

separate paragraphs covering description, field characters, world distribution (with maps), habitat, feeding and breeding habits, voice and displays. For most species there is a line drawing by Robert Gillmor, these being based on rough sketches by the author who is himself a gifted illustrator. Of course, colour illustrations would have been better but costs prevented this and so there are only three colour plates depicting family diversity, sexual dimorphism, and adult and juvenile plumages in certain species where considerable differences exist. For many of the species there is still a marked paucity of field knowledge and inevitably the ecological sections are brief and the feeding habits summarized by such statements as: "feeds both in branches and on ground on seeds and berries". Fortunately many of the pigeons have been kept in captivity and there are observations, albeit sometimes anecdotal, by aviculturalists to supplement some of the sections dealing with behaviour.

So much literature has been reviewed that it is a pity that more references have not been reproduced; bibliographical details must be one of the main functions of a book of this kind. This was a serious criticism of the first edition and about thirty new citations have now been given. But it remains true that there are gaps and the book cannot be relied on to provide an up-to-date entry into Columbidae literature. For example, since the first edition reasonably important papers have appeared dealing with the feeding and breeding ecology of the rock dove *Columba livia* and turtle dove *Streptopelia turtur* and these are omitted. The author has now added a previously neglected paper on the breeding biology of the band-tailed pigeon *C. fasciata* but fails to record an important one dealing with mortality estimates for this species which appeared in 1967; in view of the paucity of data for most non-European pigeons these omissions cannot really be afforded.

Separate chapters are devoted to topics such as nomenclature, plumage, feeding and breeding habits, and there are six chapters which reflect the author's interest in ethology. These chapters add to the interest of the book and like the main text are interjected with the author's own experiences and observations which are stimulating to read. But they suffer from being a rather one-sided assessment which is not appropriate to a general treatment of this kind. For example, there is an enormous literature on pair formation in *Streptopelia risoria* and on the endocrine-behavioural correlates associated with egg-laying and incubation behaviour; yet no mention of D. S. Lehrman and his colleagues at Rutgers

University appears in the relevant sections. Such casual statements as "the wood-pigeon maintains its numbers in spite of persecution" are acceptable even if relatively meaningless. But it is not acceptable to add the highly contentious suggestion "that this is probably consequent on game preservation reducing its natural enemies", in contradiction to intensive scientific studies of the bird which show this sort of conceptual approach to be incorrect and outmoded. It is a pity that some of these points were not dealt with when the second edition was prepared but in spite of them the book remains a very worthwhile contribution to ornithology, containing as it does so many first-hand accurate and original observations by a highly perceptive worker. The radiation of the Columbidae is really excellently portrayed in punctilious detail; the minute white spot on the wing of the purple quail dove is intentional and not a block-maker's fault as the non-initiated may suppose.

R. K. MURTON

The Locust Problem

The Desert Locust. By Stanley Baron. Pp. xiv+228+16 photographs. (Eyre Methuen: London, January 1972.) £3.50.

FROM the Eighth Plague of Egypt to the present day the desert locust has intermittently ravaged an area of 25 million square miles. Mr Baron has written an excellent account of the biology of this major and persistent insect pest, and the measures taken to subdue the 1967-69 plague. This book is for the general reader, and the insect physiologist will find some oversimplifications, such as the description of the cuticle as a "box containing the creature's physical and nervous systems"; and some general insect features are attributed specifically to the locust. These, however, are minor criticisms of a book intended to convey the complexity of the locust problem to the non-specialist. Britain has always been prominent in locust research and control, mainly because of the extent of our late Empire and the untiring work of the late Sir Boris Uvarov. The author describes the prolonged battle to put locust control on an international basis, and to expand basic locust research. Insect control has often been held back by a lack of basic information, and this is illustrated by the description of the early concept of the "inhalation" of poisonous dust sprays by locusts. One of the most interesting aspects of locust biology is phase change. The solitary phase of the locust differs in morphology, physi-

ology, and behaviour from the swarm-forming gregarious phase. This book does not elaborate on the fascinating problems of developmental biology involved in phase change, but concentrates more on the ecological aspects, for example, the evidence that swarm outbreaks are caused by the crowding of locusts in limited areas of vegetation, followed by multiplication and gregarization. Much of the book is based on the author's experiences in the field with locust control officers. Locust swarms are controlled largely by chlorinated hydrocarbon insecticides, so raising a conflict between control and conservation. When forty-five goats were killed by insecticide poisoning, the author agreed with the verdict of the Governor of Dankalia that this was justified to kill locusts, which illustrates that in many underdeveloped countries the nebulous long term disadvantage of insecticide use is, when set against the possibility of immediate starvation, a western sophistry. This book shows that international cooperation is possible in the face of an international threat, and that large areas of the world depend on extensive insect control measures which, until further research is done, must inevitably be broad spectrum chemical methods.

L. HILL

Development of the Dog

Integrative Development of Brain and Behaviour in the Dog. By Michael W. Fox. Pp. xii+348. (The University of Chicago: Chicago and London, October 1971.) £10.15.

THE purposes of this book are, first, to integrate recent neurological and behavioural theorizing and research relevant to the problem of development; and secondly to present some original multidisciplinary data gathered by the author specifically on the development of the dog. Of its seven chapters, the first is concerned with a critical review of some of the more salient issues in the field. In chapters 2-6, Fox presents a series of original studies concerned with the development of reflexes, electrical brain potentials, central anatomical and biochemical changes, simple and complex types of learning and the effects of various kinds of early experience. In the final chapter and epilogue, an attempt is made to provide a comprehensive theoretical framework for the future study of development based on the key concept of "integration".

It cannot be said that the book accomplishes its rather ambitious goals. The literature survey strikes me as having a "grab-bag" sort of character—many surprises both in its inclusions and in