiate caring for the temple landscape sees each individual creature as beautiful in itself and beautiful in its interrelationship with its neighbors. The trees, the small clump of flowers, the rock and the sand, become more than xylem and chloroplasts, or feldspar and quartz. For the dedicated practitioner, the sanctity of the environment is an inspiration and a blessing. The spiritual realization of the Buddhist, in turn, blesses the environment (14th Dalai Lama 1992). In early and medieval Christianity, where love and compassion were key values and holiness was fervently pursued, the monks and desert ascetics often cared for wildlife, healing animals with injuries and even rescuing them from hunters. The early Christians thought animals could recognize the pure of heart, and that even wild lions and wolves would show affection for the great saints.

The religious myths and stories that teach us about the importance of other species are often so basic that we, in our human-dominated, industrial world, miss the critical message. Take, for example, the tale of Noah's ark. Noah did not save the animals just to be nice. Noah saved the animals because humans need the animals—all the animals, not just the domestic and the edible. Also, in the Genesis original, it is God who instructs Noah to build the ark. The great God of Israel wanted the animals rescued, and put Noah to a great deal of trouble during a very damp climatic period to accomplish this. God had created the animals in wondrous diversity and in marvelous order, and had blessed them as both good and beautiful well before the Garden of Eden was an official mailing address. When the animals march onto the ark according to their kinds, it is divine organization that is being honored, and when Noah saves them all, not just a few, it is the glory of divine handiwork that is being preserved (Bratton 1993). Modern conservation biology can perhaps take a lesson from this.

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food. No one would want that to happen. To avoid it, Singer (1975) and Regan (1983) argue, we must lower the criterion for moral considerability. But if it is pitched low enough to include the human marginal cases, then it will also include a number of nonhuman animals. Singer (1975) follows Kant's 18th-century contemporary, Jeremy Bentham, and argues that sentience, the capacity to experience pleasure and pain, ought to be the criterion for ethical standing.

Goodpaster (1978) first took the step from animal liberation to biocentric (literally "life-centered") environmental ethics. From a biological point of view, sentience, he argued, evolved not as an end in itself, but as a means to animals' survival. Hence if there is something morally relevant about sentience, how much more morally relevant is that which sentience evolved to serve—namely, life. Moreover, all living things, as explained earlier in this chapter, have a good of their own, and therefore have interests. That fact too, according to Goodpaster (1978), ought to entitle all living things to ethical standing.

Defining a more extreme view, Taylor (1986) argues that all living things are of equal "inherent worth" (Figure 2.4). Apart from the ethically problematic and practically impossible task of according equal moral consideration to each and every living thing, Taylor's pure and extreme biocentrism has little relevance to conservation biology—which, once more, is not concerned with the fate of specimens, but of species, ecosystems, and evolutionary processes.

As modified by Rolston (1988), however, biocentrism may address the concerns of conservation biologists and hence may represent a viable conservation ethic. Rolston agrees with Taylor that all living things have intrinsic value (or inherent worth) and thus should enjoy moral standing. But he does not agree that all living things are equal. To the baseline intrinsic value that organisms possess by virtue of having interests and a good of their own, Rolston adds a value "bonus," as we might think of it, for being sentient, and he adds an additional value bonus for being rational and self-conscious. Hence, sentient animals have more intrinsic value than insentient plants, and human beings have more intrinsic value than sentient animals (Figure 2.4). Rolston's biocentrism thus better accords with our intuitive sense of a value hierarchy than does Taylor's, because in Rolston's version, the life of a human being is more valuable than that of a white-tailed deer, and that of a deer is more valuable than that of a jack pine. And, as noted earlier in this chapter, Rolston also provides intrinsic value, or something similar to it—a value "dividend" as we might think of it—for species, ecosystems, and their evolutionary processes. He argues, therefore, that we have a moral duty to preserve them as well. The development of biocentric and ecocentric philosophies in a historical framework is further explored in Essay 2C by Roderick Nash.

