

sess. "If a person hears a chickadee when he is in the forest away from home, the person...will receive a visitor." I recorded precisely this belief for the Sahaptin Indians of Washington State (Hunn 1990:324), though the languages of the two groups are not at all closely related. Also, the Dena'ina, like people everywhere, would like to preserve their youth, in this case, keep their glossy black hair from turning gray. They believe that "if a young girl wears a raven-feather hat, the girl's hair will not turn gray..." (p. 143). In the same spirit, the Tzeltal Maya of southern Mexico apply raven's blood to their hair to prevent graying (Hunn 1977: 118).

In conclusion, this is a fascinating account of a highly sophisticated ethno-ornithological system that rewards close scrutiny.

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Folk Mammalogy of the Northern Pimans. Amadeo M. Rea. 1998. University of Arizona Press, Tucson. Pp. xxiii + 286. \$45.00 (cloth). ISBN 0-8165-1663-4.

This is the third in a series presenting the results of over thirty years of ethnographic studies of Northern Piman ethnobiology by Dr. Amadeo Rea. *Once a River: Bird Life and Habitat Changes on the Middle Gila River* (1983) and *At the Desert's Green Edge: An Ethnobotany of the Gila River Pima* (1997) deal with birds and plants, respectively, but are more sharply focused on the Gila River Pima. The present volume brings together all available information for the entire Piman language area, north and south of the Mexican border.

Dr. Rea is by profession a museum ornithologist but by inspiration and personal inclination an accomplished and highly sympathetic ethnographer of Native American folk science. Like most ethnobiologists, he synthesizes a sophisticated understanding of and deep appreciation for both biological and cultural diversity and a concern that neither be lost beneath the heavy tread of progress. Dr. Rea offers this book as his return to his Native colleagues on the value of their gifts

of friendship and shared fascination with the Sonoran desert flora and fauna. His brief tribute to six Gila River Pima men who have been his primary teachers for many years is telling, as all are now deceased. Their intricate knowledge of the Piman natural world lives on in these pages.

The book is in two parts. The first includes eight chapters, each devoted to a discussion of a particular aspect of the Pima relationship with their environment in which mammals play key roles. We learn that Pima country encompasses a wide range of habitats, from the to-our-eyes bleak Pinacate, the sand and lava country of the Hiá ch-ed O'odham, the "Sand People," to the Oob or "Mountain Pima" of the pine- and oak-forested Sierra Madre on the borders of the Mexican states of Sonora, Sinaloa, and Chihuahua. Though the historical and ethnographic record for these people is thin, Dr. Rea leaves no stone unturned in his effort to document the traditional knowledge and ecological practices of these people whose lives have been so drastically changed by first Spanish, then Euroamerican settlement and consequent social and environmental transformations.

Dr. Rea pays close attention to linguistic detail, as the precise rendering of names for local animals is essential for reconstructing Northern Piman history. Of particular note is the odd distribution of special ritual treatment of certain animals. Some are noted for causing "staying sickness" if mistreated by hunters, or a hunter's newborn child may be afflicted if certain precautions are neglected by a man whose wife is pregnant. As in the notorious case of the "Abominations of Leviticus" (Douglas 1966), the forbidden animal foods of the ancient Hebrews, puzzling through the alien logic of such ritual distinctions is an intellectual challenge. Dr. Rea develops a complex but not perfectly satisfying explanation for which animals are of special potency. The fact that most mammals limited to the northern margins of the Piman range are so distinguished, while very few that are widespread across Piman territory are singled out, suggests that Northern Piman peoples originated south of the contemporary U.S. border. Thus, the "new" species encountered during this expansion were ascribed special powers. The Northern Pimans show extraordinary consideration for mule deer (*Odocoileus hemionus*)—which range south only as far as the northern edge of Pima country. This contrasts sharply with their matter-of-fact attitude toward white-tailed deer (*Odocoileus virginianus*), which are found throughout the Piman range. The classic debate about the Old Testament food taboos has been attributed to the anomalous conceptual place of the tabooed animals. The Piman distinction, however, is experiential and ecological rather than conceptual.

Hunting strategies, technology, food preparation, and the anatomy of prey species is analyzed in great detail, a task facilitated by the author's intimate knowledge of the anatomy and behavior of local animals. Dr. Rea describes hunting as an essentially male activity. Women might trap birds and young girls before puberty might accompany their fathers and brothers on hunts, but "actual hunting" (p. 50) was off limits to women. The ecological balance between hunting, fishing, gathering, and agriculture might have been more clearly delineated. We learn that the River Pima depended more on fish, the Desert Pima or "Papago" more on game, that "the bulk of the diet" of the River Pima "in traditional times" came from wild gathered foods such as mesquite pods, saguaro fruits, and agaves (p. 9), that Hispanic contact increased dependence on agriculture at the expense

of hunting (p. 48), but that the requirements of agricultural work could interfere with hunting. Yet the River Pima are credited with irrigation aboriginally (p. 9), which would suggest that agriculture was substantially important in pre-colonial times.

