



INDIANA UNIVERSITY PRESS
INDIANA UNIVERSITY

Individualism, Holism, and Environmental Ethics

Author(s): Kristin Shrader-Frechette

Reviewed work(s):

Source: *Ethics and the Environment*, Vol. 1, No. 1 (Spring, 1996), pp. 55-69

Published by: [Indiana University Press](#)

Stable URL: <http://www.jstor.org/stable/40338929>

Accessed: 24/01/2013 20:08

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Indiana University Press is collaborating with JSTOR to digitize, preserve and extend access to *Ethics and the Environment*.

<http://www.jstor.org>

**Kristin
Shrader-
Frechette**

Individualism, Holism, and Environmental Ethics

ABSTRACT: *Neoclassical economists have been telling us for years that if we behave in egoistic, individualistic ways, the invisible hand of the market will guide us to efficient and sustainable futures. Many contemporary Greens also have been assuring us that if we behave in holistic ways, the invisible hand of ecology will guide us to health and sustainable futures. This essay argues that neither individualism nor holism will provide environmental sustainability. There is no invisible hand, either in economics or in ecology. Humans have no guaranteed tenure in the biosphere. Likewise there is no philosophical quick fix for environmental problems, either through the ethical individualism of Feinberg, Frankena, and Regan, or through the ecological holism of Callicott and Leopold. The correct path is more complex and tortuous than either of these ways. The essay argues that the best way to reach a sustainable environmental future probably is through a middle path best described as "hierarchical holism."*

ENVIRONMENTAL HOLISM

Neoclassical economists have been telling us for years that if we behave in egoistic, individualistic ways, the invisible hand of the market will guide us to efficient and sustainable futures. Many contemporary Greens also have been telling us that if we behave in holistic ways, the invisible hand of ecology will guide us to healthy and sustainable futures. In this essay, I argue that neither environmental individualism nor first-order environmental holism—to which many ecologists and environmentalists appear to subscribe—will provide environmental

Direct all correspondence to: Kristin Shrader-Frechette, University of South Florida, Department of Philosophy, 4202 E. Fowler Ave., CPR107, Tampa, FL 33620-5550.

sustainability. There is no invisible hand, either in economics or in ecology. Humans have no guaranteed “tenure in the biosphere” (Passmore, 1974, pp. 75-96). Likewise there is no philosophical “quick fix” for planetary problems, either through the environmental individualism of Feinberg (1974), Frankena (1979), and Regan (1983), or through the first-order environmental holism of Callicott (1989) and Leopold (1968). The correct path is more complex and tortuous than either of these ways. I argue that the most ethically defensible way to reach planetary protection and a sustainable environmental future probably is through a middle path that I describe as “hierarchical holism.”

ENVIRONMENTAL INDIVIDUALISM AND ITS PROBLEMS

As expressed in a classic article by Joel Feinberg, the cornerstone of environmental ethics in the individualistic tradition is the view that because only individual, sentient beings have interests, therefore only they can be said to be moral patients, beings to which we have duties (Feinberg, 1974, pp. 43-68). William Frankena’s argument here is that we owe no moral consideration to beings or systems that are merely alive but have no conscious experience because they are incapable of pleasure or suffering. Frankena maintains that to accord the status of “moral patients” to systems or nonconscious beings is to beg the question of ethical value and to make a claim that is simply “incredible” (Frankena, 1979, pp. 3-20).

Environmental individualism, however, is questionable on the grounds of both its philosophical intuitions and its consequences for environmental protection and sustainability. From a philosophical point of view, the environmental individualism of Frankena and Feinberg is suspect because it relies in large part on at least two problematic intuitions or postulates:

P1: *We cannot harm a being if it is not capable of consciousness*

P2: *Physical or psychological suffering is the only type of harm that we impose on another.*

Contrary to **P1**, however, it seems plausible to claim that if we destroy or even increase the probability of death of a living, nonconscious being—such as a large old tree—we cause it harm. Moreover we seem to cause harm to such a being for the same reason that we cause humans harm—by increasing their probability of death—even when they do not know it and even when there is no physical or psychological pain or suffering involved. As all those conversant with quantitative risk assessment realize, increasing my average annual probability of fatality—induced by exposure to a particular pollutant such as benlate, for example—clearly harms

me, even when I do not know it and even when there is no clear physical or psychological harm involved. I am harmed by having my life shortened or my death made more probable, even if such shortening or heightened probabilities are associated with no obvious physical symptoms of suffering. To ignore such probabilities is to presuppose that harm is simpler, more deterministic, more physical, and more obvious than it is. Contrary to what Feinberg, Frankena, and Parfit suggest, physical and psychological suffering does not appear to exhaust the category of harm (Parfit, 1984; Shrader-Frechette, 1987, pp. 50ff.; 1988, pp. 75-96). It seems equally plausible to claim that increasing the probability of death is an instance of harming a being. Likewise, to presuppose that consciousness or sentience is necessary for a being to be harmed is to presuppose a purely psychologistic definition of "harm." Psychological responses may be a sufficient condition for a person's being harmed, but clearly they are not a necessary condition. The presupposition errs because it confuses being harmed with knowing that one is harmed. Knowing that one is harmed does not seem to be a necessary condition for being harmed. And if not, then ethical individualists may err in assuming that beings can be harmed only if they are conscious and capable of suffering (Shrader-Frechette, 1988, pp. 75-96).