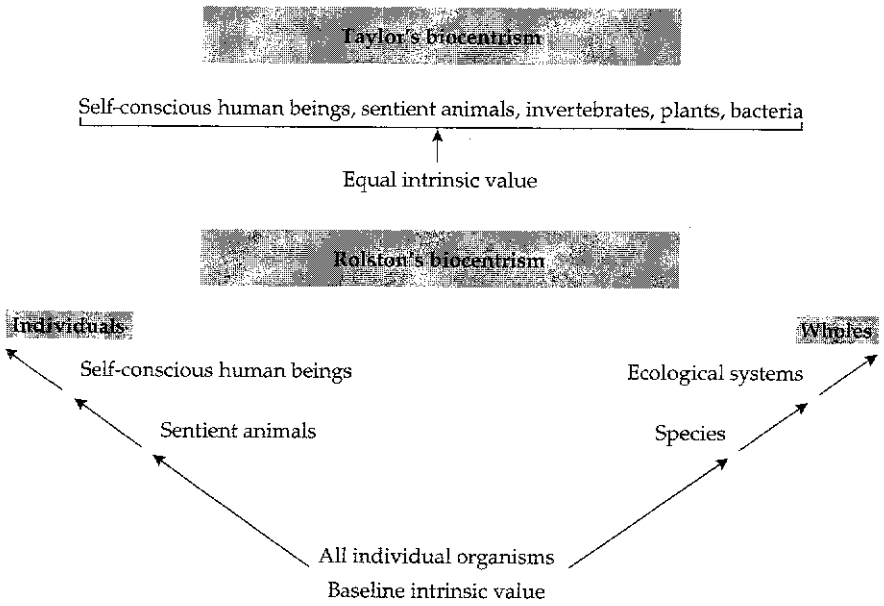

Figure 2.4 Taylor's biocentrism, in which all individual organisms have equal intrinsic value, and Rolston's, in which the baseline intrinsic value at the level of individual organisms is augmented by sentience and self-consciousness; that is, organisms incur increasing intrinsic value for sentience and self-consciousness. Rolston also provides a parallel valuation scheme for "wholes": species and ecosystems.

ESSAY 2C

An American Perspective

Discovering Radical Environmentalism in Our Own Cultural Backyard

From Natural Rights to the Rights of Nature

Roderick Frazier Nash, University of California at Santa Barbara

The search for philosophical foundations for ecocentrism and radical environmentalism have led to ancient Asian religions, pre-Christian Druidic rituals, and Native American cosmologies. Much can be learned—and certainly much inspiration gained—from these attempts to relate humans to nature respectfully and responsibly. But are these belief systems the most promising platform for environmental reform—indeed, paradigm change—in the modern American context?

The problem is that mainstream Americans cannot easily think like Indians, Druids, or Taoists; for better or for worse, we march to the beat of a different cultural drummer. But we do have one powerful ideal with which to change paradigms. It is as American as apple pie, and it could provide the motivation to save the planet and us along with it.

Natural rights liberalism is the most potent concept in the history of American thought. It was present before the American experiment, in 1215, when a handful of English nobles presented a Magna Carta to their king, challenging the exclusivity of the royal definition of rights. The message was straightforward: we are members of this society and we want rights too. By 1776, England's American colonies had expanded the meaning of natural rights considerably. Now "all men" were thought to be endowed with them, and the colonists felt strongly enough about them to fight a war for independence.

Granted that the Jeffersonian sense of "men" was severely limited. Red men, black men, and female men were not yet regarded as full members of the moral community. But the spirit of 1776 was extremely volatile. One of its most dramatic extensions resulted in a huge paradigm change: the abolition of slavery. Beginning in the 1830s, a handful of "radical" American reformers determined to extend basic American natural rights ideals to blacks. The campaign struck one of the most sensitive chords in the American mind: the rights of an oppressed minority to liberation. By 1865 the moral circle had widened and all slaves were legally free.

Today we see in the environmental movement remarkable growth of another "radical" idea: nature has rights that humans should respect. **Deep ecology** calls for the liberation of land and nonhuman life from ownership and abuse. There are appeals for the end of *earth* slavery. Echoing the Abolitionists' cry, "No Compromise with Slave Holders!," Earth First! proclaims, "No Compromise in Defense of Mother Earth!" The Boston Tea Party of 1773 and John Brown's 1859 raid on Harper's Ferry, Virginia, on behalf of slaves inspire environmental radicals. The arresting implication of this parallel is that the slavery issue was not educated or legislated away; it took a civil war and cost a million lives. Will the implementation of environmental ethics also involve conflict?

