dealing with the governing body and many of his colleagues, inevitably leading to severe personality clashes and eventually his resignation as director in 1937—all of these make absorbing reading. This part of the history gives fascinating vignettes of Raman's strong personality, the fierce political intrigues in the Indian scientific community, and Raman's single-minded devotion to science. Correspondence between Rutherford, who interceded on Raman's behalf, and the viceroy, Lord Linlithgow, reproduced in the book is illuminating in the human concern it shows for Raman as well as for a unique institution. The outstanding biography of Raman, *Journey into Light* by G. Venkataraman, reviewed in this journal (**244**, 848 [1989]), is excellent parallel reading for this part of the story.

The Institute prospered steadily under the stewardship of the many directors who followed Raman. Subbarayappa narrates its evolution in the post-Raman period, when it expanded with the addition of several new departments. Well established and with full support from the government of India, the Institute has grown steadily in the years since Indian independence in 1947, conducting research in many new disciplines in science and technology and maintaining a faculty with worldwide reputation. The premier position it enjoys in India is evidenced by the eminent engineers and scientists who have been at its helm. The current director, C. N. R. Rao, internationally known for his contributions in many branches of physical and solid state chemistry, is preparing it for the 21st century.

In Pursuit of Excellence is an outstanding documentation of how great institutions originate in the imagination of great men with foresight and concern for humanity and of how unique personalities may interact in their political and social setting and succeed in initiating and nurturing a great tradition. There is thus a universal message in this superb book.

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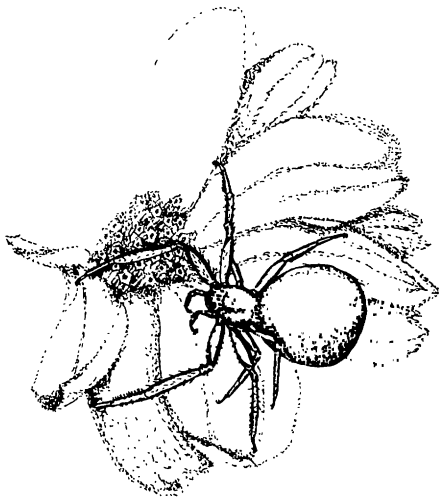
Arachnophilia

Spiders in Ecological Webs. DAVID H. WISE. Cambridge University Press, New York, 1993. xiv, 328 pp., illus. $79.95 or £45. Cambridge Studies in Ecology.

Spiders have an image problem, as most arachnologists can testify. My microcassette recordings of spider behavioral observations are punctuated with attempts to convey

The orb web of *Tetragnatha extensa*. [From *Spiders in Ecological Webs*]



"A gravid crab spider, *Misumena vatia* (Thomasidae), waiting in ambush on a flower." [From *Spiders in Ecological Webs*]

enthusiasm to dubious passersby. Granted, the sight of a person hunched over the shrubbery with a tuning fork (to mimic the vibration of prey) may rightly generate questions, but people are less prone to edge away from my lepidopterist husband. Though the charming spider facts scattered throughout David Wise's book will probably not win the hearts of confirmed arachnophobes, his promotion of spiders as an ecologist's tools should gain converts to the study of these elegant predators.

Wise makes a convincing case for the use of spiders as a model system for testing ecological theory. Their abundance and intermediate size make field experimentation with them easy (and cheap) compared to the use of rarer and larger organisms. Web-weavers are the ultimate convenience: they generally stay put, even without fencing them in, and they live their lives publicly on a stage of their own construction. An experimenter can toss supplementary food into the web, watch its consumption, and later collect egg sacs and measure reproductive success. Wanderers, such as wolf spiders and jumping spiders, have also been successfully manipulated in ecological studies.

And manipulation is what it's all about, in Wise's view. He emphasizes the use of well-designed experiments to test the strands of the ecological web (a metaphor considerably stretched by the end of the book). The bulk of the text is a review of empirical studies of spider ecology, during which Wise keeps firmly in mind Hurlburt's landmark paper (*Ecological Monographs* **54**, 187 [1984]) on the dangers of pseudoreplication in experimental design (most commonly, treating subsamples of a single plot as independent entities in a statistical analysis). Wise summarizes and critiques each experiment in detail, giving praise where it is due and occasionally including reanalyses or reinterpretations of the data to conform to his more stringent requirements; his reasoning is always explicit. He does not let himself off the hook: one section is titled "Confessions of a pseudoreplicator" (now reformed). Taken as a whole, these critiques constitute a tutorial in how to (and how not to) design ecological experiments.

