Paleontology

Silurian and Devonian Corals of the Falls of the Ohio. Erwin C. Stumm. Geological Society of America, New York, 1964. x + 184 pp. Plates. $8.50.

In 1810 Jonathan Williams saw what he thought were fossil trees, the remains of an ancient forest, in the rocks at the Falls of the Ohio River opposite present-day Louisville, Kentucky. These were fossil corals occurring in vast numbers in limestones of Middle Silurian and the Middle Devonian age. They appear to have been first recognized as fossil marine organisms by Henry McMurtrie in 1819; a year later several were described by C. S. Rafinesque and his friend Clifford, and since then literally hundreds of "species" of rugose and tabulate corals have been described from the outcrops at the Falls and surrounding regions of Indiana and Kentucky—indeed, so many have been described that for too long there has been confusion as to just what corals were there and in which of the two main horizons, which differ so widely in age, they occur.

The laborious task of analyzing this maze of "species" and locating the hundreds of types and figured specimens was undertaken several years ago by the author, E. C. Stumm, whose results are now presented in a handsome monograph. Aside from a short but clear analysis of the stratigraphy of this classic area, the monograph consists of concise systematic descriptions of 273 recognized species, with extensive synonymies, repositories of types and other specimens, and illustrations of nearly every form. Sixty-seven species representing 33 genera are recorded from the Middle Silurian Louisville limestone, and 206 species (7 new) distributed among 54 genera (1 new) from the Middle Devonian limestones.

The author points out that "more than two thirds of the species names previously proposed are proved to be invalid." "Proved" is a strong word, for in such morphologically plastic organisms as the rugose, scleractinian, and tabulate corals the range of individual variation is generally very great and a coral "species" is a highly subjective matter at present. In the present work there is little or no discussion of variation or critical evaluation of the species, to the extent that even with the very good figures other workers on corals will find the systematics as a whole disappointing and difficult to work with.

The memoir is well produced, but curious is the omission of periods at the end of the last sentences of most paragraphs and the lack of diacritical marks in many of the articles cited in the extensive list of references. Stumm cannot be blamed for these minor oversights, and paleontologists are indebted to him for these fruits of a long study.

J. W. WELLS
Department of Geology, Cornell University

Aspects of Nuclear Physics

A Textbook of Nuclear Physics. C. M. H. Smith. Pergamon, New York, 1965. xvi + 822 pp. Illus. $17.50.

Although the title indicates that this volume is a text on nuclear physics, the first six chapters present outlines of atomic physics, relativity, and quantum mechanics. In addition, chapters on mass spectroscopic techniques, electronics, particle accelerators, elementary particle physics, and thermonuclear reactions in stars provide coverage of topics peripheral to the main topic.

The book is designed for use in an intermediate-level course and is comparable in level to the recent text by W. E. Burcham and the older book by Robley Evans. It contains rather extensive discussions of a historical nature as well as brief résumés of recent results. Rather good bibliographies are provided at the end of each chapter. However, the student who uses this as a textbook will have difficulty following the references. The author begins with kinetic theory and the historical work in the development of the quantum theory, and then treats relativity and x-ray and electron diffraction before giving a brief summary of quantum mechanics. Without some prior knowledge of the topics treated, it will be quite difficult for a student to assimilate the material presented up through quantum mechanics. A treatment of nuclear physics begins in chapter 7. Gross properties of nuclei, radioactive decay, neutron physics, nuclear magnetism, and fission are treated before the topic of nuclear forces is discussed. The presentation is essentially descriptive, with occasional developments of a theoretical nature which are, unfortunately, too brief. Good descriptions of experimental techniques are presented with rather complete references to the original papers. Nuclear forces and models are treated in only two chapters. The presently accepted facts and interpretations of nuclear structure are briefly treated. Many of the most active topics of current research in nuclear structure are dismissed with extremely brief mention. I would prefer to see fewer topics introduced, and a more thorough development given to those treated. I also disagree with the concept that elementary particle physics is an essential component of the study of nuclear physics as the author suggests.

For the purposes of an introductory text this book presents the historical and experimental aspects of the subject quite well. It suffers from the author's attempt to present too much theoretical material that is not really relevant to the apparent aim of his text. Rather few problems or exercises for the student are presented at the end of each chapter.

DAVID A. LIND
Department of Physics and Astrophysics, University of Colorado, Boulder

Two-Body Motion

Elements of Astromechanics. Peter van de Kamp. Freeman, San Francisco, 1964. viii + 147 pp. Illus. Paper, $2; cloth, $4.

The author's stated purpose in this book is to provide a brief introduction to basic concepts in elementary astromechanics. Except for a short chapter on the stationary points in the restricted problem of three bodies, the discussion is limited to two-body motion. What is covered—Kepler's Laws, gravitation, kinematical and dynamical orbit characteristics, and double-star orbits—is well done. In fact, owing to repetition, some of it appears overdone. The exposition is clear, and considerable attention is given to detail, presumably with the novice in mind.

In some places the text is marred by oversimplified, and consequently not wholly correct, discussions of dy-