

**Ethics: An International Journal of Social,
Political, and Legal Philosophy**
18(no. 2, 1975):93-109.

Is There an Ecological Ethic?

Holmes Rolston III

Colorado State University

*The Ecological Conscience*¹ is the arresting title of a representative environmental anthology. The puzzlement lies neither in the noun nor in the by now familiar modifier, but in their operation on each other. We are comfortable with a Christian or humanist ethic, but the moral noun does not regularly take a scientific adjective: a biological conscience, a geological conscience. In a celebrated survey, *The Subversive Science** where ecology reaches into our ultimate commitments, Paul Sears entitles an essay "The Steady State: Physical Law and Moral Choice." To see how odd, ethically and scientifically, is the conjunction, replace homeostasis with gravity or entropy.

The sense of anomaly will dissipate, though moral urgency may remain, if an environmental ethic proves to be only an ethic—utilitarian, hedonist, or whatever—*about* the environment, brought to it, informed concerning it, but not in principle ecologically formed or reformed. This would be like medical ethics, which is applied to but not derived from medical science. But we are sometimes promised more, a derivation in which the newest bioscience shapes (not to say, subverts) the ethic, a resurgent naturalistic ethics. "We must learn that nature includes an intrinsic value system," writes Ian McHarg.³ A *Daedalus* collection is introduced with the same conviction: Environmental science "is the building of the structure of concepts and natural laws that will enable man to understand his place in nature. Such understanding must be one basis of the moral values that guide each human generation in exercising its stewardship over the earth. For this purpose ecology—the science of interactions among living things and their environments—is central."⁴ We shall presently inquire into the claim that an

1. Robert Disch, ed., *The Ecological Conscience: Values for Survival* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970).

2. Paul Shepard and Daniel McKinley, eds., *The Subversive Science* (Boston: Houghton Mifflin Co., 1969).

3. Ian L. McHarg, "Values, Process, and Form," in Disch, p. 21.

4. Roger Revelle and Hans H. Landsberg, eds., *America's Changing Environment* (Boston: Beacon Press, 1970), p. xxii.

ecological ultimacy lies in "The Balance of Nature: A Ground for Values." Just what sort of traffic is there here between science and morality?

The boundary between science and ethics is precise if we accept a pair of current (though not unargued) philosophical categories: the distinction between descriptive and prescriptive law. The former, in the indicative, marks the realm of science and history. The latter, including always an imperative, marks the realm of ethics. The route from one to the other, if any, is perhaps the most intransigent issue in moral philosophy, and he who so moves will be accused of the naturalistic fallacy. No set of statements of fact by themselves entails any evaluative statement, except as some additional evaluative premise has been introduced. With careful analysis this evaluation will reappear, the ethics will separate out from the science. We shall press this logic on ecological ethics. Environmental science describes what is the case. An ethic prescribes what ought to be. But an environmental ethic? If our categories hold, perhaps we have a muddle. Or perhaps a paradox that yields light on the linkage between facts and values.

We find representative spokesman for ecological morality not of a single mind. But the multiple species can, we suggest, be classified in two genera, following two concepts that are offered as moral sources. (A) Prominent in, or underlying, those whom we hear first is the connection of homeostasis with morality. This issues largely in what we term an ethic that is secondarily ecological, (fl) Beyond this, surpassing though not necessarily gainsaying it, is the discovery of a moral ought inherent in recognition of the holistic character of the ecosystem, issuing in an ethic that is primarily ecological.

But first, consider an analogue. When advised that we ought to obey the laws of health, we analyze the injunction. The laws of health are nonmoral and operate inescapably on us. But, circumscribed by them, we have certain options: to employ them to our health, or to neglect them ("break them") to our hurt. Antecedent to the laws of health, the moral ought reappears in some such form as, "You ought not to harm yourself." Similarly the laws of psychology, economics, history, the social sciences, and indeed all applied sciences describe what is (has been, or may be) the case; but in confrontation with human agency, they prescribe what the agent must do if he is to attain a desired end. They yield a technical ought related to an if-clause at the agent's option. So far they are nonmoral; they become moral only as a moral principle binds the agent to some end. This, in turn, is transmitted through natural law to a proximate moral ought. Let us map this as follows:

<i>Technical Ought</i> You ought not to break the laws of health	<i>Natural Law</i> for the laws of health describe the conditions of welfare	<i>Antecedent If-Option</i> if you wish not to harm yourself.
<i>Proximate Moral Ought</i> You ought not to break the laws of health	<i>Natural Law</i> for the laws of health describe the conditions of welfare	<i>Antecedent Moral Ought</i> and you ought not to harm yourself.

Allow for the moment that (in the absence of overriding considerations) prudence is a moral virtue. How far can ecological ethics transpose to an analogous format?

