

directly into microbial ecology, the heart of hydrothermal vent ecosystems.

Working her way up the organizational hierarchy, the author leads her reader through symbiotic relationships and on to physiological and trophic ecology. The next dyad of chapters covers reproductive ecology and community dynamics. The chapter on congeneric communities that follows gives roughly equal coverage to both Atlantic and Pacific sites; it includes a rather thorough-going analysis of both biotic and abiotic ecological relationships.


Many readers will be fascinated by the final chapter, which relates current ideas about the origin of life to certain facts about hydrothermal vents and their communities. A final section of this chapter deals with extraterrestrial hydrothermal systems and the search for life in outer space.

This book is a must read for persons interested in marine biology or ocean systems in general or in deep-sea and hydrothermal vent ecology in particular.

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## ANIMAL BEHAVIOR

**The Astonishing Elephant.** By Shana Alexander. 2000. Random House Publishers (299 Park Ave., New York, NY 10171) 300 pp. Hardback \$25.95.

 Those old enough may remember the historic photos of a live U.S. elephant birth at the zoo in Portland, Oregon, in 1962. The birth of Packy, the male Asian elephant, was reported for *Life Magazine* by Shana Alexander. In her new book, *The Astonishing Elephant*, Shana reports that Packy is now "certainly the largest Asian elephant anyone has ever seen." Packy's story provides a unifying theme as the author meanders through the history of human interactions with elephants. The conversational survey of anecdotal stories about elephants reveals reverence for the awe and fear inspired by elephants in myth, war, religion, the early American entertainment industry, and even throughout modern scientific research efforts to breed elephants in captivity using artificial insemination.

The demands for the care of elephants make it astonishing that man has assumed a role with elephants: an elephant in the wild forages 50 tons annually and requires 60 gallons of water per day. The elephant digests

only 44 percent of its hay intake, leaving loads to shovel at the other end. Such facts highlight the complexities of life with elephants. The story of Morgan Berry, owner of the elephant that sired Packy, adds dimension. Morgan's partner, Eloise, was disemboweled by Packy's sibling during a circus performance in 1978. Morgan remained dedicated to the hard work of caring for his nine-elephant herd until his body was found folded up, absolutely flat, next to an elephant staked outside his barn. We begin to comprehend, if not accept, the extermination of nearly all male elephants in the U.S. earlier this century.

According to John Lenhardt, Animal Operations Manager at Disney's Animal Kingdom, three percent of elephants in the U.S. and Canada have been involved in one or more human deaths. Some of these deaths are attributed to bull elephants in musth looking for a fight. In terms of evolution, musth may be nature's way to get young bulls to challenge the herd bull. In the absence of a herd, the human trainer has the place of the alpha male—until the trainer shows a sign of weakness and the elephant challenges. Warm and touching contacts with female elephants exemplify the loving bonds elephant workers develop with their charges. However, examples of aggressive females that slam around elephant calves show that aggression is not limited to males in musth and help us comprehend the current system of "protected contact only."

This story of co-existence of man and elephant often reveals more about man's caring and cruel behaviors than about elephants. A biologist may want more detail on elephant physiology and survival skills—but perhaps that remains to be learned. While the book provides more questions than answers, it is delightfully written, with enough examples to prove that each one of us shares responsibility as we determine how we will co-inhabit the Earth with elephants.


Teachers will find anecdotal details to interest and motivate students to delve into the ethics of animal handling. Zoology students will appreciate the pitfalls that come with emotional attachments, and the reasons why modern researchers translate their love of an animal into the distanced effort and care required for saving a species. Fascination has been fatal for both elephants and humans, highlighting risks and questions that will interest students in learning more so that we can take the steps that may result in salvation of a species whose diversity,

adaptability, and ultimate demise may reflect our own.

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## SCIENTIFIC FRAUD

**Voodoo Science: The Road from Foolishness to Fraud.** By Robert L. Park. 2000. Oxford University Press, Inc. (198 Madison Ave., New York, NY 10016). 230 pp. Hardback \$25.

 What is "voodoo science?" It is nothing more than another name encompassing pseudoscience and fraudulent science and what Park calls "junk science" and "pathological science." Park expertly and entertainingly, and even, at times, humorously, explains the nature of several cases in which people have not only fooled themselves, but others as well.

Each case explored—power lines and cancer, Vitamin "O," homeopathy, cold fusion, perpetual motion machines, extravagant expenditures for space exploration, and more—is debunked expertly. Years ago, as a young student, my eyes were opened to fraudulent science when I read Martin Gardiner's *Facts and Fallacies in the Name of Science*. I had hoped that this book would be capable of opening the eyes of my young students today. Unfortunately, it is not easily accessible to them.

The tales of delusion and sham are certainly interesting. And who can deny that we all need to be sufficiently scientifically literate to recognize the snake oil salesman? Frequently Park uses the Paul Harvey technique of putting off "the rest of the story" until some later time—perhaps chapters later. For my students, the rest of the story is too far away and the tale too technical or convoluted.

In the interest of brevity, he has omitted references. This is unfortunate, since much of its value could be the simplified explanation with references for more development or a guide to the historic documents related to the issue. Maybe I am deluding myself, but I think a few well chosen references would help me use the book to engage my students in Park's work. How nice it would be to have the newspaper headline related to an issue. I'm pleased that the editor didn't cut the index.

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