It is important to acknowledge that the extension of ethics to include nature is not even a simple *conceptual* task. Colonists and slaves, after all, were human; Spotted Owls and wild rivers are not. Classic natural rights are individual-oriented: *every* human has them. This spells trouble in the human relationship to nature. Are we to refrain from *any* impact on our environment? Can we never kill *anything* to eat? Few rational people think so; clearly there must be differences in moral behavior. But for increasing numbers of people it does make sense to say that all the species that share the planet with us have rights to exist and pursue their lives in their own way. Some feel that ecosystem processes have intrinsic value and a claim to freedom from the tyranny often imposed by human civilization.

Already we have legislation such as the Endangered Species Act of 1973, which gives legal protection to nonhuman existence rights. We also have national park and wilderness acts, which protect nonliving things and ecological processes. From this starting point, it is plausible that American morality can once again expand. This time we could move from natural rights to the rights of nature.

Ecocentrism

For sound philosophical as well as temperamental reasons, those conservation biologists with nonanthropocentric sympathies have gravitated to the Aldo Leopold Land Ethic in their search for a fitting conservation ethic. Leopold was himself a conservation biologist; indeed, he was, perhaps, the prototype of the breed (Meine 1992). Further, the Leopold Land Ethic is not based on religious beliefs, nor is it an extension of the ethical paradigm of classic Western moral philosophy. It is grounded, rather, in evolutionary and ecological biology. Hence, most nonanthropocentric conservation biologists, irrespective of their religious or cultural background, find the Leopold Land Ethic intellectually congenial.

In *The Descent of Man*, Darwin tackled the problem of the evolutionary origins and development of ethics. How could "limitations on freedom of action" possibly have arisen through natural selection, given the universal "struggle for existence" (Leopold 1949)? In a nutshell, Darwin (1904) answered as follows: social organization enhances the survival and reproductive efficiency of many kinds of organisms. Among mammals, parental and filial affections, having spilled over to other close kin, bound individuals into small social units such as packs, troops, and bands. When one mammal—*Homo sapiens*—acquired the capacity for reflection and speech, behaviors that were conducive to social integrity and stability were dubbed "good" and those that were antisocial were dubbed "bad." Or, as Darwin (1904) wrote, "No tribe could hold together if murder, robbery, treachery, &c., were common; consequently such crimes within the limits of the same tribe, 'are branded with everlasting infamy.'" Once originated, ethics developed apace with the growth and development of society. According to Darwin (1904),

> As man advances in civilization, and small tribes are united into larger communities, the simplest reason would tell each individual that he ought to extend his social instincts and sympathies to all the members of the same nation though personally unknown to him. This point being once reached, there is only an artificial barrier to prevent his sympathies extending to the men of all nations and races.

Here, at the end of the 20th century, we have finally reached the point that Darwin could only envision in the middle of the 19th: a universal ethic of human rights. But, also during the 20th century, ecology discovered (actually rediscovered, because many tribal peoples seem to have represented their natural environments in analogous terms) that human beings are not only members of various human communities—from the familial clan to the family of man—but members of a "biotic community" as well.

From Darwin we learn that "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts" (Leopold 1949); and from Leopold, that ecology now "simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land." If whenever a new community came to be recognized in the past, "the simplest reason would tell each individual that he ought to extend his social instincts and sympathies," Leopold argues, then the same "simplest reason" ought to kick in again, now that ecology informs us that we are members of a biotic community.

Though it has been altogether forgotten in Western moral philosophy over the last 200 years, human ethics has always had a strong holistic aspect. That is, human beings have felt that they had duties and obligations to their communities as such, as well as to individual members of those communities. About this Darwin (1904) was emphatic: "actions are regarded by savages, and were probably so regarded by primeval man, as good or bad, solely as they obviously affect the tribe, not that of the species, nor that of the individual member of the tribe. This agrees well with the belief that the so-called moral sense is aboriginally derived from the social instincts, for both relate at first exclusively to the community."

