Comparative Ecology

Ecology and Natural History of Desert Lizards. Analyses of the Ecological Niche and Community Structure. ERIC R. PIANKA. Princeton University Press, Princeton, NJ, 1986. xii, 209 pp., illus., + plates. $45; paper, $19.95.

Lizards have been touted as model organisms in ecology, and Eric Pianka's efforts have played a major role in focusing the attention of ecologists on these fascinating animals. In addition, Pianka's detailed quantitative observations on resource partitioning in assemblages of lizards have become paradigmatic of an entire approach to community ecology. Thus this monograph, an overview and synthesis of Pianka's empirical work, will be greeted with interest.

The monograph is organized through the descriptive comparison of lizard communities in three desert ecosystems. The Great Victoria desert in Australia, the Kalahari semi-desert of Africa, and the Great Basin–

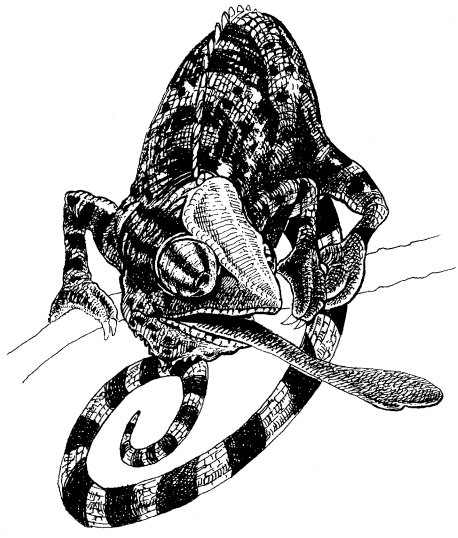
Sonoran deserts of North America offer three sets of communities whose members have independent phylogenetic affinities and thus represent three independently evolved desert systems. The three areas differ dramatically in the numbers of lizard species and in the population densities of those species. Comparative ecology in these assemblages offers the potential for considerable insight into problems of species coexistence, convergent evolution, and a host of autecological questions. With this in mind, Pianka reviews the data he has collected over the last two decades, adds new results, and, in extensive tabular appendixes, put his life's work on display for anyone to use in further hypothesis testing.

The monograph includes extensive data on the thermal relations, activity patterns, foraging modes, reproductive tactics, and morphology of 60 to 90 or more species (depending upon the topic), but nearly all the data are focused upon one theme: how do coexisting species differ? Observed differences are discussed in terms of their importance in avoiding or of having evolved in response to interspecific competition.

Pianka's approach to community ecology depicts a group of species within some major taxon as a static unit at or near equilibrium with respect to relative abundances of species and patterns of resource use. Resources are the factor limiting abundance, and nearly all the resources that are available are used up by the community as a whole. In this sense the community is very much the sort of "super-organism" envisioned by the American plant ecologist Frederick Clements.

There is nothing intrinsically wrong with this point of view as a hypothesis, testable in principle by manipulative experiments. And here in Pianka's monograph the reader will find a crossroads: no such experiments are reported, and indeed in the final chapter the author states that they are not feasible. There are no attempts to test any of the fundamental assumptions upon which the entire theory of resource partitioning is based. Pianka takes the assumptions as true and proceeds to interpret all of his data in the light of one theoretical construct. He gives mention of alternative explanations in every chapter, but it is clear that he puts little stock in them. This is a crossroads because this very issue, whether analyses of observational data alone are sufficient to test any single ecological hypothesis, has been at the core of a vigorous and often bitter argument among ecologists for the past decade. Pianka, whose approach to ecology has been at the center of that debate, cites its literature only in passing.

Whether the approach to ecology this monograph represents and the conclusions derived therefrom are correct or not is an empirical problem; only further study and, in my view, experimentation will resolve this issue. For many animals, regardless of taxon, the manipulative experiments are difficult to perform and require long time periods for conclusive results to be obtained. Thus resolution of the more general issues will be a long time coming. Nonetheless, in Pianka's book we have a monograph that is full of information, thoroughly interesting, and provocative from start to finish. Different ecologists will be provoked in different ways, but if they are provoked enough to perform more empirical studies on lizard communities, then Pianka's book will stand as a landmark in the literature.



"Chameleo dilepis, a bizarre and uncommon arboreal lizard in the eastern Kalahari." [From *Ecology and Natural History of Desert Lizards*]

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Reprints of Books Previously Reviewed

Foundations of Space-Time Theories. Relativistic Physics and Philosophy of Science. Michael Friedman. Princeton University Press, Princeton, NJ, 1986. Paper, $14.50. *Reviewed* **222**, 1007 (1983).

Historical Writing on American Science. Perspectives and Prospects. Sally Gregory Kohlstedt and Margaret W. Rossiter, Eds. Johns Hopkins University Press, Baltimore, 1986. Paper. $15. *Reviewed* **232**, 406 (1986).

Books Received

American Electoral Mosaics. J. Clark Archer and Fred M. Shelley with cartography by Ellen R. White. Association of American Geographers, Washington, DC, 1986. x, 97 pp. Paper, $6. Resource Publications in Geography.