esis that ancestral finches ate arthropods and berries and that granivory evolved later. Clearly, many additional hypotheses about ancestral character states will emerge from carefully constructed phylogenies, and so the direction of evolutionary change will be deciphered. Incidentally, the finch phylogeny has been placed into a new time frame. Recalibration of the allozyme molecular clock shows that finch evolution on the islands has been occurring for at least 1.5 million (and, perhaps, as long as 3 million) years—three to seven times longer than the previous estimate of <500,000 years. Further, the geologic evidence now indicates that the number of islands in the archipelago has increased during the past 3 million years (p. 427), and the number of finch species seems to have increased in parallel.

The second area of interest discussed at length by Grant in the afterword includes some of the recent findings on the paleoecology of the Galapagos archipelago. Grant argues that we need to understand past environments in detail if we expect to understand the past and future evolution of this group of birds. Evolutionary changes and speciation in the finches have been, in Grant's estimation, highly dependent upon past climatic change. In this context, one cannot help but think of the possible negative effect that the increasing frequency of El Niño events might have on the flora and fauna of the Galapagos islands.

I was personally intrigued by the many observations of hybridization among the finches that have been made since the first edition. I recall that many people were initially surprised by the evidence of hybridization, and even more so by Grant's claim that such infrequent hybridization events could be a significant source of genetic variation in finch populations. The Grants have expanded their discussion of avian hybridization (Grant and Grant 1992), providing much-needed evidence that hybridization might be genetically nontrivial in a wide variety of bird species.

Grant ends his afterword with a warning. Loss of biological diversity anywhere on earth is a tragedy, but its loss on the Galapagos would be particularly sad for obvious historical reasons. Unfortunately, the threat is real. Despite efforts at protection, the archipelago's flora and fauna continue to display the vulnerability so characteristic of species on oceanic islands. For example, habitat devastation of the volcanic slopes on Isabela by introduced goats has erased any evidence of possible prior existence of a divergent population of the Sharp-billed Ground Finch (*G. difficilis*) and any influence they may have had on the evolution of the remaining finch species (p. 438). And, what would be the chances of the finches' survival if an avian pathogen, such as avian malaria, was accidentally introduced to the islands?

A small disappointment for me was the reproduction quality of the black-and-white nonglossy photographs, of which there are many. Without exception, each of these (at least in my copy) is noticeably "muddier" than the photograph that appeared in the original book. That may be the result of how the book was produced; I am guessing that the original text, including black-and-white photographs, was simply itself photographed for reproduction, resulting in the loss of resolution in the second edition.

Should readers of *The Auk* buy a copy of this new edition? If one already owns the 1986 book, I see little reason to do so. One might be tempted (after considering any relevant copyright laws!) to photocopy the new preface and, especially, the afterword and new reference list, from a library copy, and shove the photocopied pages in one's own copy of the 1986 book. Obviously, if Grant had decided to incorporate new findings into the text of the original book (a much larger task for him), I'd probably recommend that one purchase the new book. But he did not. This is not meant as a criticism, but simply an observation. Having said that, if one does not have a copy of the original one should, by all means, buy the new edition. And, have the university library buy a copy even if it already has the first edition. One could even argue to molecular-oriented colleagues that this book is a worthwhile read because it does, indeed, have some information about molecules in it, besides all that other "ecology and evolution stuff".—RANDALL BREITWISCH, *Department of Biology, University of Dayton, Dayton, Ohio 45469-2320, USA. breit@notes.udayton.edu*

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Untangling Ecological Complexity: The Macroscopic Perspective.—Brian A. Maurer. 1999. University of Chicago Press, Chicago, Illinois. ix + 251 pp. ISBN 0-226-51132-4. Cloth, $50.00. ISBN 0-226-51133-2. Paper, $18.00.—What patterns exist in com-

munities? How do they arise? And, how can they be revealed? Those fundamental questions have motivated ecologists for a century, but only recently have the distribution and abundance of individual species across their entire geographic range been the units of analysis. Advocates of macroecology, as this approach has become known, emphasize that the small spatial scale and short duration of most community ecology research miss the processes that occur at larger scales, thereby losing the opportunity to derive generalizations or deduce mechanisms. Maurer has been involved in macroecology since it became a formalized discipline about a decade ago and, together with James H. Brown, has made some of the most important advances in the field. In this book, the author reviews some of those advances and addresses some new areas, but equally presents the philosophy, historical stimuli, and statistical basis for macroecology.

