outstanding as a comprehensive yet coherent review of the biochemical, structural and physiological aspects of lens membranes in association with cytoskeletal filaments. By treating this aspect of lens cellular biology in the context of what is known from other organelles, the authors make obvious the advantages of this system and indicate promising areas for further research. The way forward is further underlined by Ramaekers and Bloemendal when they argue the case of the influence of the cytoskeleton on lens cell differentiation, bringing to call many exquisite illustrations.

The book makes clear the many advantages in studying this simple one-type cellular organ and it is not surprising that many people have spent time in characterizing crystallins, the lens structural proteins. These turn out to be not at all simple, but thankfully one book can only produce one classification system; a consistent usage here has led to a reasonable degree of coherence among the different authors. This classification of crystallins, complex though it must be, is where much of lens molecular biology begins and ends. It is thus a pity that where further explorations of molecular structures have been attempted, such as those resulting in a proposed model for the quaternary structure of α-crystallin, they are barely mentioned. However, there is an excellent chapter by Wilfried de Jong in which genetic relationships among crystallins are inferred from recently obtained amino acid sequences. By surveying the variability of lens crystallins throughout the animal kingdom and unearthing some obscure information relating to the functions of these diverse lenses, de Jong has produced a valuable essay on lens evolution.

In many of the chapters considerable space is given to experimental procedures and in parts this becomes an intrusion, especially when only the contributors' data are covered. In other areas the findings of all investigators and all points of view are discussed but with no synthesis; hence large tracts are unreadable. Not so, however, is the chapter by John Harding on the question of cataract research, in which he challenges most of the conventional cataract hypotheses by discussing the assumptions and contradicting the experimental data on which they are based. As a consequence, he strikes out a large body of lens research, thus rendering the book considerably shorter than it otherwise could have been.

The heroine of this book is the lens itself: the molecular story of its refractile transparency is still untold. But by presenting the background to important questions, the book can be recommended to anyone who wishes to look for the answers. □

Christine Slingsby is at Birkbeck College, University of London.

Australia's biogeographical development

Peter D. Moore

Ecological Biogeography of Australia. Edited by Allen Keast. Three volume set, pp. 2,182. ISBN 90-6193-092-8. (Dr W. Junk: 1981.) Dfl. 950, $495.

THIS is an impressive work by any standards, even those of the publishing house of Dr W. Junk, which is renowned for its quality of production of specialized texts. Now, three volumes replace the previous book in the series dealing with Australian biogeography, published in 1959. It says much for the development of detailed knowledge of the Australian biota, and for the conceptual advances within biogeography as a science, that it has been necessary to rewrite and expand the original text within this time span.

The first volume deals with the evolution of the physical environment and its biota, and with the plant life of Australia; the second is largely concerned with invertebrates, fresh water biology and poikilothermic vertebrates; and the third covers homeothermic vertebrates, including man.

The development of the Australian environment is one area where great advances in both theory and the accumulation of raw data have taken place in the past two decades. Much attention is therefore given in the early part of the first volume to the break-up of eastern Gondwanaland and also to climatic changes during the Tertiary. Another important advance in the past ten years has been the analysis of Quaternary deposits using pollen analysis, and an integration of these data is briefly presented by Kershaw.

An interesting chapter on fire is rather uncomfortably inserted at this point, presumably because of its relationship to floral and faunal evolution, but it would have been better placed after the vegetation descriptions which follow.

The phytosociological account of Australian vegetation by Specht has more of a taxonomic than an ecological ring to it, but has some very valuable and novel components, such as the representation of C3 plant species in the vegetation formations. Some distribution patterns of selected taxa are also discussed. Specht follows this chapter with an account of the ecophysiological aspects of the vegetation. Plant–climate interactions, particularly in relation to drought and temperature, dominate this chapter, but some attention is also given to soil nutrients and the role of fire.

There follows an unconformity in that the historical approach is reinstated for the detailed consideration of Australia's fossil flora and the development of phytogeographical regions. Again, one wonders whether a more natural sequence of topics could have been arranged. For example, Hélène Martin's detailed account of the Tertiary flora would have been better placed adjacent to the Tertiary climate section and before that dealing with the Quaternary flora. The first volume is completed by a series of papers each dealing with a separate taxonomic group of plants, such as *Eucalyptus*, the grasses, the lichens and so on, or with particular environments, such as the high mountains or the deserts. These varied approaches provide a wealth of information on the Australian flora.

The arrangement of the second and third volumes is almost entirely taxonomic, though the emphasis is generally on the evolutionary development of the group being discussed. These specific accounts of groups are interspersed with more general overviews and reviews of such subjects as the biogeography of terrestrial invertebrates or of aquatic insects. The second volume concludes with fishes, amphibians and reptiles. The arrangement of material here, by taxonomy, leads to a certain amount of repetition between chapters, particularly those relating to habitat distribution and the history of land masses.

The final volume, concerning homeothermic vertebrates, naturally spends much time on the evolutionary development of Australia's mammals, with particular emphasis upon the relationship of marsupials to arid climates and upon the late arrival in Australia ($5-4 \times 10^6$ years ago) of rodents. Birds also occupy a position of prominence, and a paper by Kikkawa *et al.* on the biological history of the Cape York peninsula, where plant and animal interchange with New Guinea has been concentrated, is worthy of especial mention.

It is refreshing to see a work of this kind in which man can be treated not simply as an additional factor of the environment, but as an organism with a biogeographical story of his own. The prehistory, physiology and anthropology of Australia's aboriginal population gives ample opportunity for this kind of treatment. The relative importance of man's arrival, about 60,000 years ago, and climatic changes since that time upon Australia's fauna is difficult to unravel, but Norman Tindale presents a graphic summary of the evidence.

This superbly produced set of books can be criticized only in that it has attempted to cover so vast a mass of information that arrangement and editing has evidently been a problem. Systematic and subject indexes are included, the former comprehensive, but the latter rather sketchy. These volumes establish a data base and reference source upon which biogeographical research in Australia will be built for many decades to come. □

Peter D. Moore is Senior Lecturer in the Department of Plant Sciences, King's College, University of London.