tions with no restrictions on the amount of film they are provided with, only to have them come home to an editor who must abide by rules of "balance" and conservative concerns about not offending the largely white, middle-class readership. Lutz and Collins write, "At the *Geographic*, balance is pursued most assiduously in photo selection. . . . As one editor put it, 'It behooves us to show reality—and nothing is all bad or all good. If [the photographer] didn't find any happy people, I'd tell him to go back and find them' " (p. 65). The authors also describe the photo editors' concerns that certain photographs might be too "strong." The editors "refer to disturbing pictures . . . as strong or tough. Strong pictures are dangerous because they may offend some viewers or may be seen as inappropriate for children." To the editors the authors talked to "the inverse of strong photographs was not 'weak' but 'balanced' " (p. 71). When the pictures themselves cannot reach the "balance" wanted, the caption writers are called on to influence how the photographs are read.

Photo captions and their writers deserve more attention than the few pages they are given in *Reading National Geographic*. The captions direct the readers' attention within each picture and often reveal more about the current historical and political context than do the photographs. There is a timelessness about *Geographic* photographs. Captions are more time-bound, as Lutz and Collins suggest in their look at how captions have been changed under photographs reprinted years after their original publication. Later in the book, the authors discuss interviews they have conducted with readers regarding various pictures from the magazine. There is good reason to gather feedback about the photographs without captions to bias the responses, but given the authors' concern with how the current political and economic context influences the magazine, some interviews centering on captioned versions of the same pictures might have provided valuable insights into how the captions direct the meaning found in an otherwise "objective" image.

Lutz and Collins's interviews about the pictures alone, though, provide an insight into the world view of white Americans—or at least those interviewed. While the interviews were aimed at understanding how the *Geographic* has influenced its readers' world views, the interviewers also heard stereotyped views of and attitudes toward the non-Western world that have been shaped by the media at large. The *Geographic's* marketing surveys have in revealing these views to the magazine editors reinforced their conception of what their readers like to hear (and see). One of the things we learn that readers like about the magazine is that it lets them look at the world and "it doesn't seem to be politicized too much" (interviewee, p. 229). It also offers an easy way to become "cultured," or at least look cultured. As one interviewee commented, "I think that's why people read it—because they want to learn about different cultures . . . either that or they want to throw it on their coffee table when company comes over, and think they know about it . . . It shows that they're cultural people, that are interested in other cultures, and that's good" (p. 232).

Perhaps having *Reading National Geographic* on your coffee table would put you even higher in the "cultured" category the next time you want to impress your guests.

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Vignette: Monetary Rewards

Australia takes a great pride in her scientific pioneers. Consider the paper currency. On the two-dollar note we found William Farrer, agricultural experimenter, with his sheaves of wheat. The five-dollar note carried scientific progenitor Sir Joseph Banks encrusted about with many of the sturdy banksia species to which he lent his name. The 100-dollar note commemorates the Australian born 19th century astronomer John Tebbutt . . . , together with the South Australian geologist, Sir Douglas Mawson . . . . The 20-dollar note shows the remarkable aeronautical experimenter Lawrence Hargrave . . . . With the 50-dollar note science shines again. We have entered the 20th century with two Australian scientists on either side: the medical scientist Sir Howard Florey whose work on the development of penicillin earned him a Nobel prize, and the veterinary scientist Sir Ian Clunies Ross, Chairman from 1949-59 of Australia's great government scientific organisation, the CSIRO.

—*Ann Moyal*, in *A Bright and Savage Land* (Penguin reprint of a work originally subtitled "Scientists in Colonial Australia")

A Success in India

In Pursuit of Excellence. A History of the Indian Institute of Science. B. V. SUBBARAYAPPA. Tata McGraw-Hill, New Delhi, 1992. xiv, 426 pp. + plates and maps. $11.50.

"In Pursuit of Excellence" is an apt title for a history of the Indian Institute of Science. Located in Bangalore, a well-laid-out city in south India renowned for its many institutions of higher learning and high-tech industries as well as for its salubrious climate and beautiful parks, the Institute is a place where students competitively selected on the basis of merit from across the country receive instruction at the highest level and research is conducted at the frontiers of science and technology.

Subbarayappa has succeeded in presenting a fascinating story of an institution that can claim, with considerable justification, to be the leading scientific and educational establishment in India. The Institute owes its origins to the foresightedness of the late-19th-century industrialist and philanthropist Jamsetji Tata. Anticipating the needs of India as a modern nation, Tata conceived the idea of an institute of science and technology entirely devoted to postgraduate research and teaching and backed the endeavor with both his personal energies and a munificent material endowment.

The book gives a detailed account of Tata's family history; the prevailing climate in the public life and in the government of India, then a part of the British Empire; Tata's interaction with famous contemporaries such as the legendary Swami Vivekananda and Lord Curzon, the outstanding viceroy who firmly believed in the eternal British Raj; the numerous ups and downs and committees involved in the planning of the project; and finally, in 1909, the opening of the Institute, fully five years after Tata's death. The trials and tribulations of the Institute's formative years under the first three directors, all British, and the appointment in 1933 of C. V. Raman (1930 Nobel Prize winner for his discovery of the Raman effect) as the first Indian director are recounted in a compelling manner. Raman's ambitious plans to make the Institute preeminent by international standards, his success in establishing a world-class physics department where highly significant discoveries were made, his singular lack of success in

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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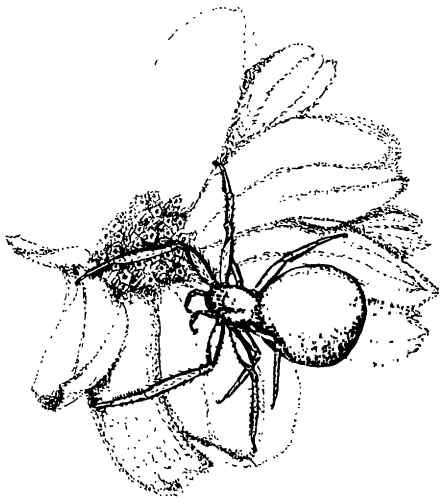
Arachnophilia

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