Perhaps the paramount law in ecological theory is that of homeostasis. In material, our planetary ecosystem is essentially closed, and life proceeds by recycling transformations. In energy, the system is open, with balanced solar input and output, the cycling being in energy subsystems of aggradation and degradation. Homeostasis, it should be noted, is at once an achievement and a tendency. Systems recycle, and there is energy balance; yet the systems are not static, but dynamic, as the forces that yield equilibrium are in flux, seeking equilibrium yet veering from it to bring counterforces into play. This perpetual stir, tending to and deviating from equilibrium, drives the evolutionary process,

1. How does this translate morally? Let us consider first a guarded translation. In "The Steady State: Physical Law and Moral Choice," Paul Sears writes: "Probably men will always differ as to what constitutes the good life. They need not differ as to what is necessary for the long survival of man on earth. Assuming that this is our wish, the conditions are clear enough. As living beings we must come to terms with the environment about us, learning to get along with the liberal budget at our disposal, promoting rather than disrupting those great cycles of nature—of water movement, energy flow, and material transformation that have made life itself possible. As a physical goal, we must seek to attain what I have called a steady state."⁵ The title of the article indicates that this is a moral "must." To assess this argument, begin with the following:

<i>Technical Ought</i>	<i>Ecological Law</i>	<i>Antecedent If-Option</i>
You ought to recycle	for the life-supporting ecosystem recycles or perishes	if you wish to preserve human life.

When we replace the if-option by an antecedent moral ought, we convert the technical ought to a proximate moral ought. Thus the "must" in the citation is initially one of physical necessity describing our circumscription by ecological law, and subsequently it is one of moral necessity when this law is conjoined with the life-promoting ought.

<i>Proximate Moral Ought</i>	<i>Ecological Law</i>	<i>Antecedent Moral Ought</i>
You ought to recycle	for the life-supporting ecosystem recycles or perishes	and you ought to preserve human life.

The antecedent ought Sears takes, fairly enough, to be common to many if not all our moral systems. Notice the sense in which we can break ecological law. Spelling—the conditions of stability and instability, homeostatic laws

5. Shepard and McKinley, p. 401.

operate on us willy-nilly, but within a necessary obedience we have options, some of which represent enlightened obedience. To break an ecological law, means then, to disregard its implications in regard to an antecedent moral ought.

Thus far ecological morality is informed about the environment, conforming to it, but is not yet an ethic in which environmental science affects principles. Antecedent to ecological input, there is a classical ethical principle, "promoting human life," which, when ecologically tutored, better understands life's circulations, whether in homeostasis, or in DDT, or strontium 90. Values do not (have to) lie in the world but may be imposed on it, as man prudentially manages the world.

2. Much attention has focused on a 1968 address, "The Tragedy of the Commons," given by Garrett Hardin to the American Association for the Advancement of Science. Hardin's argument, recently expanded to book length, proposes an ecologically based "fundamental extension in morality."⁶ While complex in its ramifications and deserving of detailed analysis, the essential ethic is simple, built on the model of a village commons, Used by the villagers to graze cattle, the commons is close to its carrying capacity. Any villager who does not increase his livestock will be disadvantaged in the market. Following self-interest, each increases his herd; and the commons is destroyed. Extended to the planet, seen as a homeostatic system of finite resources the model's implication of impending tragedy is obvious. (The propriety of the extrapolation is arguable, but not at issue here.) The prescription of an ecological morality is "mutual coercion, mutually agreed on" in which we limit freedom to grow in order to stabilize the ecosystem to the mutual benefit of all.

To distill the ethics here is not difficult. We begin as before, with ecological law that yields options, which translate morally only with the addition of the life-promoting obligation.

<i>Technical Ought</i> We ought to stabilize the ecosystem thru mutually limited growth	<i>Ecological Law</i> for the life-supporting ecosystem stabilizes at a finite carrying capacity or is destroyed	<i>Antecedent If-Option</i> if we wish mutually to preserve human life, imposed
<i>Proximate Moral Ought</i> We ought to stabilize the ecosystem thru mutually imposed self-limited growth	<i>Ecological Law</i> for the life-supporting ecosystem stabilizes at a finite carrying capacity or is destroyed	<i>Antecedent Moral Ought</i> and we ought mutually to preserve human life.

To clarify the problem of mutual preservation, Hardin uses an essentially Hobbesian scheme. Every man is an ego set over against the community, acting in his own self-interest. But to check his neighbor's aggrandizement, he compromises and enters a social contract where, now acting in enlight-

6. Garrett Hardin, "The Tragedy of the Commons," *Science* 162 (1968): 1243-48.

ened self-interest; he limits his own freedom to grow in return for a limitation of the encroaching freedom of his competitors. The result is surprisingly atomistic and anthropocentric, recalling the post-Darwinian biological model, lacking significant place for the mutual interdependence and symbiotic cooperation so prominent in recent ecology. In any event, it is clear enough that Hardin's environmental ethic is only a classical ethic applied in the matrix of ecological limitations.

Typically, ecological morality generated by population pressure resolves itself into a particular case of this kind, as for instance in the analysis of Paul Ehrlich in *The Population Bomb*. This is an ethic of scarcity, but morality since its inception has been conceived in scarcity.