Influenced by Darwin, Leopold also gave his land ethic a decided holistic cast: "In short, a land ethic," he writes, "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 1949). Indeed, by the time Leopold came to write the summary moral maxim, or "golden rule," of the land ethic, he seems to have forgotten about "fellow-members" altogether and only mentions the "community as

such": *"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."*

Staunch apologists for the rugged individualism characteristic of Western moral philosophy during the last two centuries have charged that the land ethic leads to "environmental fascism"—the subordination of the rights of individuals, including human individuals, to the good of the whole (Regan 1983; Aiken 1984). They have a point where nonhuman animals are concerned. The land ethic would permit—nay, even require—killing animals, such as feral goats or rabbits, that pose a threat to populations of endangered floral species or to the general health and integrity of biotic communities. But Leopold, following Darwin, represented the land ethic as an ethical "accretion"—that is, an addition to, not a substitute for, our long-standing human-to-human ethics.

That human beings have recently become members of national and international communities does not mean that we are no longer members of more ancient and more narrowly circumscribed social groups, such as extended families, or that we are relieved of all the moral duties and responsibilities that attend our active family, clan, and civic affiliations (Figure 2.5). Similarly, because we now realize that we are also members of a biotic community does not mean that we are relieved of all the moral duties and responsibilities that attend our membership in the full spectrum of human communities.

This defense of the Leopold land ethic against the charge that it promotes environmental fascism leads to the charge that it is a "paper tiger," an ecocentric environmental ethic without "teeth." For if we must fully acknowledge all our ancient and modern human duties and obligations as well as our more recently discovered environmental ones, how can we ever justify sacrificing human interests to conserve nonhuman species and ecosystems?

Fortunately, not all human-environment conflicts are life and death issues. We rarely face a choice between killing human beings and conserving biodiversity. Rather, most choices are between human lifestyles and biodiversity. For example, Japanese and other consumers of whale meat are not asked to lay down their lives to save the whales, only to change their dietary preferences. To save forests, we do not have to commit suicide; we can save them

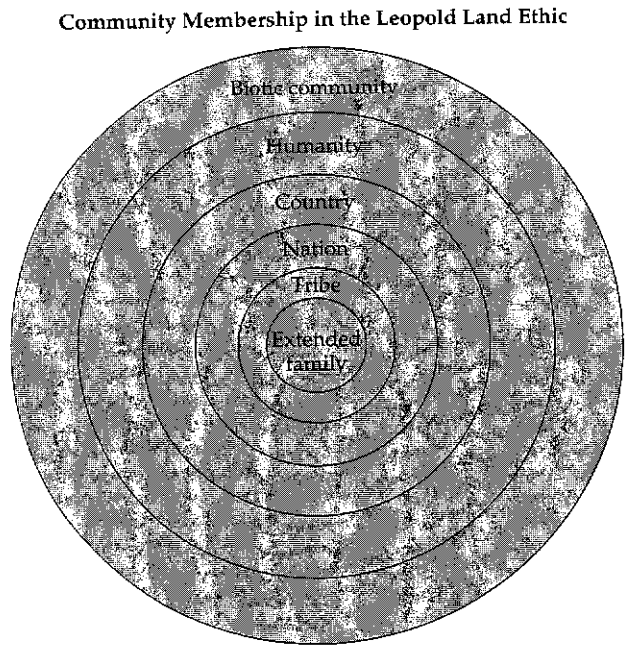

Figure 2.5 The various communities to which human beings belong, and how these communities are hierarchically ordered in the Leopold Land Ethic. The smallest and most intimate community is the family; the largest is the multispecies biotic community. In general, duties and obligations related to the communities at or closer to the center historically have taken precedence over those at or closer to the perimeter. But we must also consider the gravity, or weight, of duties and obligations to these communities, as well as their proximity, when they come into conflict with one another.

simply by using less lumber and paper, and by recycling what cellulose we must extract. All human interests are not equal. We should be prepared to override less important human interests for the sake of the vital interests of other forms of life, and for ecological health and integrity.

