

## INTRODUCTION

During the interval 1979 to 1984, no fewer than six international symposia convened for the purpose of discussing patterns and processes in ecological communities. The breadth of treatment was unequal, with dominant themes dealing with the prevalence of interspecific competition and philosophical discussions on the role of "science" and "scientific methods." The results of some symposia were published in a *pot pourri* of research articles, whereas others concentrated more on review, with readings appropriate for classroom use in senior undergraduate or graduate courses. All resulted in bringing together a diversity of researchers working on an even greater diversity of biological organisms. Participants in every symposium pointed out contentious issues in community ecology, yet none achieved a satisfactory synthesis on the relative roles of different structuring forces in ecological communities. That outcome may say more about the interests of speakers than it does about patterns and processes. Why should ecologists expect guilds of organisms as different as marine algae, insectivorous birds, and stem-boring insects to be structured in exactly the same way?

We have noted one other curious feature of the previous symposia. With a few notable exceptions, studies of mammalian communities have not been covered, and the complexity of interactions among coexisting mammals have not received the attention we feel they deserve. Mammalian ecologists have contributed substantially to the development of ecological theory and to empirical tests of that theory. Mammals, more than any other class of vertebrates, and most invertebrates, represent a diversity of trophic levels, and they have succeeded in colonizing virtually every earthly habitat available to animals of their size. They occur in a diversity of forms and every major habitat is occupied by several closely related species. We reasoned that a comparison among different kinds of mammalian communities would cover a broad spectrum of possible forces in the structuring of ecological systems. At the same time, it controls for major differences in physiology, morphology, and life history that in themselves may be responsible for much of the apparent complexity in the organization of ecological communities. The strength of our approach is to use comparative studies on reasonably closely-related and well-known animals to search for processes that lead to repeated patterns of distribution and abundance. The patterns and processes we discover will be representative of the factors influencing groups of similar coexisting species.

We met in Edmonton during the Fourth International Theriological Congress in August of 1985. We arrived, manuscripts in hand, with the objective of reaching some consensus on factors structuring mammalian communities. Our coverage varied from overviews of repeated patterns in mammalian faunas through millions of years of evolution to ecological

snapshots of competitive processes in action; from geographical patterns in distribution and abundance to microhabitat use and foraging; from the sands of Mediterranean and North American deserts to tropical forests, heaths, and mangrove swamps in Australia; from the rich grassland savannas of southern Africa to the boreal forests of Canada. Our contributors discussed grazing and browsing ungulates, insectivorous marsupials, fruit and insect-eating bats, omnivorous Carnivora, and seed-eating rodents. They searched for patterns in morphology, trophic relations, competitive interactions, habitat selection, predation, and species assembly. They tested for processes by exclusion, enclosure, and removal experiments, density alteration, habitat modification, and resource manipulation. Together they emphasize the most significant impact of this symposium—its demonstration that understanding and insight come from detailed field studies of ecological relationships. Our contributors have not allowed their perception of mammalian community organization to be clouded by a suspicion that some approaches are somehow nonscientific, or that some are more scientific than others. Instead, they have focused on the fundamental objective of understanding the evolutionary ecology of mammals, and will let history be the judge of their undersanding, and of their science.

We are most grateful to everyone who contributed to our symposium, "Patterns in the Structure of Mammalian Communities," at the Fourth International Theriological Congress. We thank Dr. William A. Fuller, the Secretariat, and the University of Alberta for hosting a first-rate congress, and for performance well beyond anything that reasonably could have been expected. We especially want to thank those contributors whose papers do not appear in this issue; page constraints severely limited what could be published. Their posters at Edmonton contributed greatly to the success of the symposium. We would also like to thank Texas Tech University Press and The Museum, Texas Tech University for their cooperation in publishing these proceedings. In particular, J. Knox Jones, Jr. and Carole Young were most helpful in editorial matters. We also acknowledge W. Broom, D. Carter, C. Jones, E. Jones, E. Sandlin, and M. Ybarra for their cooperation in seeing this work to fruition.

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27 January 1987