Ecology and Morality

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In the first part of this selection, Wenz, a deep ecologist, briefly characterizes healthy ecosystems. In the second, he presents two cases intended to test readers' moral intuitions. These cases are calculated to show that our current morality includes prima facie obligations toward ecosystems that depend on neither the interests of human beings nor those of other sentient beings.

In the first section of this article I characterize good or healthy ecosystems. In the second I argue that we have a *prima facie* obligation to protect such ecosystems irrespective of all possible advantage to human beings.

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GOOD ECOSYSTEMS

An ecosystem is what Aldo Leopold referred to as a "biotic pyramid." He describes it this way (1970, p. 252):

Plants absorb energy from the sun. This energy flows through a circuit called the biota, which may be represented by a pyramid consisting of layers. The bottom layer is the soil. A plant layer rests on the soil, an insect layer on the plants, a bird and rodent layer on the insects, and so on up through various animal groups to the apex layer, which consists of the large carnivores.

Proceeding upward, each successive layer decreases in numerical abundance. Thus, for every carnivore there are hundreds of his prey, thousands of their prey, millions of insects, uncountable plants.

The lines of dependency for food and other services are called food chains. Thus soil-oak-deer-Indian is a chain that has now largely converted to soil-corn-cow-farmer. Each species, including ourselves, is a link in many chains. The deer eats a hundred plants other than oak, and the cow a hundred plants other than corn. Both, then, are links in a hundred chains. The pyramid is a tangle of chains so complex as to seem disorderly, yet the stability of the system proves it to be a highly organized structure.¹

It is so highly organized that Leopold and others write of it, at times, as if it were a single organism which could be in various stages of health or disease (p. 274):

Paleontology offers abundant evidence that wilderness maintained itself for immensely long periods; that its component species were rarely lost, neither did they get out of hand; that weather and water built soil as fast or faster than it was carried away. Wilderness, then, assumes unexpected importance as a laboratory for the study of land-health.

By contrast,

When soil loses fertility, or washes away faster than it forms, and when water systems exhibit abnormal floods and shortages, the land is sick (p. 272).

The disappearance of plant and animal species without visible cause, despite efforts to protect them, and the irruption of others as pests despite efforts to control them, must, in the absence of simpler explanations, be regarded as symptoms of sickness in the land organism (pp. 272–273).

In general, a healthy ecosystem consists of a great diversity of flora and fauna, as "the trend of evolution is to elaborate and diversify the biota" (p. 253). This flora and fauna is in a relatively stable balance, evolving slowly rather than changing rapidly, because its diversity enables it to respond to change in a flexible manner that retains the system's integrity. In all of these respects a healthy ecosystem is very much like a healthy plant or animal.

A description of one small part of one ecosystem will conclude this account of the nature of ecosystems. It is Leopold's description of a river's sand bar in August (1970, p. 55):

The work begins with a broad ribbon of silt brushed thinly on the sand of a reddening shore. As this dries slowly in the sun, goldfinches bathe in its pools, and deer, herons, killdeers, raccoons, and turtles cover it with a lacework of tracks. There is no telling, at this stage, whether anything further will happen.

But when I see the silt ribbon turning green with Eleocharis,* I watch closely thereafter, for this is the sign that the river is in a painting mood. Almost overnight the Eleocharis becomes a thick turf, so lush and so dense that the meadow mice from the adjoining upland cannot resist the temptation. They move *en masse* to the green pasture, and apparently spend the nights rubbing their ribs in its velvety depths. A maze of neatly tended mousetrails bespeaks their enthusiasm. The deer walk up and down in it, apparently just for the pleasure of feeling it underfoot. Even a stay-at-home mole has tunneled his way across the dry bar to the Eleocharis ribbon, where he can heave and hump the sod to his heart's content.

At this stage the seedlings of plants too numerous to count and too young to recognize spring to life from the damp warm sand under the green ribbon.

Three weeks later (pp. 55-56):

The Eleocharis sod, greener than ever is now spangled with blue mimulus, pink dragonhead, and the milk-white blooms of Sagittaria. Here and there a cardinal flower thrusts a red spear skyward. At the head of the bar, purple ironweeds and pale pink joepyes stand tall against the wall of willows. And if you have come quietly and humbly, as you should to any spot that can be beautiful only once, you may surprise a fox-red deer, standing knee-high in the garden of his delight (pp. 55–56).

HUMAN OBLIGATIONS TO ECOSYSTEMS

Let us now consider whether or not we, you and I, have *prima facie* obligations towards ecosystems, in particular, the obligation to avoid destroying them, apart from any human advantage that might be gained by their continued existence. My argument consists in the elaboration of two examples, followed by appeals to the reader's intuition. The second, Case II, is designed to function as a counter-example to the claim that human beings have no obligations to preserve ecosystems except when doing so serves human interests or prevents the unnecessary suffering of other sentient beings.