The reader eager to learn the fruits of the macroecologists' labors will need patience through about the first half of the book. The patterns revealed by macroecology are reviewed more thoroughly in Brown's 1995 book *Macroecology.* Maurer's approach is to first show why short-term, local-scale results can be misleading, and why macroecological processes should be expected. Simply put, species behave as statistical entities, making it necessary to back away from individual species or small assemblages to examine top-down processes. In the first five chapters, Maurer performs useful, if zealous, scholarship by using recent empirical data, ideas from the physical sciences, and early models of population and community dynamics to criticize reductionism and support his approach. The theoretician will likely find much stimulating material here, although those who have ever generalized from local data will likely find issues to challenge. But those with local data not agreeing with data from elsewhere (inevitably published by those of greater reputation) may feel vindicated by Maurer's later discussion of how niche variation across space can be expected to alter relative abundance and competitive interactions.

As an empiricist awaiting results, I found more of interest in the second half of the book. Even so, most of the conclusions described in Chapters 6–8 will be familiar to the reader who has followed the development of macroecology. This information is revisited in order to discuss mechanisms and demonstrate that the macroscopic perspective has yielded some important successes. These results will be especially significant to ornithologists because so many such conclusions are derived from analyses of North American Breeding Bird Survey (BBS) data. In fact, it is probably safe to say that the BBS data are the single most important resource in the development of macroecology. The main conclusions here are the following: species tend to reach their maximum abundance in the central part of their distribution; there is a positive relationship between mean local abundance and range size; there is a positive relationship between body size and range size; species with highest densities are those of intermediate body size; and the evolutionary trend within clades is toward larger mean body size. Population processes that could account for these patterns, such as the intuitively attractive idea that optimal environmental conditions lead to overproduction of offspring which will then disperse to peripheral, suboptimal areas of the range, are also considered. Note here that the conclusions come from analyses of multiple species, and are supported by theories of population processes. Interspecific interactions contribute only as part of density dependence. Similarly, Maurer argues earlier in the theoretical part of the book that niche partitioning and assembly rules are evidence only of local processes operating in ecological time.

So, what does determine the specific community in a given place? Based mostly on models, Maurer proposes in Chapter 8 that local communities owe their composition to phylogeny and local geography, meaning the location within the ranges of the species present. He shows that patterns, such as the species–area relationship and nestedness among communities of different sizes, can be explained best by models that incorporate geographic range. Perhaps, but the alternative models in that section seemed like rather frail straw men. To be fair, however, the intent was as much to demonstrate another approach to showing pattern as it was to attack these specific problems.

Chapter 9 is the first look at long temporal scales, in this case whether generalists or specialists are more likely to leave more descendant species. The conclusion, apparently supported by the only appropriate data set (for two clades of foraminiferans) is that specialists speciate more rapidly, but that they also go extinct more rapidly. As such, at any point in time, there are more species of generalists than there are specialists. We can only hope that the fossil record for birds will one day be complete enough to consider this question. Considering extant species, Maurer suggests that the abundance and range size of the specialist and species-poor Phaethornithinae (hermit) hummingbirds will be shown to be lower than for the generalist and species-rich Trochilinae. I doubt it, given that most of the hermits are lowland species with broad distributions, compared to the higher frequency of high-elevation, restricted distribution Trochilinae. But, like so many other questions raised in the book, this one awaits more data and analysis.

The book concludes with a brief chapter on macroecology and conservation. Maurer is optimistic about the contribution that the macroscopic approach can make to conservation, but the news so far is likely to make the job of managers more difficult. We have been shown that short term data are noise, that local demographic or community composition data can not be extended to other locations, and that

rare species are likely to be doomed to small populations and narrow niches. On the other hand, Maurer neglects to mention that many local problems do not require a macroscopic look—tools such as the proper use of fire, control of alien species, or remediation of disturbance often provide acceptable outcomes. One objective recommendation Maurer makes, which has also been noted elsewhere, is that simple tallies of species richness do not necessarily indicate the most important areas for conservation, as the species total is likely inflated by widespread species or by species on the very edge of their geographic ranges.

