

Important New Flora

Flora of North America. Volume 1, Introduction. Flora of North America Editorial Committee. 1993. Oxford University Press, New York. 372 pp. \$75.00. ISBN 0-19-505713-9.

Flora of North America. Volume 2, Pteridophytes and Gymnosperms. Flora of North America Editorial Committee. 1993. Oxford University Press, New York. 475 pp. \$75.00. ISBN 0-19-508242-7.

The Flora of North America Project, conceived in 1982, has just published the first 2 of the projected 12-volume series on synoptic flora of the vascular plants and bryophytes of North America north of Mexico. Volume 1 presents essays on a wide range of general topics. Although these do not treat their subjects in depth, critical issues and research are summarized clearly. An outstanding essay by Luc Brouillet and David Whetstone reviews the tectonic and glacial history, climate, geography, and physiographic regions within the flora range. Paleoecology is thoroughly covered in two essays, one by Alan Graham on Cretaceous through Tertiary vegetation change and the other by Paul and Hazel Delcourt on Late Quaternary vegetation. Contemporary vegetation is reviewed by Michael Barbour and Norman Christensen, who provide an overview of the vegetation of each biome with discussions of regional variation, current issues, and human impacts.

James Reveal and James Pringle have contributed a fascinating essay

on the history of botanical exploration and flora-writing in North America, complete with photographs of important botanists such as Benjamin Smith Barton and John Thomas Howell (the photo of A. S. Hitchcock is a classic). Weeds are considered by Ronald Stuckey and Theodore Barkley, who present a picture of a dynamic flora significantly influenced by the introduction of exotic species. For example, the flora of New York is estimated to include 36% foreign species and weeds make up 30% of the collective flora of New England.

One of the most interesting essays is that of George Yatskievych and Richard Spellenburg on plant conservation. It examines the arguments for the protection of biodiversity and provides compelling summaries of the ecological and economic impact arguments. It also examines issues of plant conservation and the management of exotics and summarizes conservation efforts and programs in Canada and the United States.

The last chapter of this volume deals with classification, including concepts of genera and species, classification of the pteridophytes and gymnosperms, the general system of angiosperm classification, and an overview of angiosperm families.

Volume 2 (Pteridophytes and Gymnosperms) treats 25 families, 77 genera, and 439 species of ferns and 6 families, 20 genera, and 115 species of gymnosperms. The editors have done a fantastic job. Despite the 55 contributors to this vol-

ume, stylistic differences are not apparent. Generic descriptions are expansive and focus on relationships, recent research, and diversity. For each species or infraspecific taxon Flora provides full synonymy, a description, range map and discussion of distribution, and other information on habitats, conservation status, economic uses, hybrids, and differences in taxonomic opinion. Additional research needs are also identified. The range maps, although small, generally present a clear picture of the general distribution of a species. Keys are thorough and accurate. Approximately one third of all species are illustrated using very clear line drawings which focus on critical and diagnostic characters. Common names are provided in English and French.

One disadvantage, particularly for the general user, is the absence of a glossary of terms. This is not as much of a problem as it might have been because the authors have used vernacular terms to the greatest extent possible. The editorial committee is still developing a glossary, which seems to be evolving as treatments for different groups are prepared.

The taxonomic revisions presented in Volume 2 are primarily of interest in the Pteridophytes. Considerable recent revision in several groups, notably the Lycopodiaceae and Ophioglossaceae, are not reflected in any regional treatment. Numerous segregate species and subspecies are recognized that are likely to change the picture of bio-

diversity within regions, and to require critical re-examination of these groups by conservation botanists. The recognition of segregate taxa may also enable community ecologists to detect additional differences in plant community structure or relationships.

The test for many species notes that they are "of conservation concern." This was determined through consultation with the Center for Plant Conservation, but is not clearly defined. Many very localized endemics are not identified as being of conservation concern, a conclusion that plant conservation program managers may disagree with. The designation "of conservation concern" is applied at the species level, ignoring taxa that are of substantial concern only in part of their range.

