BOOK REVIEWS

Systematics and Taxonomy of Australian Birds

L. Cristidis and W. E. Boles, 2008.
CSIRO Publishing, Collingwood, Victoria, Australia.
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THE Australian avifauna is one of the most biologically important in the world. For its size, it has the highest diversity and endemism of any continent. Importantly, as a key piece of Gondwana, it was at a crossroads for the early history of modern birds (Neornithes). Indeed, it has phylogenetically deep lineages of palaeognaths, galliforms, anseriforms, caprimulgiforms, parrots, and songbirds. Moreover, patterns of endemism and diversity are well-marked and provide a natural laboratory for the study of speciation and diversification. All of this is why studies of the systematics and taxonomy of Australian birds are so important, for without a clear understanding of the taxonomic limits of taxa and their relationships we cannot hope to make progress toward answering critical evolutionary questions. Nor can we provide the systematic framework for comparative studies in the organismal sciences, especially behaviour, ecology, and conservation biology.

The community is now fortunate to have several authorities examining the taxonomic status of Australian birds from different perspectives. In 1999, Richard Schodde and Ian Mason published the first volume of *The Directory of Australian Birds* (1999), which detailed the species-level status, geographic variation, and distribution of passerine birds (see Recher 2001, *Pacific Conservation Biology* 7(2): 146-148). Their treatise is an invaluable resource for anyone seriously interested in the taxonomy of Australian birds, and we eagerly await their future efforts on non-passerines.

What has been missing is a broad-scale summary of recent advances in the taxonomy of Australian birds. Now we have that, thanks to the efforts of two of Australia's most preeminent avian systematists, Les Christidis and Walter Boles of the Australian Museum. *Systematics and Taxonomy of Australian Birds* is the successor to the author's 1994 volume, *The Taxonomy and Species of Birds of Australia and its Territories* (a RAOU Monograph). The focus of the latter was a list of species, but it had a 40 page discussion of the systematics and taxonomy of Australian birds that drew heavily on the DNA hybridization work of Charles Sibley and Jon Ahlquist. That technique has given way to comparative DNA sequence analysis, which offers the potential for much finer resolution of relationships. Fourteen years have passed and Christidis and Boles' have produced an expanded revision that incorporates a host of new studies primarily based on DNA sequence analysis. Although somewhat similar in title and overall purpose, it is a world apart in much of its content and has nearly 300 pages packed with new information. By adding the word "systematics" to its title the authors signal their intention that this new book is taking a broader, more synthetic approach than their earlier work, and that it summarizes our understanding at all taxonomic levels. Because of this, the book is unique within ornithology.

Systematics and Taxonomy of Australian Birds is divided into four parts. In the introduction the authors lay out their criteria for the taxonomic decisions and structure of the book. Importantly, and I think correctly, they want to make changes only when published evidence justifies the change. They discuss species concepts at length and opt to support the *status quo* (the biological species concept, or BSC). At the same time they raise many of the old (and specious) arguments against the phylogenetic species concept (PSC). Leaving these debates aside, the issue is whether the taxonomic diversity of the avifauna is being individuated correctly and species concepts bear decisively on this. With adoption of the biological species concept, taxonomic accounts later in the book focus on the history of "splitting" or "lumping" of taxa traditionally ranked at or near biospecies-level rather than the evidence that bears on identifying diagnosably distinct taxa regardless of current thinking about their rank (the authors may have made the conscious decision not to duplicate information in *The Directory of Australian Birds*). Thus, their list of species taxa, which comprises the second section of the book, necessarily underestimates the actual taxonomic diversity, and in Australia where many diagnosably distinct taxa (often ranked as subspecies) are found in isolated areas of endemism, using a BSC approach severely underestimates taxic diversity.

The third section of the book is a short (12 pages) review of the higher-level systematics of birds, focusing on those groups found in Australia. The authors' purpose here is not to break new ground, but to summarize current thinking, and thus provide an overview for the general reader. They succeed admirably. It is worth pointing out that after their manuscript was submitted, a major genomic analysis of avian relationships (Hackett *et al*., 2008. *Science* 320:1763–1768) was published, as were papers on the relationships of parrots, ratite birds, and other groups. None of these have significant consequences for the authors' discussion, although it is worth noting that the new genomic data suggest that the ratites are not monophyletic; that is, they indicate tinamous are embedded within the ratites and related to kiwis and emus/cassowaries. As the authors stress, the higher-level relationships of birds are still in a state of flux.

The last section of the book —and by far the largest at 171 pages— is a family by family discussion

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of the systematics of Australian birds. There is a wealth of information here for anyone interested in the relationships of all birds, not just those found in Australia. Under each order they review what is known about familial interrelationships, and within each family they discuss generic relationships as they relate to Australian birds, then do the same for the Australian species. Compared to *The Directory of Australian Birds (Passerines)*, Christidis and Boles pay scant attention to distributions (and have no maps) or to detailed plumage variation, opting instead to create a synthesis of what is known about taxonomy. The two books complement each other very well, but obviously *Systematics and Taxonomy of Australian Birds* is more up-to-date on the literature.

Occasionally the linear taxonomic arrangement is a bit baffling, especially given their extended discussions about relationships. Placing the Petroicidae behind Paradisaeidae, for example, rather than much earlier in the passerine sequence must have been a lapse, as multiple papers have shown the former to be outside the core corvidans. Although this is a minor quibble, we can hope that the next edition will use the sequences of taxa as a means of conveying more information about relationships.

Christidis and Boles have brought a broader vision to the typical monograph about the birds of a particular area. This is a volume that will be widely consulted as a reference for the taxonomic literature about a large, diverse avifauna, and as a source for current thinking in avian systematics in general. Our knowledge about avian relationships, at all taxonomic levels, seems to many of us to be changing at light-speed. Thus, let us hope that the authors will see their way to offer up a revision in the not too distant future.

Biodiversity: Integrating Conservation and Production: Case Studies from Australian Farms, Forests and Fisheries

T. LeFroy, K. Bailey, G. Unwin and T. Norton (eds), 2008
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Pp. x + 258 Paperback; ISBN 97806430945681
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THIS book presents to a wider audience the papers read to a meeting in Tasmania, which brought people whose main interest was in biodiversity together with others who were concerned with economic production from the same areas. Introductory chapters, notably one by David Lindenmayer, set out general problems and principles in the management of land for competing purposes.

Production and the maintenance of biodiversity are often regarded as competing purposes in land management. But some practising farmers from Tasmania showed that this is not necessarily true – that the two goals may in fact be mutually supportive. In the aquatic environment another paper showed that the northern prawn fishery can benefit economically, if measures are taken to reduce the bycatch of non-target species, and hence improve biodiversity. Unfortunately there was no contribution from the rapidly-developing field of aquaculture.

Some readers will find the chapters on market-based techniques to encourage farming practices favourable to biodiversity particularly interesting. Programs involving auctioning of alternative proposals for this purpose, for instance, are outlined.

As is inevitable in a wide-ranging conference, the attempts to draw all the threads together in summary chapters were doomed to end in little more than "motherhood" statements. But this does not detract from the interest of the individual case-studies presented.

The photographs which illustrate the book are unfortunately of poor quality – perhaps they were colour photographs not suitable for reproduction in black-and-white.

There is no index.

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