back from the Orient 364 species of plants. These are all listed by Dannenfeldt in an appendix, the 34 species considered by Kurt Sprengel as new to science being indicated. During the 30 years war, Rauwolf's herbarium was taken out of Germany, and after being kept in Sweden and England was bought by the University of Leiden. There J. F. Gronovius used it to prepare his *Flora orientalis* (1755). When Vossius brought Rauwolf's herbarium to England in 1670, Robert Morison used it in his *Plantarum historiae universalis oxoniensis*.

Rauwolf did great service to botany and we are indebted to Dannenfeldt for synthesizing a vast amount of material relating to Rauwolf's travels. Chapters one and fourteen in particular will be appreciated by students of sixteenth century botany.

ROBERT OLBY

TROPICAL FAUNA

The Zoology of Tropical Africa

By J. L. Cloudsley-Thompson. (The World Naturalist.) Pp. xv + 355 + 32 plates. (Weidenfeld and Nicolson: London, March 1969.) 84*s*.

To attempt to write a zoology of tropical Africa is a formidable task, and in this work Professor Cloudsley-Thompson has wisely limited himself to two aspects of the field. The one is an account of the fauna of the major ecological zones; the forest, the savanna and the desert as well as the freshwaters and the sea shores. The other is the physiology of adaptation to life in hot and either humid or arid environments. Inevitably, much that is of great interest, especially in the field of social behaviour, has had to be omitted. Nevertheless, the book brings together a vast deal of the lamentably scattered information about the fauna. For this reason all students of African zoology will find the work most valuable.

In approaching the faunistics an essentially taxonomic approach has been adopted, and what could easily become little other than a catalogue of names is enlivened by short accounts of what is known about the habits of the different animals. Such a treatment, while allowing stress to be laid on particular and interesting adaptations, fails to produce a coherent picture of the economy of the different zones. For this our ignorance rather than the author is largely to blame, as our knowledge of the ecology of Africa has hardly progressed beyond the stage of simple faunistic description. Apart from some limited data on the savanna, there are almost no quantitative studies. It is not possible yet to describe how the limited but exciting desert fauna makes ends meet in so barren an environment, nor even how the biomass of insects of the rain forest is distributed between the canopy and the floor.

The second half of the book achieves a greater unity, as the themes are clearer and our knowledge of the physiology of the animals in the more arid regions is extensive. Much of this is due to a new interest in the adaptations of desert mammals, much to the activity of Cloudsley-Thompson's own department at Khartoum. By contrast, our almost total ignorance about the forest fauna stands out starkly.

Such a work prompts one to consider the future—the future both of zoological research in Africa and of the fauna itself. One cannot but be surprised by the fact that we know far more of the physiology of the fauna than of its ecology. This is the result of the fact that while much research in environmental physiology can be undertaken by relatively few people with relatively simple equipment, the major problems of African ecology belong to the world of big science, requiring large teams of people working intensively over long periods. These problems cannot be solved by short expeditions, nor can the governments of the African countries, faced with the more pressing challenges of development, afford to divert the necessary money or manpower to such an end.

Yet the need is urgent. In a final and effective chapter, the author discusses the impact not only of the fauna on man but of man on the fauna. It is not pleasant reading and there seems little to suggest that the ecological mistakes of the past are not being repeated today. In a continent where there is a desperate need to improve health, nutrition and the general standard of living, the temptation to look for quick answers with little thought for the morrow is comprehensible. Much of the aid given to African countries has ecological consequences. The tragedy is that the donors are equally anxious to see quick returns and have not yet accepted, as part of their responsibility, the necessity for a much greater investment in fundamental ecological research as an essential basis for any sound policy of exploitation and conservation. It is as much in forcing us to think where we are going, as in showing us what has been achieved, that the value of this book lies.

D. W. EWER

BIRDS OF INDIA

Handbook of the Birds of India and Pakistan

Together with those of Nepal, Sikkim, Bhutan and Ceylon. By Salim Ali and S. Dillon Ripley. Vol. 1: Divers to Hawks. Pp. lviii + 380 + 18 plates. (Oxford University Press: Bombay, London and New York, 1968.) 95*s*.

THE wonderfully rich avifauna of the Indian subregion has been comprehensively surveyed on three former occasions—by Jerdon (1862–64), by Oates and Blandford (1889–98), and by Stuart Baker (1922–31). The new information accruing in recent years fully justifies another major work, and here is the first of its projected ten volumes. It is sponsored by the renowned Bombay Natural History Society; and it covers the whole of the subcontinent, including the Himalayan states and Ceylon. The authors are Dr Salim Ali, doyen of Indian ornithologists, and Dr Dillon Ripley, secretary of the Smithsonian Institution in Washington. Ripley's *Synopsis of the Birds of India and Pakistan* (1961) provides the taxonomic backbone. The illustrations by various artists are repeated from earlier publications, with the sole disadvantage that in some instances (as duly stated) slightly different extralimital forms are portrayed.

The introductory chapters include a discussion of the zoogeography of the subregion, an account of migration as affecting the area, and a thoughtful essay on systematics. Of the 176 species that are peculiar to the Indian subregion, more than 60 per cent show affinities with the birds of SE Asia, while the rest are about equally divided between those related to the Palaearctic and the Ethiopian avifaunas respectively. Of the more than 2,100 species and sub-species that make up the full total, about 350 are extralimital seasonal migrants, not counting those with breeding ranges that encroach a little on the area. Two main streams of migration enter from either end of the Himalayan mountain chain, although some birds cross this, and they converge—weakening as they go—on the tip of the peninsula, with a trickle continuing over to Ceylon. Large-scale ringing in India, added to the recoveries of northern ringed birds, is beginning to give precision to the information.

The bulk of the book consists of the detailed treatment of species and sub-species under the heads, where relevant, of local names, size, field characters, status (with distribution and habitat), general habits, food, voice, breeding and museum diagnosis (including measurements and the colours of the bare parts). The present volume deals in this way with the first seven orders in the systematic list. When the work is complete, obviously several years hence, the avifauna of the subregion will indeed be well documented.

LANDSBOROUGH THOMSON