What have spiders and spider ecologists taught us about ecological processes? An important debate among ecologists, briefly reviewed by Wise, concerns the importance of interspecific competition in structuring communities. Spiders seem good candidates for the role of competitor. For example, they are usually hungry: empirical evidence shows that spider growth and reproductive success are often limited by food. Ecologists have amassed indirect evidence, such as patterns in species distributions and niche parameters, that suggests that competition is influential in structuring spider communities. However, Wise concludes that experimental manipulations, with the notable exception of David Spiller's work, "generally have failed to support competitionist views of communities of web-building spiders." The verdict is still out for wandering spiders. One might argue that not nearly enough studies have been done to make a general statement about the strength of competition in either spider group; however, certainly competition is not the ubiquitous force it was assumed to be by some earlier arachnologists. Wise's carefully presented empirical evidence should be welcomed by any ecologist interested in this issue.

This timely book appears when there is still a manageable number of studies of spider ecology: in less than 300 pages of text, Wise covers all the major work in depth. This also means there is still plenty to do. I hope many readers of this book will be inspired to become spider ecologists long

before the last chapter, where Wise presents his suggestions for future research. If they hurry, there might still be some *Arachnophobia* posters left for their office walls.

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Perspectives on Poisons

Natural and Synthetic Neurotoxins. A. L. HARVEY, Ed. Academic Press, San Diego, CA, 1993. xviii, 359 pp., illus. $45 or £45. Neuroscience Perspectives.

It has been more than a century since Claude Bernard, in his *Experimental Science*, provided a definition of poisons in modern terms and indicated their special usefulness for the physiologist. Bernard suggested that by dissecting the mechanisms that result in death we could learn much about the physiological processes of life. The 19th-century reader of Bernard's book could not have imagined the impact this suggestion would have, the extent of the information that would accumulate, or the number of books and articles on the subject that would appear. *Natural and Synthetic Neurotoxins* is the latest such endeavor. Its individual contributions review the fundamental chemistry and pharmacology of neurotoxins, describe their main interactions with their target structures, and indicate their many interesting uses as experimental tools.

The book centers around a well-written and pedagogically valuable chapter on neurotoxins that act on acetylcholine receptors. Here Chiappinelli gradually reveals the problems, offering an optimistic yet realistic outlook on future research. The chapter contains a history of work on this topic, rich in learned citations, as well as a systematic analysis of the structure and mode of action of the toxins known to be active on nicotinic and muscarinic acetylcholine receptors. Equally effective is Simpson's chapter on the action of clostridial neurotoxins on the storage and release of neurotransmitters, although an explosion of new data on the putative mode of action of these toxins has undermined some of the ideas in it. I also enjoyed Lobban and Milligan's chapter on the structure and function of bacterial exotoxins (essentially cholera and pertussis toxins) and their action on the second intracellular messenger pathway. Irwin and Langston review the toxicology of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), which induces a parkinsonian syndrome in humans that is very useful for developing animal models of that disease. Equally stimulating are the chapters on the neurotoxins that allow a mapping of neuronal pathways by lesioning that both elucidates the toxins' physiological and behavioral effects and facilitates the establishment in animal models of syndromes that mimic human diseases. Vornov *et al.* have contributed a well-documented chapter describing the neurotoxicity of excitatory neurotransmitters.

The authors of the rest of the chapters tend to present their data by way of an iterative formula: "toxin–toxin structure–target structure–putative organization of the target." Although informative, these contributions are too schematic to really engage the reader. A more serious criticism I have of the book is that some chapters seem to contain categorical statements about matters that are still under investigation (for instance, in the coverage of the effects of cannabinoids, social and behavioral aspects are ignored).

Overall I found this book a balanced compendium but rather inharmonious in style and awkward in structure. Problems of this sort can be forgiven in a book of such wide scope. Less acceptable are the numerous small errors scattered about (for example, "internationalization" for "internalization," "aspecific" for "a specific"), which could have been prevented by more careful proofreading.

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