Foraging Isn't Depleted

Author: Giraldeau, Luc-Alain

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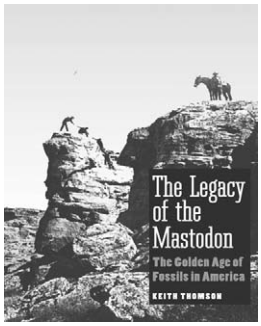
operations, the Peabody Museum of Natural History at Yale. Cope and Marsh started on friendly terms but soon became bitter rivals who would stop at nothing to obtain and name specimens of fossil vertebrates. Leidy, a retiring man without comparable means, could not compete with these driven youngsters. Cope and Marsh recruited and worked with teams of collectors to explore the vast territories along the rapidly expanding western frontier, and each assumed control of a scientific journal to ensure rapid publication of their latest discoveries. Thomson paints vivid portraits of these two men. Intense and impatient, Cope had a brilliant, wide-ranging mind and was a prolific writer. His published work comprises some 1400 articles, monographs, and books, with subjects ranging from ichthyology and herpetology to paleontology and evolutionary theory. By contrast, Thomson likens Marsh to a corporate executive. Marsh was politically astute, carefully cultivating contacts at the highest levels to serve his interests. A less capable researcher than Cope, he allegedly had assistants, without acknowledgment, do much of the research and writing for his major monographic studies.

Eventually, the relentless pursuit of paleontological riches ruined both men financially. Cope's predicament was further exacerbated when he lost much of his inherited wealth through bad investments, and he and Marsh were both forced to seek paid faculty appointments to support them in their waning years. Furthermore, their bitter feud became national news when a reporter from the *New York Herald,* encouraged by Cope, started publishing a series of articles on Marsh and his alleged misdeeds. Marsh quickly responded with attacks on Cope's conduct and integrity. This public controversy ultimately led to Marsh's loss of his privileged status with the United States Geological Survey and having (I am pleased to say) to turn over large collections made with the Survey's support to the Smithsonian.

While the feud between Cope and Marsh discredited paleontology in the eyes of many of their contemporaries, the wealth of discoveries made by these men represents a lasting testimony to their extraordinary efforts. Marsh's discoveries of the remarkably complete fossil record of the evolutionary lineage of horses and of Cretaceous birds with teeth had a profound and lasting impact on the acceptance of Darwin's views about evolution. Other finds revealed scores of previously unknown lineages of extinct vertebrates, including most of the major dinosaurian groups still recognized today, and laid the foundation for all subsequent work on the evolution of vertebrates.

In their single-minded quests, Cope and Marsh mirrored the financiers and industrialists in 19th-century America



whose ruthless drive and determination helped build this country. Thomson does a wonderful job highlighting how the emergence of American vertebrate paleontology, from its modest beginnings in the shadow of European scholarship to full intellectual maturity, parallels the development of the national identity of the United States.

HANS-DIETER SUES
Hans-Dieter Sues (e-mail: suesh@si.edu) is associate director for research and collections at the National Museum of Natural History of the Smithsonian Institution, Washington, DC.

FORAGING ISN'T DEPLETED

Foraging: Behavior and Ecology. David W. Stephens, Joel S. Brown, and Ronald C. Ydenberg, eds. University of Chicago Press, Chicago, 2007. 576 pp., illus. $99.00 (ISBN 9780226772639 cloth).

Foraging: Behavior and Ecology provides a unique and up-to-date reference covering an astonishingly diverse set of topics ranging from neuron molecular biology and brain structures to population dynamics and community structure—quite an impressive sweep. This book, intended for graduate students looking for a research project, is ideal for use in graduate seminars or advanced undergraduate reading courses. It is also addressed to researchers who want to get the current picture of the area of foraging behavior.

The three editors are established players in foraging research. David W. Stephens, professor of ecology, evolution, and behavior at the University of Minnesota, coauthored (with John Krebs) *Foraging Theory* (Princeton University Press, 1986), which became the ninth most cited book in evolution and ecology. He is also known for his work on the cognitive processes of blue jay foraging decisions. Joel S. Brown, a biology professor at the University of Illinois at Chicago, is a coauthor (with Thomas L. Vincent) of *Evolutionary Game Theory, Natural Selection, and Darwinian Dynamics* (Cambridge University Press, 2005); he is well known for having introduced the concept of giving-up density as a means of measuring the costs that animals experience while exploiting diverse habitat types. Ronald C. Ydenberg is a professor in the Behavioral Ecology Research Group and director of the Center for Wildlife Ecology at Simon Fraser University in British Columbia. He is well known for his research on provisioning and the application of behavioral ecology to phenomena such as avian diving,

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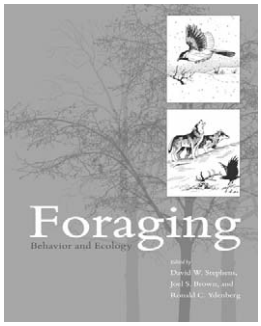
territoriality, and foraging, as well as for his work in the analysis of metabolic rate and population dynamics.

