SACRED BOVINES

FROM LEOPOLD'S "LAND ETHIC" TO ECOLOGICAL HUBRIS

DOUGLAS ALLCHIN, DEPARTMENTAL EDITOR

Why preserve wilderness? How is such a value justified? Many people – including many biology teachers, I think – regard ecological facts as the ultimate foundation. But does this mean that scientific inquiry can yield ethics, as well as knowledge? Here, I explore this important question about the nature and limits of science by focusing on Aldo Leopold's popular idea of a land ethic.

○ Aldo Leopold & the Land Ethic

Leopold first earned renown in wildlife management in the 1910s through the 1930s. Later, he eloquently expressed his appreciation of nature in his now classic *Sand County Almanac*. For example, in describing four seasons on a farm in Wisconsin, he gave deep meaning to ordinary experience. He suggested that the idea that heat comes from a furnace betrays a significant misunderstanding:

> If one has cut, split, hauled, and piled his own good oak, and let his mind work the while, he will remember much about where the heat comes from, and with a wealth of detail denied to those who spend the week end in town astride a radiator. (Leopold, 1970, p. 7)

He lamented, too, the supposition that food comes from a grocery store rather than from tilling the soil. He contrasted orienting one's perspective to human society versus wild nature. His reflections culminated in comments on "thinking like a mountain." With such evocative imagery, Leopold inspired generations of environmentalists (in *ABT*, see Flannery, 1998, 2010; Young, 2000). Leopold expressed his core perspective in a new concept, the "land ethic":

> 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. (Leopold, 1970, p. 262)

That is, Leopold gave nature – the "land" in an expansive sense – an *intrinsic value*, inherent in its very being. For Leopold, as for many others, the goal of preserving wilderness was rooted in this spiritual aesthetic of nature. Further, Leopold implied that an emotional sense of nature's value arose from ecological knowledge. Indeed, many biology teachers exhort their students to value nature and to protect it – presumably as justified under the banner of *science*.

Here, I challenge the cherished notion (this month's Sacred Bovine) that an intrinsic value of wilderness arises somehow from a scientific understanding. Namely, Leopold's ethical reasoning was flawed. We need to distinguish between an "ethic" (justified by principles) and an "ethos" (or personal aspiration). Facts and values arise from different sources. Science is not the ultimate source of valuing nature.

Science is not irrelevant to environmentalism, however. Namely, ecology critically *informs* us why other familiar values might lead us to protect nature – even untouched nature. Ironically, this perspective is human-centered, not focused on the "land" itself. Our culture has much to learn, I think, about unexpected environmental consequences and what I describe here as *ecological hubris*.

○ Ethic vs. Ethos

Ethics is not so different from science. For both, arguments and good reasons matter. While scientists rely chiefly on empirical evidence, ethical philosophers seek a foundation in generally accepted principles and values, such as "respect for life" or the reciprocity embodied in the familiar Golden Rule. Justification is the difference between an "ethic" and an "ethos."

How would one go about establishing the ethical value of nature? Here, the very term "value" can be misleading. For example, one might intuitively turn to economics, planning to catalogue and *measure* nature's benefits in monetary terms. But these numbers merely reflect supply and demand, identifying "exchange value" in a marketplace. Ethical values are "measured" instead by their justification within a system of moral relationships, virtues, rights, and responsibilities.

Of course, we could easily enumerate the ways nature is useful to us: an *instrumental* value. Any ethical argument would then depend on clarifying how the interim value contributes to another, more fundamental value. For example, one might contend that ecological services (near-term value) contribute ethically to nurturing life (ultimate value).

However, Leopold (like many others) wanted something deeper. For him, wilderness had a value quite apart from human perceptions. He wanted to characterize an *intrinsic* value in nature, such that it earned our *ethical respect*. When one appeals to animal rights or species rights, for example, one implies that they have a certain ethical status. Such rights are exceptionally difficult to justify, however. It is hard to find deeper reasons for these values, without using the target values as assumptions. Many notable conservationists have tried but failed. E. O. Wilson wanted to leverage evolutionary science in his

The American Biology Teacher, Vol. 81, No. 4, pp. 291–293, ISSN 0002-7685, electronic ISSN 1938-4211. DOI: https://doi.org/10.1525/abt.2019.81.4.291.

appeals to biophilia as a foundation for preserving diversity. But his evidence relied on the same values he sought to portray as "natural." Biophilia illegitimately tried to *naturalize* a cultural ideology, or inscribe it into nature through flawed science (*Sacred Bovines*, May 2018). Rachel Carson appealed to a "balance of nature" as another purported form of intrinsic value. It was also fraught with scientific misconceptions (*Sacred Bovines*, April 2014).