3, Let us pass to a more venturesome translation of homeostasis into moral prescription, that of Thomas B. Colwell, Jr. "The balance of Nature provides an objective normative model which can be utilized as the ground of human value. . . . Nor does the balance of Nature serve as the source of all our values. It is only *the ground* of whatever other values we may develop. But these other values must be consistent with it. The balance of Nature is, in other words, a kind of ultimate value. . . . It is a *natural* norm, not a product of human convention or supernatural authority. It says in effect to man: 'This much at least you must do, this much you must be responsible for. You must at least develop and utilize energy systems which recycle their products back into Nature.' . . . Human values are founded in objectively determinable ecological relations with Nature. The ends which we propose must be such as to be compatible with the ecosystems of Nature."⁷

Morality and homeostasis are clearly blended here, but it is not so clear how we relate or disentangle them. Much is embedded in the meanings of "ground of human value," "ultimate value," the mixed moral and physical "must," and the identification of a moral norm with a natural limit. Let us mark out first a purely technical ought, followed by an antecedent moral ought which may convert to a proximate moral ought.

<i>Technical Ought</i> You ought to recycle	<i>Ecological Law</i> for the value-supporting ecosystem recycles or perishes	<i>Antecedent If-Option</i> if you wish to preserve the ground of human value.
<i>Proximate Moral Ought</i> You ought to recycle	<i>Ecological Law</i> for the value-supporting ecosystem recycles or perishes	<i>Antecedent Moral Ought</i> and you ought to preserve the ground of human value.

The simplest reading of Colwell is to hold, despite his exaggerated terms, that the "ground of human value" means only the limiting condition, itself value free, within which values are to be constructed. Homeostasis is not "an ultimate value," only a precondition of the value enterprise, necessary but

7. Thomas B. Colwell, Jr., "The Balance of Nature: A Ground for Human Values," *Main Currents in Modern Thought* 26 (1969): 50.

not sufficient for value. But then it is misleading to say that "human values have a root base in ecological relationships." For homeostasis, like scarce resources, or the cycling seasons, or soil characteristics, or the conservation of matter-energy, is a natural given, the stage on which the value-drama is played.

If, seeking to manage my finances wisely, I ask, "How shall I spend my money?" and you counsel, "You ought to balance your budget," the advice is sound enough, yet only preparatory to serious discussion of economic values. The balanced budget is necessary but not sufficient for value, a ground of value only in an enabling, not a fundamental sense; certainly not what we would ordinarily call an ultimate value. It is true, of course, that the means to any end can, in contexts of desperation and urgency, stand in short focus as ultimate values, Air, food, water, health, if we are deprived of them, become at once our concern. Call them ultimate values if you wish, but the ultimacy is instrumental, not intrinsic. We should think him immature whose principal goal was just to breathe, to eat, to drink, to be healthy—merely this and nothing more. We would judge a society stagnant whose ultimate goal was but to recycle. To say that the balance of nature is a ground for human values is not to draw any ethics from ecology, as may first appear, but only to recognize the necessary medium of ethical activity.

Thus far, ecological ethics reduces rather straightforwardly to the classical ethical query now advised of certain ecological boundaries. The stir is, to put it so, about the boundedness, not the morality. The ultimate science may well herald limits to growth; it challenges certain presumptions about rising standards of living, capitalism, progress, development, and so on; convictions that, though deeply entrenched parameters of human value, are issues of what is, can, or will be the case, not of what ought to be. This realization of limits, dramatically shift ethical application though it may, can hardly be said to reform our ethical roots, for the reason that its scope remains (when optimistic) a maximizing of human values or (when pessimistic) human survival. All goods are human goods, with nature an accessory. There is no endorsement of any natural Tightness, only the acceptance of the natural given. It is ^ecological secondarily, but primarily anthropological.

The claim that morality is a derivative of the holistic character of the ecosystem proves more radical, for the ecological perspective penetrates not only the secondary but also the primary qualities of the ethic. It is ecological in substance, not merely in accident; it is ecological per se, not just consequentially.

Return, for instance, to Colwell. He seems to mean more than the minimal interpretation just given him. The mood is that the ecological circumscription of value is not itself amoral or premoral, neatly articulated from morality. Construct values though man may, he operates in an environmental context where he must ground his values in ecosystemic obedience. This

"must" is ecologically descriptive: certain laws in fact circumscribe him and embrace his value enterprises. And it is also morally prescriptive: given options within parameters of necessary obedience, he morally ought to promote homeostasis. But here, advancing on the preceding argument, the claim seems to be that following ecological nature is not merely a prudential means to moral and valuational ends independent of nature but is an end in itself; or, more accurately, it is within man's relatedness to his environment that all man's values are grounded and supported. In that construction of values, man doubtless exceeds any environmental prescription, but nevertheless his values remain environmental reciprocals. They complement a homeostatic world. His valuations, like his other perceptions and knowings, are interactionary, drawn from environmental transactions, not merely brought to it. In this environmental encounter, he finds homeostasis a key to all values—the precondition of values, if you will—but one which, for all that, informs and shapes his other values by making them relational, corporate, environmental. But we are passing over to moral endorsement of the ecosystemic character, and to a tenor of argument that others make clearer.

