Book Reviews

Principles of Isotope Geology. By Gunter Faure. John Wiley and Sons, Inc., New York (1977). 423 pp + appendixes and indexes. $19.95.

In the opinion of this reviewer, this is a very thorough, authoritative, up-to-date, and well-presented treatment of the subject of isotope geology. Its 21 chapters consist of 5 introductory chapters (on radioactive decay and mass spectrometry), 11 chapters on the principal methods of geological age dating (Rb/Sr, K/Ar, U/Pb, Th/Pb, Re/Os, Lu/Hf, and K/Ca methods and their various modifications), and 5 chapters on light-element dating methods (hydrogen, carbon, oxygen, and sulfur). The book also includes two appendixes and author and subject indexes. Each chapter is well supplied with literature references, ranging from 7 to 107 references per chapter, with a mean of 49 references per chapter. The text portions of the chapters range from 6 to 31 pages per chapter, with a mean of 16 pages of text per chapter. From the standpoint of its use as a textbook, it should be noted that all but two of the chapters have a number of problems at the end—ranging from 3 to 14 problems per chapter, with a mean of 6 problems per chapter.

In general, each chapter is replete with explanation, derivations, equations, tables, and graphs. Of particular interest to chemists and archeologists, the chapter on ^{14}C age dating is well done and up to date, and the chapters on the fission-track method of dating and those devoted to isotopic fractionation in nature are of particular interest. As with most first printings of first editions, the book contains a modest number of errors, mostly typographical. (These have been called to the attention of the author and hopefully will be corrected in later printings.) It should be emphasized, however, that these minor errors do not significantly detract from the usefulness and value of this excellent book.

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About the Reviewer: Vincent Guinn, with experience in radioactive matters spanning nearly three decades, again reviews for us, this time Professor Faure's writing on isotope geology. Professor Guinn is at the Irvine Campus of the University of California. His current academic responsibilities were preceded by industrial-laboratory experiences at Shell Development and General Atomic. Professor Guinn's graduate training was at Harvard.

Nuclear Power Reactor Safety. By E. E. Lewis. John Wiley and Sons, Inc., New York (1977). 630 pp. $32.00.

In the Preface, the author of the book states "It is difficult to recommend a reference to which a student, faculty member, or practicing engineer can turn for a unified overview of reactor safety. The objective of this text is to fill this void by providing a coherent treatment of the primary facets of reactor safety within a single volume of reasonable length. . . . Because the study of reactor safety must necessarily cut across many scientific and engineering disciplines, it is impossible to cover any one aspect of the subject with the depth available in more specialized publications. Thus, instead of emphasizing computational refinements, I have attempted to utilize the simplest mathematical models that will provide a quantitative understanding of the more important phenomena: Neutronics is treated with one-group diffusion theory, heat transfer by lumped parameter models, and so on. Where these models are inadequate, emphasis is placed on the graphical presentation of results obtained from more sophisticated analysis or from experimental data."

In effect, the author has recognized in his Preface the very great difficulty in writing a textbook about so broad a subject as power reactor safety. Were it easy, the two thick volumes on *The Technology of Nuclear Reactor Safety* by Thompson and Beckerley would have been followed by several textbooks by now.

To this reviewer, the question of whether the author has met his objective will, in large part, depend on the degree of sophistication sought by the reader and user of the book. For the faculty member new to reactor safety who seeks a readable, introductory text, the book may be quite suitable. The book is clearly written and includes background material and a skillful discussion of physical concepts and phenomena important to most of the safety topics treated. The book should be quite readable for most MS candidates in nuclear engineering.

For the faculty member or student seeking an intermediate or more advanced level of treatment of reactor safety, however, the book will not be adequate. And it generally does not provide enough tools to facilitate the step into a more advanced treatment.

The chapter headings are as follows: Chap. 1, Nuclear Power Reactor Characteristics; Chap. 2, Safety Assessment; Chap. 3, Reactor Kinetics; Chap. 4, Reactivity Feedback Effects; Chap. 5, Reactivity-Induced Accidents; Chap. 6, Fuel Element Behavior; Chap. 7, Coolant Transients; Chap. 8, Loss-of-Coolent Accidents; Chap. 9, Accident Containment; and Chap. 10, Releases of Radioactive Materials.

Clearly, a broad spectrum of safety-related topics is included, especially in view of the coverage of light water