BOOKS: ECOLOGY AND EVOLUTION

# Despised Marvels of Deception and Adaptation

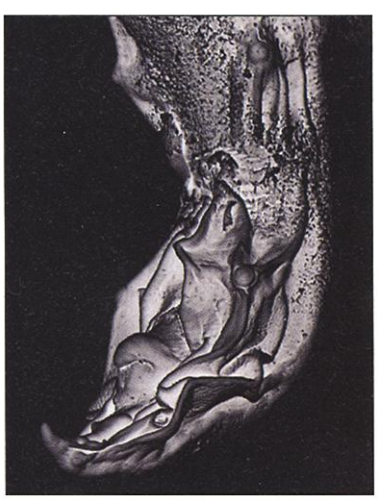
Albert O. Bush

*"and on the following Monday God created parasites."*

A caveat is in order. Once in a while—far too infrequently in the life sciences—a good book surfaces. This review is not about such a book. I have been studying the ecology of animal parasites for almost 30 years and I knew instinctively that I would not like *Parasite Rex*. With such a title, what could it be other than an overweight sibling to the numerous popular articles, many from the last decade or so, that focus on the blood and guts, the gross and disfiguring, and the morbidity and mortality that seem to dominate the pervasive view of parasitism? When the book arrived, I was not surprised. The subtitle, the gruesome-looking scanning electron micrograph of a tick on the cover, and the series of photographs to which the book flopped open were ample evidence that reading this monstrosity would be a painful chore. My goal was to trash the book in a meaningful way, in order that my review would still be published and, I hoped, dissuade any potential purchasers. However, *Parasite Rex* is not one of those good books; Carl Zimmer's tome is really a great book with a catchy title and an unfortunate subtitle. (Perhaps because this combination helps to sell books?)

Zimmer, a science journalist who writes a regular column for *Natural History*, takes a truly holistic view of parasitism. He dismisses members of no kingdom, and he is fluent in many dialects of biology, ranging from immunology to evolution. He begins *Parasite Rex* with a brief historical overview. Early on, he introduces the once (and still?) prevalent belief that parasites are degenerate losers. Throughout the book, he repeatedly returns to confront this opinion, and each visit convincingly undermines its validity. Zimmer also dispels the notion that parasites are the disgusting and loathsome creatures that we all love to hate. (Although, in the all-too-rare personal glimpses one can glean from the book, it is clear that his enthusiasm has its limits.)

He argues instead that parasites, in all their many guises, are marvels of adaptation and evolution in their own right. In addition, they have been a very powerful force that shapes the natural selection of their hosts. While discussing parasite influences on the evolution of their hosts, Zimmer presents easily understandable summaries of such current hypotheses as how parasites can maintain sex in populations and how they can enhance species richness in communities of free-living organisms. He provides a very readable primer on immunology, in which he notes how parasites have adapted to overcome this surrogate for environmental resistance. He concludes with interesting speculations on living "in a parasitic world." The environmentalist in each of us will be forced to ponder his closing suggestion that Gaia has parasites and we are they.



**Gripping tail.** Even the posterior end of the nematode *Echinocephalus janzeni* can appear horrific, especially if, as in the book, it is rotated 180° to look like a cobra rearing up and baring its fangs.

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The author's approach to researching and writing the book follows a popular formula. He began by visiting some of today's most respected and forward-thinking evolutionary parasitologists. He joined these scientists as they worked in locations such as the salt marshes of southern California, the tropics of Costa Rica, the bowels of an old guinea pig farm, or among the bricks and mortar of universities. In the book, he uses descriptive introductions to personalize the researchers for the reader. He then goes on to explain their work and describe how they have found elusive pieces of the evolutionary jigsaw puzzle.

The purist will find the odd mistakes, oversights, and minor errors of fact in Zimmer's account. All are insignificant, and they do not detract from the book's overall quality or, more importantly, its focus and take-home message.

Reading *Parasite Rex* is like taking a course in evolutionary biology, albeit one with an admittedly strong focus on parasitism. But that focus is fine. And if after reading this book you do not understand the importance of parasitism throughout evolutionary history, the failure is not Zimmer's. He writes with clarity, conviction, and seemingly without prejudice. It is apparent from the onset that he knows his subject, that he knows it very well indeed. He provides an unparalleled breadth of material that would not be found in the more traditional, more encyclopedic (and much less fascinating) courses offered as fare for the students of today and the scientists of tomorrow. Were it not for my efforts to adhere to the editor's suggested length, this would have been a very short review, to wit: If you are a student of the life sciences, and particularly of evolutionary ecology, read *Parasite Rex*. Read it twice.

**Parasite Rex**
**Inside the Bizarre World of Nature's Most Dangerous Creatures**
*by Carl Zimmer*
Free Press, New York, 2000. 320 pp. $26, C$38.50. ISBN 0-684-85638-7.

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BOOKS: MEDICINE

# Teaching Healing and Healing Teaching

Robert G. Petersdorf

In 1985, a young physician-historian, Kenneth M. Ludmerer, published his first book, *Learning to Heal*. He portrayed the development of U.S. medical education from its birth in the 1850s through World War II, a task that he carried out with scholarship and style. However, his coverage of the subsequent modern era was compressed into one short 25-page chapter, which left many gaps. I had the privilege of reviewing that account, and I ended my review [*J. Higher Educ.* **59**, 594 (1988)] with the remark, "I only hope that Dr. Ludmerer is at work on Volume II in which he will bring the era from the 1930s to the 1980s into proper historical focus."

In his new book, *Time to Heal*, the author has approached this task with a ven-

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