The value of this volume to conservation biologists, ecologists, and botanists (to the extent that these categories are nonoverlapping) is tremendous. The *Flora of North America* synthesizes all taxonomic revisions, new taxa, and changes in the flora over the past 100 years. It is the single best reference for understanding the biodiversity of plants in North America at a local, regional, or continental scale.

Lisa A. Standley

VHB, Inc.
101 Walnut Street
Watertown, MA 02272, U.S.A.

A Personal Journey into the Amazon

Tales of a Shaman's Apprentice: An Ethnobotanist Searches for New Medicines in the Amazon Rain Forest. Plotkin, M. J. 1993. Viking Press, New York. 318 pp. \$22.00 ISBN 0-670-831379.

What is the best way to carry the conservation biology message to the general public? Writers like Wilson

(*Diversity of Life*) and Carson (*Silent Spring*) tell a strong scientific story in order to let nature do the talking, relying on our sense of affiliation or aesthetics to engage the reader's emotions. Others use themselves as the messenger—the scientist or observer who offers his or her experiences and reflections as the vehicle by which the reader is moved to new insight and appreciation of the diversity and interconnectedness of life and its environment. The narrator (even if mostly in the background, as in Leopold's *Sand County Almanac*) helps the reader feel an identity between the human and the nonhuman world and prepares the reader to learn and think about conservation issues, as well as to feel. Mark Plotkin in *Tales of a Shaman's Apprentice* decidedly follows the second strategy.

Plotkin offers a lively account of his apprenticeship as an ethnobotanist working in the forests of northern Amazonia and uses the interdisciplinary nature of his work to confront the reader with the complexity of conservation issues; despite the first-person approach, the author is for the most part unobtrusive. Native peoples' cultures are presented with respect and with a certain distance—Plotkin makes no claims about his "belonging" to Amazonia, and his persona as a visitor lets him use culture shock as a teaching tool. In addition to the rainforest flora we meet good missionaries and bad, good shamans and scary ones, predators and parasites, Amazonia pristine and Amazonia degraded by its contact with Western culture. Plotkin is particularly good at portraying the dynamic by which a native people comes to devalue its own heritage and over-value the powerful, alien culture arriving by plane and road.

Plotkin is also strong in his portrayal of the Indian's relationship with the forest and the extensive, minute, and specific understanding that shamans and others have of the properties of the flora and fauna.

Though the fireworks come in accounts of healing herbs and hallucinations (his description of his experience with Yanomamo psychotropics is worth the price of admission), Plotkin quietly and steadily makes clear the astonishing range and specialization of the forest peoples' material culture.

One nagging concern about the book's tone is the extent to which Plotkin emphasizes the "rainforest as treasure-house of benefits for humans" argument in environmental ethics. A cost-benefit calculation may be a necessary part of an ideal conservation plan, but it founders all too quickly when the question comes down to specifics such as, "Is the preservation of species X really more important than providing hydropower for 100,000 people?" Few policy makers, and few of those 100,000 people, are yet ready to say "yes" sometimes, but stories like Plotkin's could prepare the way for a broader view of such conflicts of values. On the other hand, Plotkin has clearly found one possible path to make scientific research benefit the forest peoples directly, through his "shaman's apprentice" program, and that story deserves wider circulation in its own right.

Plotkin weaves useful vignettes about science practice into his ethnography, history, and personal narrative, so that the reader learns quite a bit about the laborious process by which "rainforest medicines" are actually sought and found and about the politics and economics of this kind of prospecting. It is hard to think of an important issue in conservation biology that is not touched upon in the course of the book. Thus, it succeeds to a great degree as an invitation and an eye-opener to the biodiversity of Amazonia and to the science and politics of its preservation.

Brian Drayton

Biology Department
Boston University
5 Cummingtown Avenue
Boston, MA 02159, U.S.A.

Addressing the Chiropteran Crisis

Old World Fruit Bats. An Action Plan for their Conservation. Mickleburgh, S. P., Hutson, A. M., and Racey, P. A. (Compilers). 1992. World Conservation Union (IUCN), Gland, Switzerland. 252 pp. Price: \$25.00. ISBN 2-8317-0055-8.

