Arid Lands, Their Flora and Fauna

Life in Deserts. J. L. Cloudsley-Thompson and M. J. Chadwick. Dufour, Philadelphia, 1964. xviii + 218 pp. Illus. $8.95.

The late A. G. Tansley set going a trend foreshadowed much earlier by von Humboldt and Darwin. Traditionally naturalists have engaged themselves in biological inventories of the lands they have visited. Tansley, by arranging an empire-wide conference of ecologists (many of whom had been his students), broadened the scope of inquiry to include ecosystems.

The authors, zoologist and botanist respectively, both with degrees from Cambridge and long experience in the Sudan, exemplify this newer approach. Both are obviously good systematists, so that inventory is not neglected. But it is vastly enriched, first by an account of the desert environment, then by an absorbing discussion of the structures and behaviors that enable fauna and flora to survive in it. A final section deals with the desert complex. Interspersed in the text are nearly 100 good drawings, 10 tables, and many fine halftones.

Although the discussion naturally focuses on the African region that the authors know best, there are many references to desert investigations elsewhere. These include generous attention to American workers, although one misses any mention of Shreve. Of the desert areas outside of Africa, the authors credit those of North America as being most intensively studied. Baja California, a classic area, is represented only by a fine photograph of *Pachycereus pringlei* on a desert island near Guaymas. One wishes the authors might have had available a picture of its weirdly beautiful, endemic *Idria columnaris*.

On two tests *Life in Deserts* comes through with flying colors so far as I am concerned. I found it impossible to turn to any page that is not interesting. And I have been seduced—as reviewers not always are—into word-by-word, cover-to-cover reading. This brings on its own troubles, for one cannot summarize the great variety of ways in which organisms of the desert have come to tolerate, evade, and avoid the ever-present threat from heat and desiccation.

There is, however, one generalization which scientists will endorse and which lay authority should understand. Centuries of trial and error by simple cultures, nomadic or gardening, have fairly well tested the safe limits of human pressure in arid regions. To increase this pressure by modernization may be politically expedient. Biologically it is likely to be self-defeating.

Thus, the authors document what was clear from the Arid Lands Conference in 1955 (*The Future of Arid Lands*, 1956, AAAS Publication No. 43). Unless modern man uses his science to understand rather than to exploit, the deserts of the world have had about all they can take from him.

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New York Botanical Garden Memoirs

Atlas of North American Astragalus (Memoirs, New York Botanical Garden, vol. 13). pts. 1 and 2. pt. 1, *The Phacoid and Homaloboid Astragali* (600 pp.); pt. 2, *The Cercidothrix, Hypoglottis, Piptoloboid, Trimeniaeus, and Orophaca Astragali* (592 pp.). Rupert C. Barneby. New York Botanical Garden, 1964 (available from Stechert-Hafner, New York). Illus. Paper, $30; cloth, $35, set.

Rupert Barneby, who has been a student of the *Astragali* for more than 20 years, has shown sufficient understanding and command of the literature of the genus so that authors of recent regional manuals commonly call on him to treat the genus for their area. Most of us would view the present two-volume work treating the genus in a comprehensive fashion for the whole of North America as the work of a lifetime. Barneby views it as an "interim report," and I dare say he is correct. It is a magnificent cornerstone on which to build, not only an understanding of the genus *Astragalus*, but also an understanding of ecological regions, plant migration, and patterns of evolution.

Barneby recognizes 368 species and 184 varieties for a total of 552 taxa. The first 37 pages deal with the historical treatments, beginning with Asa Gray's treatment 100 years ago. He gives a chart comparison of variations in treatment and coverage by Gray (1864), Sheldon (1894), Jones (1923), and Rydberg (1929) and the current treatment. Barneby analyses the coverage by each of these authors and gives some long overdue praise to both Jones and Rydberg. At the same time he points out that it has been necessary to reduce from 40 to 60 percent of the names of these two workers to synonymy and often to change the rank that is recognized. He notes that Jones was a field man and Rydberg a museum specialist who had access to large collections as well as libraries.

Barneby is a field man like Darwin, Douglas, and Jones, and he has definitely gained a greater insight into this complicated genus than any previous worker. As Ernst Mayer pointed out in the introductory chapter of his book, *The Species Problem*, the naturalist often comes closest to an accurate understanding of the entities in nature and the dynamics of their relationship. One surprise was the paucity of Mexican taxa, but then the genus is well developed in Eurasia, suggesting Northern Hemisphere origin and development, in contrast to my findings in *Lupinus*, where Mexico appears to be one of the centers of development.

Barneby's tabular enumeration of sections and species requires 16 pages, and his keys require 34 pages. His unique regional keys are offered as an aid to taxonomists so that one will not have to wade through a key involving hundreds of taxa not in an area. The interesting feature of his regional groupings, shown on a map on page 56, is that these regions are in large measure ecological provinces that will often be significant with respect to other groups of plants. I have taxa in *Lupinus* either restricted to one of his regions or very closely resembling the distribution. I would have split his Region X at Humbolt County, California, because there is a climatic break in that area of the coast.

Barneby's keys, as always, are excellent, and his descriptions give accurate metric measurements which are sorely needed. The work is a must for every herbarium and science library in North America.

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