The environmental individualism of Frankena and Feinberg also appears problematic because it is premised on a metaphysics and science that presuppose that we harm individual sentient beings "one at a time." On the contrary, we can jeopardize obvious ecological interdependencies, system relationships, and cases of coevolution, despite our inability to describe fully these relationships through precise, predictive, general ecological theory (Shrader-Frechette and McCoy, 1993). These interdependencies show that the consequences of our actions can affect not merely individuals but a variety of biotic systems and relationships—such as the carbon cycle and the nitrogen cycle—that could be considered as moral patients. Moreover, to say that one can harm the carbon cycle and nitrogen cycle does not seem any more metaphorical a case of harm than to say that one has harmed the fuel-injection system of an automobile or the due-process system of a nation. And if so, then there may be both philosophical and metaphysical grounds for questioning environmental individualism and for subscribing to some sort of ethical holism.

First-Order Environmental Holism and Its Problems

Even Frankena opens the door to some version of ethical holism. For example, he admits that G.E. Moore and W.D. Ross were not individualists in the classical ethical sense. Moore held that a beautiful world would be intrinsically good even if there were no sentient beings to enjoy it, and Ross claimed that a state of affairs in which happiness is distributed in proportion to merit or virtue is intrinsically good (Frankena, 1979, pp. 3-20; Moore, 1903, p. 27). If the insights of persons such as Moore and Ross are plausible, then ethical

holism, as such, may not be as philosophically suspect as persons like Feinberg have alleged. We shall argue that what does seem problematic, however, are particular versions of holism, like that of J. Baird Callicott.

Callicott's first-order holistic environmental ethics, following Aldo Leopold, "locates ultimate value in the biotic community and assigns differential moral value to the constitutive individuals relatively to that standard" (Callicott, 1989, p. 37). He says that, "in the last analysis, 'the integrity, beauty, and stability of the biotic community' is the measure of right and wrong actions affecting the environment" (p. 58). In Callicott's view, the biotic community has not only moral considerability but primacy; he writes: "not only are other sentient creatures members of the biotic community and subordinate to its integrity, beauty, and stability; so are *we*. . . . [H]uman beings are equally subject to the same subordination of individual welfare and rights in respect to the good of the community as a whole" (pp. 92-93). In other words, he has a first-order ethical principle to optimize the welfare of the biotic community. Callicott has no second-order principles to use in adjudicating disputes between community and individual welfare because individual welfare is always subservient to community welfare. Thus Callicott subscribes to a first-order environmental holism.

Defending Leopold's (and his) ethics as Darwinian and sociobiological, Callicott argues persuasively that this holistic ethics is a natural result of the evolutionary extension of the boundaries of the moral community. Once we see land as a "biotic community," says Callicott, "the land (or environmental) ethic" emerges. The "conceptual and logical foundations of the land ethic," he says, are evolutionary and ecological biology, "a Copernican cosmology, a Darwinian protosociobiological natural history of ethics, Darwinian ties of kinship among all forms of life on earth, and an Eltonian model of the structure of biocenoses all overlaid on a Humean-Smithian moral psychology. Its logic is that natural selection has endowed human beings with an affective moral response to perceived bonds of kinship and community membership and identity; that today the natural environment, the land, is represented as a community" (Callicott, 1989, pp. 82-83). More specifically, Callicott argues that the biotic community, currently viewed as the ecosystem, has moral considerability because it is the object of a specially evolved public affection that all psychologically normal humans have inherited from a long line of primates (Callicott, 1989, p. 86). Providing for the moral considerability of nature as a whole, however, is problematic because this value apparently must be grounded in some property. Yet anyone could reasonably deny that a particular natural or metaphysical property, e.g., "stability," is truly good. To counter this difficulty, Callicott argues that "good and evil, like beauty and ugliness, rest in the final analysis upon feelings or sentiments which are, as it were, projected onto objects, persons, or actions and affectively 'color' them" (Callicott, 1989, p. 160). In so arguing Callicott realizes that "intrinsic or inherent value in nature in the strict, objective sense of the terms must by definition be abandoned if one assumes a

Humean subjectivist axiology” (Callicott, 1989, p. 161). Nevertheless, he says, this subjectivist axiology allows natural biotic communities to “be valued *for themselves*” (p. 163). It also escapes relativism, according to Callicott, because sociobiology has achieved a “consensus of feeling” through the “biologization of ethics.” Human ethical feelings, in turn, “have been standardized by natural selection” (p. 164).

Although first-order environmental holism, as such, may be ethically defensible, there are problems with some prominent versions of it espoused by philosophers and environmentalists such as Callicott. Callicott’s ethics, for example, fails because: (1) there is no biologically coherent notion of “community” robust enough to ground either contemporary scientific theory in community ecology or environmental ethics; (2) it is not possible to safeguard the “rights” of biological communities; (3) in relying on natural-selection mechanisms to deliver it from relativism, Callicott’s evolutionary ethics has lost its normative dimension; and (4) his version of ethical holism appears to sanction what Regan calls “environmental fascism.” Let’s examine these four points in order.