With accelerated habitat loss in the Paleotropics posing an increasing threat to wildlife, Mickleburgh, Hutson, and Racey have compiled a timely prescription to prioritize research for the conservation of bats in the family Pteropodidae. Old World fruit bats, as they are commonly known, are important players in forest maintenance and regeneration as seed dispersers and pollinators. These bats face pressures not only from habitat loss and disturbance, but also from commercial interests in various cultures. Bats are considered a delicacy in many regions, while in some places they are treated as pests by commercial fruit growers. Several species have become extinct in recent years and many others are considered threatened or endangered.

The compilers of this book, members of the Chiroptera Specialist Group of the World Conservation Union's (IUCN) Species Survival Commission, have drawn upon their own knowledge, as well as that of several contributors, to develop this action plan. It is directed toward aspiring conservationists and professionals and provides general background information, species accounts, priority grades, and recommended actions.

The book opens with an introduction detailing the evolution, distribution, ecology, population biology, threats, and protection status of the Pteropodidae in general. It then catalogs the family by genera, complete with primary references. Species accounts, written by specialists on particular taxa, provide valuable infor-

mation for most bats and comprise about one third of the book. Measures of biodiversity are reviewed, explaining how priority grades were assigned. Objectives are then outlined for each species on a country by country basis, including priority grades and specific project recommendations. An overview of survey techniques, captive breeding, and translocation programs follows, along with a summary of 20 top priority project recommendations. Included in the appendices are sections on plant utilization by Old World fruit bats, biodiversity indices, and distribution information.

This is not a comprehensive volume, replete with everything one needs to know before venturing into the field, but that is not its objective. Project recommendations may be brief but they adequately point out the right direction for applied research. Ample references are provided to direct the reader to additional details on distribution, methodologies, ecology, regional information, and more. This action plan provides a framework for future research where it is most critically needed, based on the status of each species and regional concerns. The book adopts a "top-down" approach, assessing the breadth of the problems facing the bats and then assigns priorities for the recommended actions.

This is a good reference volume and starting point for students and professionals interested in addressing the plight of Old World fruit bats. In an increasingly reductionist and myopic world, this book is a welcome beacon to direct the efforts of conservation biologists toward a common goal of coordinated research.

**Bruce W. Hazam
Thomas H. Kunz**

Department of Biology
Boston University
5 Cumming Avenue
Boston, MA 02215, U.S.A.

Evaluating the U.S. Endangered Species Act

Saving All the Parts: Reconciling Economics and the Endangered Species Act. Barker, R. 1993. Island Press, Washington, D.C. 268 pp. \$15.95 (paper). ISBN 1-55963-201-1.

Twilight of the Panther: Biology, Bureaucracy, and Failure in an Endangered Species Program. Alvarez, K. 1993. Myakka River Publishing, Sarasota, Florida 501 pp. \$19.95 (paper). ISBN 0-9635656-05.

Consideration of the Endangered Species Act (ESA) is appropriate because reauthorization is being debated in an arena of mounting pressure to drastically weaken its provisions. The cry to disarm the ESA arises primarily from its perceived socioeconomic impacts and a similar perception that it has failed to protect endangered species. The future of the ESA may rest on the outcome of high-profile environmental conflicts that center on species, such as the Pacific salmon, the Northern Spotted Owl, and the Florida panther, for which recovery could affect citizens within multi-state regions.

Saving All the Parts will help those who hope to retain a strong ESA by explaining how the Act is implemented and the roles of economics and politics in the listing and recovery of endangered species. *Twilight of the Panther*, on the other hand, will likely bring solace to those who wish to call the Act a failure. Both books explain obstacles facing wildlife and land managers and conservationists protecting endangered species. And both point out flaws in implementation of the ESA whereby protection of endangered species almost always comes unnecessarily late, making recovery difficult and fraught with economic and political obstacles. Beyond that, these two books have little in common.