Writing a synthesis of foraging theory in the early 1980s may have been a rather straightforward task, given the small number of basic models and empirical investigations that characterized the field, but at the turn of the millennium, that task is completely different—and most likely daunting—because the field has exploded into a surprisingly diverse set of research programs and traditions.

So what should be included in such a new synthesis of contemporary foraging research? Clearly, the synthesis should present a greater integration of neural mechanisms and cognition into foraging behavior. It should also be clear that those physiological mechanisms of digestion and energy management that have long been ignored by foraging behavioral ecologists must be brought to the forefront. It would be unthinkable for such a book not to update certain problems of classic foraging theory without also dealing with more recently formulated social foraging questions. Finally, the long-unfulfilled promise must be met: the book must deal with the population-level phenomena that foraging theory was meant to address in the first place. *Foraging: Behavior and Ecology* does all of this in four parts.

To cover such a broad diversity of subjects would be nearly impossible for a single author, so Stephens, Brown, and Ydenberg invited a team of 27 contributors to help them achieve their goal. However, calling upon such a team of collaborators, which includes both senior and junior scientists, leads to a problem frequently found in edited volumes: the uneven depth of treatment of issues and the different writing styles turn the book, at least in some parts, into a quilt of topics rather than a unified whole. Most chapters were simply delightful to read, and I learned a great deal from them. A few, unfortunately, failed to capture my attention, as I kept wondering why I was being told what I was being told. The editors apparently worked very hard to overcome this unevenness by insisting that each chapter start with a clear, vivid natural history example of the topics the chapter would cover. These chapter openings are universally interesting.



The construction of *Foraging* is innovative. The editors asked some contributors to write full-length chapters, whereas others were invited to compose boxes for presentation within the chapters; the boxes provide either a review of a related topic, some introductory material, or more specialized accounts of specific topics. This innovation works well. The numerous halftones by Todd Telander give the book a pleasing visual quality (which reminded me of the illustrated adventure books of my childhood). In general, *Foraging* is a good piece of workmanship with an impressive bibliography and nice graphs, but I must point out that typographical glitches—Greek letters missing in the text and in the equations of chapter 2—marred my cloth edition. An errata sheet inserted in the paperback version took care of that problem, so if you buy a copy, make sure it comes with the errata sheet.

I highly recommend this book to all who study foraging. Graduate students will find a wide array of fascinating questions about foraging, from the neurological pathways of the ventral unpaired median neurons to cognitive maps, digestive physiology, impulsiveness foraging games, food hoarding and provisioning, the cycling of predators and prey populations, trophic cascades, isobars, and giving-up densities and conservation strategies, to name a few. Researchers and faculty members will find a convenient source of updated information on foraging theory and foraging behavior.

Reading *Foraging* will surely conjure up exciting discussion topics. For instance, as I read chapters on brains and foraging behavior, I wondered whether it could be possible for mechanisms to be of general interest, given that they so often seem specific to each of the extremely diverse set of taxa being studied. Perhaps the persistent calls for greater study of mechanisms in behavioral ecology are dangerous sirens luring behavioral ecology toward the same end that ethology met only a few decades before? At that time, many ethologists abandoned proximate questions of mechanisms to embrace a behavioral ecology that boasted a more general and exciting functional approach. Stephens, Brown, and Ydenberg have demonstrated that foraging is most certainly not a depleted research patch. It is rich, and offers a diverse set of questions moving into a wide range of research traditions. Make sure you read it.

LUC-ALAIN GIRALDEAU
Luc-Alain Giraldeau (e-mail: giraldeau.luc-alain@uqam.ca) is the chair of the Department of Biological Sciences, and codirector of the Behavioral and Animal Ecology Research Group, at the University of Québec in Montreal, Canada.

ERNST MAYR: SOME QUESTIONS ANSWERED

Ornithology, Evolution, and Philosophy: The Life and Science of Ernst Mayr 1904–2005. Jürgen Haffer. Springer, New York, 2008. 474 pp., illus. $59.95 (ISBN 9783540717782 paper).

Every evolutionary biologist has read something by Ernst Mayr, for he was one of the 20th century's great evolutionists. In *Ornithology, Evolution, and Philosophy,* Jürgen Haffer chronicles Mayr's life and his research. This is essentially a long obituary rather than a critical examination of Mayr's work, written by an obvious admirer. Haffer

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