and a careful presentation of the physical basis of radiation dosimetry. Methods of measurement are presented first and then there is a study of special methods in dosimetry. A clear distinction is made between external and internal hazards. The basis for determining maximum permissible concentrations is given. There follow several chapters emphasizing various phases of radiation biology. Appropriately, the book ends with a careful discussion of nuclear criticality accidents.

As with all new books, it is plagued with typographical errors and blunders, but to a less-than-usual extent. For example, on page 82, equation (2-19) is upside down. These are very minor things and do not detract from the overall usefulness of the book. It is hoped they will be corrected in the second edition.

This reviewer has taught Health Physics for the past eighteen years and is most happy to have at long last an excellent and authoritative book for his students to use in his courses and to keep for their further use in future years.

Newton Underwood

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May 26, 1968

About the Reviewer: Dr. Underwood is not a newcomer to these pages, having reviewed a health physics book for us in October 1967. That his interests are broad is attested by his position as Professor of both Physics and Radiological Science at Chapel Hill. He completed his graduate work at Brown and has been a member of the faculty at Vanderbilt and North Carolina State.

Nuclear Reactor Materials. By Charles O. Smith. Addison-Wesley Publishing Company, Reading, Mass. (1967). 262 pp. $13.50.

The author is Professor and Chairman of the Department of Mechanical Engineering at the University of Detroit. A former Oak Ridge National Laboratory staff member, he taught the Reactor Materials course in the Oak Ridge School of Reactor Technology for nine years. This book, an adaptation of the notes used by the author in the course, should, in his opinion, be useful to people engaged in the areas of education, operation, design, and development as they pertain to nuclear reactors. The publisher states that the book is an in-depth survey of the subject, one which "surveys the spectrum of materials usage." In addition, the publisher feels that the logical development of the role of materials in reactors is an important feature of the book, intended to serve beginners in the reactor field.

The 262-page book consists of four general or introductory chapters plus chapters on Radiation Effects (30 p.), Uranium (21 p.), Plutonium (10 p.), Thorium (8 p.)., Structural Metals (26 p.), Ceramics and Cermets (14 p.), Graphite (8 p.), Fuel Elements (16 p.), Liquid Fuels (27 p.), Materials Development (9 p.), and Some Specific Applications (20 p.).

The physical quality of the book is good. It contains a generous supply of pictures, drawings, and tables. In a few cases, however, over-reduction of figures led to illegibility. Few proofreading errors were found. The bibliography has 55 entries (average publication date—1959), including 8 handbooks and 9 ORNL series documents. An Appendix contains 12 tables of material property values. The index consists of about 3.2 pages.

The book is about reactor materials. To a greater degree than in most books of this type, materials applications are discussed with relation to specific reactors. While this may be a useful pedagogic approach, the reader's perspective may become distorted if the group of reactors used in this way is not carefully selected. Professor Smith's choice of examples will not reveal to the student that a strong, substantial light-water-moderated reactor industry exists and that several billion dollars worth of such reactors either are operating or are in various stages of design or construction. Nor will the reader become aware that the fast breeder reactor is the focus for the major materials development efforts in government- and industry-sponsored programs today. Fast reactors receive only passing mention in the text and no mention in the index.

The book will not be easy reading for beginners. Terms are frequently introduced without definition and the scanty index is of limited assistance. Acronyms are freely used and, although they are defined once, their appearance later in the book strains the memory unduly. The figures are frequently poorly explained in the text, and, in many, extraneous unexplained details are given. The sentence structure and grammar are unusual and the clarity is reduced by the rambling generalities often encountered. It is difficult to determine what degree of accomplishment is presumed for the reader. In a chapter containing a rather detailed description of the crystallography of deformation of zirconium, for instance, the review questions start off with "Why is aluminum a commercial structural metal?"

Because of its historical interest, the book is recommended to those libraries which desire to maintain a state of completeness in their collections.

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About the Reviewer: T. W. Evans is a member of the materials development staff of the Pacific Northwest Laboratory. He has been at Hanford since 1952, first with General Electric and for the past year with Battelle Memorial Institute, with interests in various problems in metallurgy and ceramics. In particular, he was involved in the design and development of fuel elements for the Plutonium Recycle Test Reactor and the N *power-production reactor. His current interests are ceramic reactor fuel and fast-reactor control materials. Dr. Evans completed his graduate studies in physical chemistry at Wisconsin following undergraduate work at North Dakota State University.*