

200 photographs and drawings, it will be of value to all whale-watching and seal-watching enthusiasts.

The book is divided into three parts. Part 1, on whales, dolphins and porpoises, is the largest. An introduction covers the general biology of cetaceans, discusses environmental threats such as chemical pollution, entanglements and whaling, and provides helpful guidelines for whale watchers, such as where to see whales, how to overcome sea sickness, and the best type of film to use. Species accounts for the 22 species found in the area start by describing how to identify the whale from a distance. The emphasis is on features of whales that are visible at sea, including details such as coloration, shape, and dive times. The guide then summarizes general biology of the whale—diet, feeding behavior, voice, distribution, abundance, and seasonality. A helpful key for identifying stranded whales, dolphins and porpoises is included at the end of Part 1.

A small Part 2 on basking sharks, sunfish, and turtles has been added as a bonus for whale watchers, as these animals often wash ashore dead or become entangled in nets.

Part 3, on seals, contains accounts of seven species known from the area. Their general biology is described and a features key for identification is provided. Overexploitation, quotas on annual take, and other management issues are discussed.

There are two appendixes: one summarizes important prey species of whales, porpoises, and seals, while the other lists whale-watching and seal-watching excursions. There is an extensive bibliography and a list of audiovisual sources.

Perhaps my only frustration with this book is that I see it soon becoming damaged under the onslaught of harsh marine field conditions—a plastic cover would extend its life. Overall, it provides both excellent descriptive detail and a thoughtful analysis of the problems faced by today's marine mammals.

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ENVIRONMENTAL SCIENCES

KEEPING ALL THE PIECES: PERSPECTIVES ON NATURAL HISTORY AND THE ENVIRONMENT.

By Whit Gibbons; Foreword by Eugene P. Odum. Smithsonian Institution Press, Washington, D.C. \$16.95 (paper). xxi + 182 p.; index. ISBN: 1-56098-224-1. 1993.

As ecologists we find ourselves in a difficult situation in the late twentieth century. Before us yawns a new dark age driven by overpopulation and over-

consumption. Ecologists stand, like the thin red line of the British Empire, between our current civilization and this black hole of history. Either we succeed in our research, and in publicizing the results, or we know that our future will be—unpleasant. Yet it seems that in spite of our importance at this point in history, the public fails to understand. This shows up in several unfortunate ways: (1) We are denied the resources we need to carry out our work. Most of us have lifetime research budgets less than the yearly salary of one professional sports figure. (2) If we do find the money to do research, it is likely that it will be ignored. (3) We do not get the critical acclaim that we so richly deserve.

There seem to be three possible responses.

(1) We return like troglodytes to the lab and the field, counting ourselves among the (un-)fortunate few to watch as the planet slides into a new dark age. We accept that an ecologist is like a gut bacterium, something necessary for health, but not the sort of entity one wants to keep as a pet or take to bed.

(2) We switch careers into those that society has decided are useful. Professional baseball, hairdressing, and video game design are all possibilities.

(3) We take the time to write for the public to tell them about what we are doing and why.

Thankfully, a few colleagues are taking this latter route. Rather than criticizing them ("What—another article in the newspaper? Why did you not write for a refereed journal?"), we need to honor and respect them. They are our public relations staff. One such courageous person is Whit Gibbons, a professor of zoology at the University of Georgia. He has written some 20 essays which, according to the acknowledgements, were originally presented in newspaper columns, and are now presented as chapters of *Keeping All the Pieces*. The title of course comes from the adage by Aldo Leopold, "To keep every cog and wheel is the first precaution of intelligent tinkering."

These essays are organized around the theme of biological diversity. They fall into four categories: stories that illustrate natural complexity and ecological relationships, stories about the threat of extinction, a discussion of culprits, and commentaries on possible actions.

In the second category there was an essay on the disappearance of panthers. An intriguing part of this story was the description of how easy it is for the public to misidentify wild animals, leading to false reports of endangered species. It was a good reminder about the difficulty of collecting accurate data, even without the added problem of

public sightings. Of course, those of us who have worked as park naturalists or in museums will know of some of the utterly remarkable birds and plants people claim to have seen. If public reports are accurate, there are many new species to science still drifting around campgrounds in North America.