Leopold penned the land ethic at mid-century. Ecological science then represented nature as tending toward a static equilibrium, and portrayed disturbance and perturbation—especially that caused by *Homo sapiens*—as abnormal and destructive (Odum 1953). In light of recent doubts about the very existence of "biotic communities" that persist as such through time (Brubaker 1988), in view of the shift in contemporary ecology to a more dynamic paradigm (Botkin 1990), and in recognition of the incorporation of natural disturbance into theories of patch- and landscape-scale ecological dynamics (Pickett and White 1985), we might wonder whether the Leopoldian Land Ethic has become obsolete. Has the paradigm shift from "the balance of nature" to "the flux of nature" in ecology invalidated the land ethic? No, but recent developments in ecology may require revising the land ethic.

Leopold was aware of and sensitive to natural change. He knew that conservation must aim at a moving target. How can we conserve a biota that is dynamic, ever-changing, when the very words *conserve* and *preserve*—especially when linked to *integrity* and *stability*—connote stasis? The key to solving this conundrum is the concept of temporal and spatial **scale.** A review of Leopold's "The Land Ethic" reveals that he had the key, though he may not have realized just how multiscalar change in nature actually is.

In "The Land Ethic," Leopold (1949) writes, "Evolutionary changes . . . are usually slow and local. Man's invention of tools has enabled him to make changes of unprecedented violence, rapidity, and scope." As noted, Leopold was keenly aware that nature is dynamic, but, under the sway of mid-century equilibrium ecology, he conceived of natural change primarily in evolutionary, not in ecological, terms. Nevertheless, scale is equally relevant when consideration of ecological change is added to that of evolutionary change; that is, when normal climatic oscillations and patch dynamics are added to normal rates of extinction, hybridization, and speciation.

Homo sapiens is a part of nature, "a plain member and citizen" of the "land-community," as Leopold (1949) put it. Hence, anthropogenic (human-caused) changes imposed on nature are no less natural than any other. But, because *Homo sapiens* is a moral species, capable of ethical deliberation and conscious choice, and because our evolutionary kinship and biotic community membership add a land ethic to our familiar social ethics, anthropogenic changes may be land-ethically evaluated. But by what norm? The norm of appropriate scale.

Temporal and spatial scale in combination are the key to the evaluation of direct human ecological impacts. Long before *Homo sapiens* evolved, violent disturbances regularly occurred in nature (Pickett and White 1985), and they still do, quite independently of human agency. Volcanoes bury the biota of whole mountains with lava and ash. Tornadoes rip through forests, leveling trees. Hurricanes erode beaches. Wildfires sweep through forests and savannas. Rivers drown floodplains. Droughts dry up lakes and streams. Why, then, are analogous anthropogenic disturbances—clear-cuts, beach developments, hydroelectric impoundments, and the like—environmentally unethical? As such, they are not; it is a question of scale. In general, frequent, intense disturbances, such as tornadoes, occur at small, widely distributed spatial scales; spatially broader disturbances, such as droughts, occur infrequently. And most disturbances, at whatever level of intensity and scale, are stochastic (random) and chaotic (unpredictable). The problem with anthropogenic perturba-

tions—such as industrial forestry and agriculture, exurban development, drift net fishing, and such—is that they are far more frequent, widespread, and regularly occurring than are nonanthropogenic perturbations; they are well out of the normal spatial and temporal range of disturbances experienced by ecosystems over evolutionary time (Holling and Meffe 1996).

Pickett and Ostfeld (1995)—proponents of the new natural disturbance/patch dynamics paradigm in ecology—agree that appropriate scale is the operative norm for ethically appraising anthropogenic ecological perturbations. They note that

> the flux of nature is a dangerous metaphor. The metaphor and the underlying ecological paradigm may suggest to the thoughtless and greedy that because flux is a fundamental part of the natural world, any human-caused flux is justifiable. Such an inference is wrong because the flux in the natural world has severe limits. . . . Two characteristics of human-induced flux would suggest that it would be excessive: fast rate and large spatial extent.