Following Leopold (1968), Callicott argues that all creatures are subordinate to the integrity, beauty, and stability of the biotic community. This first-order ethical imperative is problematic from a biological point of view because there is not a clear notion of balance, integrity, stability, or community. There is, for example, no clear sense in which one can claim that natural ecosystems proceed toward homeostasis, stability, or balance and no consensus among ecologists on the ecosystemic view of balance or stability (Peters, 1991; Shrader-Frechette and McCoy, 1993, chp. 2; Shrader-Frechette and McCoy, 1992, pp. 184-199; Taylor, 1986, p. 299), although there has been significant philosophical work on these concepts (Westra, 1994). Likewise, there is almost no support for the diversity-stability view held by MacArthur, Hutchinson, and Commoner (Connell, 1978, pp. 1302-1310; Goodman, 1975, pp. 237-266; Levins, 1974, pp. 123-138; Lewin, 1984, pp. 36-37; May, 1973; McArthur, 1955, pp. 533-536; McIntosh, 1985, p. 142; Norton, 1987, chp. 4, sect. 2; Paine, 1969, pp. 91-93; Sagoff, 1985a, pp. 107-110; Soulé, 1986, pp. 6-7; Taylor, 1986, p. 8). The reasons for the disfavor attributed to the view of MacArthur et al., are both empirical and theoretical. Salt marshes and the rocky intertidal are two of the many counterexamples to the diversity-stability view (Sagoff, 1985a, p. 109; Sagoff, 1985b, p. 81), and empirically based counterexamples have multiplied over the last two decades. May, Levins, Connell, and others have seriously challenged the diversity-stability hypothesis on both mathematical and field-based grounds (Connell, 1978; Levins, 1974; May, 1973; McIntosh, 1985, pp. 187-188; Sagoff, 1985a, p. 109). Even though some laypersons and policymakers appeal to the hypothesis, most ecologists have either repudiated it or cast strong doubt on it (Commoner, 1971, p. 38; Myers, 1983; U.S. Congress, 1973).

Doubts about balance and stability have arisen, in part, because ecologists cannot say what it would be, in a noncontroversial, precise, and nonquestion-begging way, to hinder some biological “balance,” “stability,” or “integrity.” Not only are

there a variety of competing definitions for each of these terms, but whether a particular term is applicable in a specific situation is largely a function of the temporal and spatial scale that is chosen. Moreover, communities and ecosystems regularly change and regularly eliminate species. Nature does not merely extirpate species or cause them to move elsewhere because their niches are gone. And if not, then there are no clear *ecological* grounds for defining and preserving some partial notion of balance or stability. Hence, it is not clear how Leopold's and Callicott's appeal to these ecological concepts can help defend a holistic environmental ethics. It will not do to say that what happens naturally is good, whereas what happens through human intervention is bad; this would be to solve the problem of defining "balance" or "stability" in a purely stipulative or *ad hoc* way. Nor can the criterion be merely that it is wrong for humans to do quickly (e.g., cause lake eutrophication) what nature does more slowly. One also would need both second-order ethical arguments (given by neither Callicott nor Leopold) that accelerating ecosystemic changes is bad, even if the changes themselves are natural, and second-order arguments that a particular account of what is "natural" is defensible.

Another conceptual problem besetting environmental appeals to ecological balance, wholeness, or integrity is that ecologists must take into account thousands of different communities, species, and individuals, relative to the health or balance of an ecosystem or the biosphere. It is not clear how to define the health of a system (as opposed to that of an individual), because system health is relative to some specific goal. Nor is it obvious how to define the system at issue. The ecological problem of defining the system at issue is analogous to the economic problem of defining a theory of social choice and choosing some "whole" that aggregates or represents numerous individual choices. Defining an ecological "whole" to which Callicott and Leopold can refer is especially problematic, both because the biologists (e.g., Clements, Elton, Forbes) cited by Callicott to explicate his views are no longer accepted by most contemporary scientists as having correct views about ecological communities, and because the contemporary variant of Clements's position, the GAIA hypothesis, has been rejected by most ecologists as unproved metaphor or mere speculation. At best it is an hypothesis. They admit the scientific facts of interconnectedness and coevolution on a small scale, but they point out that particular ecosystems and communities do not *persist* through time. Hence, there is no clear referent for the alleged "dynamic stability" of an ecosystem or community (Goodman, 1975, p. 239; McArthur, 1955; Norton, 1987, chp. 4 sect. 2; Shrader-Frechette, 1985, pp. 77-92; Shrader-Frechette and McCoy, 1993, chp. 2).

Moreover, it is not clear which (of many) alleged ecological communities whose balance or stability ought to be sought. One could seek to "stabilize" (whatever that is taken to mean) the ecosystem, or the association (McIntosh, 1985, pp. 44, 79, 107), or the trophic level, for example. Or, if one is a holist, then why should not the collection of communities and ecosystems be stabilized or optimized, namely, the biosphere? Optimizing the well-being of a particular community, how-

ever, does not lead to the optimization of another community in the biosphere or of a particular association. If not, then Callicott has little scientific basis for choosing a given “whole” as the unit that is to be stabilized or optimized (McIntosh, 1985, pp. 126ff., 157ff., 181-82ff., 252; Shrader-Frechette, 1985, pp. 77-92). One can make a *value judgment* to optimize the well-being of a particular community or the biosphere, but this is just that, a *value judgment*. It is not part of an empirically defensible ecological science.

