

and in particular that miscellaneous collection of animals masquerading as the order Insectivora is introduced in masterly fashion. There are photographs of members of nearly every family and clear drawings of skulls, teeth, limbs and other skeletal details as appropriate, all portrayed in a clear, uniform style similar to that first adopted in Romer's *Vertebrate Palaeontology*.

The second half of the book is devoted to a number of topics of general biological interest which have special relevance to mammals: ecology, zoogeography, behaviour (especially social behaviour), reproduction, metabolism and temperature regulation and echolocation, with a final brief comment on the effects of man on mammalian wild life. From this list it can be seen that only certain subjects are included, but many of them are of obvious importance like the section on zoogeography. This covers a summary of types found in the various regions, a description of continental drift and its effects including a very useful discussion of the "unusual" faunas, past and present, of South America, Australia and Madagascar. Other sections like that on echolocation in bats and cetaceans provide concise summaries of detailed topics which presumably reflect the author's interests.

It is very easy to read large sections of the book straight through, as well as to use it as a reference book for facts, ideas and as a lead in to further reading. It is well produced and relatively cheap—in fact a good buy.

At first sight one might suppose that *Animal Physiology*, by Roger Eckert and David Randall (Freeman: San Francisco and London; \$19.95, £12.95), is merely another in the series of comparative physiology texts which started with Prosser's and which has been added to at the rate of about one every four years ever since. And so in many ways it is, for much of the content is in common with the latest editions of its rivals. But this attempt does the standard job well, and has many advantages and few disadvantages when its special emphasis is identified. The book starts with basic concepts of physics and chemistry (for example, Ohm's Law and osmosis), works through cellular processes such as the electron transport chain, active transport and membrane potentials, and then covers individual nerve and synaptic functioning. This leads on to sense organs and the principles of central nervous integration, then to the other systems: muscle, cilia and flagella, chemical messengers, osmoregulation and excretion, blood circulation and gas exchange. There are appen-

dices containing useful formulae (though kinetic energy should not be printed as  $1/2mv^2$ ) and a glossary.

The main theme of the book is the explanation of physiological processes and their control; it is not a survey of comparative physiology. The choice of which processes are to be described and explained is rather selective, but mammalian functions are in general fully covered (apart from digestion and temperature regulation) and so are the major variants and additions that occur in other vertebrates and in some invertebrates, for example, osmoregulation and circulatory systems.

In spite of the complexity of the subject the book is readable. Within its chosen limits, it is an excellent textbook, clearly most appropriate for second- and third-year undergraduates taking courses in comparative or in mammalian physiology. It highlights the fact that so many processes in physiology now have their explanations pushed back to more molecular levels than they did 10 years ago. The reader

of this book might be forgiven for thinking that there is little more to be found out, so complete and satisfying are so many of the descriptions given. Rightly, in the cause of clarity, the text contains only sparing use of "probably" or "as far as is known at present" and the topics described tend to be those for which an explanation has been suggested in the literature. So it is the sort of textbook which reinforces and extends a lecture course, rather than taking its place, and it is essentially aimed at helping students understand how animals work. It is intentionally not a reference book, but the references which are given should be quite enough to allow a student (or a lecturer for that matter) to use it as the start of a more detailed library search on any specific topic.

R. W. Murray

R. W. Murray is Senior Lecturer in Zoology and Comparative Physiology at the University of Birmingham, UK.

## Fundamental nutrition

*Fundamentals of Nutrition*. Second edition. By L. E. Lloyd, B. E. McDonald and E. W. Crampton. Pp. 466. (Freeman: San Francisco, 1978.) \$19.50.

THE title of this book gives a very good indication of its contents and the intended readership. Each chapter is short so as not to overface the first-year undergraduate or college student, and at appropriate points boxes are inserted with topical information such as breeding cereals for high lysine. Potted biographies of eminent nutritionists also add to the readability of the main text.

Introductory chapters describing the composition of foods and animal tissues are followed by sections on energy and protein, vitamins and minerals; the latter, sensibly, not illustrated by well-used photographs of animals suffering from various deficiencies or excesses. Photographs could, however, have been usefully added to illustrate some of the more complex methods which are well described in the text.

A further group of chapters includes, refreshingly, discussions on experimental design and analysis and descriptions of the major areas of animal experimentation in nutrition, although

many students would presumably be taking a biometry course in parallel with nutrition and would be referred to a more detailed and comprehensive text in that subject. The same might be said of some of the biochemical coverage; surely no modern nutritionist can escape without at least one full course in biochemistry which would render superfluous those areas dealt with in this book.

The last five chapters, occupying almost 100 pages, deal admirably with quantitative aspects of nutrition—how much of each of the previously defined nutrients are required daily by various species, including man, in various physiological states. This is not to imply that the book is a practical feeding manual, and those examples of farm animal feeding that are given are based on American standards which are not relevant to a large part of the world. The use of the calorie rather than the internationally agreed joule as the unit of energy adds further possible confusion for the majority of students who are now familiar with the latter. There is a useful index.

This is a comprehensive coverage of the whole subject of nutrition and is written in a manner that will be appreciated by all who are tackling this subject for the first time.

J. Michael Forbes

J. Michael Forbes, is Lecturer in Animal Physiology and Nutrition at the University of Leeds, UK.