Among the abnormally frequent and widespread anthropogenic perturbations that Leopold himself censures in "The Land Ethic" are the continent-wide elimination of large predators from biotic communities in North America, the ubiquitous substitution of domestic species for wild ones, the ecological homogenization of the planet resulting from the "world-wide pooling of faunas and floras," and the ubiquitous "polluting of waters or obstructing them with dams."

The summary moral maxim of the land ethic, then, must be updated in light of developments in ecology over the past quarter-century. Leopold acknowledged the existence and significance of natural environmental change, but seems to have thought of it primarily on a very slow evolutionary time scale. Even so, he thereby incorporates the concept of inherent environmental change and the crucial norm of scale into the land ethic. In light of more recent developments in ecology, we can add norms of scale for both climatic and ecological dynamics to the land ethic. Although one hesitates to edit Leopold's elegant prose, we attempt to formulate a contemporary summary moral maxim for the land ethic with the following:

> A thing is right when it tends to disturb the biotic community only at normal spatial and temporal scales. It is wrong when it tends otherwise.

Summary

Conservation biology is driven by the *value* of biodiversity. But why should people value biodiversity? Philosophers have distinguished two basic types of value, instrumental and intrinsic. Biodiversity is instrumentally valuable for the *goods* (e.g., actual and potential food, medicine, fiber, and fuel), *services* (e.g., pollination, nutrient recycling, oxygen production), *information* (e.g., practical scientific knowledge, a genetic library), and *psycho-spiritual satisfaction* (e.g., natural beauty, religious awe, pure scientific knowledge) that it provides for intrinsically valuable human beings. Biodiversity may also be intrinsically valuable—valuable, that is, as an end in itself, as well as a means to human well-being. Like ourselves, other forms of life are self-organizing beings with goods of their own. And we human beings are capable of valuing other beings for their own sakes, as well as for what they do for us.

In order to compare its value with the value of other things, economists have attempted to *monetize* both the instrumental and intrinsic value of biodiversity. Philosophers have also based *conservation ethics* on the value of biodiversity. If biodiversity is only instrumentally valuable to human beings, its destruction by one person in pursuit of personal gain may be harmful to

another person—in which case the destruction of biodiversity may be immoral. If biodiversity also has intrinsic value, its destruction may be doubly immoral.

The Bible recognizes the intrinsic value of nonhuman species (God declared them to be "good"). Accordingly, contemporary Jewish and Christian theologians have formulated a Judeo-Christian Stewardship Conservation Ethic. Many other world religions are also developing distinct conservation ethics based on their scriptures and traditions. The Aldo Leopold Land Ethic is not based on any religion, but on contemporary evolutionary and ecological biology. From an evolutionary perspective, human beings are kin to all other forms of life, and from an ecological perspective, human beings are "plain members and citizens" of the "biotic community." According to Leopold, these general scientific facts generate ethical obligations to our "fellow voyagers in the odyssey of evolution," to "fellow-members of the biotic community," and to that "community as such." Though ecology now acknowledges the normalcy of change and disturbance in nature, the Leopold Land Ethic, appropriately revised in light of these recent developments in science, remains the guiding environmental ethic for conservation biology.

Questions for Discussion

1. Should conservation biologists explain the value of biodiversity to the general public in purely instrumental (or utilitarian) terms, or should they also offer reasons for thinking that biodiversity has intrinsic (or inherent) value?
2. How should a conservation biologist trying to save a small endangered plant species, such as Furbish's lousewort, respond to the question, "What good is it?"
3. Suppose that a developer wants to build a dog track outside Houston, Texas, in the last remaining habitat of the Houston toad. If nonhuman species have only instrumental value, should the toad's habitat be saved? If nonhuman species have intrinsic value, could any development proposal that usurped the toad's habitat be morally justified?
4. Would the existence of a legal international market in ivory help or hurt efforts to conserve African elephants?
5. Should conservation biologists campaign to take biodiversity off the market and say, in effect, "Not for sale at any price," or should we try to show that the dollar value of biodiversity exceeds the dollar value of the lumber, electricity, beef, or what-have-you, whose production contributes to the erosion of biodiversity?
6. How does the understanding of human nature and the place of human beings in nature set out in Genesis in the Bible compare with the understanding of human nature and the place of human beings in nature forthcoming from science?
7. Suppose that a population of weedy sentient animals—say, feral goats—is threatening the survival of a plant species endemic to an island. What ethical concerns should a conservation biologist take into account before proposing a course of action?
8. If, in Rolston's biocentrism, the life of a white-tailed deer is more intrinsically valuable than that of a jack pine, would it also follow that the life of

a gray squirrel is more intrinsically valuable than that of a thousand-year-old redwood tree? Is the life of a human being more intrinsically valuable than that of a thousand-year-old redwood tree? Why?