In *Saving all the Parts* Barker evaluates the socioeconomic impacts of endangered species protection while handing out fair doses of criticism and occasional accolades. Adoption of the ESA of 1973 made protection of all species one of the Federal government's highest priorities and it required Federal agencies to ensure that the continued existence of endangered species is not threatened by actions they fund or carry out. However, agency funding has rarely accommodated this mandate. Although economics and politics are not among the factors the ESA includes as considerations for listing decisions, in reality socioeconomic factors do play a major role.

There are few examples of direct economic impacts due to implementation of the ESA, perhaps because there have not yet been significant impacts. There are, however, numerous examples of concessions based upon economics and politics, such as when the U.S. Park Service defers to politicians who want to calm the economic fears of nearby communities. For example, despite the improved status of grizzly bears in the Greater Yellowstone ecosystem, continued conflicts with logging, road development, mining, oil and gas development, public lands grazing, subdivision, and all the other impacts of an increasing human population provide a major obstacle to the long-term existence of the bears. This competition between nonhuman species and humans is the essence of conflicts involving the ESA.

Water fuels the economy of the Pacific Northwest through irrigation, fishing, and hydroelectricity and it is a necessary component of the habitat of many endangered species. The 10,000 mile journey of a salmon from Idaho to the Pacific Ocean and back again illustrates the link of many endangered species to water. This linkage places them in economic and environmental conflicts with many human interests

such as tribal, commercial, and sports fishing rights; logging and watershed protection; cheap hydroelectric power; aquaculture; irrigation; livestock grazing; and interstate transfer ("theft") of water. Economic impacts reach billions of dollars. Yet if the health of the region is measured in the health of its rivers, the prognosis is not good. The ESA places salmon on an equal par with economics. Do we have the resolve to see that salmon, and our environment, will maintain that status? Compromises, which have been an unappreciated facet of implementation of the ESA, will be difficult, but the opportunities for cheap alternatives have already been lost.

Economics and politics were given extensive consideration regarding endangered species during the 1980s. Reasonable management programs implemented then would have reduced economic and environmental impacts of ESA administration today. The clear lesson should be that prevention is better for species, the environment, and the economy than cures. Estimates in 1990 by the U.S. Department of Interior were that recovery of listed and candidate species could cost \$4.6 billion.

Recognizing that the ESA has failed to "save all the parts," Barker promotes the concept of managing ecosystems, rather than single species. This concept began to develop in the 1980s and has its roots in the Northern Rockies. Because grazing, logging, mining, recreation, and other public land activities affect wildlife, user fees or taxes could be imposed to develop a biodiversity trust fund. It would be used to provide and protect habitat and encourage tolerance of endangered species on private land. He concludes on a conciliatory note, pleading that within regions, nations, and the world we must overcome our differences in values, needs, and attitudes in order to "build a common future."

The Florida panther recovery program, described in detail in Alvarez's book, may be facing insurmountable odds because of Florida's burgeoning human population, habitat loss, inadequate basic knowledge of Florida panther biology, diseases, probable declining genetic diversity, and, most important in his view, four land and wildlife management agencies with often conflicting mandates, policies, and priorities. It appears the purpose of *Twilight of the Panther* is to convince readers of the inadequacy, ineptness, recalcitrance, and general incompetence of these agencies (U.S. National Park Service, U.S. Fish and Wildlife Service, Florida Department of Natural Resources, and Florida Game and Fresh Water Fish Commission). In order to illustrate further the "bureaucratic dysfunction" of these agencies, and their counterparts in other states, the author presents accounts of recovery programs for the California Condor, black-footed ferret, Dusky Seaside Sparrow, and grizzly bear in Yellowstone. Alvarez and a few others, who apparently helped reinforce his beliefs, choose to blame state and Federal agencies as the base cause of problems associated with the ESA.

Twilight of the Panther describes mistakes and failures of the agencies in recovery efforts for panthers and select other endangered species. I am intimately familiar with one endangered species program Alvarez describes, the black-footed ferret, and found the author's account of recovery efforts for this species inaccurate and biased. If accounts of recovery programs for other species are similarly flawed, the book will do an injustice to readers wishing to gain knowledge about how the ESA has performed.