Perhaps the most provocative such affirmation is in a deservedly seminal essay, "The Land Ethic," by Aldo Leopold. He concludes, "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."⁸ Leopold writes in search of a morality of land use that escapes economic expediency. He too enjoins, proximately, recycling, but it is clear that his claim transcends the immediate context to teach that we morally ought to preserve the excellences of the ecosystem (or, more freely as we shall interpret him, to maximize the integrity, beauty, and stability of the ecosystem). He is seeking, as he says, to advance the ethical frontier from the merely interpersonal to the region of man in transaction with his environment.

Here the environmental perspective enters not simply at the level of the proximate ought which, environmentally informed and preceded by homocentrist moral principles, prescribes protection of the ecosystem. It acts at a higher level, as itself an antecedent ought, from which proximate oughts, such as the one earlier considered, about recycling, may be derived.

Proximate Moral Ought
You ought to recycle

Ecological Law
for recycling preserves the
ecosystem

Antecedent Moral Ought
and you ought to preserve
the integrity of the ecosys-
tem.

Note how the antecedent parallels upper-level axioms in other systems (e.g., "You ought to maximize human good," or "You ought not to harm yourself or others," or "Love your neighbor as yourself"). Earlier, homeostatic connectedness did not really alter the moral focus; but here, in a shift of paradigms, the values hitherto reserved for man are reallocated to man in the environment.

8. Aldo Leopold, "The Land Ethic," in *A Sand County Almanac* (New York: Oxford University Press, 1949), pp. 201-26.

Doubtless even Leopold's antecedent ought depends on a yet prior ought that one promote beauty and integrity, wherever he finds it. But this, like the injunction that one ought to promote the good, or that one ought to keep his promises, is so high level as to be, if not definitional or analytic, so general as to be virtually unarguable and therefore without any real theoretical content. Substantive values emerge only as something empirical is specified as the locus of value. In Leopold's case we have a feedback from ecological science which, prior to any effect on proximate moral oughts, informs the antecedent ought. There is a valuational element intrinsically related to the concepts utilized in ecological description. That is, the character of what is right in some basic sense, not just in application, is stated postecologically. Doubtless too, the natural course we choose to preserve is filtered through our concepts of beauty, stability, and integrity, concepts whose origins are not wholly clear and which are perhaps nonnatural. But, perspectival though this invariably is, what counts as beauty and integrity is not just brought to and imposed on the ecosystem but is discovered there. Let us map this as follows:

<i>Proximate Moral Ought</i>	<i>Ecological Law</i>	<i>Antecedent Moral Ought</i>	<i>Ecosystemic Evaluation</i>
You ought to recycle	for recycling pre-serves the integral ecosystem	and you ought to preserve the integrity of the ecosystem	for the integral ecosystem has value.

Our antecedent ought is not eco-free. Though preceding ecological law in the sense that, given this ought, one can transmit it via certain ecological laws to arrive at proximate oughts, it is itself a result of an ecosystemic appraisal.

This evaluation is not scientific description; hence not ecology per se, but metaecology. No amount of research can verify that the right is the optimum biotic community. Yet ecological description generates this evaluation of nature, endorsing the systemic Tightness. The transition from "is" to "good" and thence to "ought" occurs here; we leave science to enter the domain of evaluation, from which an ethic follows. The injunction to recycle is technical, made under circumscription by ecological necessity and made moral only by the presence of an antecedent. The injunction to maximize the ecosystemic excellence is also ecologically derived but is an evaluative transition which is not made under necessity.

Our account initially suggests that ecological description is logically (if not chronologically) prior to the ecosystemic evaluation, the former generating the latter. But the connection of description with evaluation is more complex, for the description and evaluation to some extent arise together, and it is often difficult to say which is prior and which is subordinate. Ecological description finds unity, harmony, interdependence, stability, etc., and these are valuationally endorsed, yet they are found, to some extent, because we search with a disposition to value order, harmony, stability,

unity. Still, the ecological description does not merely confirm these values, it informs them; and we find that the character, the empirical content, of order, harmony, stability is drawn from, no less than brought to, nature. In post-Darwinian nature, for instance, we looked for these values in vain, while with ecological description we now find them; yet the earlier data are not denied, only redescribed or set in a larger ecological context, and somewhere enroute our notions of harmony, stability, etc., have shifted too and we see beauty now where we could not see it before. What is ethically puzzling, and exciting, in the marriage and mutual transformation of ecological description and evaluation is that here an "ought" is not so much *derived* from an "is" as discovered simultaneously with it. As we progress from descriptions of fauna and flora, of cycles and pyramids, of stability and dynamism, on to intricacy, planetary opulence and interdependence, to unity and harmony with oppositions in counterpoint and synthesis, arriving at length at beauty and goodness, it is difficult to say where the natural facts leave off and where the natural values appear. For some observers at least, the sharp is/ought dichotomy is gone; the values seem to be there as soon as the facts are fully in, and both alike are properties of the system.