Leopold's land ethic suffers from similar problems of justification. For example, Leopold promoted the stability of a biotic community, its integrity, and its beauty. Unfortunately, none of these have *ethical* standing. Stability, by itself, is not a moral value. Beauty might be, if there were an aesthetic consensus. But there is not. (Consider the many voices deriding "tree-huggers.") Adoration of nature is far from universal. The value of nature is not justified merely by declaring it. Nor is intense sentiment an ethical substitute. The land ethic is no more than a bold assertion or manifesto of individual belief. A belief without formal justification. Accordingly, the rhetoric of a universal land ethic is no more than a personal *land ethos*. A land ethos may function effectively to guide one's action. But it does not have the ethical leverage needed to preserve nature in a contested public arena.

○ Ecological Hubris

Ironically, perhaps, one does not need radically new ethical values to justify preserving nature. The task, instead, is to couple quite familiar values with knowledge about the extraordinary scope of ecological interactions.

One can probably find no more conventional ethical principle than "respect for others." At first, nature may seem irrelevant to the network of mutual responsibilities, especially if one conceives "the environment" as an independent entity, wholly outside the human realm. But harms can easily be done to others via the environment. In the simplest case, poisoning the water – with excess sewage, heavy metals, industrial effluent, pesticide runoff, and leached chemical wastes – harms *individuals*. Poisoning the air – with particulate soot, sulfur and nitrogen oxides, and carcinogenic gases – harms *individuals*. The effects may be indirect, but they are no less real. Normally, we characterize such pollution as harming the environment. But, in these cases at least, protecting "the environment" is a proxy for ensuring that a public resource remains healthy for all. Any harm is ultimately done to other humans.

Such connections may not be obvious, especially at first. Consider the dramatic case of Minamata, Japan. In the 1950s most residents of this small fishing village welcomed the economic benefits of Chisso, a chemical manufacturer that was profitably expanding its production of acetaldehyde, used for making plastics. All the while, methyl mercury was being dumped into the bay, where it entered the food chain. In a slow-motion disaster, the mercury in the fish poisoned the local cats, and then the residents, leaving horrific cases of neurological damage, upended lives, and a splintered community (see earlier lessons in *ABT*: Allchin, 1999). That was the tragic result of not fully appreciating humans' inescapable interactions via the environment. The cost of ecological ignorance in this case was devastating (Minamata Disease Municipal Museum, 2007).

Unfortunately, perhaps, the consequences through the diffuse connections of a global ecosystem (unlike those visible in Minamata) can easily escape immediate notice. The effects may be quite indirect, long-term, or infrequent (even if catastrophic). For example, CFCs enter the atmosphere. Later they reach the ozone layer and begin to deplete it (Figure 1). The first consequence is more ultraviolet radiation reaching the planet's surface. That has health effects, from skin cancer and compromised respiration to immunosuppression. UV radiation can also affect crops, fisheries, and food supply. Weather systems may be affected, with further indirect and adverse effects. This is where science excels: tracing causal connections that may be far from obvious. Equally notable today, of course, is the link between the release of greenhouse gases, global warming, and climate change. The negative effects – on crops and agricultural livelihoods; on sea level, coastal property, and population displacement; or in the damage from increasingly frequent and more severe storms, hurricanes, and floods – have concrete human costs. Again, indirect – but again no less real. Appreciating such connections depends in part on understanding how science works – sometimes through lengthy chains of reasoning.