Some clarifications are needed at the start. By "prima facie obligation" I mean an obligation that would exist in the absence of other, countervailing moral considerations. So I will construct cases in which such other considerations are designedly absent. A common consideration of this sort is the effect our actions have on intelligent beings, whether they be humans, extraterrestrials, or (should they be considered intelligent enough) apes and aquatic mammals. Accordingly, I will construct my cases so that the destruction of the environment affects none of these. Finally, the obligation in question is not to preserve ecosystems from any and every threat to their health and existence. Rather, the obligation for which I am contending is to protect ecosystems from oneself. The differences here may be important. A duty to protect the environment from any and every threat would have to rest on some principle concerning the duty to bring aid. Such principles concern positive duties, which are generally considered less stringent than negative duties. The duty to protect the environment from oneself, on the other hand, rests on a principle concerning the

*Editor's note: Eleocharis is a type of sedge.

duty to do no harm, which is a negative duty. Those not convinced that we have a duty to bring aid may nevertheless find a *prima facie* duty not to harm the environment easy to accept.

Case I

Consider the following situation. Suppose that you are a pilot flying a bomber that is low on fuel. You must release your bombs over the ocean to reduce the weight of the plane. If the bombs land in the water they will not explode, but will, instead, deactivate harmlessly. If, on the other hand, any lands on the islands that dot this part of the ocean, it will explode. The islands contain no mineral or other resources of use to human beings, and are sufficiently isolated from one another and other parts of the world that an explosion on one will not affect the others, or any other part of the world. The bomb's explosion will not add to air pollution because it is exceedingly "clean." However, each island contains an ecosystem, a biotic pyramid of the sort described by Aldo Leopold, within which there are rivers, sandbars, Eleocharis, meadow mice, cardinal flowers, blue mimulus, deer, and so forth, but no intelligent life. (Those who consider mice, deer, and other such animals so intelligent as to fall under some ban against killing intelligent life are free to suppose that in their wisdom, all such creatures have emigrated.) The bomb's explosion will ruin the ecosystem of the island on which it explodes, though it will not cause any animals to suffer. We may suppose that the islands are small enough and the bombs powerful enough that all animals, as well as plants, will be killed instantly, and therefore painlessly. The island will instantly be transformed from a wilderness garden to a bleakness like that on the surface of the moon.

Suppose that with some care and attention, but with no risk to yourself, anyone else or the plane, you could release your bombs so as to avoid hitting any of the islands. With equal care and attention you could be sure to hit at least one of the islands. Finally, without any care or attention to the matter, you might hit one of the islands and you might not. Assuming that you are in no need of target practice, and are aware of the situation as described, would you consider it a matter of moral indifference which of the three possible courses of action you took? Wouldn't you feel that you ought to take some care and pay some attention to insure that you avoid hitting any of the islands? Those who can honestly say that in the situation at hand they feel no more obligation to avoid hitting the islands than to hit them, who think that destroying the balanced pyramidal structure of a healthy ecosystem is morally indifferent, who care nothing for the islands' floral displays and interactions between flora, fauna, soil, water, and sun need read no further. Such people do not share the intuition on which the argument in this paper rests.

I assume that few, if any readers of the last paragraph accepted my invitation to stop reading. I would have phrased things differently if I thought they would. Many readers may nevertheless be skeptical of my intuitive demonstration that we feel a *prima facie* obligation to avoid destroying ecosystems. Even though no pain to sentient creatures is involved, nor the destruction of intelligent life nor pollution or other impairment of areas inhabited by human beings or other intelligent creatures, some readers may nevertheless explain their reluctance to destroy such an ecosystem by reference, ultimately, to human purposes. They can thereby avoid the inference I am promoting. They might point out that the islands' ecosystems may be useful to scientists who might someday want to study them. No matter that there are a great many such islands. The ecosystem of each is at least slightly different from the others, and therefore might provide some information of benefit to human beings that could not be gleaned elsewhere. Alternatively, though scientists are studying some, it might be to the benefit of humanity to establish Holiday Inns and Hilton Hotels on the others. Scientists have to relax too, and if the accommodations are suitable they will be more likely to enjoy the companionship of their families.

I believe that such explanations of our intuitive revulsion at the idea of needlessly destroying a healthy ecosystem are unhelpful evasions. They represent the squirming of one who intellectually believes ethics to concern only humans and other intelligent creatures, perhaps with a rider that one ought not to cause sentient creatures unnecessary suffering, with the reality of his or her own moral intuitions. The next case will make this clearer.

Case II

Suppose that human beings and all other intelligent creatures inhabiting the earth are becoming extinct. Imagine that this is the effect of some cosmic ray that causes extinction by preventing procreation. There is no possibility of survival through emigration to another planet, solar system or galaxy because the ray's presence is so widespread that no humans would survive the lengthy journey necessary to escape from its influence. There are many other species of extraterrestrial, intelligent creatures in the universe whom the cosmic ray does not affect. Nor does it affect any of the non-intelligent members of the earth's biotic community. So the earth's varied multitude of ecosystems could continue after the extinction of human beings. But their continuation would be of no use to any of the many species of intelligent extraterrestrials because the earth is for many reasons inhospitable to their forms of life, and contains no mineral or other resources of which they could make use.