Admittedly, once one makes a value judgment about which particular whole one wants to stabilize or balance, it is obvious that specific ecological conclusions are valid within certain spatial and temporal scales. Nevertheless, a given ecological conclusion regarding balance or integrity, for example, typically holds for some “wholes” (e.g., communities) and for some temporal and spatial scales but not others. Ecologists cannot optimize the welfare of all the different wholes (each having a different spatial and temporal scale) at the same time. Because they cannot, there is no general level at which ecological problem solving takes place. Hence, there is no general temporal or spatial scale within which a stable “whole” is exhibited. Also, because there is no general, universal ecological theory to which one can appeal in defining the “whole” about which Leopold and Callicott speak, ecologists are forced to work on a case-by-case basis. They recognize that there is no universal level, across all communities, at which some balanced or stable whole exists. In part this is because numerous alleged “wholes,” e.g., populations, exhibit density vagueness rather than density dependence, while other wholes do not (Strong, 1986, pp. 257-268). Also, many ecosystemic or holistic explanations are neither falsifiable nor even testable. For this reason, at least one scientist called ecosystems ecology “theological ecology” (McIntosh, 1985, p. 193). There is neither a clear definition of what it is to be balanced or stable, nor a clear definition of the whole that is allegedly balanced or stable. The absence of both definitions is attributable ultimately to the fact that theorists do not agree on the underlying processes that structure communities and ecosystems (Cody and Diamond, 1975; Gilpin and Diamond, 1984, pp. 298-315; Lewin, 1983, pp. 636-639; Simberloff, 1983, pp. 626-635; Strong, Simberloff, Abele and Thistle, 1984).

A second biological problem with Callicott’s holism concerns his argument in favor of duties to the biotic community and against according rights to individual members of the biotic community. He argues against the latter because he says that it is not possible to safeguard the rights of each individual; he says that such a “safeguard” would stop all trophic processes beyond photosynthesis (Callicott, 1989, pp. 43, 51). The biological problem with Callicott’s reasoning here is that nature does not respect communities either. There is strong biological evidence (e.g., fossilized pollens) of radical changes in community composition and structure throughout history (Graham, 1986, pp. 300-313; Strong, 1986). These changes, in turn, suggest that there is no such thing as a stable or balanced community “type” existing through time. Rather the types only appear stable because our time frame of examination is relatively short. Even if climate and environment remained the same,

however, communities could not be classified into balanced or stable “types.” Both spatial and temporal fluctuations undercut any universal notion of a stable or balanced community. And if so, then arguments analogous to those that Callicott uses against Regan can be used against him. Just as Callicott argues against Regan’s individual rights, by saying that nature does not respect them, so also we can argue against Callicott’s notion of stable communities, by saying that nature likewise does not respect them. If nature does not respect ecological communities, we need specific arguments to show how and why humans can be expected to do so.

A third problem with Callicott’s using biology to undergird his holistic environmental ethics is that he destroys the normative dimension of his ethics. This problem occurs because Callicott reasons, quite correctly, that in relying on a Humean notion of ethics, he is open to the charge of ethical relativism. He avoids this relativism by postulating that ethical uniformity/unanimity is achieved by means of natural selection. Callicott claims that “human feelings . . . have been standardized by natural selection” (Callicott, 1989, pp. 82ff.). His analysis fails to show that natural selection standardizes ethics in the requisite sense, however, because one can be neither morally blamed for doing something contrary to natural selection nor morally praised for acting in accord with natural selection. Either a certain ethical tendency is selected for, or it is not. As a result, behavioral uniformities that are explained through natural selection are descriptive, not normative. Hence Callicott may have saved his ethics from relativism, but at the price of its “oughtness” or normative character.

A similar normative problem occurs when epistemologists attempt to explain rules or norms of knowing by means of natural selection; their “evolutionary epistemology,” apart from other difficulties, is naturalized, descriptive, and non-normative. It is no longer epistemology, but psychology (Bartley, 1987, pp. 24-25; Hookway, 1984b, pp. 1-16; O’Hear, 1987, pp. 19-23). Similar to evolutionary epistemology, Callicott’s evolutionary ethics cannot take account of the fact that arriving at ethical beliefs/actions relies on cognitive and evaluative aims, on anticipating experience, solving problems, and so on. The “evolution: ethics” analogy therefore breaks down because, although evolution does not operate according to ends or aims, ethics does. Evolution and natural selection ignore the contribution to reflective self-understanding of ourselves as agents of inquiry, even though this reflective agency is at the core of ethical knowledge (Hookway, 1984b, pp. 13-15; O’Hear, 1987, pp. 27-29). Moreover Callicott’s natural-selection explanation fails to explain how someone could make the *first* correct ethical guess or have the *first* ethical feeling; at best, natural selection could only explain later correct guesses or feelings (Skagstad, 1978, p. 615).

Evolution and ethics are also disanalogous in that, in ethics, we select theories/behavior on the basis of hypotheses about the facts and our evaluations of them. In evolution, however, the facts themselves, neither our hypotheses nor our evaluations of them, are the guide. Hence, evolution is blind both to an

organism's evaluations of the facts and to the adaptive need of the organism, whereas ethics is blind to the facts and can see only evaluations or hypotheses about the facts (Skagestad, 1978, p. 617). For all of these reasons, Callicott's appeal to natural selection to ground his ethics appears to create more philosophical problems than it solves.