Most remarkable, perhaps, is how often and repeatedly society has forged ahead, clueless to ecological consequences. It certainly was not obvious when propellants were put into spray cans of air fresheners, paint, and deodorants that the CFCs would damage the ozone layer and expose others to dangerous doses of ultraviolet radiation. The addition of lead to paint and gasoline was hailed as a technological enhancement long before the lead in these products was viewed as an unwelcome poison. No one saw high-sulfur coal as problematic until acid rain started leaching poisons from the soil into the water, damaging local fishing and timber forests, eroding building stone, and harming health. No one was wise to the zebra mussels hiding in the bilge water of a ship from the Baltic, or that they would eventually escape and devastate shipping, boating, and water pipes in the Great Lakes area. So, too, in the cases of kudzu, cane toads, gypsy moths, and others (Matthews & Cummo, 1999). Houston residents generally

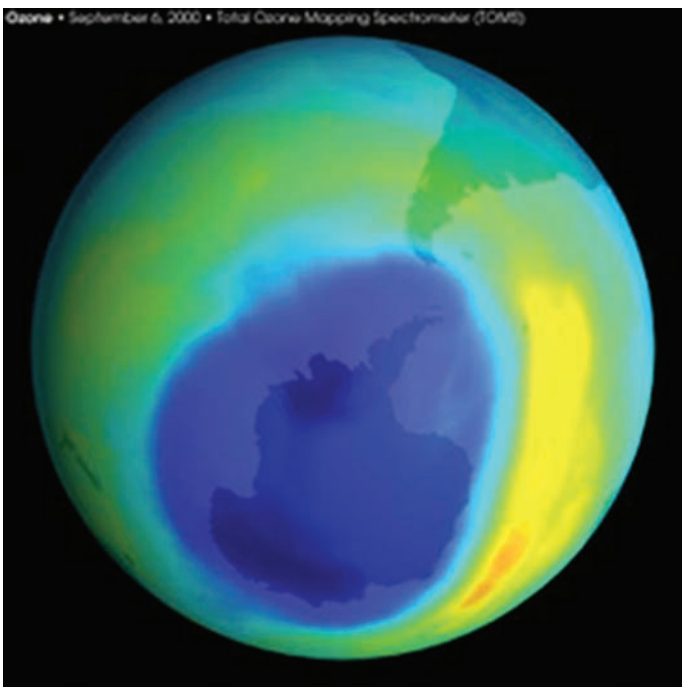

Figure 1. The ozone hole in 2000. No one imagined the ultimate consequences when they began using CFCs in aerosal cans for air fresheners, paint, and deodorants – a vivid illustration of ecological hubris. (Image by NASA)

did not appreciate the role of "worthless" wetlands in flood control until an exceptionally big hurricane revealed the consequences of having already destroyed them. Nor did anyone imagine, when internal combustion engines made transport easier or when coal-fired power plants provided abundant cheap energy, that the accumulation of carbon dioxide in the atmosphere would eventually change the planet's temperatures and climate. And so on. That the outcome seemed so surprising in case after case after case might prompt reflection (Harremoës et al., 2002).

The historical lesson may be simply that humans tend to exhibit gross blindness to the far-reaching consequences of their actions, what might be called *ecological hubris*. The affliction is not so different from the Ancient Greek concept of hubris: the arrogant disregard of the powers that determined fate. In the modern version, humans fail to see or adequately respect the power of their own actions to cascade through nature's complex interconnections. The lack of awareness or humility leads to corresponding consequences, over and over again. However, rather than offend the gods, we harm other people.

The dangers of ecological hubris may seem to resonate with Leopold's claim about valuing the *integrity* of nature. Not that nature itself should be revered or hallowed. Rather, every action has potentially amplified effects. Ethically, precaution is warranted: a need to tread carefully (O'Riordan & Cameron, 1994; World Commission. . ., 2005). A responsibility to proceed, sensitive to ecological context and wary of possible long-term consequences to others. The larger the scale of the action, the greater the need for caution. The plainest remedy to ecological hubris seems to be a posture of ecological humility. Ironically, in a narrow view, that might well resemble an ethical respect for nature itself.

So, the source of environmental *values* here is conventional ethics: "respect for others" and perhaps "first, do no harm." Ecology merely *informs* us of the often unseen links from actions to their ethical consequences.