While it is frequently held that the basic criterion of the obligatory is the nonmoral value that is produced or sustained, there is novelty in what is taken as the nonmoral good—the ecosystem. Our ethical heritage largely attaches values and rights to persons, and if nonpersonal realms enter, they enter only as tributary to the personal. What is proposed here is a broadening of value, so that nature will cease to be merely "property" and become a commonwealth. The logic by which goodness is discovered or appreciated is notoriously evasive, and we can only reach it suggestively. "Ethics cannot be put into words," said Wittgenstein, such things "*make themselves manifest*."⁹ We have a parallel, retrospectively, in the checkered advance of the ethical frontier recognizing intrinsic goodness, and accompanying rights, outside the self. If we now universalize "person," consider how slowly the circle has been enlarged fully to include aliens, strangers, infants, children, Negroes, Jews, slaves, women, Indians, prisoners, the elderly, the insane, the deformed, and even now we ponder the status of fetuses. Ecological ethics queries whether we ought again to universalize, recognizing the intrinsic value of every ecobiotic component.

Are there, first, existing ethical sentiments that are subecological, that is, which anticipate the ecological conscience, and on which we might build? Second, is the ecological evaluation authentic, or perhaps only a remodeled traditional humanist ethic? Lastly, what are the implications of maximizing the ecosystem, and what concept of nature warrants such evaluation?

1. Presumably the evaluation of a biotic community will rest partly on the worth of its elements, if not independently, then in matrix. We have a long-standing, if (in the West) rather philosophically neglected, tradition that

9. Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. D. F. Pears and B. F. McGuinness (London: Routledge & Kegan Paul, 1969), 6:421, 522.

grants some moral ought to the prevention of needless animal suffering: "A righteous man has regard for the life of his beasts" (Proverbs 12.10). Consider what we oddly call "humane" societies or laws against cockfighting, bear baiting, and (in our nation) bullfighting, and (in most states) steer busting. We prohibit a child's torture of a cat; we prosecute the rancher who carelessly lets horses starve. Even the hunter pursues a wounded deer. That one ought to prevent needless cruelty has no obvious ecological foundation, much less a natural one, but the initial point is that animals are so far endowed with a value that conveys something like rights, or at least obligates us.

More revelatory is the increasingly common claim that one ought not to destroy life, or species, needlessly, regardless of suffering. We prevent the wanton slaughter of eagles, whether they suffer or not. Even the zealous varmint hunter seems to need the rationalization that crows rob the cornfield. He must malign the coyote and wolf to slay them enthusiastically. He cannot kill just for fun. We abhor the oilspills that devastate birdlife. The Sierra Club defends the preservation of grizzlies or whooping cranes on many counts as means to larger ends—as useful components of the ecosystem, for scientific study, or for our children's enjoyment. (We shall return to the integrated character of such argument.) But sufficiently pressed, the defense is that one ought not destroy a life form of beauty. Since ecosystems regularly eliminate species, this may be a nonecological ought. Yet it is not clearly so, for part of a species' evaluation arises as it is seen in environmental matrix. Meanwhile, we admit they should continue to exist, "as a matter of biotic right."¹⁰

This caliber of argument can be greatly extended. A reason given for the preservation of Cades Cove in the Great Smoky Mountains National Park is the variety of rare salamanders there. Certain butterflies occur rarely in isolated hummocks in the African grasslands. Formerly, unscrupulous collectors would collect a few hundred then burn out the hummock to destroy the species, and thereby drive up the price of their collections. I find myself persuaded that they morally ought not do this. Nor will the reason resolve into the evil of greed, but it remains the needless destruction of even a butterfly species. At scattered occurrences of rare ferns in Tennessee I refused to collect, not simply to leave them for others to enjoy, but morally unwilling to imperil a species. Such species are a fortiori environmentally pressed, yet they remain, and even prosper, in selected environmental niches, and their dispatch by human whim seems of a different order from their elimination by natural selection—something like the difference between murder and death by natural causes.

This respect enlarges to the landscape. We preserve certain features of natural beauty—the Grand Canyon, or Rainbow Bridge, or the Everglades. Though it seems odd to accord them "rights" (for proposals to confer rights on some new entity always sound linguistically odd), we go so far as to say

10. Leopold, p. 211.

that, judged to be places of beauty or wonder, they ought to be preserved. Is this only as a means to an end, that we and others may enjoy them? The answer is complex. At least some argue that, as with persons, they are somehow violated, even prostituted, if treated merely as means; we enjoy them very largely for what they are in themselves. To select some landscapes is not to judge the omitted ones valueless. They may be sacrificed to higher values, or perhaps selected environments are judged sufficiently representative of more abundant ones. That we do preserve any landscape indicates our discovery of value there, with its accompanying ought. Nor are such environments only the hospitable ones. We are increasingly drawn to the beauty of wilderness, desert, tundra, the arctic, and the sea. Planetary forces ever reshape landscapes, of course, and former environments are now extinct; nevertheless, we find in extant landscapes an order of beauty that we are unwilling to destroy.

2. Do we perhaps have, even in this proposed primary ecological ethic, some eco-free ought? If Leopold's preserving the ecosystem is merely ancillary to human interests, the veiled antecedent ought is still that we ought to maximize human good. Were we so to maximize the ecosystem we should have a corporate anthropological egoism, "human chauvinism," not a planetary altruism. The optimum ecosystem would be but a prudential means to human welfare, and our antecedent ought would no longer be primarily ecological, but as before, simply a familiar one, incidentally ecological in its prudence.

