Oak Ridge National Laboratory
P. O. Box X
Oak Ridge, Tennessee
37831

About the Reviewer: K. B. Brown has been in the nuclear materials field for more than 19 years and is currently a Section Chief in the Chemical Technology Division at Oak Ridge National Laboratory. From the late 1940's to late 1950's, he directed an intensive development program on the processing of uranium and thorium ores. One important outcome of the program was the development of the Amex and Dapex solvent-extraction processes which are widely used in the United States and some foreign countries. He received the Mining World Technical Achievement Award for 1956. In recent years he and his co-workers have turned their attention to radiochemical separations and have developed new solvent-extraction processes for the recovery and separation of fission products, transplutoniums, neptunium, plutonium and other elements.

Handbook of Astronautical Engineering. Edited by H. H. Koelle; McGraw Hill, New York; 1805 pp; $27.50.

McGraw Hill and Mr. Koelle have brought about a handbook aimed at the engineer or scientist at work in the expanding fields of aerospace technology. Typical of a handbook, it will not be particularly useful to an individual in his working field, but instead will augment his background in all relating areas. It is quite complete and should serve as a continuing reference for many years. This is augmented by the fact that the essence of most chapters is an understanding of the problems and how to attack them both as to philosophy and theoretical approach. The book must surely be augmented in many areas as far as design data are concerned, but this is a requirement which comes with age in any case.

The handbook, composed of twenty-eight chapters, has been formulated into six major areas: fundamentals of astronautical engineering, astrodynamics, astrionics, propulsion systems, space vehicles, and space flight operations. The scope of coverage is tremendous and yet in each area consideration is given to the most recent advances, particularly in advanced vehicle design concepts, space flight economy, components, and systems integration. Information of a historical nature is presented which indicates early interests in space flight and the rapid growth in activity today. The nature and operational characteristics of missiles, probes, and space vehicles currently existing or under development will provide an important reference to design engineers.

The content of chapters concerning technological and design problems will be of particular aid in preliminary design application. A basic presentation is given of design problem areas and their method of attack. Much of the design data presented are in graphical form and are only suitable to preliminary design application. Likewise, a probing into the refinement of engineering problem areas is left to external treatment in specialized sources. Technology of more general application, such as nuclear technology and reactor design considerations are treated most lightly. Very little is included on general properties of materials except those particularly oriented to space applications. It must be presumed that the user would refer to other handbooks.

An instrumental fact leading to the high quality of material presented and the clarity of the philosophy is that a very high-quality editorial board, chaired by Dr. Wernher von Braun and including such names as Dixon, Herrick, Lange, Stuhlinger, and Sutton assisted Mr. Koelle. Over and above this, 150 specialists from government agencies, industry, and universities contributed their expertise to this major undertaking.

Certainly the *Handbook of Astronautical Engineering* does not provide everything needed to build and fly a space vehicle, but there is collected in this one volume a composite of information which covers the technological scope in adequate detail to give an understanding of all major technical problems and the approaches to their solution. Design, development, and operational considerations are covered completing a handbook that should be useful to any space systems engineer.

Robert F. Trapp

Office of Advanced Research and Technology
National Aeronautics and Space Administration
Washington 25, D. C.

About the Reviewer: Robert F. Trapp is currently Chief of Man-System Integration Division in the Office of Advanced Research and Technology, National Aeronautics and Space Administration, Washington, D. C. In this capacity he is involved with all aspects of incorporating man into future space systems.

Mr. Trapp's previous experience includes six years with Douglas Aircraft Company, Missiles and Space Division, in charge of their nuclear space system activities.

Mr. Trapp has been active for some years in

the American Nuclear Society, serving as chairman to the recently organized Aerospace Division; he has been chairman of the Los Angeles section of the ANS.

Proceedings of the International School of Physics "Enrico Fermi", Course 23: Nuclear Physics. G. Polvani, ed., Academic Press, Inc., New York, 1963, 186 pp., $7.50.

This type of volume can serve a very useful purpose in a rapidly developing field. The unavoidable time lag before publication of a formal text often means omission of reference to the latest developments, while the author of a conventional review article is usually restrained to present only established results. On the other hand, the various summer schools and similar institutions which have become so popular offer the opportunity for the free expression of ideas without undue restrictions, as well as a summary of current progress. It is then of advantage to make these discussions available to a wider audience. However, there are two prerequisites, firstly rapid publication, and secondly low price. The present volume is marginal on the second count, but the delay of two years between meeting and publication dates is most unfortunate. The purpose of this type of publication would be best served by issuing it in the form of a paperback of considerably less luxurious and enduring quality.

The transcripts of 5 lecture courses and 4 seminars are presented, each devoted to some aspects of theoretical nuclear physics. The first is a somewhat formal, but nonetheless rewarding, 46-page survey by F. Villars of the use of the Hartree-Fock approximation in nuclear physics. It includes discussions of the treatment of singular forces, collective motions and the introduction of quasi-particles. Next, A. de Shalit contributes a discussion of the interpretation of nuclear moments, particularly the magnetic dipole moment, in terms of the independent particle and "excited core" models. Then follows the series of lectures by C. A. Levinson on some recent developments of nuclear shell model techniques. After some introduction, the emphasis here is on the recent work, using deformed orbitals, of Levinson and his collaborators, and of J. P. Elliott, with particular application to 2s-, 1d-shell nuclei.

New insight has been gained recently on the problem of collective motions in nuclei by applying techniques previously used in solid-state physics. These are described in the lectures given by G. E. Brown, who has played an important role in their development.

The final lecture course by T. Ericson has a quite different orientation from the others. He discusses the statistical aspects of nuclear structure which may be revealed through the fluctuations with energy of the compound nucleus contributions to nuclear reactions.

The more abbreviated seminars are concerned with the "Spurious State in Connection with β-Vibration of Nuclei" (D. Bes and Z. Szymanski), the "Distribution of Nuclear Charge and Magnetization from Atomic Hyperfine Structure" (H. H. Stroke), "Effective Interactions in Deformed Nuclei" (J. Unna), and "The Interference of Compound and Direct Processes" (J. E. Young).

A wide spectrum of readers will find something of interest in this volume, from research students to experienced workers in adjacent fields. Nonetheless, as already remarked, it seems a serious mistake for material of this nature to receive such a high-quality presentation, with the concomitant long delay in publication.

G. R. Satchler

Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831

About the Reviewer: After some 7 years teaching and research at Oxford University, and a year (1956-57) as Research Associate at the University of Michigan, G. R. Satchler has been associated with the Physics Division of ORNL since 1959. His chief interests have been in the theory of nuclear reactions and nuclear structure, and he is co-author (with D. M. Brink) of the book "Angular Momentum."