Suppose that you are the last surviving human being. All other intelligent animals, if there were any, have already become extinct. Before they died, other humans had set hydrogen explosives all around the earth such that, were they to explode, all remaining plant and animal life on the earth would be instantly vaporized. No sentient creature would suffer, but the earth's varied multitude of ecosystems would be completely destroyed. The hydrogen explosives are all attached to a single timing mechanism, set to explode next year. Not wishing to die prematurely, you have located this timing device. You can set it ahead fifty or one hundred years, insuring that the explosion will not foreshorten your life, or you can, with only slightly greater effort, deactivate it so that it will never explode at all. Who would think it a matter of moral indifference which you did? It seems obvious that you ought to deactivate the explosives rather than postpone the time of the explosions.

How can one account for this "ought"? One suggestion is that our obligations are to intelligent life, and that the chances are improved and the time lessened for the

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evolution of intelligent life on earth by leaving the earth's remaining ecosystems intact. But this explanation is not convincing. First, it rests on assumptions about evolutionary developments under different earthly conditions that seem very plausible, but are by no means certain. More important, as the case was drawn, there are many species of intelligent extraterrestrials who are in no danger of either extinction or diminished numbers, and you know of their existence. It is therefore not at all certain that the obligations to intelligent life contained in our current ethical theories and moral intuitions would suggest, much less require, that we so act as to increase the probability of and decrease the time for the development of another species of intelligent life on earth. We do not now think it morally incumbent upon us to develop a form of intelligent life suited to live in those parts of the globe that, like Antarctica, are underpopulated by human beings. This is so because we do not adhere to a principle that we ought to so act as to insure the presence of intelligent life in as many earthly locations as possible. It is therefore doubtful that we adhere to the more extended principle that we ought to promote the development of as many different species of intelligent life as possible in as many different locations in the universe as possible. Such a problematic moral principle surely cannot account for our clear intuition that one obviously and certainly ought not to reset the explosives rather than deactivate them. It is more plausible to suppose that our current morality includes a prima facie obligation to refrain from destroying good ecosystems irrespective of both the interests of intelligent beings and the obligation not to cause sentient beings unnecessary suffering.

It is not necessary to say that ecosystems have rights. It is a commonplace in contemporary moral philosophy that not all obligations result from corresponding rights, for example, the obligation to be charitable. Instead, the obligation might follow from our concept of virtuous people as ones who do not destroy any existing things needlessly. Or perhaps we feel that one has a *prima facie* obligation not to destroy anything of esthetic value, and ecosystems are of esthetic value. Alternatively, the underlying obligation could be to avoid destroying anything that is good of its kind—so long as the kind in question does not make it something bad in itself—and many of the earth's ecosystems are good.

Our intuition might, on the other hand, be related more specifically to those characteristics that make good ecosystems good. Generally speaking, one ecosystem is better than another if it incorporates a greater diversity of life forms into a more integrated unity that is relatively stable, but not static. Its homeostasis allows for gradual evolution. The leading concepts, then, are diversity, unity, and a slightly less than complete homeostatic stability. These are, as a matter of empirical fact, positively related to one another in ecosystems. They may strike a sympathetic chord in human beings because they correspond symbolically to our personal, psychological need for a combination in our lives of both security and novelty. The stability and unity of a good ecosystem represents security. That the stability is cyclically homeostatic, rather than static, involves life forms rather than merely inorganic matter, and includes great diversity, corresponds to our desires for novelty and change. Of course, this is only speculation. It must be admitted that some human beings seem to so value security and stability as to prefer a purely static unity. Parmenides and the eastern religious thinkers who promote nothingness as a goal might consider the surface of the moon superior to that of the earth, and advocate allowing the earth's ecosystems to be vaporized under the conditions described in Case II.

My intuitions, however, and I assume those of most readers, favor ecosystems over static lifelessness and, perhaps for the same reason, good ecosystems over poorer ones. In any case, the above speculations concerning the psychological and logical derivations of these intuitions serve at most to help clarify their nature. Even the correct account of their origin would not necessarily constitute a justification. Rather than try to justify them, I will take them as a starting point for further discussion. So I take the cases elaborated above to establish that our current morality includes a *prima facie* obligation to avoid destroying good ecosystems, absent considerations of both animal torture and the well-being of intelligent creatures.

REFERENCES

1 Leopold, A. 1970. A Sand County Almanac, with essays on conservation from Round River. New York: Ballantine Books.

QUESTIONS

- 1 Do you agree with Wenz's moral intuitions about the intrinsic value of ecosystems?
- 2 If you recognize the intrinsic value of ecosystems as well as other natural nonsentient objects, how would that change your perception of the relation between you and the rest of the natural world?