Even when richly appreciative of nature's values, much ecological moralizing does in fact mix the biosystemic welfare with an appeal to human interests. Reminiscent of Leopold, René Dubos suggests extending the Decalogue with an eleventh commandment, "Thou shalt strive for environmental quality." The justification may have a "resources" cast. We preserve wilderness and the maximally diverse ecosystem for reasons scientific and aesthetic. Natural museums serve as laboratories. Useless species may later be found useful. Diversity insures stability, especially if we err and our monocultures trigger environmental upset. Wild beauty adds a spiritual quality to life. "Were it only for selfish reasons, therefore, we must maintain variety and harmony in nature, . . . Wilderness is not a luxury; it is a necessity for the protection of humanized nature and for the preservation of mental health."¹¹

But the "were it only . . ." indicates that such reasons, if sufficient, are not ultimate. Deeper, nonselfish reasons respect "qualities inherent" in fauna, flora, landscape, "so as to foster their development." Haunting Western civilization is "the criminal conceit that nature is to be considered primarily as a source of raw materials and energy for human purposes," "the crude belief that man is the only value to be considered in managing the world and that the rest of nature can be thoughtlessly sacrificed to his welfare and

11. René Dubos, *A God Within* (New York: Charles Scribner's Sons, 1972), pp. 166-67.

whims." While holding that man is the creature who humanizes nature, the ecological conscience is sensitive to other worth. Indeed, somewhat paradoxically, it is only as man grants an intrinsic integrity to nature that he discovers his truest interests. "An enlightened anthropocentrism acknowledges that, in the long run, the world's good always coincides with man's own most meaningful good. Man can manipulate nature to his best interests only if he first loves her for her own sake."¹²

This coincidence of human and ecosystemic interests, frequent in environmental thought, is ethically confusing but fertile. To reduce ecological concern merely to human interests does not really exhaust the moral temper here, and only as we appreciate this will we see the ethical perspective significantly altered. That alteration centers in the dissolution of any firm boundary between man and the world. Ecology does not know an encapsulated ego over against his environment. Listen, for instance, to Paul Shepard: "Ecological thinking, on the other hand, requires a kind of vision across boundaries. The epidermis of the skin is ecologically like a pond surface or a forest soil, not a shell so much as a delicate interpenetration. It reveals the self ennobled and extended, rather than threatened, as part of the landscape, because the beauty and complexity of nature are continuous with ourselves."¹³ Man's vascular system includes arteries, veins, rivers, oceans, and air currents. Cleaning a dump is not different in kind from filling a tooth. The self metabolically, if metaphorically, interpenetrates the ecosystem. The world is my body.

This mood frustrates and ultimately invalidates the effort to understand all ecological ethics as disguised human self-interest, for now, with the self expanded into the system, their interests merge. One may, from a limited perspective, maximize the systemic good to maximize human good, but one can hardly say that the former is only a means to the latter, since they both amount to the same thing differently described. We are acquainted with egoism, *egoisme a deux, trots, quatres*, with familial and tribal egoism. But here is an *egotime a la systeme*, as the very etymology of "ecology" witnesses: the earth is one's household. In this planetary confraternity, there is a confluence of egoism and altruism. Or should we say that egoism is transformed into ecoism? To advocate the interests of the system as a means of promoting the interests of man (in an appeal to industry and to congressmen) is to operate with a limited understanding. If we wish, for rhetorical or pragmatic reasons, we may begin with maximizing human good. But when ecologically tutored, we see that this can be redescribed as maximizing the ecosystem. Our classical ought has been transformed, stretched, coextensively with an ecosystemic ought.

To illustrate, ponder the observation that biotic-environmental complexity is integrally related to the richness of human life. That the stability and integrity of an ecosystem is a function of its variety and diversity is a

12. *Ibid.*, pp. 40-41, 45,

13. Shepard, p. 2.

fairly well-established point; and it is frequently observed that complex life forms evolve only in complex environments. The long evolution of man, accordingly, has been possible only under the stimulation of many environments—marine, arboreal, savannah, tropical, temperate, even arctic. Even when man lives at a distance from some of these, they remain tributary to his life support. Without oceans, forests, and grasslands, human life would be imperiled. Thus man's complex life is a product of and is underlain by environmental complexity.

This complexity is not simply biological but also mental and cultural. For maximum noetic development, man requires an environmental exuberance. So Shepard eloquently introduces the "universal wisdom" of *The Subversive Science*:

Internal complexity, as the mind of a primate, is an extension of natural complexity, measured by the variety of plants and animals and the variety of nerve cells—organic extensions of each other. The exuberance of kinds as the setting in which a good mind could evolve (to deal with a complex, world) was not only a past condition. Man did not arrive in the world as though disembarking from a train in the city. He continues to arrive. . . . This idea of natural complexity as a counterpart to human intricacy is central to an ecology of man. The creation of order, of which man is an example, is realized also in the number of species and habitats, an abundance of landscapes lush and poor. Even deserts and tundras increase the planetary opulence. . . . Reduction of this variegation would, by extension then, be an amputation of man. To convert all "wastes"—all deserts, estuaries, tundras, ice-fields, marshes, steppes and moors—into cultivated fields and cities would impoverish rather than enrich life esthetically as well as ecologically.¹⁴

Mountains have both physical and psychic impact. Remove eagles from the sky and we will suffer a spiritual loss. For every landscape, there is an inscape; mental and environmental horizons reciprocate.