Apart from natural selection, Callicott's and Leopold's versions of ethical holism also are problematic because they sanction what Regan calls "environmental fascism" (Regan, 1983, p. 262; Taylor, 1986, p. 118; Rolston, 1987; Taylor, 1986, pp. 45-46, 225-226, 246, 259, 281-282). If one follows Callicott's and Leopold's first-order ethical principle of subordinating the welfare of all creatures to the integrity, beauty, and stability of the biotic community, then one subordinates individual human welfare, in all cases, to the welfare of the biotic community. This means that a second-order conflict over community versus individual welfare could not arise. With no second-order ethical principles to protect humans, under at least some circumstances, massive human deaths or violations of basic civil liberties could be justified, even required, on the grounds that allowing them would help check the population problem and contribute to the good of the biosphere. Such an argument has already been proposed by Garrett Hardin in his famous discussion of "lifeboat ethics" and by a number of "deep ecologists" following in the tradition of Thomas Malthus, Paul Ehrlich, and David Foreman (Hardin, 1974, pp. 561-568; Young, 1990, pp. 128ff.). Of course, Callicott denies that his ethics would lead to "environmental fascism." He claims that his environmental ethics presupposes that all existing systems of human rights would remain in existence (Callicott, 1989, p. 93). However, his verbal response here does not solve the conceptual problem, and for two reasons. First, it is inconsistent with his continuing claims for the priority of the biotic community. If the welfare of the biotic community takes priority over human rights, as he claims, then existing systems of human rights would no longer be in operation, contrary to Callicott's claims. Second, apart from inconsistency, it is impossible to maximize two variables and hence impossible to give priority position to both the biotic community and to human rights. If Callicott does the former, he can be accused of being an environmental fascist. If he does the latter, then he contradicts his own claims for the priority of the biotic community and is no longer the biocentric holist that he claims to be. The only way to recognize both community and human-rights values is to have second-order ethical principles and a priority ranking system that specifies the respective conditions under which holistic and individualistic ethical principles ought to be recognized. In the remainder of this essay, I shall sketch such a ranking system. It is a third position, a way of integrating holistic and individualistic ethics so as to safeguard basic human rights while recognizing environmental welfare.

HIERARCHICAL HOLISM

We might call this integrated position “hierarchical holism” because it recognizes the plausibility of attributing inherent worth (therefore the status of moral patients) to systems and processes that are not sentient, yet it provides for a hierarchical or lexicographic ordering of various duties regarding humans, other beings, and environmental systems or processes. Several of the most prominent characteristics of this hierarchical holism are: (1) that it is based on a metaphysical rather than merely a scientific notion of the biotic community; (2) that it relies on an ethics that is both anthropocentric and biocentric; and (3) that it includes some second-order ethical principles capable of adjudicating conflicts among human versus nonhuman interests.

Because of all the ecological difficulties (already mentioned) with current scientific definitions of biotic wholes, their boundaries, and their processes, hierarchical holism relies on a metaphysical, not merely a scientific, account of biotic communities. As our earlier criticisms of Leopold’s and Callicott’s first-order environmental holism reveal and as Arne Naess’s criticisms of “ecologism” argue (Naess, 1989, pp. 26-27, 39-40, 130-33), there is no ecological conception of holism that is precise, predictive, and clear. Hence, our view of the biotic whole must be based on some metaphysical presuppositions about the value of various processes, systems, relationships, and species. Possibly ecologists are the best persons to make the metaphysical and value judgments about how to define this biotic whole; nevertheless, such judgments are based on expert opinion and values, not merely on scientific fact. As a consequence of such ecological judgments, hierarchical holism is not subject to the same scientific criticisms as Leopold’s and Callicott’s versions of holism discussed earlier.

Hierarchical holism also relies on partially anthropocentric accounts of ethical behavior because ecology is insufficiently precise and predictive regarding concepts such as equilibrium, homeostasis, stability, and community. Hence, we humans—given unavoidably human understanding of the natural world—must make our best guesses as to how to maintain some biotic health. Again, ecologists may be in the best position to offer opinions on this issue because of their professional expertise. The main point, however, is to “call a spade a spade”: because of the problems with scientific or biocentric definitions of stability, our holistic ethics has a warrant which is metaphysical rather than purely ecological and which is unavoidably and partially anthropocentric rather than purely biocentric. As a consequence, our hierarchical holism, unlike other versions of holism, retains the full normative force of ethics.

In order to avoid the incoherence besetting the environmental ethics of all those who posit both holism and human rights but provide no clear and specific way to adjudicate conflicts, hierarchical holism provides some second-order principles. As a consequence, of course, it cannot postulate the “biotic equality” of ethicists

such as Callicott or Paul Taylor (Taylor 1986). Instead, it must establish principles specifying a hierarchy of duties, rights, and responsibilities. One possible second-order principle might be to give priority to strong human rights (such as the right to bodily security) over duties to any other environmental or biocentric goal, and to give priority to environmental and biocentric goals over weak human rights (such as rights to property). By following such second-order principles, we not only have a practical scheme for adjudicating environmental controversies, but also we have a rule that places the burden of proof on anyone who interferes with nature for any reason except to preserve strong human rights (Naess, 1989, pp. 26-27). There is no space here to defend the strong rights/weak rights framework, but Ronald Dworkin provides one possible justification (Dworkin, 1977, pp. 267-279; Shrader-Frechette and McCoy, 1993, chps. 6, 7, 9). Strong rights, on his scheme, are essential to human dignity and personhood; they are rights that can never be overridden. Weak rights are those that are not essential, that can be overridden if the common good demands it. One benefit of the strong rights/weak rights framework is that it allows us to avoid environmental fascism and to recognize the most basic human rights even though it calls for more stringent protection of the environment.