○ Imagining an Ecological Level of Self

Clarifying the interaction of values and science allows us to thread our way back to Leopold and his land ethos. As a first step, acknowledging nature as a bridge that connects all global inhabitants helps transform the ethical landscape. We shift moral regard from an exclusive focus on direct person-to-person interactions to the longer causal chains that link one person to other, socially remote persons. There is a world of upstream actions and downstream consequences (the ethics explored more fully in Scherer, 1993). The moral horizon of our apparently private routine behavior expands dramatically in scope. Any act with environmental overtones has inherent moral implications, as measured by the eventual effects on others. That includes virtually everything: from driving a car or using plastic bags to eating meat or charging a smartphone (Brower & Leon, 1999). Nature, so often conceived as distinct from and apart from humans, vividly becomes part of a fabric that ties us together. Atmosphere, oceans, soil, climate, glaciers, forests, rivers – Leopold's "land": all are interwoven into a very human ethical tapestry.

The second step is realizing that many of the greatest environmental concerns are ultimately about human welfare. Despoiling or destroying wilderness endangers *ourselves*. This is decidedly anthropocentric – in stark contrast to Leopold's land ethos. Valuing nature need not rely at all on establishing an intrinsic value of nature.

Yet Leopold was surely right about one thing. An understanding of ecological interactions gives greater importance to more holistic, systems-level perspectives (Scheffer & van Nes, 2018). Everything becomes ethically relevant. The status of nature, too. Even uninhabited wilderness. A human-oriented ethics, when informed by the large-scope view of ecology, inevitably becomes, ironically, more ecocentric.

Customarily, we ascribe identity to individuals, and think of them as moral units. But we also assume other identities, or "selves": our family, our neighborhood, our school, our hobby club, our sports team, our nation. The lessons of ecological hubris lead us directly to consider the global ecosystem as another simultaneous level of "self." In other words, we benefit by regarding Earth's ecology as a dimension of our own identity. "Think like a biosphere." In this perspective, preserving nature or wilderness ultimately reflects another version of caring for oneself, just writ very (very) large.

Leopold envisioned the "land" as wilderness, or as distinctly nonhuman. But a scientific understanding underscores the role of human interactions with the environment and, equally, the environment with humans. Historically, we may well wonder about the origin and meaning of a posture that nature is – or can be – distinct and apart from humans. That shortsightedness seems the root of our ecological hubris. How did we become aloof to our impact on the environment and thence on each other? Humans are an integral part of nature. And understanding that may have been, arguably, at the heart of Leopold's ethical vision.

References

Allchin, D. (1999). The tragedy and triumph of Minamata. *American Biology Teacher*, *61*, 413–419.

Brower, M. & Leon, W. (1999). *The Consumer's Guide to Effective Environmental Choices*. New York, NY: Three Rivers Press.

Flannery, M. (1998). Aldo Leopold reconsidered. *American Biology Teacher*, *60*, 148–151.

Flannery, M. (2010). Classics. *American Biology Teacher*, *72*, 581–584.

Harremoës, P., Gee, D., MacGavin, M., Stirling, S., Keys, J., Wynne, B. & Vaz, S.G. (2002). *Late Lessons from Early Warnings: The Precautionary Principle 1896–2000*. Copenhagen: European Environmental Agency.

Leopold, A. (1970). *A Sand County Almanac*. New York, NY: Ballantine Books.

Matthews, C.E. & Cummo, E. (1999). All wrapped up inn kudzu and other ecological disasters. *American Biology Teacher*, *61*, 42–46.

Minamata Disease Municipal Museum (2007). *Minamata Disease: Its History and Lessons*. Minamata City, Japan: Minamata City Planning Division.

O'Riordan, T. & Cameron, J. (1994). *Interpreting the Precautionary Principle*. London: Earthscan.

Scheffer, M. & van Nes, E.H. (2018). Seeing a web of connected systems. *Science*, *362*, 1357.

Scherer, D. (Ed.) (1993). *Upstream/Downstream: Issues in Environmental Ethics*. Philadelphia, PA: Temple University Press.

World Commission on the Ethics of Scientific Knowledge and Technology (2005). *The Precautionary Principle*. Paris: UNESCO.

Young, C. (2000). A textbook history: use of the Kaibab lesson in teaching biology. *American Biology Teacher*, *62*, 559–564.

DOUGLAS ALLCHIN is a historian and philosopher of science and science educator. He is author of *Teaching the Nature of Science: Perspectives and Resources* (2013) and *Sacred Bovines: The Ironies of Misplaced Assumptions in Biology* (2017), based on essays from this column.