mental surveillance with consideration of equipment for studying ground, water and atmospheric conditions.

The author's long and varied experience in the field has allowed him to choose those topics of most value to a wide group of readers. The book is firmly packed with useful information, nicely tabulated or illustrated with well-chosen tables and graphs, and the topics are clearly explained. There is a good selection of references to the literature but the book is not dependent for its usefulness as a literature survey. It should have considerable lasting value.

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About the Reviewer: After teaching and doing research for the Manhattan District at Purdue University, D. W. Pearce joined the General Electric Company at Hanford in 1947. Here he was Manager, Biophysics, and Manager, Chemical Effluents Technology. He served as Director of the Division of Health, Safety and Waste Disposal at the International Atomic Energy Agency, Vienna, during 1961-1963, returned to G. E. at Hanford as Consulting Scientist in the Chemical Laboratory and is now Senior Research Associate there with Battelle Northwest Laboratory.

Concise Dictionary of Atomics. Edited by Alfred del Vecchio. Philosophical Library, New York City. 262 pages, $6.00.

The *Concise Dictionary of Atomics* is designed to explain the vocabulary of the atomics energy program to students and newcomers to the field. From A for argon to Zr for zirconium, the author has assembled some two- or three-thousand definitions of scientific, medical and historical terms used in the AEC programs. In addition brief biographies are given of well-known nuclear scientists, as well as descriptions of the most important organizations sponsoring nuclear research.

Certainly the author has done a very comprehensive job of assembling information about the program. Thus one can find that "crud" is slang for an undesirable impurity in a process, a "daraf" is a unit of elastance which is obtained by spelling farad backwards, "anaphase" is the third stage of mitosis in cell division, etc. The author appears to have done a good job of covering chemical and physical terms, with engineering and medical terms not quite so well represented.

The chief criticism this reviewer has is in the handling of the mathematical definitions. Evidently the publisher has had little experience with scientific publications, and numerous errors appear in the mathematical equations and formulas. For example, the Laplacian operator is written Δ^2 rather than the more customary ∇^2, the equation for the (α,n) reaction is wrong, the symbol for frequency is written v instead of ν, the de Broglie equation has a square root upside down, u is used for absorption coefficient instead of μ, and several of the equations are rather poorly set up. In view of the very limited amount of mathematical material which is included, it might have been better to eliminate it entirely rather than to do such a poor job with it.

In summary, the book can be recommended for nontechnical personnel who are associated with the atomic energy program such as those in administration, secretarial staff, newspaper reporters and in general anyone who has to work with scientific personnel. The book might be of limited value to those who are first starting to study the technical features of atomic energy, but the experienced engineer or scientist will probably find the definitions too general to be of much value to him.

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About the Reviewer: Dr. Richard Stephenson was in the engineering division of the Oak Ridge National Laboratory from 1950 to 1954, during which time he performed shielding experiments and wrote a book, Introduction to Nuclear Engineering.

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Nuclear Power Systems. By C. D. Gregg King. The MacMillan Co., New York, N. Y., (1964). 480 pages. $13.00.

Published as an introductory text, *Nuclear Power Systems* serves this purpose admirably. It is comprehensive, well-organized, well-written

and nicely illustrated. Few technical books are its equal in clarity and coverage. It should be particularly useful in undergraduate survey courses and for independent study by persons with a reasonably good background in physics and mechanical engineering. It is not suitable for graduate work (obviously it was not intended to be) but might serve as a 'refresher' for students who have been away from the academic scene for a few years.

Because of the unusually broad scope of this book it is necessarily limited in detail, but much of the missing information can be readily obtained from the references given at the end of each chapter. The review questions and problems are generally germane and helpful—although a few are concerned with relatively unimportant points—and contribute greatly to the value of the book as a teaching tool.

The following modifications might enhance the overall usefulness of the book.

1) Include more explanatory material in the chapters on nuclear physics and core design. The treatment of the basic nuclear principles is somewhat superficial compared with the treatment of the basic engineering principles.

2) Include more pictures and/or drawings of actual nuclear power systems and their component parts. This would give the reader a better feeling for the complexity of these systems and the amount of engineering effort required to design them. For example, a flow sheet for the Shippingport plant showing the maze of auxiliary equipment would eliminate the delusion of simplicity which one gets from the schematic diagrams.

3) Mention the need for digital and analog computers at appropriate places in the text, particularly in the chapter on reactor control, which could well be expanded to cover reactor kinetics and plant operation in a more sophisticated manner. Here again, a few specific examples might serve to make the reader aware of the big step between the analyses presented and the analyses actually required. The example that comes to mind first is the use of the analog computer to analyze various plant maneuvers and simulated accidents.

4) Add a chapter on economics. The merit of any nuclear power system is inevitably determined by the cost of the energy produced. This is a factor in reactor design and operation which must not be overlooked. A concise discussion of both capital and fuel costs in typical systems would be most pertinent.

5) Replace the chapter on turbine design with a shorter chapter on the salient operating characteristics of turbines and associated equipment. The nuclear engineer does not need to know the details of turbine nozzle and blade design, which is an entirely separate technology, but does need to know something about the effects of turbine load changes on the reactor.

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About the Reviewer: Formerly manager of the Babcock and Wilcox Company's Atomic Energy Division, John W. Landis is now general manager of Washington Operations for B & W. From 1950-1953 he was reactor and project engineer for the AEC's Reactor Development Division. In this position he was active in initiating and administering the industrial participation program.

He is a founder and director of the American Nuclear Society, and is currently Treasurer of the Society.