

'*Native and Introduced Freshwater Fishes*' C. S. Woods. Pp. 64; 50 text-figures. A.H. & A.W. Reed. Price 7/6.

Until recently, one of the greatest limitations to the study of natural history in New Zealand has been the lack of cheap up-to-date handbooks. This situation has been steadily improved by the issue of increasing numbers of the 'Nature in New Zealand' series. One of the latest to appear is 'Native and Introduced Freshwater Fishes' by C. S. Woods. The general policy of this series is to provide an introduction to the group within the limits of a set number of pages and a modest price. In relatively small groups, however, even with these limitations, it is possible to cover most of the species present in New Zealand. Such has been Mr. Woods' aim in this case. Under these circumstances, what was intended as an introduction can become very useful as a source of identification for even advanced workers dealing with a group in which they are not specialists.

Such a publication as the present one should be useful to freshwater ecologists in general. Mr. Woods discusses all the known fishes recorded from New Zealand, both native and introduced, and figures 47 of them. Some of the unfigured species are mentioned mainly in passing with a note of their distribution. These are mainly from offshore islands or restricted localities. From any mainland habitat therefore, the book should serve as a useful means of identification.

*Desert Animals: Physiological Problems of Heat and Water.* KNUT SCHMIDT-NIELSEN. Pp. 277; 36 tables, 51 text-figures, 8 photographic plates. Oxford University Press. Price 45 shillings.

Zoologists have long wondered how many desert animals not only survive but thrive on the seemingly lethal combination of excessive heat and lack of water. To quote the publishers' understated announcement on the dust-jacket, "this book discusses the life of desert animals, the difficulties they face in their hostile environment, and the solution to the physiological problems of water and heat". The book does indeed do just this, and does it uncommonly well. But it is confined to mammals, birds and reptiles (and mostly to mammals); invertebrates are omitted.

This is not just a book on the physiology of desert animals, which the animal ecologist may or may not read according to how far he is inclined to deviate from his chosen line. It is a book giving a fascinating and highly informative account of the physiological adaptations of desert animals, closely related to their behaviour and ecology: as such it should be read by both physiologists and animal ecologists, with enjoyment.

Knut Schmidt-Nielsen of Duke University is well qualified in this field and the reader will be impressed with the scope of his own research, notably with animals from north African and north American deserts. He is also widely read as the list of 360 references makes clear. In a book reviewing a field like this, however, the author should have stated up to what date published literature is included: that the book was published in 1964 is not enough. The list of references in fact includes one or two as late as 1963, but the numbers for 1962 and 1961 are rather small. Over 90% of the references are in the English language, and many of those in other languages (notably French and German) are to older works.

The book opens with two introductory chapters, the first on man's responses to the desert environment and the second a discussion of the advantages of a large body. The rest of the book consists of chapters giving

Freshwater fishes lend themselves very well to the line and stippled figures used in this series. Mr. Woods' illustrations are crisp and very attractive, so much so that one tends to forget the very demanding technique involved. Apart from two they have all been drawn for this publication from actual specimens and are a welcome addition to recent illustrations of our fauna.

The author has been faced with the usual problems of coining common names for a number of species. In spite of the feeling which most scientists have that scientific names are just as easy to use as a complicated common name, the public at large do not, and will not, use latinised names. It is hoped that books such as this will help to standardise a set of common names for New Zealand animals.

As a popular handbook, this publication may lose a little from the all-inclusive nature, but for an ecologist this may be an advantage. In 'difficult' groups, such as *Galaxias*, it may not prove easy to distinguish all the species that have been included and the bullies may also prove recalcitrant. These are not however easy groups even for specialists and the author is to be congratulated on attempting to cover them all.

The treatment of introduced species may not prove sufficiently detailed for the demands of fishermen and certainly identifications based on this section will tend to be uncertain.

R.K.D.

detailed accounts of the relevant physiology of the camel, donkey, sheep (N.Z. readers take note), carnivores, rabbits and hares, ground squirrel, pack rat, kangaroo rat, other rodents, aestivating mammals, marsupials, desert birds, and finally, lizards, snakes and tortoises: a nicely varied fare. Each chapter has its own short summary, and inevitably each covers much the same ground; but there is nothing dull or repetitive about this.

The facts alone are intensely interesting; but without the author's leaven facts alone might have seemed as indigestible as a donkey's diet. Schmidt-Nielsen fortunately has a very readable style; parts of the book run like a detective story, others are humorous. Naturally he is happiest writing of the animals he knows best: the camel is a good example.

The camel's hump is exploded once and for all as a water reservoir. It consists, of course, of adipose tissue, mostly fat, oxidation of which potentially yields more than its weight in water. The snag is that oxidation needs oxygen; this in turn involves ventilation of the lungs, with consequential loss of about as much water through evaporation as the quantity of oxidation water formed. Nonetheless the camel's hump represents a valuable, localised store of energy, comparable to that of the fat-tailed sheep and "perhaps even to the Hottentot women whose fat buttocks are considered a sign of beauty . . ." New Zealand readers will sympathise with the author shearing an entire camel (to test the insulation of its coat) with a pair of laboratory scissors, the electric clippers have jammed with sand.

*Desert Animals* appears in the sober yet attractive format associated with its publishers. The text is liberally punctuated with tables and figures, and there are eight nice photographs of some of the animals most discussed. One would wish also for a selection of photographs of the desert environment itself, which is not always featureless; but this would have increased the price, which at 45/- makes the book very good value.

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