By giving priority to strong human rights over environmental welfare, and to environmental welfare over weak human rights, we appear to be following priorities that are similar to those of Naess and Sessions who argue that humans have no right to reduce the richness and diversity of the world except to satisfy vital human needs (Naess, 1989, ch. 1). Hence, our hierarchical holism appears consistent with deep ecology, in at least some respects. For those who argue that we need a biotic equality, not a hierarchical environmental ethics, however, we can make several responses. First, Aristotle's basic intuition—that ethics requires us to treat equal beings equally—seems correct (Aristotle, 1973, pp. 1131a10-1131a30). Because humans are not equal to nonhumans as moral agents, or as free and responsible beings, or as having the capacity to suffer and be harmed, it is not obvious that they ought to be treated as equal moral patients. Moreover, treating all members of the biotic community equally is impossible, given the requirements for human food and shelter and the disturbance that accompanies meeting such requirements. Hence, in order to operationalize any environmental ethics, there are practical requirements for second-order principles; otherwise we would face the Scylla of environmental fascism or the Charybdis of being unable to adjudicate environmental controversies.

In addition to second-order principles there are, of course, a number of other important steps for converting hierarchical holism to a workable and practical environmental ethics that can be used as a basis for policymaking. One of the most important conditions for implementing hierarchical holism is that persons understand and accept a number of important principles of environmental education that illustrate the mutual interdependencies of the inhabitants of the planet (Palmer, 1992, pp. 181-186; Shrader-Frechette and McCoy, 1993, chp. 10). In the light of such interdependencies, it is obvious, for example, that protecting fish from dan-

gerous pesticide runoff is essential also to protecting humans and vice versa. Understanding the necessity for sustainable agriculture and sustainable population growth is also a precondition for accepting the reforms entailed by implementing hierarchical holism (Harwood, 1993). Environmental education thus is essential to implementing a new environmental ethics of hierarchical holism because without it, policymakers will face endless debates over coercive means of environmental management. Without education, presumably people would have no choice except for environmental management based on Garrett Hardin's principle: "mutual coercion mutually agreed upon" (Hardin, 1968, pp. 1243-1248).

Once persons have accepted environmental education and principles of hierarchical holism, actually using these ethics in policymaking will require a significant amount of ethical analysis, so as to assess the practical consequences of specific policy actions. This ethical analysis will need to incorporate not only traditional considerations of ethical decisionmaking in situations of social and individual choice, but it also will need to be implemented within an improved framework of environmental risk assessment (including negotiation or adversary assessment) (Shrader-Frechette, 1991b, chps. 11-12), and within a new system of environmentally enlightened laws governing property and toxic torts (Caldwell and Shrader-Frechette, 1993; Cranor, 1993). In addition, implementing environmental ethics in the form of hierarchical holism will also require us to change the burden of proof in policymaking regarding the environment and to look for procedural ways (including ethical analysis) to resolve environmental controversies. There is no time to sketch these implementation schemes here, but a variety of attorneys, policymakers, scientists and risk assessors have already begun to outline the needed environmental reforms (Caldwell and Shrader-Frechette, 1993; Cranor, 1993; Hardin, 1968; Harwood, 1993; Palmer, 1992; Shrader-Frechette, 1991).

In response, traditional philosophers might object, as does Passmore, that all holistic ethics are misguided by virtue of being based on irrationality or mysticism (Passmore, 1974, pp. 173ff.). This objection appears to miss the mark, however. Attributing ethical or metaphysical value to nonhuman, nonsentient, or nonindividual beings does not presuppose either mysticism or irrationality, any more than Moore's or Ross's attributing value to nonsentient beings presupposes mysticism or irrationality. Moreover, just as Frankena admits that, for the person who is unconvinced, there is no compelling response to the person who asks "Why be moral?" (Frankena, 1963, pp. 96-98), so also there is no compelling response to the unconvinced person who inquires, "Why value nonhumans or biotic wholes?" Just as the lack of a compelling response to the first question does not undercut ethics, so also the lack of a compelling response to the second question does not undercut hierarchical holism. Indeed, the burden of proof may be on those who presuppose only an instrumental rationality, or (what Passmore calls) a "puritanical" rationality that fails to have an adequately sensuous appreciation of nature (Passmore, 1974, p.

188). There may be something wrong with an ethics that narrows the scope of human rationality and appreciation rather than expands it.

CONCLUSION

Neither the invisible hand of economic law and environmental individualism nor the invisible hand of precise, predictive ecological law and first-order environmental holism are sufficient for planetary sustainability. But if not, then environmental ethics needs to move beyond science—beyond economics and ecology—to ground environmental protection. We need to move to a hierarchical holism that is both biocentric and anthropocentric. We need to move to an environmental ethics based on a healthy and sane metaphysics rather than based only on incomplete sciences. Most of all, we need an environmental ethics based both on what we wish the world to be and on what scientists tell us it is.

