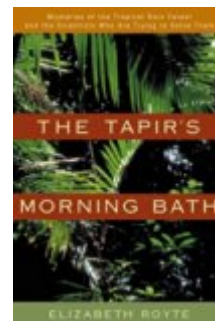


Elizabeth Royte. *The Tapir's Morning Bath: Mysteries of the Tropical Rain Forest and the Scientists Who Are Trying to Solve Them.* New York: Houghton Mifflin Company, 2001. 328 pp. \$25.00, cloth, ISBN 978-0-395-97997-6.



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A Big, Wet Diorama

On the surface, this book is a journalist's report on the research that takes place on Barro Colorado Island, a six square mile nature preserve in the middle of the Panama Canal. But the tropical biologists who conduct the research are Elizabeth Royte's real subjects. As she joins them on their collecting trips, often serving as the assistant their grants don't provide, she collects information both on the island's many fascinating native inhabitants and on the work, lives, and goals of its human invaders.

Quite late in her account, after she has introduced most of the researchers as well as quite a few of the nonhumans of Barro Colorado Island, Royte explains that the mysteries of the tropics remain unsolved because scientists have been studying the tropics for less than 200 years while "the tropics have been in business since at least 3.5 billion years ago, when the first photosynthesizers figured out how to use sunlight for energy and began releasing carbon and oxygen into the atmosphere." The photosynthesizers created a nearly global tropical environment in which in-

sects, amphibians, reptiles, dinosaurs, and finally mammals and birds successfully evolved. In "the Eocene period, 38 million years ago, tropical vegetation extended. . .to southern Alaska and Labrador," so some solutions to the mysteries of tropical rain forests lie in fossil records far afield from what we now think of as the tropics! Indeed, some scientists believe "that a majority of temperate lineages are evolutionary derivatives of tropical precursors," making what we now know as "the temperate zone. . .an aberration, and the tropics. . .the norm" (p. 167). For that reason, Steven Pinker refers to the tropics as "'the ultimate multicultural curriculum'" (p. 166).

Royte's concern is that in an almost perverse reversal of what one would expect given the vast number of species of each floral and faunal order the tropics is known to contain--many of them "still unknown and undescribed"--contemporary researchers seem to have abandoned "animal studies, which dominated the first five decades of Barro Colorado's history" for the study of principles and patterns in which quantitative methods, utilizing fast evolving technology, can be used. Ob-

servations by animal behaviorists of individual animals or species "were dismissed [as "soft, subjective"]" (pp. 218 and 219). In the 1970s "the change was reflected at universities where courses in ichthyology, herpetology, mammalogy, ornithology, and the like dwindled in favor of courses in genetics and molecular biology. Field trips fell to budget cuts and liability concerns. Those who studied whole animals and those who studied molecules found their languages mutually incomprehensible" (p. 219).

Unfortunately, in a move familiar to those of us in the humanities, traditional biologists were penalized as grants and other funding went more and more exclusively to studies whose results were drawn from technological sources, producing neat statistics and graphs that often seemed to have immediate utilitarian applications in medicine, genetics, conservation, or ecology. The divide, of which Royte obviously disapproves, deepened as "biologists constructed their own pyramid of rigor. At the top were mathematics because it resembled physics, and experimental population genetics, which also relied on complicated theoretical models. Ecology and evolutionary studies malingered in the middle, with the stubborn animal behaviorists, taxonomists and paleontologists relegated to the bottom of the heap" (p. 221). The effects of this trend were bemoaned by Reed F. Noss, editor of *Conservation Biology*, in a 1996 editorial. Royte quotes the editorial both because it supports her own view and because it raises important questions. Is it possible for a researcher who had failed to acquire "a personal connection to the land, developed . . . after years of observing living creatures in their natural environment" to "exercise sound judgment in making recommendations for conservation"? He feared that "computer fabrication" was replacing "biological truth" (p. 222).

Royte actually suggests this to her reader much earlier in the book by contrasting the work of Barro Colorado's early researchers--from

founders Thomas Barbour, William Morton Wheeler, and David Fairchild, to Frank Chapman in the 1920s and '30s, to Edward O. Wilson (the author's own mentor)--to the work of most current researchers. Those earlier scientists are compared to the shamans of indigenous peoples "who have intimate knowledge of the rain forest" based on years of observation of the island's life forms. That "science has fewer and fewer people with the field skills to find and recognize creatures, especially in tropical forests" strikes Royte as unbelievably shortsighted--especially since what little remains of Earth's rain forests are so endangered and "some tropical forests have never hosted a collector. Millions of species are yet to be described" (pp. 223-224). To offer just one example: "experts believe that there may be as many as thirty million more tropical insect species waiting to be described" (p. 166)--so many cultural perspectives lost to us! Sadder, still, is what Royte sees as the loss among biologists of the "propensity to be impressed with all of nature, to be filled with [what Rachel Carson called the sense of] wonder, that led so many scientists to biology in the first place" (p. 224).

Royte's title refers to an observation that straightened out the findings of a highly technical study of water levels in Lake Gatun, whose waters surround Barro Colorado, and the connected Panama Canal. The confused researcher happened to mention the unexplained discrepancy to an animal behaviorist who laughed and told him he'd been noticing "Alice the tapir, a friendly rhino-like beast who daily partook of kitchen scraps, wade chest-high into the weir and empty her bowels." A few quick calculations later, having taken "Alice's geometry" into account, put the researcher's "mathematical models in order." Adds Royte, "The currency of old-fashioned observation in sussing the mysteries of nature went up another tick" in her eyes (p. 142).

The naturalists Royte most admires are those who fit "Douglas J. Futuyma's description of the

scientific naturalist: 'the person who is inexhaustibly fascinated by biological diversity, and who does not view organisms merely as models, or vehicles for a theory but, rather, as the *raison d'être* for biological investigation--the thing in itself, that excites our admiration and our desire for knowledge, understanding, and preservation'" (pp. 251-252). It struck me that much the same ideal might apply to the artist's recreation of individual animals in both the visual arts and literature.

Complaints that such imaginative observations are far too subjective to be taken as serious contributions to what is known about the animal subject are, or so it seems to me, countered by the fact that Royte's own sense of wonder, sparked by personal contact with the island's nonhuman denizens and with researchers like Wilson, and by the writings of others like Chapman and Fairchild, is heightened most in the last chapters of *The Tapir's Morning Bath* by her own pregnancy. It is not her ten years of research on Barro Colorado, but her growing awareness of the individuality of her daughter growing in her own womb, that causes Royte to fully understand why it is important that future generations experience a nature with wildness and natural diversity at least equal to what we are still able to experience: "Prognosticators said that the most profound challenge [of the 21st century] would be maintaining a livable earth. But 'livable' wasn't enough for me. I was greedy. For my daughter I wanted open space, I wanted fast-flowing waterways and forested mountains. I wanted her to witness, if she so desired, an iridescent green and black river of migrating diurnal moths" (pp. 316-317). Royte wrote this book because of her fear that the current enthusiasm for experimental science may wipe out our appreciation of nature's mystery by making "the rain forest nothing but a big, wet diorama--a set in a theme park or zoo" (p. 252).

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