

BOOK REVIEWS

FAUNAL ELEMENTS

Grundriss der Zoogeographie

By Gustaf de Lattin. (Hochschulbücher für Biologie, Band 12.) Pp. 602. (Fischer Verlag: Jena, 1967.) 136s. 10d.

THE realization that animals and plants are not spread uniformly round the world has a long history. Aristotle observed local differences in the animals in neighbouring countries and considered that variations in climate would account for many such peculiarities but realized that climate was unlikely to account for the presence of elephants in India and Africa. He speculated on whether this was indicative of former land connexions between the two continents.

Study of local differences in fauna and flora has led, broadly speaking, to ecology; and study of world complexities of fauna has led to zoogeography. But the line between the two is more difficult to draw than many of the lines between zoogeographical regions. In the nineteenth century interest centred on the world problem, culminating in the broad generalizations in *The Geographical Distribution of Animals* by A. R. Wallace, published in 1876. He found a unifying principle in the theory of evolution by natural selection to explain the continental faunal elements, to elucidate discontinuities in distribution, and to include the distribution of fossils. From this he deduced the state of the world in the past. He gave comparatively little attention to the study of local differences within the great continental regions of the world, although he divided the regions into sub-regions and figured the fauna of mountains, forest and open steppe.

In 1924, the *Tiergeographie auf Oekologischer Grundlage* by Hesse, translated into English in 1937 by Allee and Schmidt, approached the subject primarily from the ecological point of view and included a consideration of the inhabitants of the fresh and salt waters of the world.

More recent books on zoogeography have mainly emphasized one or other of these lines.

Grundriss der Zoogeographie attempts to cover both aspects of the subject but with a bias towards the ecological. The author describes the fauna of the seas, the shores, the freshwater and the three main ecological land types: arboreal, desert-steppe and mountain-tundra and the special case of cave-dwellers. He discusses Wallace's zoogeographical regions and considers the classification of the world into faunistic realms and regions to be reasonably satisfactory because each has at some time formed a land mass and each at some time has been surrounded by sea or other serious barrier to land animals. Isolation has clearly been the important factor in the development of their characteristics. Curiously, the author gives only cursory attention to the most interesting developments in this field in recent years. He mentions the theory of continental drift and some of its implications, but opts for the permanence theory of the continents on the basis of the zoogeography of vertebrates like Wallace nearly a hundred years ago. But clearly his interests are in present day faunas and in local differences.

One of the most interesting sections of the book is devoted to the effects of Pleistocene glaciations on certain aspects of the faunas of the world. The author stresses the extensive influence of polar glaciation. It not only lowered the temperature of the world generally and produced tundra conditions analogous to mountain environments but it also lowered the sea level to connect up

many of the continental islands of the world with their parent continents and increased world humidity, thereby reducing the areas of desert and steppe. The author discusses the faunistic consequences of this and the more direct effect of the ice in breaking up populations in the north temperate land masses. Consequently, relict populations, such as Siberian forest elements in the Massif Central of France, can be detected in the modern holarctic fauna. Further, refuges from the ice provided dispersion centres from which the modern fauna could spread. The author discusses these in some detail and is able to identify sub-regions by the traditional historical approach.

But, finally, he points out that this type of classification is based on incomplete data. As in all zoogeographical studies, the distribution of only some animals is known in enough detail or a particular author is interested only in the vagaries of one particular group of animals. How to resolve these basic criticisms of the science of zoogeography has been exercising students of the subject during the past few years, and de Lattin agrees with those who think that the new zoogeography should lose its obsession with boundary lines and should, instead, record the distribution of species and subspecies on the map in such a way as to give peaks of species density and density gradients. Only some members of the holarctic fauna are well known enough to be treated in this way, but he gives examples from many types of animals, both invertebrate and vertebrate. Studies in the distribution of palearctic butterflies which are his own contribution to the subject are particularly interesting. He concludes that, on present findings, there are peaks of species density that indicate in the holarctic region five high density areas or faunal elements. These faunal elements are identified as western palearctic arboreal, eastern palearctic arboreal, nearctic arboreal, holarctic desert and holarctic mountain-tundra. This he maintains is a more plastic classification, more suitable to organisms that are notoriously dynamic and one that combines the ecological with the strictly zoogeographical approach. The graphical method, the density gradient approach, seems to offer some solution to the difficulty encountered in any numerical zoogeography: that some groups of animals dominate the picture because they are represented by an overwhelmingly large number of species.

Grundriss der Zoogeographie justifies its title. It surveys the whole subject. It is well produced and has an excellent bibliography.

WILMA GEORGE

ANGOLAN FISHES

Contribution à la Faune Ichthyologique de l'Angola

By Max Poll. (Museu Do Dundo: Subsídios Para O Estudo Da Biologia na Lunda. Publicações Culturais No. 75.) Pp. viii+381. (Companhia de Diamantes de Angola: Lisbon, 1967.) n.p.

STUDENTS of African freshwater fishes have long felt the need for a detailed study of Angolan fishes. Dr Max Poll's *Contribution à la Faune Ichthyologique de l'Angola* goes a long way towards filling that need. At the same time it highlights those areas, both geographical and ichthyological, still requiring study.

As a result of Poll's researches based on both a new collection from the region (totalling some 10,000 specimens) and a critical survey of the pertinent literature, the number of species recorded from Angola has been increased by well over a hundred to a total of 268. A relatively small proportion (less than 12 per cent) of this total is derived from new taxa.

Zoogeographically, five major elements can be recognized in the ichthyofauna of Angola. It is with collections from the Congo and upper Zambesi drainage systems of Angola that Poll's paper is mainly concerned. Most