This supports, but only by curiously transforming, the preservation of the ecosystem in human self-interest, for the "self has been so extended as to be ecosystemically redefined. The human welfare which we find in the enriched ecosystem is no longer recognizable as that of anthropocentrism. Man judges the ecosystem as "good" or "bad" not in short anthropocentric focus, but with enlarged perspective where the integrity of other species enriches him. The moral posture here recalls more familiar (if frequently unsettled) ethical themes: that self-interest and benevolence are not necessarily incompatible, especially where one derives personal fulfillment from the welfare of others; that treating the object of ethical concern as an end in itself is uplifting; that one's own integrity is enhanced by recognition of other integrities.

3. This environmental ethic is subject both to limits and to development, and a fair appraisal ought to recognize both. As a partial ethical source, it does not displace functioning social-personal codes, but brings into the scope of ethical transaction a realm once regarded as intrinsically valueless

14. *Ibid.*, pp. 4-5.

and governed largely by expediency. The new ethical parameter is not absolute but relative to classical criteria. Such extension will amplify conflicts of value, for human goods must now coexist with environmental goods. In operational detail this will require a new casuistry. Mutually supportive though the human and the ecosystemic interests may be, conflicts between individuals and parties, the rights of the component members of the ecosystem, the gap between the real and the ideal, will provide abundant quandaries.

Further, interpreting charitably, we are not asked to idolize the whole except as it is understood as a cosmos in which the corporate vision surrounds and limits, but does not suppress the individual. The focus does not only enlarge from man to other ecosystemic members, but from individuals of whatever kind to the system. Values are sometimes personalized; here the community holds values. This is not, of course, without precedent, for we now grant values to states, nations, churches, trusts, corporations, and communities. And they hold these values because of their structure in which individuals are beneficiaries. It is similar with the ecosystem, only more so; for when we recall its diffusion of the boundary between the individual and the ecosystem, we cannot say whether value in the system or in the individual is logically prior.

Leopold and Shepard do not mean to deep freeze the present ecosystem. Despite their preservationist vocabulary, their care for the biosystemic welfare allows for "alteration, management, and use."¹⁵ We are not committed to this as the best possible ecosystem; it may well be that the role of man—at once "citizen" and "king"—is to govern what has hitherto been the partial success of the evolutionary process. Though we revere the earth, we may yet "humanize" it, a point made forcefully by René Dubos.¹⁶ This permits interference with and rearrangement of nature's spontaneous course. It enjoins domestication, for part of the natural richness is its potential in human life support. We recognize man's creativity, development, openness, and dynamism.

Species regularly enter and exit nature's theater; perhaps natural selection currently tests species for their capacity to coexist with man. Orogenic and erosional forces have produced perpetual environmental flux; man may well transform his environment. But this should complement the beauty, integrity, and stability of the planetary biosystem, not do violence to it. There ought to be some rational showing that the alteration is enriching; that values are sacrificed for greater ones. For this reason the right is not that which maintains the ecosystemic status quo, but that which preserves its beauty, stability, and integrity.

What ought to be does not invariably coincide with what is; nevertheless, here is a mood that, recalling etymology again, we can best describe as man's being "at home" in his world. He accepts, cherishes his good earth.

15. Leopold, p. 204.

16. Dubos, chap. 8.

Purely scientific descriptions of an ecosystem may warrant the term "stability," neutrally used; they facilitate the estimate of its beauty and integrity. Added, though, is a response of the ecologist to his discoveries, an evocation of altering consciousness. We see integrity and beauty we missed before, partly through new realization of fact—interdependence, environmental fitness, hydrologic cycles, population rhythms, and feedback loops—and partly through transformed concepts of what counts as beauty and integrity, for world and concept mutually transform each other.

Though the full range of that shifting concept of nature and the ecological description which underlies it are beyond our scope, we can suggest their central axis. After Darwin (through misunderstanding him, perhaps), the world of design collapsed, and nature, for all its law, seemed random, accidental, chaotic, blind, crude, an "odious scene of violence."¹⁷ Environmental science has been resurveying the post-Darwinian natural jungle and has increasingly set its conflicts within a dynamic web of life. Nature's savagery is much less wanton and clumsy than formerly supposed, and we are invited to see the ecosystem not merely in awe, but in "love, respect, and admiration."¹⁸ Ecological thinking "moves us to silent wonder and glad affirmation."¹⁹ Oppositions remain in ecological models, but in counterpoint. The system resists the very life it supports; indeed it is by resistance not less than environmental conductivity that life is stimulated. The integrity of species and individual is a function of a field where fullness lies in interlocking predation and symbiosis, construction and destruction, aggradation and degradation. The planet that Darrow characterized, in the post-Darwinian heyday, as a miserable little "wart"²⁰ in the universe, eminently unsuited to life, especially human life, is now a sheltered oasis in space. Its harmony is often strange, and it is not surprising that in our immaturity we mistook it, yet it is an intricate and delicate harmony nevertheless.

