BOOK REVIEWS

Snakes, The Evolution of Mystery in Nature

Greene HW (1997). Berkeley: University of California Press, 351 p., ISBN 0-520-20014-4.

A colleague tells of a huddled group of juvenile baboons, tittering and screeching as they crowd to the front to peek in the grass, only to scamper to the back of the pack. The object of their fascination? A python! The incident is a parable for our own fascination with snakes. As a herpetologist who works with snakes, I long ago learned that when after-dinner conversation veers onto snakes, it is likely to stay there for the rest of the evening. Encounters with snakes are bundled with high emotion and lasting memories. Even professional snakemen are capable of tittering like baboons as the stories unfold.

As young primates, Harry Greene and I found that special place in our school libraries where the books of the snakemen were kept. The archetypes of the genre were books by Raymond L. Ditmars, *Thrills of a Naturalist's Quest,*[1] and many more. The biggest thrill of them all was Ditmars' quest for the Bushmaster (*Lachesis muta*), a poisonous snake of legendary size. In retrospect, it is amazing how little we learned about the Bushmaster and its way of life from Ditmars' account of his quest. The preparations for the Bushmaster's arrival from Trinidad are recounted in detail. The cages are built, the crate is fetched from the freighter, the crate is opened, the snake escapes from its bag, the butler faints, and the snake is finally installed in its cage. The quest is over! Ditmars was not alone in his haste to move on to the next quest. Throughout most of this century, scientific study of snakes was mainly done in museums, on animals snatched from the road or from under a trash pile on the edge of town. Snakemen learned to drive the roads for snakes by night and to spot corrugated tin, and other hiding places, at 55 mph by day, pausing only momentarily for each capture. Our professors encouraged us to preserve our catch in formalin and alcohol as soon as possible. Much can be learned from museum jars. Diets can be gleaned from stomach contents, and life history can be inferred from gonads. Nevertheless, much is missing from the jar, and that is what Greene's quest is all about.

Greene wants to understand snakes on their own terms, outside the jar, and has kept his eye on this prize throughout his career. He wants to discover those key features of structure, behavior, and ecology that make whole radiations of snakes snap into register; to visualize clades of snakes across evolutionary time and reconstruct the causes of their diversification. As in Tinbergen's 1953 classic,[2] Greene wants to understand the snake in its world. This quest is more ambitious than Ditmars', but no less exciting. In *Snakes, The Evolution of Mystery in Nature*, we go along with Greene on the first phase of his journey. It is a pleasant ride, as he lapses in and out of first person narrative, just like being there.

This book is about snakes, but it is also about natural history and its place in contemporary science. Greene has argued that natural history is unappreciated and unfairly disparaged in the modern world.[3] His argument is not that we should abandon the intellectual developments of the past 30 years (model construction, hypothesis testing, and parameter estimation), but that we should continue to practice and revere high-quality natural history work. Just as George Schaller—working with only binoculars and notebook—revolutionized the way we think about gorillas, lions, and tigers, Harry Greene and his colleagues are changing the way we think about snakes. In the process, they are keeping the science of natural history alive. Some recent field observations are truly astounding and make a strong case for natural history as a catalyst and companion to other methods. In the American southwest, for example, blindsnakes (*Leptotyphlops dulcis*) can be found crawling in marauding columns of army ants. Protected from ant attack by chemical secretions, the blindsnakes follow the pheromone trails of the ants and prey on the army ant brood. The blindsnakes in turn are captured by Screech-owls and carried back to owls' nests. Some blindsnakes survive this ordeal and take up residence in the floor of the nest, apparently feeding on the insect larvae that live there. This telling vignette and many others are detailed in Greene's book.

Although Greene's eye for penetrating natural history sets his book apart from others, technology also plays a role. One technological breakthrough has been the use of radiotelemetry to find, observe, and track snakes in the field. By surgically implanting miniature radiotransmitters—or by making snakes swallow them—herpetologists have at last been able to find and observe rare and cryptic species in nature. Radiotelemetry has given us a window on the lives of many snakes over the past 10 years, including the mysterious Bushmaster. We now know from Greene's own work that the Bushmaster uses chemoreception to locate a well-used mammal track and then coils into a strike-ready pose to wait for a mammal to come along. The snake may wait for days or weeks!

The other technological breakthrough in this book is in photography. This book contains the most magnificent collection of snake photographs that has ever been published. The image on the book's cover of a Sumatran Tree Viper in defensive display is, I would argue, the best photograph of a snake that has ever been made. The photographs are the work of Michael and Patricia Fogden, renowned nature photographers with many credits in nature books and magazines. In Ditmars' time and until recently, snakes were photographed studio-style on unnatural backgrounds. Sometimes snakes were taken out of their museum jars and posed, as if alive. The Fogdens

have taken snake photography to a new level. Their images show snakes on natural backgrounds, in the field, doing things! Finally, we see the snake in its world, burrowed in the sand, coiled on a liana, swallowing its prey, giving birth to its young. One portrait technique is to use the wide-angle lens, showing the animal in the foreground and its environment in the background, but with everything in focus. Another, more familiar technique is to use a flash to freeze the action in the middle of a strike or while protruding the tongue. One remarkable shot shows a pitviper in the act of striking at a hummingbird, frozen in flight as it evades its attacker. However, there is more to snake photography than following these techniques with a Nikon camera and Metz strobe. Try it yourself! Aside from their remarkable composition, color fidelity, and clarity, the Fogdens' images beautifully convey the main theme of the book—the snake in its environment.

The book opens with chapters on phylogeny and general biology, locomotion and habits, diets and feeding, venomous snakes and snakebite, predators and defense, and finally behavior, reproduction, and population biology. Seven chapters in the middle of the book are devoted to individual families and clades. The concluding chapters cover evolution and biogeography, humans and snakes, and that big mystery of why do snakes (especially the venomous ones) captivate Harry Greene and his fellow snakemen.

The writing and the photos set this book apart from its competitors. The table of contents is, after all, pretty standard. Two other large format books cover much the same territory and have strengths of their own.[4,5] But in the Greene/Fogden book every photograph is a work of art, and every paragraph rings with passion, insight, and craftsmanship. "As we scrambled over to it, the Bushmaster's only responses were slight elevation and retraction of its head, then a slow, vertical sweep of the long black tongue, aimed directly at us. The snake's behavior was not exaggerated — no lunging strikes, no frenzied escape efforts — but there was a powerful sensation of measured readiness, like Clint Eastwood's squint in *High Plains Drifter*: 'Don't come closer.'"

Greene was provoked into writing this book by a conversation with Norman Maclean, the author of *A River Runs Through It*. Maclean must have been a spiritual companion throughout the creative process. Maclean, too, was a wonderful raconteur and a superb craftsman of the written word. He would have read this book with satisfaction and admiration, and so will you.

REFERENCES

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5 Bauchot R (1994) "Snakes, A Natural History." New York: Sterling Publishing.

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