tems; they contain a short narrative of paleontology from the ancient world to the present, and offer a résumé of organic evolution, including evidence of such, and its theories and mechanics as well; they describe the earliest primates, manlike apes, fossil men, and *Homo sapiens* himself. Even the story of the Piltdown hoax is retold with interest.

The appendices (A to F), comprising 40 percent of the book, provide a source of material useful to the more mature student. Here are included a synopsis of the divisions of the organic world and their distinguishing characteristics, geologic ranges, and relative importance or unimportance as guide, or index, fossils; a glossary, a list of readings and references on historical geology and paleontology, a register of agencies and dealers supplying maps, publications, fossils, and collecting equipment; and a partial listing of the larger museums where fossils are on display.

We have in *Fossils* a book that should become a welcome addition to the library of anyone interested in knowing more about prehistoric life.

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Science Today Series

Radio Astronomy. J. H. Piddington. Harper, New York, 1961. 128 pp. Illus. $2.50.

Although radio astronomy began in the United States with the discoveries of Jansky and the solitary work of Reber in the 1930's and the early 1940's, after the war this country inexplicably passed the ball to England and Australia, and also to Russia in terms of theoretical interpretations. A gradual resurgence over the last decade has seen the United States make up most of the deficiency in instrumental facilities, but the loss of much of a generation in the training of students and in the seasoning of senior personnel has not been easy to recover. The effects of this lag appear strongly in the field of monograph publications, none of which has so far been written by an American. The work under review continues this tradition, the author being a distinguished Australian radio astronomer.

Piddington's *Radio Astronomy* is ninth in the Science Today series, a series in which authors are apparently required both to cover their subjects and to quit after precisely 128 small pages.

Since radio astronomy is already a vast subject, this may have been the principal factor imposing an exceptional terseness of text and a relative sparseness of illustration on *Radio Astronomy*. Further, the book is marred by extreme carelessness of production, featuring frequent misprints, sloppy setting of equations, and even occasional questionable grammar. The type is so closely packed as to encourage the reader to seek a strong light. While reasonably priced as a hard-cover, the book is essentially a paperback in content and might better have appeared as such, at a still lower price and with a more generous and careful format.

Such faults, while real, are peripheral, merely tending to obscure what is, apart from a few inaccuracies, basically a good book. The author has packed a remarkable amount of explanation and factual detail into his treatment of instrumentation and techniques, the background and sources as seen in continuum radiation, hydrogen-lines studies, lunar and planetary emissions, and radar astronomy. Nearly a third of the book, and much the best part, is devoted to two of the author's specialties —the generation of radio waves and radio waves from the sun. In fact, this is the only book in which one can find satisfactory brief discussions of the known major source mechanisms, including the important class of space-charge or growing-electron-cloud effects; likewise its brief summary of the complex variety of solar noise events is uniquely good.

The jacket suggests that this book will be interesting to the reader with little scientific training, a statement I question. (So far the only book on radio astronomy which could really appeal to and be read profitably by both scientists and laymen is the splendid and sprightly recent Penguin paperback by F. G. Smith of the Cavendish group.) The author more modestly and more correctly states in the preface his goal of producing a complete but not detailed account, useful as an introduction for scientists working in other fields. Such relatively sophisticated readers, and graduate students first approaching the field, will indeed profit from a close reading of this deceptively simple appearing book.

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Geochronological Sequence

Prehistoric Life on Earth. Kai Petersen. Edited, adapted, and supplemented by George Zappler. Dutton, New York, 1961. 163 pp. Illus. $4.95.

This beautifully illustrated, clearly written, semipopular book presents a geochronological sequence of animals since pre-Cambrian time. It is a refreshing approach to the origin and succession of life on earth. A pictorial geologic time chart is included. The author states that the continents, as we know them today, have always been approximately in the same relative position to each other. Life is said to have originated somewhere far back in pre-Cambrian time when inanimate substances, in some way unknown to us, changed into organic compounds that could reproduce themselves.

Petersen stresses evolution, dispersal, and distribution of the vertebrates. The evolutionary transitions between the major groups that we now recognize in our classification are described and their selective adaptations toward more efficient means of reproduction, the prevention of desiccation, temperature control, better nervous and circulatory systems, and locomotion are elucidated. The earliest vertebrates are thought to have originated in a fresh-water environment.

Most of the discussion and description of invertebrates is centered on the early and middle Paleozoic assemblages. Reference to plants is usually in connection with vertebrate environments and the first land plants are said to have appeared during the Silurian-Devonian transition.

There are chapters that include discussions of the early history of paleontology, of fossils and of how these remains were buried, of heredity and selection, and of classification. Relationships of the different groups are illustrated with numerous phylogenetic figures. There are 44 black-and-white figures and 83 stimulating color illustrations, but there is no bibliography. This book will be useful to both high school and college students.

The following comments about some of the illustrations may be useful to readers: on page 20, the names *Merychippus* and *Miohippus* should be reversed; on page 25, the large extinct mammal is a glyptodont, not an armadillo; on page 121, the cranium of *Andrewsarchus* is elongate and probably as long, or longer, than the entire