REFERENCES

- Aristotle. 1973. *Nichomachean Ethics*, edited by John Burnet. New York: Arno Press.
- Atkinson, W. and B. Shorrocks. 1981. "Competition on a Divided and Ephemeral Resource: A Simulation Model," *Journal of Animal Ecology*, 50: 461-471.
- Bartley, W. 1987. "Philosophy of Biology Versus Philosophy of Physics." Pp. 7-46 In *Evolutionary Epistemology, Rationality, and the Sociology of Knowledge*, edited by Radnitzky and W. Bartley. LaSalle, Ill.: Open Court.
- Caldwell, L. K. and K. S. Shrader-Frechette. 1993. *Policy for Land: Law and Ethics*. Savage, MD: Rowman and Littlefield.
- Callicott, J. B., ed. 1987. *Companion to a Sand County Almanac: Interpretive and Critical Essays*. Madison, WI: University of Wisconsin Press.
- . 1989. *In Defense of the Land Ethic: Essays in Environmental Philosophy*. Albany: State University of New York Press.
- Cody, M. L. 1968. "On the Methods of Resource Division in Grassland Bird Communities." *American Naturalist*, 102: 107-145.
- Cody, M. L. and J. M. Diamond, eds. 1975. *Ecology and the Evolution of Communities*. Cambridge: Harvard University Press.
- Cole, L. 1960. "Competitive Exclusion." *Science*, 132: 348-349.
- Commoner, B. 1971. *The Closing Circle*. New York: Knopf.
- Connell, J. H. 1978. "Diversity in Tropical Rain Forests and Coral Reefs." *Science*, 199: 1302-1310.
- . 1980. "Diversity and the Coevolution of Competitors." *Oikos*, 35: 1314-1338.
- . 1983. "On the Prevalence and Relative Importance of Interspecific Competition: Evidence from Field Experiments." *American Naturalists* 122: 661-696.
- Cranor, C. 1993. *Regulating Toxic Substances*. New York: Oxford University Press.
- Davidson, N. 1978. "Ecological Questions about Territorial Behaviour." In *Behavioural ecology: An Evolutionary Approach*, edited by J. R. Krebs and N. B. Davies. Oxford: Blackwell Scientific Publications.
- Feinberg, J. 1974. "The Rights of Animals and Unborn Generations." Pp. 43-68 In *Philosophy and Environmental Crisis*, edited by W. Blackstone. Athens, GA: University of Georgia Press.
- Frankena, W. 1963. *Ethics*. Englewood Cliffs, NJ: Prentice-Hall.
- . 1979. "Ethics and the Environment." Pp. 3-20 In *Ethics and Problems of the 21st Century*, edited by K. E. Goodpaster and K. M. Sayre. Notre Dame: University of Notre Dame Press.

- Gilpin, M. E., and J. M. Diamond. 1982. "Factors Contributing to Non-Randomness in Species co-occurrences on Islands." *Oecologia*, 52: 75-84.
- _____. 1984. Are species co-occurrences on islands non-random, and are null hypotheses useful in community ecology? Pp. 297-315 in *Communities: Conceptual Issues and the Evidence*, edited by D. R. Strong, et al. Princeton: Princeton University Press.
- Goodman, D. 1975. "The Theory of Diversity-Stability Relationships in Ecology." *Quality Review of Biology*, 50: 237-266.
- Graham, R. W. 1986. "The late quaternary." In *Community Ecology*, edited by J. M. Diamond and T. Case. New York: Harper and Row.
- Hardin, G. 1960. "The Competitive Exclusion Principle." *Science*, 131: 1292-1297.
- _____. 1968. "The Tragedy of the Commons." *Science*, 162: 1243-1248.
- _____. 1974. "Living on a lifeboat." *Bioscience*, 24: 561-568.
- Harwood, R. R. and the Committee on Sustainable Agriculture and the Environment in the Humid Tropics. 1993. *Sustainable Agriculture and the Environment in the Humid Tropics*. Washington, D.C.: National Academy Press.
- Hookway, C., ed. 1984. *Minds, Machines, and Evolution*. Cambridge: Cambridge University Press.
- _____. 1984b. "Naturalism, Fallibilism, and Evolutionary Epistemology." Pp. 1-16 in *Minds, Machines, and Evolution*, edited by C. Hookway. Cambridge: Cambridge University Press.
- Hutchinson, G.E. 1959. "Homage to Santa Rosalia," *American Naturalist*, 93: 145-159.
- Leopold, A. 1968. *A Sand County Almanac*. New York: Oxford University Press.
- Levins, R. 1974. "The Qualitative Analysis of Partially Specified Systems," *Annals of the New York Academy of Science*, 231: 123-138.
- Lewin, R. 1983. "Santa Rosalia was a Goat," *Science*, 221: 636-639.
- _____. 1984. "Fragile Forests implied by Pleistocene Data," *Science*, 226: 36-37.
- Luria, S. and M. Delbruck. 1943. "Mutations of Bacteria from Virus Sensitivity to Virus Resistance," *Genetics*, 28: 491-511.
- MacArthur, R.H. 1955. "Fluctuations of Animal Populations, and a Measure of Community Stability," *Ecology*, 36: 533-536.
- MacArthur, R.H. and R. Levins. 1967. "The Limiting Similarity, Convergence, and Divergence of Coexisting Species," *American Naturalist*, 101: 377-385.
- May, R.M. 1973. *Stability and Complexity in Model Ecosystems*. Princeton: Princeton University Press.
- McIntosh, R.P. 1985. *The Background of Ecology: Concept and Theory*. Cambridge: Cambridge University Press.
- Moore, G.E. 1903. *Principia Ethica*. Cambridge: Cambridge University Press.
- Myers, N. 1983. *A Wealth of Wild Species*. Boulder: Westview Press.
- Naess, A. 1989. *Ecology, Community, and Lifestyle*, translated by D. Rothenberg. Cambridge: Cambridge University Press.
- Norton, B.G. 1987. *The Spice of Life: Why Save Natural Variety?* Princeton, NJ: Princeton University Press.
- O'Hear, A. 1987. "Has the Theory of Evolution any Relevance to Philosophy?" *Ratio*, 29: 16-35.
- Paine, R.T. 1969. "A Note on Trophic Complexity and Community Stability," *American Naturalist*, 103: 91-93.
- Palmer, J.A. 1992. "Towards a Sustainable Future." Pp. 181-196 in *The Environment Question*, edited by D.E. Cooper and J.A. Palmer. New York: Routledge.
- Parfit, D. 1984. *Reasons and Persons*. Oxford: Clarendon Press.
- Passmore, J. 1974. *Man's Responsibility for Nature*. New York: Charles Scribner's Sons.
- Peters, R. 1991. *A Critique for Ecology*. Cambridge: Cambridge University Press.
- Regan, T. 1983. *The Case for Animal Rights*. Berkeley: University of California Press.
- Rolston, H. 1987. "Duties to Ecosystems." In *Companion to a Sand County Almanac: Interpretive and Critical Essays*, edited by J. B. Callicott. Madison, WI: University of Wisconsin.
- Ross, W.D. 1930. *The Right and the Good*. Oxford: Clarendon Press.
- Sagoff, M. 1985a. "Fact and Value in Environmental Science," *Environmental Ethics*, 7: 107-110.

