

**The Life of Fishes**, by **N. B. Marshall**. Weidenfeld and Nicolson, 63s.

The modern type-face used in this book hurts one reader, but its use may have allowed the price to be so low for a big book, finely illustrated as this is by Mrs Marshall. Another discomfort comes from too many facts per paragraph—one contained eight detached facts in ten lines—but the book is successful, in that it is interesting and useful in a high degree. I do not know where else I could find a compendium on:—swimming, swim-bladders, electrics, sound-production, fishes of the coral seas, of the open ocean, of continental slopes, and of the abysses. But, for several reasons, it does not supersede Norman's *History*.

The teleostean fishes embody a great variety of inventions: weightlessness in water allows them to be flexible, swift and supple; and to be quite still, which gives precision of aim in those with protrusible jaws. Some fishes walk and climb or hop on land. Breeding fish often claim territories, which they usually defend by warning colours and display movements, but in some species in muddy water a trespasser is perceived and warned by disturbance of an electric field. Before they go to sea, salmon and eels adjust their blood and other tissues. Teleostean fish are among the minority of vertebrate orders whose members can perceive colour. Some fish are guided by the position of the sun, but homing to a former river habitat is by smell. Many fish grunt in courting; one species purrs. Most deep-sea fishes manufacture their own light; but coastal species keep cultures of luminous bacteria, housed in dark lanterns, which the fish can open at will.

There is no end to the interest and diversity of fishes but there must be some end to a review.

MICHAEL GRAHAM

**Handbook of Waterfowl Behaviour**, by **Paul A. Johnsgard**. Constable, 75s.

Paul Johnsgard knows more about waterfowl behaviour than anyone else in the world. He has seen more species alive than Jean Delacour or Peter Scott, and has applied the methods of comparative ethology to them more thoroughly than Konrad Lorenz. As Dr Johnsgard is the first to acknowledge, he stands on the shoulders of these illustrious precursors, and so he sees more, and more clearly, than any of them. His stated aim in this book was "to provide the barest minimum of information on each species that will allow other persons to compare their observations and to develop more detailed and quantitative studies". He has succeeded brilliantly. The work is well-organised and carried through with clarity and economy, despite the problem of depicting rapid actions in words, still photographs and drawings.

The book is indispensable to professionals, but what will other enthusiasts make of it? Probably not much. Cornell University Press made a half-hearted attempt to enter it in the glossy-bird-book market by printing the text and the author's diagrammatic drawings on creamy paper, but did not make a success of reproducing the photographs. The English publishers have put on a more striking jacket, with the letter "u" inserted in "Behavior", but otherwise left the book untouched. So will the general

reader: in my local public library this great book has been issued once in the three months since it was acquired. How many ornithophilic Pauls have still to take their road to Damascus?

HUGH BOYD

**Insect Sex Attractants**, by **Martin Jacobson**. John Wiley, 60s. One of the best examples of evolution in action today is the spread of strains of insect pests which are resistant to insecticides. Within a very few years it was found that far higher doses of insecticide were needed to kill a pest than were originally sufficient. This led to a vicious spiral of increased doses and more frequent application of insecticide, and to those 'side effects' which have become so widely known through Rachel Carson's *Silent Spring*.

The welcome result has been a new interest in the search for specific insecticides and also for sex attractants which might be used to lure amorous insects to their doom. The complex chemical signals which female insects employ to attract males, often from great distances, and the complex scents and scent-distributing organs which male insects use to signal their arrival, are only just beginning to be studied. This book provides some information about 150 kinds of insect—out of some thousands of known pests. It is to be expected that insects cannot easily evolve changes in so fundamental a process as that which brings the sexes together, and the exploitation of their natural specific behaviour may eventually provide reliable and specific remedies for particular insect species which cause crop damage or transmit diseases to man or domestic animals.

This book seems to have been written in rather a hurry. It is not an exhaustive treatise on the subject of insect sex attractants; although references are made to some 400 scientific papers the author has not looked much beyond the literature published in the USA, Canada, the UK, and Germany. He is clearly an expert chemist, but appears to have little first hand knowledge of insects (on page 92 the house fly and the honey bee are both listed as *Diptera*). Written for the specialist, not the layman, the book will serve a useful purpose in making some of the facts more widely available, and speed the arrival of the day when truly specific methods will be available for pest control.

G. C. VARLEY

**Grasshoppers and Locusts, Volume 1**, by **Sir Boris Uvarov**. Cambridge University Press, £5.

Periodical surveys of the vast literature on such well studied groups as the locusts are of great value, and two such surveys rank among Sir Boris's most useful contributions to entomology. The earlier one, *Locusts and Grasshoppers* (1928), was published in one volume, but it was found necessary to divide the present one into two: the first deals with anatomy, physiology, development and taxonomy; the second will cover biology and control. About half this first volume is taken up with an account of the structure and function of each system of the body, presented with the utmost clarity. In addition to numerous diagrams and graphs, there are comparative charts bringing together in a most useful way the results of past studies. Two valuable chapters on temperature and water relations are followed by a detailed account of development, from embryology to reproduction.

The theory proposed by Sir Boris 45 years ago that locusts exist in two