

Book Reviews

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GAIA

Gaia's Body: Toward a Physiology of Earth. By Tyler Volk. 1998. Springer-Verlag (175 Fifth Ave., New York, NY 10010). 269 pp. 27 illustrations. Hardback \$27.

 Many of us remember the more than 30-year-old movie, "The Fantastic Voyage," in which a miniaturized surgical team travels in the blood stream of a critically injured diplomat in order to clear the brain of an inoperable blood clot. Using the movie analogy, Tyler Volk explains in the preface to *Gaia's Body* that the idea of traveling inside a giant body is not unfamiliar to him. We are all voyagers inside the biosphere, cells within the physiology of Gaia. Volk argues neither for nor against the concept of a living Earth, a self-regulating and self-sustaining organism, and he cautions against the image of a volitional being. "Organisms evolved; Gaia did not."

Like James Lovelock who first named Gaia, Volk considers Gaia (our biosphere) to be an interacting system of life, soil, atmosphere and ocean. Through precise analysis of cycling ratios of life-sustaining elements, Volk carefully details material flows and cycles of the biosphere as he articulates his view of geophysiology, the science of Gaia. It is clear that Volk is amazed and awed by the processes that maintain life. While much of the book

involves lengthy descriptions of biogeochemical cycles (the "global biogeochemical symphony"), a sense of wonder pervades. He writes, for example, of the "duet of nitrogen and phosphorus, a harmony in the realm of Poseidon." When writing about the border between ocean and atmosphere, we learn that "gases flow to and fro, like the sharing of breath between the lips of lovers, at this vast interface of water and sky."

Throughout the book, Volk continually returns to the question, "How would the planet be different without life?" He distinguishes life as something special among the four components of Gaia. Thus, the dynamics of Gaia are of life and the three Gaian matrixes. By understanding the flows and cycles of Gaia, Volk says, scientists will gain a truer picture of our place in the biosphere and will be better equipped to shape the future of Gaia.

Do not think you must be a believer in Gaia as a self-sustaining organism in order to appreciate *Gaia's Body*. Clearly written and articulated, the book will appeal to all who seek a deeper understanding of our living planet. Those who seek solutions to Earth's environmental problems and those who are merely curious will find something of interest in *Gaia's Body*. While the detail may overwhelm readers with little background knowledge, the substantive message of the book is clear and worthwhile for readers from upper secondary through adult levels.

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ENVIRONMENTAL PROBLEMS

Nature Wars: People vs. Pests. By Mark L. Winston. 1997. Harvard University Press (79 Garden St., Cambridge, MA 02138). 1997. 210 pp. Hardback \$24.95.

 After a summer on Cape Cod with the U.S. Department of Agriculture's program designed to control the gypsy moth with chemical sprays, author Mark Winston decided

to become a career entomologist. Following formal training, he joined the Centre for Pest Management at Simon Fraser University in Vancouver. In the early 1990s the city of Vancouver also became infested with gypsy moths. *Agriculture Canada*, the Canadian equivalent of the USDA, decided to spray the city with the bacterium *Bacillus thuringiensis*. The faculty at the Centre approved the plan but the citizens of Vancouver reacted strongly against it regardless of the scientists' effort to reassure the citizens of its safety and environmental correctness.

This book was written in response to that event. Winston explains various new biological methods of pest control and explores the factors that influence decisions about how to deal with pests. By now he had expected to find a dramatic decrease in the use of chemical pesticides, replaced by a variety of biologically based strategies. Instead he found that most biological methods remain at the fringes of pest management. Chemical pest control continues to dominate our attempts to manage pests because of its lower cost and simplicity. Winston himself favors its limited use, but as a last resort.

Winston makes a strong case for pest management versus our ill-fated attempts at pest eradication. He supports his approach with a battery of case histories illustrating the complex political, biological, economic, social and personal interactions that lie behind each pest management decision. Various chapters discuss the use of insect-killing bacteria, pheromones, parasites and predators, sterile insects, transgenic plants, and integrated pest management (which he says has become a pesticide-driven program). He provides the advantages and disadvantages of each method.

Winston also discusses the problems arising from the evolution of pesticide-resistant populations of target pests, the impact of control measures on non-target organisms, the tendency of consumers to overreact to the sight of a single cockroach or a blemished fruit, and the attitude that we have a divine right to manipulate nature to shape a world of human design.

Rita Hoots, Book Reviews Editor, is a professor at Yuba College and teaches classes in the biological sciences, human anatomy, and chemistry. Her various degrees in the sciences, counseling, and education come from the City University of New York, University of Wisconsin-Madison, California State University-Sacramento, and the University of California-Berkeley. Before entering the education field, Hoots was for many years a researcher in cell ultrastructure and immunology. Her predominant passion in education is directed to the popularization and illumination of science for the public. Her address is: **Science Dept., Yuba College, 41605 Gibson Rd., Woodland, CA 95776; e-mail: rahoots@ix.netcom.com.**