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Book Reviews

Thermal Neutron Scattering. Edited by P. A. Egelstaff. Academic Press, London and New York (1965). 496 pp. 115 shillings.

Peter Egelstaff has done a good job of editing this collection of ten review papers, and I recommend the book to anyone seriously interested in the field of thermal neutron scattering. The fact that the chapters are really review papers, and *good* review papers, means that the book will not be of great value to the student trying to learn the field, but this is no criticism, merely an observation.

As an example, to understand Chap. 3 ("Crystal Diffraction Techniques") requires some knowledge of, say, Bacon's book on neutron diffraction, but for the person who has such knowledge, this chapter will serve as an excellent source of references, an outline of the methods and their theoretical bases, and an updating of the field.

The authors of the various chapters are among the outstanding names in the field, so it is no surprise that they have maintained a high technical level. Presumably, the excellent choice of topics, leading to a broad coverage of the field, and the consistency among the various chapters, as well as the fine job of cross referencing and indexing, are due to the editor.

As always, faults may be found. The most serious, in my opinion, is a slight unevenness in level, both among the chapters and within a given chapter. Thus, for example, we find Chap. 7 ("Theory of Neutron Scattering by Liquids") by Sjölander is aimed at the theoretician working in this field. One might then reasonably expect that Chap. 2 ("Mechanical and Time of Flight Techniques") by Brugger should be aimed at the experimentalist working with chopper systems. However, the level of Chap. 2 is such that I feel it might be more profitably read by an expert in some other area of thermal neutron scattering who wants to learn something about choppers.

The same dichotomy exists between portions of Chap. 1 ("Introductory Theory") by Lomer and Low in that some parts are very elementary, whereas the overall level is quite high. The elementary parts might better have been omitted in view of the expected proficiency of the reader.

I particularly liked Chap. 7 (previously mentioned) and Chap. 6 ("Magnetic Inelastic Scattering of Neutrons") by Sjölander and by Jacrot and Riste, respectively. In addition, Chap. 3 by Cocking and Webb ("Neutron Sources and Detection") warrants special mention, as does Chap. 9 ("The Theory of Neutron Scattering by Molecules") by Janik and Kowalska. (This chapter, incidentally, appears to be the least well referenced of the collection, and also omits some important work, but makes up for these deficiencies with a very lucid presentation.) Cocking and Webb probably do not devote enough space to discussion of linear accelerators, which have only recently become important as a source for thermal neutron scattering experiments. Also, nowhere in the book was I able to find a good comparison of various systems—choppers, crystal spectrometers, rotating crystals, etc.—which would help someone choose the system most appropriate to the experimental program he wished to carry out.

Neither this, nor any other single book, could presume to cover an entire field. Thus, much important work is not discussed at all, although most of it seems to be referenced. One would like to have read more details about calculations of scattering from organic molecules, more about Nelkin's water calculations, and considerably more about the cross-sections calculations for crystalline materials that have been carried out at General Atomic. But there are limits to how much could be included. (The omission of many of these details is exactly what might be be expected in a review paper—the reader is expected to have the competence to refer to the original papers). I would not let any of these minor complaints dissuade me from owning a copy of the book.

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About the Reviewer: P. F. Zweifel is a professor of Nuclear Engineering at the University of Michigan where he has been a member of the faculty since 1958. During earlier years he held various academic positions at Duke, MIT, and Union College; more recently he was visiting Professor at Wisconsin and at Middle East Technical University, Ankara, Turkey. He was also manager of the theoretical physics group at KAPL, and has been associated with a number of industrial and governmental laboratories as a consultant. Dr. Zweifel received his academic degrees from Carnegie Tech and Duke.

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This latest in the series of paperback annual reviews of selected topics in reactor technology is, like its predecessors, dated by the year of intended publication, but the material presented has a "closing date" in the Autumn of 1964, according to the preface. While previous numbers have dealt primarily with narrowly defined topics in reactor technology, nearly 60% of the present volume is devoted to subjects of interest to reactor designers, but peripheral to their own field of endeavor. These are articles in "Radioactive Waste Management," by W. G. Better and D. W. Pearce; "Transportation of Radioactive Materials," by L. L. Zahn, C. L. Brown, and J. W. Lang-