

**EVOLUTION AND BIOGEOGRAPHY OF AUSTRALASIAN VERTEBRATES**, by John R. Merrick, Michael Archer, Georgina M. Hickey, and Michael S. Y. Lee (editors), 2006. Australian Scientific Publishing, Sydney, 942 + xxviii pp. \$A207.00 hardback, \$A153.00 paperback, ISBN 0 9757790 1 X (hardback), 0 9757790 0 1 (paperback).

Cox (1985) wrote of the predecessor of this book, Archer and Clayton's (1984) *Vertebrate Zoogeography and Evolution in Australasia*, that it was less a coffee table book than a coffee table in itself. This smaller, although still large, volume, as the editors carefully note, is not a second edition of that one, but an introduction to the zoogeography and evolutionary history of Australasian vertebrates inspired by that massive tome—one that is still useful, provided a copy can be found. Great size seems to be a feature of surveys of Australasian vertebrate palaeontology, as shown by the complementary volumes edited by Patricia Vickers-Rich and colleagues (Rich and Thompson, 1982; Vickers-Rich et al., 1991). The subtext here is that, at last (!), there is enough known of the palaeontology of these lands to warrant large tomes.

This volume seems to be primarily directed to advanced students, but also is a useful source for workers outside Australasia wishing current information on Australasian vertebrate palaeontology, as well as for those within Australasia wishing updates on groups (or regions) outside their speciality.

In 38 contributions, the text covers vertebrates from agnaths to marsupials. An introductory chapter by Mike Lee on phylogenetic and taxonomic methods precedes a section on the geological history of Australia, also with chapters on that of New Zealand, and the zoogeography of New Guinea and Indonesia (welcome additions). These, in turn, are followed by 29 systematic chapters on fossil fishes (mostly Paleozoic), temnospondyls, frogs, Mesozoic reptiles, freshwater turtles, lizards, snakes, crocodylians, birds, the origins of mammals, monotremes, marsupials (a survey and a chapter on origins), bats, rodents, dingos, whales, and primates. The latter might seem a bit out of place, but does follow from the earlier work. Included also among these are chapters concentrating on modern forms: marine and freshwater fishes, frogs, skinks, and birds. Innovations are keys to the identification of living mammals, birds, skinks, and frogs, and a timely increased emphasis on conservation and conservation planning. Essays on phylogenetic systematics (including the phylocode) and techniques of molecular systematics round out the text.

The presentations are competent and well written, although the coverage and format are not uniform. This is not necessarily a disadvantage, especially as a volume with uniform coverage would require a physique like that of a governor of California to use, or, if often used, might produce such a physique. It is clearly easier to criticize such a volume than to compile it, and the production of this volume has had its ups and downs, but some omissions should be mentioned. There are no surveys of Mesozoic or Cenozoic fishes or Cenozoic reptiles, desirable though these may be, presumably because of the absence of specialists. Most of the taxonomic tables of the original version are omitted (although Boles's chapter on birds and Scanlon's on Mesozoic reptiles do include such tables). These tables were (and still are) very useful, but one for mammals might now threaten to occupy most of the book. A survey of the bibliographies suggests most of the contributions were completed circa 2000, so they are not quite up-to-date, but—given the rate of progress in Aussie vertebrate

palaeontology—even if they were somehow published instantaneously, certain aspects would become quickly dated. The bibliographies are extensive, and useful in themselves. The reprints of popular articles and a few review papers, which gave the original volume a massive 1203 pages, have been omitted. Finally, the quirky, but entertaining, cartoons, often with specific pedagogical points, of the original volume are absent here, giving a more staid air to this volume.

The book is generously illustrated—145 figures and 136 color photos—with line and wash drawings, black and white and color photographs, some in stereo, as well as maps and graphs. Those of Musser's chapter on monotremes are particularly fine, but that of *Adelobasilus* (p. 499) could be improved by having structures and views labelled. The general quality of the reproductions is high, although that of the tooth of *Tingamarra* (p. 570) suffers from too much contrast.

There is little point in discussing the content of the text, which is a presentation of current results and current consensus, taking into account differing viewpoints. For example, the discussion of *Tingamarra*, the (probably) Eocene alleged condylarth from southeastern Queensland, acknowledges that more evidence than a single tooth is required to confirm this taxonomic assignment. *Tingamarra* was initially presented as evidence that marsupials were not inherently competitively inferior to eutherian mammals. The view that marsupials were 'inferior'—at least as far as I can tell—is not much held outside of Australasia. Given the climatic history of Australia and the reproductive strategies of Australian marsupials, the possible replacement of early placental mammals by marsupials is plausible, but plausibility doesn't guarantee that it actually happened. It is interesting, however, that in chapter 27 (Marsupial origins) microbiotheriids are not well defined (on the basis of teeth) and "the referral of any fossil taxa to this clade should be ingested with a strong dose of salt" (p. 566). In the following chapter (Australian marsupial radiations) they have been identified from southern Queensland, presumably on the basis of dental material, and are suggested as "the source for most, if not all, of Australia's living marsupial groups" (p. 577). A seemingly significant issue not mentioned is the composition of the Australian freshwater fish fauna that seems consistent with the notion of fixed continents, rather than with continental drift. Most are derived from saltwater forms or are tolerant of salt water (with the obvious exception of the lungfish). What happened in Australia to eliminate those (presumably Mesozoic) forms derived from the primordial Gondwanan freshwater fish fauna? And regarding other fish, it must be mentioned that Figures 2b and c of Basden, Trinajstić, and Merrick's chapter on fish are incorrectly labeled; 2b is a larval lamprey, not an adult, and 2c is an adult lamprey, not an adult hagfish. And what is portrayed in the unlabeled Figure 2a? Finally, one might wonder about the mention in that chapter of the allegedly oldest known vertebrate, reported in news media in 2003, but not yet, 7 years later, described. Is it really the oldest vertebrate?

In spite of these few shortcomings, I liked the book, and would heartily recommend it, were it not for the price, which is out of