raptor species can be explained in terms of food' – a point of view with strong echoes of David Lack. It would be odd if food did not figure strongly in raptor research, but this seems to have produced a tendency to demonstrate the food hypothesis rather than test it. As Newton observes, the effect has been merely to confirm food relationships already found with other birds. It may also have diverted attention away from other processes. For example, there are various implicit hints that mates rather than food might be the primary resource for raptors, and that calibre of mate may be the most relevant variable to define. Competence at finding and catching food might seem the most obvious criterion, but as the best hunters may often get the best feeding areas or territories, the real problem is to explain how they do so. Newton agrees that raptor social behaviour and organisation deserve fuller study. On conservation he argues that nature reserves and legal protection will not be enough to ensure long-term raptor conservation, particularly of the migratory and larger species.

This book should interest ornithologists generally, and also be valuable to wildlife managers and conservationists. However, further evidence of the same kind will do little to advance our knowledge of raptor population ecology, and perhaps this phase of research should now be ended. Newton advocates a greater use of experiments in future studies, and hopes that these will challenge his conclusions. Worthy sentiments!

ART N. LANCE

**The Animal World,** by **Maurice and Robert Burton.** Macmillan, £4.95.

**Animals and Their World,** by **Mary Parker Buckles.** Ridge Press/Blandford Press, £8.95.

The first title, seen only on the spine of the book on the shelf of a bookshop, might mislead a prospective buyer into thinking that this was just another animal encyclopaedia, of which there have been so many in recent years. The subtitle, however, identifies the work as 'An Encyclopaedia of Animal Behaviour', and further examination confirms that it is truly encyclopaedic in scope.

We are so accustomed to think that the study of animal behaviour is a recent science that it is useful to be reminded by the authors that its roots lie in the careful observations of earlier naturalists, including Darwin and Fabre (Gilbert White might also have been mentioned), before Lorenz and his followers established the European school with their classic studies of 'instinctive' or innate behaviour of wild animals in natural situations. More recently, behaviourism, with which the name of J.B. Watson is linked, has concentrated in the laboratory on studying the ability of an animal to modify its behaviour in the light of experience: in other words, learning.

Both aspects of study are considered in this book in thirteen chapters covering such topics as feeding, escape from enemies, territory, reproduction, movements and migrations, social life, language; and two chapters deal with unusual behaviour and unsolved problems. An attractive and valuable feature is the use of wide margins to give specific examples of observed behaviour.

The text throughout is written in the attractive, clear style and language for which Dr Maurice Burton has become well known. His son, Dr Robert Burton, has collaborated in the text, and his daughter, Jane, has contributed the 31 beautiful colour plates. The many splendid line illustrations are by Hilary Burn. This paperback edition is very good value for money.

*Animals and their World* is concerned only with mammals and with their ecology worldwide. Two hundred and seventy species have been selected to show how they are adapted for living in their respective climatic zones: tropical rain forest, temperate deciduous forest, coniferous forest, tropical grassland, temperate grassland, desert, tundra and ocean. The brief account of each animal includes much fascinating and up-to-date information. There are also introductory chapters on mammals in general and to each geographical zone. Among the illustrations are eighty in full colour and over

a hundred in black and white photographs.

Together these two books provide valuable reference material on a global scale on two subjects that are usually fragmented.

JOHN CLEGG

**From the Edge of Extinction:** Endangered Species in North America, by **Darryl Stewart.** Warne, £6.95.

Mr Stewart takes 21 species of North American animals rescued from threats of extinction of varying severity. They range from the mighty bison, once 50 million strong, to the tiny Kirtland's warbler, never numerous, and from the now abundant beaver to the California condor, which may perhaps survive only by captive breeding. Each short chapter describes one species, gives a well-researched history of its tribulations and the legislative and other measures for its survival, and its present status and prospects. Every species is illustrated in black and white by the author, a former art student in London.

There is much in this book that is encouraging, particularly when one compares present dedicated conservation efforts with the previous indifference which cost the US (including Hawaii) 70 animals, most of them reaching final extinction in this century. Undoubtedly there has been a sudden upsurge in many countries of an awareness of the need for conservation, but not yet of a comparable awareness of how vast are the sums needed to pay for it. Both voluntary and government support for North American conservation compare most favourably with that to be found elsewhere, but even the US Fish and Wildlife Service (to which this book is gratefully dedicated) still lists 162 native species and subspecies as endangered. Yet funds to save habitats and species in Third World countries, with their desperate poverty and population problems, are much harder to raise, though it is there that they are most urgently needed if irreversible damage is to be kept within bounds in this century.

G.T. CORLEY SMITH

**East African Mammals:** an Atlas of Evolution in Africa, Volume III Part B (Large Mammals), by **Jonathan Kingdon.** Academic Press, London, £55.

Jonathan Kingdon is nearing the end of his road: this is the penultimate of the six tomes which will span the diversity of the mammal fauna of East Africa. With primates, small mammals and carnivores already behind him (in volumes I, IIA, IIB and IIIA) he tackles here the largest herbivores, reserving most of the even-toed ungulates for the final volume.

He tackles them in his usual way. He draws a profile of each family – elephants, rhinos, equids, pigs, hippos, camels, chevrotains, and giraffes – in which he considers the general themes of structure, evolution and way of life, with more emphasis on the fossil record than in previous volumes. He then takes each species in turn, and describes its distribution, ecology, coat pattern, behaviour, reproduction, and so on, all superbly illustrated as usual with his own drawings. These range from meticulous depictions of the whole animal, the skinned animal, and the skeleton, to the haziest of thumbnail sketches capturing the essence of a particular posture. They are as lively and informative as the text. My only major criticism of the book is that its bibliography is unnecessarily subdivided into three sections, making it both repetitious and maddening to use.

The book contains a fair number of maps, most of which convey the same gloomy message summarised in the Introduction: 'All the species described . . . are in a decline that has accelerated in recent years and can only continue.' The largest mammals are the most threatened because they generally need most land, reproduce relatively slowly, and are often unfortunate enough to carry valuable trophies in the form of tusks or horns. A huge amount of work has been involved in collecting the dismal statistics – for