The author makes his case that the Florida Game and Fresh Water Fish Commission, Wyoming Game and Fish Commission, and California Department of Fish and Game, in particular, and all state fish and game

commissions in general, are inadequate to administer the challenges of endangered species management. State game agencies are run on folk wisdom by biologists with "expertise (that) often has limited scope for expression." Administrators know too much about politics and too little about biology. "Unprofessionalism" is "institutionalized" and state game agencies are "incompetent" and "dysfunctional." Citizens' boards as policy making commissions are outmoded and should be replaced by nonagency professionals better capable of understanding pressing environmental and endangered species challenges of this modern time.

He continues that, the Federal government has in the U.S. Fish and Wildlife Service "a woefully inadequate instrument with which to execute the ESA." Although there are times when I agree with him, I do not agree that the ESA is "soundly if not lavishly financed." Alvarez believes the problem with the Fish and Wildlife Service is that, in addition to being "the sick man of the federal land management agencies," it is too weak to force other agencies to implement necessary recovery action, e.g., its failure to force Everglades National Park to manage for more deer.

Management agencies have never been perfect and they never will be; mistakes are made and recovery actions are implemented too slowly. Treatment of recovery efforts in *Twilight of the Panther* is, however, biased to the point that the reader has little opportunity to evaluate the author's conclusions. If liberally viewed, examples in the book may provide insight into how to improve recovery programs, although the author seldom provides help by suggesting realistic changes.

Alvarez's most damaging belief, as far as the ESA is concerned, is that its implementation is adequately, if not overly, funded. He frequently states that there is no funding shortage,

which suggests an enormous naivete about endangered species recovery. Furthermore, he rarely acknowledges socioeconomic impacts recovery of Florida panthers and other endangered species may have. Recommendations for captive breeding, giving panther recovery primacy over hunting, public land management for panthers, and creation of a system of refuges and corridors demand extensive socioeconomic considerations, which are lacking. By denying funding shortages for ESA implementation and ignoring socioeconomic impacts of recovery programs, Alvarez does his greatest disservice to the Act and endangered species.

E. Tom Thorne

Wyoming Game and Fish Department
Laramie, WY 82071, U.S.A.

A Genetic Need to Love Nature?

The Biophilia Hypothesis. Kellert, S. R., and E. O. Wilson (editors). 1993. Island Press, Washington, D.C. 484 pp. \$34.95. ISBN 1-55963-148-1.

Edward O. Wilson coined the term "biophilia" to refer to the emotional ties that human beings feel toward other living things. These ties are complex, he claims, and do not always involve positive evaluation. They include fear as well as love, aversion as well as attraction. The biophilia hypothesis states that these attachments are at root genetically determined and unfold according to the same principles of *epigenesis* that other biologically determined traits show. If biophilia tendencies are heritable, and if they are widespread, it is likely that they confer an evolutionary advantage on use or—at the very least—are associated with features that turn confer advantage on us. To ignore such feelings and attachments and so continue logging out watersheds, for example, even when we feel to do so is

wrong, may be to engage in maladaptive behavior.

This new collection of essays takes stock of the biophilia hypothesis, nine years after Wilson put it forth in his book, *Biophilia*. The range of contributors alone makes the publication of this volume an event to note: zoologists, philosophers, anthropologists, psychologists, foresters, ecologists and other biologists bring an impressive reach of disciplinary perspectives, often with cross discussion of each others' work. Major disagreements about, for example, the attitudes of primary people to their environments, are dealt with in detail. Thus Stephen Kellert's long essay on the biological basis for human valuation of nature is balanced by Jared Diamond's account of his reservations about the biophilia hypothesis based on many years of living and working among New Guinean peoples. Holmes Rolston's careful philosophical appraisal of the limits of sociobiological thinking ends with the ethical injunction that we should learn to respect nature better. Lynn Margulis and Dorion Sagan, by contrast, question the idea that we know our planet is sick and that we can fix it by conservationist measures: conservation on an evolving planet is, they suggest, ultimately a lost cause.

