authors go into agonizing detail on their subject and others are unfortunately brief—although there are more of the former than the latter. Furthermore, the organization of the material allows for considerable overlap of subjects and a certain amount of redundancy. There is even what appears to this reviewer to be a disorder of the presentation. The section on Radiation Attenuation Methods, which starts with an extensive treatment of the Monte Carlo Method, comes before the individual treatment of Photon Attenuation and Neutron Attenuation. Radiation Sources are treated in Chap. 2 for the radiation aspects and in Chap. 6 for the geometrical aspects.

One does not find editorial guidance about where he should look to find the most appropriate solution to his particular problem. I believe this work might well have benefited from a very carefully written Introduction which would have served to direct the reader's attention to the most effective way to use the book, as a function of the kind of problem the reader has to treat. To use the book effectively, a reader should familiarize himself thoroughly with the entire volume.

As one who has spent a good portion of his career in what is generally called weapon effects shielding problems, I was quite surprised to find that the chapter on Radiation Sources does not treat the rather special problems of the characteristic "fallout source." It is a technology that has received enough attention and research effort to deserve special description at an earlier point than Chap. 4.

Similarly, I found the omission of AVF cyclotrons in the section on Particle Accelerator Radiation Sources somewhat disturbing, since the potential beam power and energy of these machines makes them a significant radiation hazard.

All in all, the *Engineering Compendium on Radiation Shielding* deserves to be widely distributed and extensively used. It should effectively serve the shielding community for many years. Since its existence will probably prevent another such work for a long while, it is unfortunate that the editors did not use their own expertise to provide a sort of teaching or guidance section for the benefit of the less experienced reader.

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Title Introduction to Modern Physics 2-E

Authors C. H. Blanchard, C. R. Burnett, R. G. Stoner, and R. L. Weber

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Reviewer Rocco A. Fazzolare

The physics of the atom and the microscopic structure of matter represent an important segment of man's contemporary knowledge of the physical world. The basic concepts of the atom, quantum theory, and relativity are reliable enough to be not only compatible with observation but to predict phenomena. The rapid technological progress of the past few decades is, for the most part, due to the evolution of this area of physics. The applications of atomic physics is so widespread today that it is no longer the cherished domain of the physicists alone. It is hardly conceivable that any student of science and engineering would be adequately prepared today without some familiarity with what is called "modern physics."

The second edition of *Introduction to Modern Physics* by C. H. Blanchard, C. R. Burnett, R. G. Stoner, and R. L. Weber fulfills the need for a well written textbook, appealing to the general science and engineering student. Therein is presented the fundamental concepts of the atom, its nucleus, electrons, and aggregate behavior. It is addressed to the undergraduate with one year of preparation in mathematics and general physics.

The contents of a good course textbook should be compatible with the student's prior preparation as well as with the objectives of the course. The mathematical treatment should not be so rigorous that it obscures comprehension. Too descriptive a presentation, on the other hand, can create the illusion of understanding. At this level, books must be pedagogically oriented. Too often in some texts the material is sketchy, poorly linked together, or illogically sequenced. Scope and balance in the subject matter presented may also be lacking. According to these criteria, this book is excellent; it fulfills its intended purpose and should be well received by students and teachers.

The topics developed are not too different from those generally found in similar texts. The book's uniqueness stems primarily from the subject sequence, emphasis, and presentation. The book begins with an outline of some helpful fundamentals of Newtonian mechanics and electrical and magnetic forces. After skimming over the kinetic theory of gases and the historical evidence for atoms and electrons, the real substance of the book begins with a chapter on electromagnetic radiation. The Rutherford scattering experiment and the Bohr atom are then described in the conventional manner. Schrodinger's equation is introduced and applied to the harmonic oscillator and the hydrogen atom. The wave solution for the transmission and reflection of particles by a potential barrier is lacking; its inclusion would have been appropriate and would have added to the completeness of the discussion. The uncertainity principle merits further discussion.

The mathematical approach is generally mature, including the application of vector analysis and partial differential equations. Analytical methods are explained in accordance with the presumed preparation of the student. However, quantitative descriptions are judiciously utilized and the transmission of ideas is not compromised.

After discussing the electron structure of the atom, a few concepts related to molecular structure and the solid state are exposed. Aside

from nuclear energy, the most significant impact of atomic theory on modern technology has been the insight and knowledge gained with respect to the aggregate behavior of atoms and electrons. Consequently, I thought that another chapter on this general theme would have been in keeping with the importance and utility of these concepts.

Two chapters are devoted to the special theory of relativity and its consequences in particle behavior. The remainder of the book is devoted to the atomic nucleus with the simpler aspects of nuclear structure, radiation absorbtion, radioactivity, and nuclear reactions revealed. The book closes with three rather qualitative, yet informative, chapters on fission and fusion, particle accelerators, and fundamental particles.

While some subjective comments can be made with regard to the scope and depth of one section or another, the book as a whole embodies a substantial amount of information and is more than adequate for a one-semester course. There is enough material to permit the instructor some flexibility in formulating his specific course.

Throughout the book, the authors remain faithful to their teaching responsibilities. The material is well organized and careful attention is given to transmitting a conceptional understanding. The language and diagrams are clear and easy to read. The book is one of the best in its category and highly recommended.

Rocco A. Fazzolare is guest lecturer in the Department of Nuclear Engineering at The University of Arizona. He received a BS in chemical engineering from CCNY, and after a tenure of 5 years in the U.S. Army Corps of Engineers attended UCLA where he received his PhD (1967). Until recently he has been Professor of nuclear engineering at the Instituto Politecnico Nacional in Mexico City and head of their laboratory facilities. He has been instrumental in the reorganization of the nuclear engineering program of the institute. In addition to his interest in engineering education in Latin America, his research activities are in experimental reactor physics, radioisotope applications, and material science.