

graduates in chemistry, some biochemists, and post-graduate and research workers interested in steroids and/or reaction mechanisms. It is strongly recommended to all those who feel they might be interested in it, only with the reservations that, first, the real steroid expert will find little that is new here (but, nevertheless, will gain an excellent catalogue of reaction types and references), and, second, the price is a bit high.

DUDLEY H. WILLIAMS

EVOLUTIONARY PATTERNS

The Pattern of Vertebrate Evolution

By L. B. Halstead. (University Reviews in Biology.) Pp. xii + 209. (Oliver and Boyd: Edinburgh, May 1969.) 60s boards; 30s paper.

It is difficult to understand for whom this book has been written. In his preface, the author states that it is concerned with the interpretation of data rather than its documentation, and some sections, such as those on the Agnatha, require considerable knowledge before they can be comprehended. This suggests that the author may have been writing for advanced students, yet in other sections elementary matters are expounded, such as the nature of the amniote egg.

The first chapter is on the origin of vertebrates and starts with a discussion of the non-vertebrate chordates. Here, the pogonophores are accepted as "incredibly aberrant" relatives of the hemichordates on the grounds that resemblances (which are not given) should be emphasized, not differences. Yet in table I it is shown that they have none of the eight chordate characters selected by the author as important. In his account of the earliest vertebrates, the curious and interesting Heterostraci, the author is at home, having studied them in detail. But in his section on their environment he emphasizes that they occur in marine deposits without informing the reader that no freshwater deposits are known until much later. Sections on the histology of early skeletons are detailed and interesting, but the current Swedish theories concerning the fusions of early exoskeletal components are used to resuscitate yet again the archaic conrescence theory of tooth cusps, and Bolk's doubtful embryology is preferred to the direct evidence of palaeontology.

Jawed fishes are dealt with lightly and the origins of tetrapods and their possible diphyletic nature are discussed; the reader is presumed to have considerable knowledge of the early amphibia.

In his discussion of reptile classification, the author claims that Goodrich (1916) divided them into two groups on their blood systems, and that this has been brilliantly confirmed by Watson by a study of the ear. If he had read Goodrich's article he would have known that this view was first advanced by Osborn in 1903 and that Goodrich acclaimed it as brilliant and supported it on the structure of the ankle as well as the blood systems. Yet Goodrich himself did not use it in his famous book published in 1930. Those familiar with the facts do not accept reptile diphyletic evolution based on ear structures; neither, in fact, does the author who, in a superficial examination of the problem, claims that six lines of reptiles evolved independently from the amphibia and uses this to introduce several new names.

In his account of the evolution of the mammalian jaws the author states that the jaw musculature was divided into two parts, the temporalis and masseter (making no mention of the pterygoideus muscles), and claims that "ultimately a state was reached where the functioning of the jaws was accomplished entirely by the muscles . . ."!

The chapters on Mesozoic reptiles are interesting and made provocative by the adoption of various new interpretations, though in a brief chapter on their extinction the author approaches the level of buffoonery.

There is no real account of the well documented evolution of mammals during the Tertiary, but the palaeontology of the higher primates is used as an introduction to a final chapter on sociology in which the author appears to believe that "evolutionary vitality" is stimulated by turmoil and sapped by affluence.

The book gives the impression that the author has read widely, if not deeply. It is well illustrated and on the whole well produced.

F. R. PARRINGTON

SELLING EVOLUTION

The Wonderful World of Evolution

By Julian Huxley. Pp. 96. (Macdonald: London, April 1969.) 21s.

WHEN this book was first published in 1958 it promoted the story of evolution with compelling visual images. The text was simple and relatively less important than the large and garish illustrations that spread across every page. An earlier reviewer wrote that it was designed to combine education with entertainment. It was divided into three sections: the evidence for evolution, the how of evolution and the course of evolution.

The new edition follows the same pattern, but each section is typographically more independent. The text is the same, but an illustrated glossary has been added which occupies a quarter of the new book.

The illustrations are no longer the successful selling point of the book. *Physophora* has become a shadow, and four convincing illustrations of dark and light forms of peppered moth against coloured country and progressively darker and darker town landscapes in the first edition have been reduced in this edition to one black-and-white meaningless picture.

The original work was published in London with English spelling. This work is published in London with American spelling. There is no indication from the publisher that the spelling has been changed.

It is a pity, when the glossary was added and the numerous symbols indicating words in the glossary were inserted into the text, that the text itself was not revised. Man is still said to have 48 chromosomes and *Jaymoytirus* to be the most primitive vertebrate, related to the lancelet.

A bright advertisement for evolution has faded out.

WILMA GEORGE

DINOSAUR HUNTERS

Men and Dinosaurs

The Search in Field and Laboratory. By Edwin H. Colbert. Pp. xviii + 283 + 116 plates. (Evans: London, March 1969.) 63s.

THE familiar story of dinosaur evolution is an interesting one, but many of the men who, over the past 150 years, have themselves provided first the physical bones, and then fleshed out the story with the details of dinosaur variety and of their range in time and space, are quite as bizarre as any duck-billed dinosaur. Dean Buckland of Oxford, cleric-geologist who described the first dinosaur remains in 1824, was almost the storybook caricature of the Oxford don, with a household that included a jackal and a bear (and a precocious son). Baron Nopcsa, who studied the Cretaceous dinosaurs of Transylvania, was (except for his homosexuality) more a character from a boys' adventure novel. He spent part of the 1914-18 war disguised as a Romanian shepherd, spying for the Austro-Hungarian army along the Hungarian-Romanian border, and also aspired to the throne of Albania. Like men of other professions and interests, scientists are susceptible to pettiness and to small-minded rivalries. The long and bitter competition between