among the contributions, although it can be interesting to see the range of opinions that exists in this active field. Despite its minor flaws, the book succeeds in summarizing a significant component of our current knowledge about star formation and its consequences on galactic scales. It is important reading for anyone interested in the astrophysics of star formation.

*John S. Gallagher III*
*Department of Astronomy, University of Wisconsin, Madison, WI 53706–1582*

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## Worthy Animals

**A Functional Biology of Parasitism.** Ecological and Evolutionary Implications. GERALD W. ESCH and JACQUELINE C. FERNÁNDEZ. Chapman and Hall, New York, 1993. xiv, 337 pp., illus. $59.95 or £37.50. Functional Biology Series.

For most of us, a walk through the woods or along the creekside reveals the living world as we commonly think about it—the flash of a colorful bird, all the shades of photosynthesis, the near-frantic activity of insects as the day warms up. Through the good graces of biology texts and the Public Broadcasting System, we know that these organisms compete, that their population levels are by no means fixed, and that they are in a continuing adaptive process with a changing environment.

Gerald Esch and Jacqueline Fernández ask us to look again. Dwelling inside (and on) most of these organisms are other populations, other communities. Esch and Fernández write about how the parasites of free-living organisms compete with one another, adapt to their living environments, and endure the predictable insults of immune systems and the vicissitudes of passage from host to host.

Although ecological questions have been asked by parasitologists for decades, their findings have been published in the parasitological literature, where they were largely ignored by ecologists. In recent years, motivated by Peter Price's *Evolutionary Biology of Parasites* (Princeton University Press, 1980), evolutionary ecologists have become excited about the possible impact of parasites on host evolution and ecology, and there has been a noticeable increase in books on host-parasite interactions. Parasites themselves also hold delightful potential as objects of ecological scrutiny—the possibility of replicating entire populations and communities in the field or the laboratory, for instance—and *A Functional Biology of Parasitism* is unique among recently published volumes in broadly addressing that aspect of parasite ecology.

Esch and Fernández fulfill their stated purpose, that the book be useful as a textbook and as a reference. They are careful to introduce parasites clearly in the beginning of the book. The emphasis is on helminths, for these animals have figured prominently in ecological studies. The authors define a number of terms but also challenge some widely held ideas about the inevitable harm associated with parasitism and about parasites' "degeneracy." This is the pattern that can be found throughout the book—instruction, good review, and, sprinkled throughout, questions and observations. Students will find much to think about: Do parasites and hosts transfer genes? What can parasites tell us about host dispersal, now and in times past? Genetically, what constitutes a parasite population? How does the presence of a host as habitat alter our consideration of ecological influences?

Chapter by chapter the authors introduce ecological ideas pertinent to parasite ecology. The choice chapters in this regard, especially from a pedagogic point of view, are the ones in which general concepts of host and parasite population biology are introduced. The authors emphasize the work of Crofton, May, and Anderson and follow their account of it with case histories. The entire book is rich in examples, but in the pages on populations their linkage to theory is especially clear.

In places, the book presents somewhat elementary information for students with ecological or parasitological backgrounds. For instance, fitness and competition are defined (the latter in at least two different chapters), and some life cycles are described in great detail. In other areas, more background is assumed. What this means is that students who have had either ecology or parasitology will feel somewhat challenged at times and comfortable at others—not a bad mix.

Parasite ecology has implications for human health and economics, and the authors do not ignore this. Unfortunately, they often substitute "man" for "human"—a convention that needs to be discarded.

As reference material, the book will also be useful. The chapters on biogeography and communities provide especially thorough reviews of the parasitological literature in these areas. This book does not break a great deal of new ground, nor do the authors claim to do so. It does cover existing ground in a way that will be useful to advanced students and scholars alike.

Early in the book (p. 34), I read, "On being digested from the dragonfly in the frog's stomach, the immature parasites crawl back into the frog's mouth" (where, by the way, they live as adults under the tongue). This is a memorable image, and I wondered briefly if it might not epitomize why many biologists, even now, are more eager to learn about birds than about worms. If so, more's the pity, for an animal that disperses in a swirl of frog feces, asexually multiplies in the hepatopancreas and later the gonads of a snail, then develops sequentially in an aquatic crustacean and its dragonfly predator, and finally executes that remarkable journey to the nether regions of the tongue of *Rana clamitans*—such an animal is worthy of our liveliest curiosity, if not our frank admiration.

*Janice Moore*
*Department of Biology, Colorado State University, Fort Collins, CO 80523*

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## Other Books of Interest

**Centennial History of the Geological Society of Washington, 1893–1993.** EUGENE C. ROBERTSON, Ed. Geological Society of Washington, Washington, DC, 1993. x, 165 pp., illus. Paper, $10.

In the late 19th century, as was recounted in a paper presented by Philip Pauly at last year's History of Science Society meeting in Washington, the federal workday was short, leaving much time for the development of a vigorous after-hours social and intellectual life among the scientists then congregating to pursue their profession in the capital city. One manifestation of this was the Geological Society of Washington, founded in 1893, 14 years after the U.S. Geological Survey, with the survey's Charles Doolittle Walcott as its first president. As the society has always been principally a discussion forum, leaving few formal publications to document its doings, its current leaders have been moved to produce a centennial volume drawing on the society's own records to offset the lack.

The volume opens with a 30-page general history of the society. Along with a thorough account of the procedures by which the society was established, its rationale is discussed, one motivation apparently having been to "restore morale to members of the Geological Survey," which had recently suffered setbacks. The remaining narrative gives information about the character and content of the society's meetings and its relations with other local organizations, most notably the Geological Survey, the Carnegie Institution of Washington, and the Cosmos Club but also including the Pick and