If the biophilia hypothesis were true, then there might be a biological basis for some forms of respect for nature. But where could we look to find a biological origin, or influence, on our attitudes to nature? First, think of our relation to nature as a resource. It is obvious that all human groups turn to nature for clothing, food, shelter, and—more recently—minerals and tourism. Jared Diamond points out that New Guinean peoples have a massively rich vocabulary for the birds that surround them and an intimate understanding of their behavior and habitats. By contrast, they have no taxonomy at all for butterflies, despite the presence of many conspic-

uous and easily identified species. He suggests this is because butterflies serve no use for them, while birds are either food sources, guides to food, or guides to other culturally and aesthetically important aspects of their surroundings.

However, Diamond doubts there are any general truths about human curiosity and disinterested enjoyment of nature. For other theorists, this is more problematic. Several contributors seem to believe that our sense of what is beautiful, right, or fitting may be a product of natural selection. Natural symbols, they argue, have a potency that is shared by few artefactual ones: could the fascination with snakes and spiders, for example, be something that is biologically based? Evidence for this, as Wilson himself points out in the opening essay, is that modern city-dwellers dream far more often about snakes than about any other single kind of thing. Stephen Kellert argues that there are nine dimensions of this sort along which we can think of human valuations of nature, each of them a candidate for being biologically based rather than culturally learned.

Does this mean that biophilia can be a foundation for conservationist practices? The trouble is that in its most general form the hypothesis allows destructive activities to count in its favor just as much as conservationist activities. The resource-based attitudes to the natural things around us to which Diamond draws attention may be as much evidence for our "natural" (that is genetic/epigenetic) adaptations to nature as any evidence drawn from those societies where an ethic or religion of respect for nature exists. Richard Nelson eloquently describes the reverence toward nature of the Koyukon and Inupiaq traditions in his essay, "Searching for the Lost Arrow." Both sets of behaviors studied by Nelson and Diamond seem to be equally "natural" and equally human. But this shows that there is no essential connection between what

is natural—biologically hard-wired in us—what is adaptive, and what is right or good. So whether our affinities or disaffinities for nature are good or bad, for us or for others, has to be discovered anew in each case.

A short review can only hint at the riches to be found in this important volume which is a tribute to the power that Wilson's original but essentially simple idea has for focusing debate in a productive way. Yet the scope for disagreement is, as Michael Soulé indicates in a useful postscript, wider than might be indicated within the volume itself. Most of the contributors belong to the neo-Darwinian tradition, within which humans are regarded as *in nature* and subject to genetic and epigenetic forces not of their own making. There are, however, other views of human life to consider as well. One, which Soulé describes as "neo-Marxist," takes human life as paradigmatically *in culture* and subject to social and historicocultural forces. There are others too, and it is perhaps prudent to remember that, just as there is no single science that provides a privileged reduction of all the other sciences, so also there is no single perspective on something as complex as human life that can claim to provide a satisfyingly complete analysis of our situation. Within the biological approaches to our present problems, however, this volume is hard to beat. It should be on the reading list of anyone interested in the philosophy and biology of conservation.

Andrew Brennan

Department of Philosophy
The University of Western Australia
Perth, Western Australia 6009
Australia

Readings in Environmental Ethics

Environmental Ethics: Readings in Theory and Application. Pojman L. P. (editor). 1994. Jones and

Bartlett Publishers, Boston. \$35.00 (paper). ISBN 0-86720-951-8.

The Environmental Ethics and Policy Book: Philosophy, Ecology, Economics. VanDeVeer, D, and C. Pierce (editors). 1994. Wadsworth Publishing Company, Belmont, California. \$37.95. ISBN 0-534-21030-9.

These are two fine collections of previously published articles on theories of moral regard for the environment and applications to public environmental policy. Both are excellent compilations of writings on the moral aspects of environmental policy and thought. I can think of no reason to intrinsically prefer one of these works over the other. Both anthologies are recommended as classroom texts or for the general reader wanting concise introductions to the field of environmental ethics.

While environmental ethics as a distinct discipline is still being developed, collections such as these help to frame the general areas of discussion. These collections differ somewhat in their approach to environmental ethics, but they share an overall similarity in the way the editors have arranged the major topics.

