

RESOLUTION OF RESPECT Richard S. Miller 1922–1990

On 12 October 1990 Richard S. Miller died. He was a devoted scientist and a proud ecologist. Rick was president of the Ecological Society of America in 1974–1975. He also served on the editorial board of *Ecology*.

Rick Miller was born on the fourth of July in 1922 in Cleveland, Ohio and was raised in Pasadena, California. His early interest in natural history developed during visits to his grandparents' ranch in California where he spent time watching wildlife. Surely his intense curiosity (one of his trademarks) was already thriving at that point.

World War II and the G.I. Bill changed the course of his life by giving him the opportunity to go to college. After returning from England (where he was stationed with the Air Force), he entered the University of Colorado. The fact that he went to college was partly due to the encouragement of Jane Dyde, an attractive Red Cross worker he met in England, and also a native Coloradan (whom he would later marry). He always said, if it hadn't been for the war he would still be working in the cellophane factory where he was when the war began.

Rick graduated from the University of Colorado in 1949. While in Colorado he read *Voles, mice and lemmings: problems in population dynamics* by Charles Elton and found it to be a most readable and remarkable book. "It would make me very happy to study with a man of Elton's stature and literacy," he remarked. From there, he went to Oxford University as a Fulbright scholar to work with Charles Elton. Or as Peter Crowcroft reports in his history of the Bureau of Animal Population (Crowcroft, 1991; p. 58), "in October a Fulbright scholar from Colorado, Richard S. Miller, strolled into the Bureau and announced to Elton that he had come to do research. . . . The Boss (Charles Elton) liked Rick and took him in, suggesting that he pick up a thread of the pioneer Bagley Wood mouse work. Thus Rick Miller began a study of the food preferences and other habits of wood mice and bank voles. The preliminary outline of the research included a note provided by the boss that summarized the conclusions eventually reached."



Rick obtained his D. Phil. in 1951 from Oxford, based on a study of small mammal population dynamics at Wytham Woods (Miller 1954, 1955, 1958). After Rick obtained his degree, Charles Elton and he developed a method to collect and organize information on the relationships between organisms and their habitats (Elton and Miller 1954).

Rick went from England to teach as an instructor at Harvard University. The academic climate at Harvard was very stimulating for the young scientist. At Harvard he further developed his ideas on what would become a central part of his research; the study of competition.

After 3 years at Harvard, it was on to gopher control at Fort Collins, Colorado, working in association with Colorado State University. His first-hand knowledge of gophers developed into an important piece of work. As Evelyn Hutchinson (Hutchinson 1965) describes in his discussion of niche diversification, "Another mammalian case in which actual competition evidently can occur in nature has been beautifully analyzed by Miller (1964). This case involves four species of pocket gopher in Colorado. The optimal conditions for all species are provided by deep light soils, but when in competition they are arranged in

a series *Geomys bursarius*, *Cratogeomys castanops*, *Thomomys bottae*, and *Thomomys talpoides*, the first tending to displace all other species and the last none, in favorable habitats. The sizes of the fundamental niches, however, are related inversely to the competitive ability in an optimal habitat, so that *G. bursarius* lives in the best terrain because it can displace all species but cannot invade the less suitable ground, while *T. talpoides*, though it potentially has the largest fundamental niche, usually exists in marginally poor habitats unsuitable for the other species. This case in fact provides an example of the reciprocal relationship between adaptability (or larger fundamental niche) and adaptation (or possessing inherent competitive powers) that has been stressed by Gause in another context."

Research on the included niche theory, as this relationship was called, was applied to another example following his move to join the faculty at the University of Saskatchewan in Saskatoon. He found the niche relations of Red-winged Blackbirds and Yellow-headed Blackbirds also fit the included niche model (Miller 1968).

Rick enjoyed his years at the University of Saskatchewan, and particularly treasured the summers spent in the wilds of the boreal forest region at the University of Saskatchewan Biological Research Station located on an island in Emma Lake. He continued his investigations of blackbirds there and also supervised graduate students in a variety of ecological studies.

While at the University of Saskatchewan he wrote an article for *Advances in Ecological Research* (Miller 1967), "Pattern and Process in Competition." Rick was proud of this paper, which synthesized important ideas about competition, the ecological niche, coexistence, competitive exclusion, and species diversity.

After 9 years at the University of Saskatchewan, he was offered an opportunity to join the faculty of the Yale School of Forestry as the Oastler Professor of Wildlife Ecology. He was excited by the expansion of the Forestry School and its development of a more interdisciplinary program. He also looked forward to regular interactions with G. Evelyn Hutchinson and other ecologists in the Biology Department and Forestry School at Yale. He continued investigating population dynamics,

expanding his interests to include endangered species and species characterized by certain demographic characteristics (K-selected species). Through collaborative efforts, he developed population models to predict the fate of these species, such as the Sandhill Crane (Miller et al. 1972) and the Whooping Crane (Binkley and Miller 1980).

His most recent research was a rebirth of an earlier interest in hummingbird foraging behavior (Miller and Miller 1971). He had become fascinated by the cognitive behavior of hummingbirds.

Rick Miller was known for his ecological research on a wide range of animal life, from fruit flies and mice, to elephants and hummingbirds. His passion for observing and understanding the biology of his animals was an invaluable and integral part of his approach to ecology, even at times when the focus of much of the ecological community shifted toward mathematical modeling. He felt strongly that good observations on natural populations were a large and essential part of attaining interesting insights into the natural world. That world was an endless source of enjoyment, excitement, and potentially answerable questions for Rick. It was also a source of passionate concern as he saw its well-being threatened and perceived the need for action on the part of informed scientists and others. Through written and spoken word and through a lifetime of actions, he communicated his concern and stimulated involvement in his many students, colleagues, and friends.

He was a stimulating and effective teacher and supervisor. His was an outstanding intellect—he seemed comfortable and informed when discussing ecology, art, or politics—and from this and his high standards came good questions. He maintained that delicate balance between healthy skepticism, challenging criticism, and essential encouragement. He was interested in his students' work and well-being, and that interest and positive influence continued through their subsequent careers and lives and into those of their students and beyond.

He is survived by his wife Jane, a psychotherapist at the Branford Counseling Center, his son Jim, a lepidopteran systematist at the American Museum of Natural History, and his son Rick, a plant ecologist and Ph.D. candidate at the University of Texas at Austin.

Memorial contributions can be made to the World Wildlife Fund, 1250 24th Street NW, P.O. Box 96220, Washington DC 20077.

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