In the section on culprits, Gibbons amplifies my introduction by describing a poll that asked people about the sources of environmental information they most trusted. Gibbons was surprised to find that doctors and nurses came out on top. When he investigated, he found that neither ecologists nor scientists were even listed as possible choices!

Some may find the book frustrating, not because of the quality of work, but because the stories mirror our own professional frustrations. In this sense the book is not light or recreational reading. This is, however, very much the sort of book I would recommend for people who are not ecologists, so they had some idea of what we do, and why it matters. It would make a good gift for that pesky relative who asks when you're going to settle down and get a real job. One might also consider this book as recommended reading to introduce non-science majors to ecology.

I had two reservations about the book's content. Both probably arise from the source of the material: a newspaper column where one is bound to entertain, and cannot risk annoying readers or asking them to pause and reflect for long.

First, the view of science presented in this book is oriented toward the natural history rather than the empirical view of ecology. That is, it emphasizes complexity and detail rather than general relationships. My own view is that we have failed to place enough emphasis upon general relationships, and that this may have actually hampered our attempts to create this new area of science (Keddy, *Trends Ecol. & Evol.*, 9: 231-234, 1994). An alternative here would be Colinvaux's book, *Why Big Fierce Animals Are Rare* (Princeton Univ. Press, Princeton, 1978).

Second, Gibbons has a certain irritating tendency to pull his punches. For example, the section on overpopulation seems rather gentle when what is needed is a clarion call and probably some good honest fear mongering. Here I would turn to Hardin [*Living within Limits: Ecology, Economics, and Population Taboos*, Oxford Univ. Press, New York, 1993 (reviewed in *Q. Rev. Biol.*, 69: 237-240, 1994)]. Similarly, the part about choosing environmental groups fails to list the five or ten most important groups he would support.

But this is nit-picking. Overall, one can hope that more of our colleagues will follow Gibbons's lead. I look forward to the day when suggesting I am an ecologist generates the sort of enthusiasm normally reserved for military heroes. I hope it happens in my lifetime. If it does, I must remember

to drop Gibbons, and some of our other popularizers of ecology, thank you notes.

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MUTUALISM AND COMMUNITY ORGANIZATION: BEHAVIOURAL, THEORETICAL, AND FOOD-WEB APPROACHES. *Based on a symposium held in Japan, 18-22 August 1990. Oxford Science Publications.*

Edited by Hiroya Kawanabe, Joel E. Cohen, and Keiji Iwasaki. Oxford University Press, Oxford and New York. \$75.00. xii + 426 p.; ill.; author and subject indexes. ISBN: 0-19-854027-2. 1993.

Since the mid-1970s, community ecologists have been fascinated, and at times frustrated, by the complexity of species interactions. The contributions in this edited volume attempt to bring together a number of approaches to the study of indirect and complex species interactions and include both empirical and theoretical approaches. (Despite the book's title, almost as much attention is given to competition and predation as there is to mutualisms.) Perhaps not surprisingly, this book shows that much progress can be made to understand such complexity, but that there is still a long way to go before our understanding can be considered satisfactory by even the most optimistic investigators.

The papers in this volume are contributions by both Japanese and foreign investigators. The quality of the papers is evenly good with the papers by the (mostly) younger Japanese scientists providing more in the way of rigor and the foreign contributions being more speculative or general. However, the editors are to be commended for obtaining an excellent balance of content and speculation from almost all the authors. Because they span such an array of approaches—theoretical and empirical, behavioral and populational, ecosystem-focused, or purely population-oriented—this volume is worth reading in its entirety to get a sense of the range of issues that are related to community complexity. For example, several contributions explore how foraging, territorial and schooling behaviors affect species interactions, both directly and indirectly. Abrams and Higashi both show how this can occur theoretically, and some fascinating empirical examples are shown by Fujii and Toquenaga, Yuma, and Nakai. This work illustrates how far mechanistically explicit models have yet to go before they deal with this sort of complexity. Additionally, a number of papers explore the use of the food-web concept to understand indirect interactions. Pimm, Burns, Tsumura et al., and Schoener all explore theoretical issues related to this problem; the practical problems are well illustrated by the chapters by Iwasaki, Itioka, and by Takabayashi and Dicke. The relation of food-web patterns to models of species interactions is an important development in