Who should read this book? Anyone whose interest in community ecology extends beyond comparing species lists should recognize the potential for macroecological processes. It should be required reading for any reviewer who ever dismissed ecological results that did not match existing data from another location, or for any writer who claimed his or her system was representative of a broad geographical area. Ornithologists have been instrumental in providing the data essential for bringing the study of macroecology to where it is today; we should now prepare ourselves to see if the generalizations hold up. For example, will Amazonian birds, with highly specialized niches and low abundance, show the same patterns of distribution and abundance as revealed by the BBS data? Do generalizations from breeding birds hold up on the wintering grounds? Similarly, although Maurer does not mention it, there are useful contributions to be made from museum collections. For example, how do clinal variation and genetic structure across distributions accord with the niche conservatism that should arise from population processes across a geographic range? This book should provide the rationale and the impetus to take a macroscopic look at what we know about birds. Only time will tell how far macroecology will take us in answering the basic questions of ecology.—PHILIP C. STOUFFER, *Department of Biological Sciences, Southeastern Louisiana University, Hammond, Louisiana 70402-0736, USA. stouffer@selu.edu*

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Atlas das Aves Invernantes do Baixo Alentejo (Atlas of the Winter Birds of Lower Alentejo).—Edited by Gonçalo L. Elias, Luís M. Reino, Tiago Silva, Ricardo Tomé, and Pedro Geraldes. 1998. Portuguese Society for the Study of Birds, Lisbon, Portugal. 416 pp., approximately 180 unnumbered maps, 180 black-and-white drawings, 16 tables and figures. ISBN 972-96786-2-6. Paper, approx. US$40.00. In Portuguese, with English summaries. Available from: Sociedade Portuguesa para o Estudo de Aves, Rua da Vítoria, 53-2°D, 1100 Lisboa, Portugal (contact *spea@ip.pt* for more information).—During the winters of 1992–1995, a large group of Portuguese bird enthusiasts set out to quantify the distribution and abundance of birds in Baixo Alentejo, a region in southern Portugal about the size of Connecticut. Their results are presented in this attractive book that follows the general format of the breeding bird atlases recently prepared for many U.S. states. Indeed, the book is meant to complement the breeding bird atlas for continental Portugal.

The species accounts will probably attract most readers, but the volume also includes four introductory chapters. The first describes the geography, vegetation types, and climate. The second chapter, on methods, allows the reader to interpret the maps in the species accounts. A goal of the work is to present quantitative data on abundance throughout the region, based on 2–4 visits to each of the 166 100 km^2 blocks. This chapter also describes tape-playback methods for surveying owls and the adjustments for species whose detection was highly dependent on the length of the observation period. It is interesting to note that for most species the abundance is presented as birds/visit, without correction for the length of the visit. This is in contrast to analyses of Christmas Count data, which are based on birds/party-hour. Summaries of the data in the third and fourth chapters include patterns of species richness and abundance, distribution of vulnerable species, and designation of areas most important for conservation. Each chapter includes an English summary.

Species accounts form the bulk of the volume, with two pages dedicated to each of 169 species. I could not find the taxonomy explicitly stated, but it appears to follow Cramp and his collaborators' *Birds of the Western Palearctic* series. Abundance is mapped as scaled circles (as percentage of maximum abundance) for each block in which the species was recorded. Obviously, there is no way to judge the coverage of the various habitats within each block, so it is difficult to interpret whether low recorded abundance reflects lower density or just less time spent surveying the appropriate habitat when that habitat is rare. Species accounts also include black-and-white drawings by a variety of artists, and brief English summaries. Many of the drawings are excellent and combine well with the maps to give a certain visual charm to the accounts. Unfortunately, the Portuguese text, presented in a large font, gets reduced to less than a page and includes relatively little information. The species accounts were written by about 30 different authors