Dr. Rea reviews the nomenclature and classification of mammals in light of Berlin's "General Principles," noting that there is but a single example of the folk specific rank, marked by the use of a binomial naming pattern, e.g., black-tailed jackrabbit is *chuk chuvi*, the white-tailed jackrabbit is *toka chuvi*. It is worth noting that a man with a pregnant wife should not hunt the black-tailed jackrabbit for fear of suffering staying sickness, but that he may hunt white-tailed jackrabbits. The black-tailed jackrabbit, like the mule deer, occurs only on the northern margins of Pima country, while the white-tailed has a wide distribution, like that of the white-tailed deer. In any case, the paucity of folk specifics is suggestive more of hunting-gathering societies than of agriculturalists, as Cecil Brown has noted. There is no named category equivalent to English "mammal." Thus, the mammalian sector of the Piman ethnozoological taxonomy is "flat," consisting of a series of 34 contrasting folk generic taxa, plus just two folk specifics. Piman speakers clearly recognize the "family resemblance" among mammals, not only native species but introduced domestic animals as well, recognizing the close affinity of the introduced pig to the native peccary while naming the cow "dressed meat." Piman consultants informally group mule deer, white-tailed deer, and pronghorn as "deer," using the English term for a category lacking a standard Piman name. Likewise, cottontail rabbits are grouped with the two jack-rabbit species; coyotes, gray and kit foxes, and wolves are associated (but the domestic dog is considered something else entirely); and several generic categories of rats and mice may be named *nahagiu*, a term applied polysemously to prototypical mice. Though Rea does not use the term, these are clearly what Berlin calls "intermediate taxa." Their existence must be inferred from hints in the way consultants talk about animals as in most cases they are not named. However, they demonstrate the recognition of more abstract patterns of resemblance and another level of classificatory structure that is not explicit.

The second part of Rea's *Folk Mammalogy of the Northern Pima* is a series of detailed accounts of each named folk generic category. These summaries amply reward a careful reading as they are packed with fascinating ethnographic, biological, and linguistic details. For example, we learn that pocket gophers (*Thomomys bottae*), living for the most part underground, have slits in their upper lips for their incisors that allow them to gnaw underground stems without swallowing dirt. Gophers are of exceptional significance to Piman peoples as they opened the way to the earth's surface for the *Vipshkam*, the first people. Piman children learned to rob gophers of their underground stashes of the edible tubers of *Hoffmannseggia glauca*, but that girls and women in their childbearing years must not eat them. Though many spiritually powerful animals are nevertheless hunted as game, gophers were not eaten. If mistreated they could cause "gopher sickness," a form of staying sickness for which diarrhea and menstrual cramps were symptoms. This was treated by the application of certain fetishes associated with gophers and by a "gopher song." If a man whose wife is pregnant should step on a gopher's tunnel, his wife could have trouble delivering the child, perhaps a

consequence of the gopher's mythic role in "birthing" the Pima's clan ancestors. This is but a single example of the rich complex of conceptual linkages that inform traditional Pima peoples relationships with animals, a conceptual system that is simultaneously scientific in its empirical grounding and "mythic."

My criticism of Rea's book is limited to a few editorial quibbles. For example, Appendix D describes the phonological conventions used in writing Piman words but fails to explain the "d" with subscripted period (a retroflex "d"?). A brief account of how Piman plurals and other compound names are formed would have been helpful also. In several instances, issues or concepts are referred to before they are properly introduced into the discussion, which can be misleading. Finally, a wider context for certain topics would have added depth to the analysis. For example, the emphasis on respect for animals is widely implicated in animistic religious perspectives.

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The Retreat of the Elephants: An Environmental History of China. Mark Elvin. 2004. Yale University Press, New Haven, Connecticut. Pp. xxviii + 564. \$39.95 (cloth). ISBN 0-300-10111-2.

This monumental work is essential for anyone interested in China's environment. The book is not an environmental history; it is a collection of brilliant and detailed essays. Some deal with deforestation and hydraulics. Three are detailed accounts of particular regions—one in the heartland, one on the southern frontier, and one on the northern. Three more give elite views of the environment: classic poetry, the "moral meteorology" of the Yongzheng Emperor (r. 1723-1736), and the observations of Xie Zhaozhe, a sixteenth- to seventeenth-century scholar whose eye was almost scientific. Elvin concentrates on extensive interpretive translations of primary sources, mostly materials never before translated, and frequently hard to find even for Sinologists.

One essential point made in the text involves the quality of Chinese observation of environments. Elvin quotes many sources showing full awareness of the consequences of deforestation. Unfortunately, such perceptions did not stop the process. He asks how such an excellent observer as Xie could maintain he actually saw dragons, in a storm at sea. My fishermen friends in Hong Kong also saw them, under the same circumstances. Looking into torrential rains, flashing lightning, and roiling clouds, from a wildly pitching boat, one can see almost anything one expects or fears to see.