- _____. 1985b. *Environmental Science and Environmental Law*, Unpublished essay Center for Philosophy and Public Policy, College Park, Maryland, March.
- Shrader-Frechette, K.S. 1985. "Organismic Biology and Ecosystems Ecology." Pp. 77-92 in *Current Issues in Teleology*, edited by N. Rescher. Pittsburgh: Center for Philosophy of Science.
- _____. 1987. "Parfit and Mistakes in Moral Mathematics," *Ethics* 97: 50ff.
- _____. 1988. "Parfit, Risk Assessment, and Imperceptible Effects," *Public Affairs Quarterly*, 2: 75-96.
- _____. 1991a. *Environmental Ethics*, 2nd ed. Pacific Grove, CA: Boxwood Press.
- _____. 1991b. *Risk and Rationality*. Berkeley: University of California Press.
- Shrader-Frechette, K.S. and E. D. McCoy. 1992. "Community Ecology, Scale, and the Instability of the Stability Concept." Pp. 184-199 in *Philosophy of Science Association 1992*, edited by M. Forbes, D. Hull and K. Okruhlik. East Lansing, MI: Philosophy of Science Association.
- _____. 1993. *Method in Ecology*. Cambridge: Cambridge University Press.
- Siegel, H. 1985. "What is the Question Concerning the Rationality of Science?" *Philosophy of Science*, 52: 517-537.
- Simberloff, D. 1983. "Competition Theory, Hypothesis Testing, and Other Community Ecological Buzzwords," *American Naturalist*, 122: 626-635.
- Simberloff, D. and W. Boecklen. Santa Rosalia reconsidered. *Evolution*, 35: 1206-1228.
- Skagestad, P. 1978. "Taking Evolution Seriously: Critical Comments on D.T. Campbell's Evolutionary Epistemology," *The Monist*, 61: 611-621.
- Soulé, M.E. 1986. "Conservation Biology and the 'Real World'." Pp. 1-12 in *Conservation Biology: The Science of Scarcity and Diversity*, edited by M.E. Soulé. Cambridge, MA: Cambridge University Press.
- Stebbins, G. 1978. "In Defense of Evolution: Tautology or Theory," *American Naturalist*, 111: 386-390.
- Strong, D.R. 1982. "Harmonious Coexistence of Hispine Beetles on *Heliconia* in experimental and natural communities," *Ecology*, 63: 1039-1049.
- _____. 1986. "Density Vagueness: Abiding the Variance in the Demography of Real Populations." Pp. 257-268 in *Community Ecology*, edited by J. Diamond and T. Case. New York: Harper and Row.
- Strong, D.R., D. Simberloff, L. Abele and A. Thistle, eds. 1984. *Ecological Communities: Conceptual Issues and the Evidence*. Princeton: Princeton University Press.
- Taylor, P. 1986. *Respect for Nature*. Princeton: Princeton University Press.
- Toulmin, S. 1972. *Human Understanding*, Vol. 1. Princeton: Princeton University Press.
- U.S. Congress, Senate, *Congressional Record*, 93rd Congress, First Session, 119 (24 July 1973): 25668.
- Westra, L. 1994. *The Principle of Integrity*. Savage, MD: Rowman and Littlefield.
- Young, J. 1990. *Sustaining the Earth*. Cambridge: Harvard University Press.