

BOOK REVIEWS

TRIBUTE OF FISH

Fossil Vertebrates

Edited by Colin Patterson and P. H. Greenwood. Pp. v+260. (London: Academic Press, Inc. (London), Ltd.; New York: Academic Press, Inc., 1967.) 70s.; \$8.60.

THE presentation of collections of research papers to eminent scientists on their retirement is a happy custom. This volume honours Dr Errol White, until recently Keeper of Palaeontology at the British Museum (Natural History) and President of the Linnean Society. It contains papers, mostly on aspects of palaeo-ichthyology, by vertebrate palaeontologists from many countries in both Europe and North America, and gives abundant evidence of the respect and affection in which he is held.

In 1950 White showed how the changes in their fish faunas could be used to classify the Lower Devonian strata of the Welsh borderland, and later showed that this scheme was valid also for Western Europe. Obruchev and Karatajute-Talimaa now show that it is similarly valid for Eastern Europe, while Dineley demonstrates that it can even be used to correlate the Knoydart faunas of Nova Scotia.

Several contributions deal with different aspects of growth and ossification. One present controversy is as to whether the carapace of the earliest fish consisted of a small number of large plates (a point of view to which a paper by Tarlo gives further support) or of a large number of small tesserae. In an elegantly argued paper, Westoll points out the difficulties involved in accepting either of these extreme positions, and suggests that the different patterns may result from variation in the extent to which the larger, deeper plates may be exposed or concealed by the development of more superficial tesserae. Another controversy concerns the methods used to identify and homologize the dermal skull bones of fish and tetrapods. Parrington argues strongly that these must be based on the overall relationships of the bones to one another and to underlying structures, accepting that minor variations will occur. As he points out, belief in complete uniformitarianism leads to surprising anomalies and the supporting arguments are, in some cases, internally inconsistent. A very useful paper by Schaeffer briefly reviews the structure and development of osteichthyan vertebrae. He shows that, although the arch components and centra are clearly homologous throughout the Osteichthyes and tetrapods, the latter differ in the resegmentation of the sclerotome and in the fact that the notochordal sheath is not involved in the formation of the centrum.

Aspects of fish evolution are discussed by Jarvik and by Gardiner. Jarvik demonstrates that the lower jaw of early Dipnoi was already very dissimilar from that of other fish and, like many other aspects of dipnoan anatomy, suggests that the group diverged at a very early date. Gardiner describes the way in which modifications in the structure and relationships of the preopercular bone have contributed to the improvements in the mechanism of feeding and gill ventilation in the actinopterygians.

These and other contributions together make up a volume which any workers concerned with the anatomy, palaeontology, taxonomy or stratigraphy of fish will find both informative and thought provoking. The editors must be congratulated on an almost error-free text, and

the publishers on the very high quality of the plates.

BARRY COX

ACROSS THE BERING STRAIT

The Bering Land Bridge

Edited by David M. Hopkins. Pp. xiii+495. (Stanford, California: Stanford University Press; London: Oxford University Press, 1967.) 176s. net.

THIS book consists of twenty-two papers with an introduction and synthesis by the editor. The book is related to, but is not a record of, the symposium entitled "Late Cenozoic History and Environments of the Bering Land Bridge" held at the Seventh Congress of the International Association for Quaternary Research (INQUA). Eight of the papers included in the book were not given at the symposium and two of the papers read at the symposium are not included in the book. The papers, by American, Canadian, English, German, Icelandic and Russian specialists, provide data and hypotheses on the geology, geomorphology, oceanography, palaeontology, biogeography, archaeology and anthropology of the areas around and under the Bering and Chukchi Seas.

Some of the evidence presented in the book has been derived from areas very far from the Bering Strait. The arrival of molluscs of Pacific boreal ancestry on the north shores of Iceland more than three million years ago, and the development of Aurignacoid industries in Eurasia, are both significant in the interpretation of the events that took place in Beringia. The timing of these events also requires a comparison of Quaternary chronologies developed in different parts of the world. The stratigraphy and chronology of the last 70,000 years in North America, Europe and Siberia is shown to be sufficiently well known to enable useful correlation. However, the period one million to three million years B.P. is less well known. The record of ten glaciations, the first occurring possibly between 2.4 and 3.0 million years ago, in northern Iceland is stated as probably representing a minimum estimate of the total number of important world-wide Pleistocene glacial cycles, and therefore the Bering Land Bridge may have been renewed as many as ten times by glacio-eustatically lowered sea level during the Pleistocene.

As a collection of research papers this book has the disadvantages of a certain amount of repetition of material, duplication of bibliographies and lack of standardization of chronological nomenclature. Although most of the authors have published most of their material elsewhere, the editor is to be complimented on bringing together contributions from many disciplines and in several languages. Most of the authors have also succeeded in orientating their papers to highlight the central theme, namely, the nature and significance of a land connexion between Eurasia and North America. The editor has had a very difficult task in writing his synthesis and he has accomplished it with clarity and confidence. It may well be that the major contribution of this book is to highlight outstanding problems and to indicate the great value of the interdisciplinary approach.

R. J. PRICE

POLYCHAETA IN AFRICA

A Monograph on the Polychaeta of Southern Africa

By J. H. Day. Part 1: Errantia. Pp. viii+1-458. Part 2: Sedentaria. Pp. 459-878. (London: British Museum (Natural History), 1967.) 300s. the two parts.

THIS important and scholarly work has a far wider value than its title would suggest. There have been relatively