

Introduction to Field Biology

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Royte, Elizabeth. 2002. **The Tapir's Morning Bath: mysteries of the tropical rain forest and the scientists who are trying to solve them.** Houghton Mifflin Company, New York. 328 p. \$18.58 (cloth), ISBN: 0-395-97997-8; \$8.00 (paperback), ISBN: 0-618-25758-6 (cloth).

Like organisms in the tropics, young ecologists seek to find their niche in the competitive environment of natural biology. Elizabeth Royte presents a dichotomy occurring in the field of ecology through a vibrant description of field work in Frijoles, Barro Colorado Island in the middle of Gatun Lake in Panama. This comprehensive overview addresses the switch in the field of ecology from scientists concerned with the big picture of ecology to a new breed of highly specialized ecologists concerned with specific organisms and biological functions. Her simple fashion of writing allows for a broad introduction to some of the main issues currently applicable in the field of ecology. Although Royte is not a scientist, her prose easily relates to prospective ecology students. Royte was originally on Colorado Island to write an article about Edward Osborne Wilson and has previously written articles for various magazines such as New York Times and National Geographic. She has also written *Garbage Land* and *Bottlemania*. Currently, Elizabeth Royte is writing articles for various newspapers and is keeping a blog at <http://www.royte.com/blog/>.

The novel is organized into broad, beginning and ending chapters, outlining major issues. In the first chapter, general ecological concepts are presented, such as coexistence versus competition, convergent evolution, as well as the latitudinal diversity gradient. The central chapters describe specific field studies in which Royte takes part; each study relates to general ecological concepts. The issue of how the science of biology and ecology was historically when compared to the present is interwoven throughout the book.

Royte juxtaposes older ecologists with the younger crowd found on Barro Colorado Island. She first discusses her talks with Bert Leigh, an older ecologist who focuses on major transitions in evolution, evolution of mutualisms, and the role of selection in evolutionary theory. He describes how the island became an established area for field scientists as well as the issues with funding that they have experienced. Royte then transitions to describing how she assisted various young field ecologists in conducting their studies. Chrissy Campbell was studying spider monkey reproduction by observing their behavior and collecting fecal samples for female hormone analysis. Campbell is an underfunded graduate student that is looking for her niche in a field nobody has studied yet. Bret Weinstein was studying bats that make tents. Tent making behavior in bats is an example of convergence, having occurred three times in history, all in various parts of the world; Furthermore, nobody has a definitive explanation for why these bats make tents. Jayne Yack was studying the evolution of hearing in butterflies, concluding the butterflies were "invented" by bats. Additionally, Hubi Hrez was studying the effect leafcutter ants have on trees. Hrez found a new way to answer this question and conducted studies on the coevolution of the ant-fungus relationship. Sabine Stuntz studied the

arthropods that live around epiphytes and how this interaction creates an even greater variety of niches in the tropical environment. Royte aided in all the previous research projects, all which were concerned with a very small niche in the tropical ecosystem.

Although, niche studies are a crucial part of understanding ecosystems, the idea that ecology should be a comprehensive study of ecosystem functions as well as a study of minute biological functions is a main issue stressed throughout the book. Brent's transformation during the course of his study is a prime example of the main issue addressed in this book. While Brent begins his studies in the narrow field of tent bats, he begins to look at the big picture of ecology. Instead of focusing solely on why bats make tents, he branches out in his dissertation and touches on the central topic of tradeoffs, a universal behavioral theory.

Tradeoffs were a large underlying component of Biology 220: Ecology and Evolution. *The Tapir's Morning Bath* would be a great supplementary text to compliment an introductory ecology course. This book is also a great introduction to field biology; it connects many ecological concepts learned in class to issues field biologists deal with on a daily basis. I would highly recommend this book to anyone interested in an introduction to field biology and to future students of the Biology 220 course. The major concepts discussed in class are elegantly put together in this book and applied to field work. The concepts of island syndrome, genetic drift, cooperation, mutualism, competition, and coexistence, among others, are effectively described and applied to real studies. The specific examples give added meaning to class content whereas Royte's thoughts as an outsider to the field studies give a perspective to the field as a whole. She ponders of the value of studying ecology and the importance of the field drifting towards an emphasis on genetic testing and statistical significance of findings; this is compared to previous ways of ecological studies. This comparison is a relevant though process that introductory students should be exposed to. Many similar examples are used in this book as discussed in class; for example, the importance of collecting baseline data and how this became important in deducing why sea otters were increasingly being consumed by orcas. Ants are used as examples in the book as often as they were used in Biology 220, from their mutualistic relationship with acacia trees to their importance in antibiotic research.

The book also contributes insights to the thought process of a field biologist. Royte expresses how important ecological concepts, such as why there is so much riot in the tropics, can be answered differently by presenting different questions. There is an in depth analysis of the various hypotheses that stem from various questions, from interspecific competition hypothesis to the refugia hypothesis. This book would go along very well with ecology and evolution courses that include a lab component. There are some studies mentioned that have very similar experimental designs to that of our labs in the Biology department. For example, Sabine Stuntz, who studied relative abundance and species richness in arboreal arthropods, used a similar method to that of the Biology 220 lab. Both utilized hanging buckets that trapped bugs to kill them in ethanol for later categorization.

In general, *The Tapir's Morning Bath* should only be read by people new to field studies as it introduces general ideas without great detail into any specific topic. Royte brings up prominent dichotomies in ecological field studies and uses real studies conducted on a specialized field island

to support her conceptualization of ecological field studies in a relatable, non-scientific manner.