Man, an insider, is not spared environmental pressures, yet, in the full ecosystemic context, his integrity is supported by and rises from transaction with his world and therefore requires a corresponding dignity in his world partner. Of late, the world has ceased to threaten, save as we violate it. How starkly this gainsays the alienation that characterizes modern literature, seeing nature as basically rudderless, antipathetical, in need of monitoring and repair. More typically modern man, for all his technological prowess, has found himself distanced from nature, increasingly competent and decreasingly confident, at once distinguished and aggrandized, yet afloat on and adrift in an indifferent, if not a hostile universe. His world is at best a huge filling station; at worst a prison, or "nothingness." Not so for ecological man; confronting his world with deference to a community of value in which he

17. John Stuart Mill, "Nature," in *Collected Works* (Toronto: University of Toronto Press, 1969), 10:398. The phrase characterizes Mill's estimate of nature.

18. Leopold, p. 223.

19. Snepard, p. 10.

20. Clarence Darrow, *The Story of My Life* (New York: Charles Scribner's Sons, 1932), p.

shares, he is at home again, The new mood is epitomized, somewhat surprisingly, in reaction to space exploration, prompted by vivid photography of earth and by astronaut's nostalgia, generating both a new love for Spaceship Earth and a resolution to focus on reconciliation with it.

We shall surely not vindicate the natural sequence in every detail as being productive of ecosystemic health, and therefore we cannot simplify our ethic to an unreflective acceptance of what naturally is the case. We do not live in Eden, yet the trend is there, as ecological advance increasingly finds in the natural given stability, beauty, and integrity, and we are henceforth as willing to open our concepts to reformation by the world as to prejudge the natural order. The question of evolution as it governs our concept of nature is technically a separate one. We must judge the worth of the extant ecosystem independently of its origins. To do otherwise would be to slip into the genetic fallacy. A person has rights for what he is, regardless of his ancestry; and it may well be that an ignoble evolutionary process has issued in a present ecosystem in which we rightly rejoice. No one familiar with paleontology is likely to claim that the evolutionary sequence moves unfailingly and without loss toward an optimally beautiful and stable ecosystem. Yet many ecological mechanisms are also evolutionary, and the ecological reappraisal suggests as a next stage an evolutionary redescription, in which we think again whether evolutionary history, for all its groping, struggle, mutation, natural selection, randomness, and statistical movement, does not yield direction enough to ponder that nature has been enriching the ecosystem. The fossil record is all of ruins. We survey it first with a certain horror; but then out of the ruins emerges this integral ecosystem. He who can be persuaded of this latter truth will have an even more powerful ecological ethic, for the injunction to maximize the ecosystemic excellences will be an invitation to get in gear with the way the universe is operating. Linking his right to nature's processes, he will have, at length, an authentic naturalistic ethic.

The perils of transposing from a new science to a world view, patent in the history of scientific thought, are surpassed only by the perils of omitting to do so. Granted that we yet lack a clear account of the logic by which we get our values, it seems undeniable that we shape them in significant measure in accord with our notion of the kind of universe that we live in. Science has in centuries before us upset those values by reappraising the character of the universe. One has but to name Copernicus and Newton, in addition to our observation that we have lately lived in the shadow of Darwin. The ecological revolution may be of a similar order; it is undeniably at work reilluminating the world.

Darwin, though, often proves more fertile than his interpreters. When, in *The Descent of Man*, he traces the natural history of man's noblest attribute, the moral sense, he observes that "the standard of his morality rises higher and higher." Initially each attended his self-interest. The growth of conscience has been a continual expansion of the objects of his "social instincts and sympathies," first to family and tribe; then he "regarded more and more,

not only the welfare, but the happiness of all his fellow-men;" then "his sympathies became more tender and widely diffused, extending to men of all races, to the imbecile, maimed, and other useless members of society, and finally to the lower animals. . . ."²¹ After the fauna, can we add the flora, the landscape, the seascape, the ecosystem? There would be something magnificent about an evolution of conscience that circumscribed the whole. If so, Leopold lies in the horizon of Darwin's vision. Much of the search for an ecological morality will, perhaps in necessary pragmatism, remain secondary, "conservative," where the ground is better charted, and where we mix ethics, science, and human interests under our logical control. But we judge the ethical frontier to be beyond, a primary revaluing where, in ethical creativity, conscience must evolve. The topography is largely uncharted; to cross it will require the daring, and caution, of a community of scientists and ethicists who can together map both the ecosystem and the ethical grammar appropriate for it.

Perhaps the cash value is the same whether our ethic is ecological in secondary or primary senses; yet in the latter I find appeal enough that it has my vote to be so if it can. To the one, man may be driven while he still fears the world that surrounds him. To the other, he can only be drawn in love.

21. Charles Darwin, *The Descent of Man*, new ed. (New York: D. Appleton & Co., 1895), pp. 124-25.