The normative theories, which are emerging as dominant in environmental ethics, center on animal rights or animal welfare, feminist philosophy, social ecology and "deep" ecology, and, most importantly, ecological or biological-based ethical systems. Because of its focus on individual rights, the legitimacy of animal rights or animal welfare concerns as properly environmental is often questioned. However, the debate attracts enough interest to justify inclusion. Feminist theory is sometimes questioned as lacking any profundity as a distinct field of thought, let alone as an environmental issue. The articles in both of these collections are serious attempts to show connections between feminist issues and environ-

mental problems. Social ecology centers on the application of ecological theory to human culture and is gaining adherents in the discussion of environmental ethics. "Deep" ecology is based almost entirely on the philosophy of Arne Naess and, while interesting, remains enigmatic to me. Finally, there are the several variations of moral theory which find their common basis in the assumption of intrinsic value in nature, ecological relationships, and evolutionary processes. This final area is, to my mind, the most robust reason for the study of environmental ethics by conservation biologists.

Economics and sustainability form another element of the milieu in these collections. Economics, along with ecology, has some basis in moral theory. Because of the political ramifications of programs promoting sustainability, it is important to have more than a passing familiarity with the major economic justifications and criticisms. Of special concern, because of its direct moral implication, is the use and abuse of benefit/cost analysis in environmental policy. The inclusion of either "costs" or "benefits" is profoundly a matter of selective normative judgment and practitioners of benefit/cost analysis become moralists by default. Ignorance of the moral implications of economic analysis remains a major problem in formulating sound environmental policy.

The final general ingredient of environmental ethics, which seems to be increasingly accepted, is the practical application of ethical theory to specific and general environmental policy. This final part of the mix is probably the reason environmental ethics continues to be con-

sidered mere applied ethics, such as medical ethics, as opposed to a distinct field of moral philosophy. I am grateful that neither of these works wastes any space on that vacuous issue but concentrates on examining as much of the literature in these areas as possible.

While these two works share some degree of similarity, there is a remarkable lack of repetition. Of the more than 140 articles by nearly as many authors in the two volumes, the few in common (probably fewer than 10 articles) are usually seminal, such as Aldo Leopold's "The Land Ethic" and Lynn White's "The Historical Roots of Our Ecological Crisis." Beyond a general organization and a few specific articles, there are some significant differences in these works.

Pojman presents all issues as a point-counterpoint debate by the use of generally opposing articles. Each section has an introduction, study questions, and suggestions for further reading. For anyone wanting a well-rounded look at the conflicting views in the field, this is an excellent sampler. This approach would usually lose in depth what it gains in breadth, but this is not a major problem here. Pojman, however, assumes a passing familiarity with general moral theories that may be somewhat unwarranted. This work lacks an overall index and bibliography, which should not be a dilemma for most readers. The readings are not too complex for the undergraduate student, and more advanced students and practitioners will be familiar with any of the articles.

VanDeVeer and Pierce are more direct and have a definite point of

view. They assume the reader accepts the premise of an environmental crisis that requires moral decisions. While some of the articles take slightly different tacks, they do not disagree on fundamentals. The editors have included an original section on moral theory and how it applies to environmental concerns that will be most useful to those not conversant with formal philosophical issues. This approach necessarily precludes wide coverage of the issues, but this is compensated for by sharper focus. The work does not have an index, but in addition to useful endnotes there is a good bibliography arranged by general topic.

The only fault I would find with these works, and it is admittedly a personal bias, is that the historical figures who have given us the foundation of environmental ethics, George Perkins Marsh, Ralph Waldo Emerson, Henry David Thoreau, John Muir, Rachel Carson, and especially Aldo Leopold, are not treated in the depth they deserve. Both of these volumes deal with the historical and intellectual roots of environmental problems; however, a more vigorous consideration of the origins of environmental awareness would have been appreciated.

Steven J. Bissell

Colorado Division of Wildlife
Denver, CO 80216, U.S.A.

ERRATUM

In issue 8:2, in the book review entitled "Greenway Ecology, The Prolegomenon," p. 603, Thomas Hoctor's name was inadvertently misspelled. We apologize for this error.