9. Suppose that your brother is a logger or millworker in the Pacific Northwest. As a conservation biologist, should you support a moratorium on all logging of old-growth forests in the region, or do family obligations require you to be more concerned about your brother's lifestyle and livelihood?

10. If indigenous peoples have lived on and significantly affected all continents except Antarctica for at least 10,000 years, are wilderness areas devoid of human residents "artificial?"

11. Suppose that, to your claim that the current episode of abrupt, massive species extinction is immoral, someone replied, "Ninety-nine percent of all species that ever existed on earth are now extinct. Why, then, should we be concerned about rendering more of them extinct?" How would you respond?

12. Suppose that, to your claim that clear-cutting the last remaining old-growth Douglas fir forests of the Pacific Northwest is immoral, someone replied, "Douglas fir is not the climax forest in the region—western hemlock is—and Douglas fir forests are found there because the forest succession in the region is periodically reset by catastrophic fires. Why, then, should we be concerned about imitating the effects of fires by clear-cutting?" Formulate an answer based on melding an ethical argument and scientific reasoning.

Suggestions for Further Reading

Callicott, J. B. (ed.). 1987. *Companion to A Sand County Almanac*. University of Wisconsin Press, Madison. Essays by biographers, historians, literary critics, scientists, and philosophers sketch Leopold's life and the natural history of Wisconsin's sand counties. They analyze his classic work on conservation values and ethics, interpret his land ethic, and trace its impact on conservation policy and practice.

Callicott, J. B. 1994. *Earth's Insights: A Multicultural Survey of Ecological Ethics*. University of California Press, Berkeley. Global conservation efforts can succeed only if they are consistent with and motivated by the deepest beliefs of people all over the world. Sketched in this book are conservation values and ethics grounded in Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, Confucianism, and in the worldviews of selected Pacific, North American, African, and Australian indigenous peoples.

Kellert, S. R. 1996. *The Value of Life: Biological Diversity and Human Society*. Island Press, Washington, D.C. Kellert identifies the biologically based, but culturally variable, value of biodiversity. Kellert's study incorporates extensive empirical information, based on sociological research, about the value various peoples find in nature.

Krutilla, J. and A. Fisher. 1985. *The Economics of Natural Environments: Studies in the Valuation of Commodity and Amenity Resources*. Revised ed. Resources for the Future, Washington, D.C. This volume provides a straightforward account of methods of monetizing the values of natural environments used by neoclassical economists.

Leopold, A. 1949. *A Sand County Almanac and Sketches Here and There*. Oxford University Press, New York. Leopold is often called a "prophet" because he was a quarter-century ahead of his time in formulating a nonanthropocentric conservation philosophy and environmental ethic. This slender volume of essays is often called "the Bible of the contemporary conservation movement," and is a "must read" for any serious student of conservation.

Norton, B. G. 1991. *Toward Unity Among Environmentalists*. Oxford University Press, New York. The "convergence hypothesis"—the idea that the full spectrum of instrumental and intrinsic values of nature converge on the same environmental policies—is here set out and championed.

Rolston, H. III. 1988. *Environmental Ethics: Duties to and Values in the Natural World*. Temple University Press, Philadelphia. The dean of the new field of environmental ethics provides a sustained defense of the objective intrinsic value of nature from which he derives our duties and obligations to conserve biodiversity.

Sagoff, M. 1988. *The Economy of the Earth: Philosophy, Law, and the Environment*. Cambridge University Press, Cambridge. Sagoff's collected essays provide a critique of the methods used by neoclassical economists to monetize the values of natural environments. Some value questions, Sagoff argues, belong in the political realm, not the economic realm.