explained to a greater or lesser extent in no less than five different places in the book.

In spite of these defects, however, I think this book is well worth reading for anyone with a technical background who is looking for an introduction to the field of nuclear propulsion.

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Heavy Water Lattices. Compiled by H. D. BROWN. International Atomic Energy Agency, Vienna, 1960. 142 pp. $1.50.

This booklet serves as the proceedings of a panel convened by the International Atomic Energy Agency in September 1959 in Vienna on the lattice physics of heavy water reactors. Its chief value is as a record of that meeting, since its value as a status report has largely been diminished by time and since some of the technical material presented in a preliminary or fragmentary fashion has since been published more fully.

The book contains two sections—a Proceedings and an Appendix. The 24-page Proceedings section contains a very brief summary of the topics discussed during the week-long meeting. Program status reports were given by the panel members from Canada, France, Norway, Sweden, the United Kingdom, and the United States. These status reports indicate the degree of effort being made in heavy water reactor physics at that time. An interesting table summarizes estimates of the accuracy of buckling measurements that have been and are being performed, from which it was concluded that measurements made in the different laboratories agree within the probable errors.

The 102-page Appendix contains 16 supporting technical papers solicited from the panel members and their colleagues. These papers cover a wide variety of topics. Of greatest value are the papers bringing up to date the various procedures for correlating experimental buckling measurements that had been described at the 1958 Geneva Conference. These papers include a complete listing of the equations used in Sweden for lattice calculations, a previously unpublished correlation from Harwell, a list of corrections to previously published buckling measurements from Savannah River, and a French analysis of some Savannah River experimental results. As far as I know this information is not widely available elsewhere.

The most important experimental paper has since been published.* Among the other experimental papers are:

1. A list of buckling values obtained in the ZEBRA exponential facility in Sweden on fuel assemblies of UO_2 rod clusters (both with D_2O coolant and with the coolant passages empty),

2. Temperature coefficient measurements measured in ZEEP at Chalk River,

3. A ZEEP experiment on the effective cross section of Zircaloy-2,

4. Some preliminary results of ZEEP experiments in which the neutron flux inside several fuel pieces was measured with several different detectors to give an indication of the departure of the reactor spectra from dE/E, and

5. ZEEP measurements on the reactivity effect of removing coolant from lattices of multiple rods (published more fully in CRRP-942).

This paper-bound book was published promptly, the printing is excellent, the drawings are well reproduced, and there is only a minimum of typographical errors.

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Elements of Nuclear Engineering. By GLENN MURPHY. Wiley, New York, 1961. 213 pp.

Professor Murphy is Head of the Department of Nuclear Engineering at Iowa State University and also serves as senior engineer at the Ames Laboratory of the U. S. Atomic Energy Commission. He has served as Vice-President for the American Society of Engineering Education and is at present chairman of the Committee on Objective Criteria for Nuclear Education, a joint undertaking of the American Nuclear Society and the American Society of Engineering Education.

The objective of this book is "to present at the college senior level a survey of the field of nuclear engineering for the purpose of indicating its scope, potentialities and limitations." It "is not a text in nuclear physics, a treatise on reactor theory, or a handbook on industrial use of radioisotopes." It is "simply to help undergraduate students in engineering decide whether or not they wish to explore this exciting field."

The text material is divided into three sections. Section I, comprising the first 73 pages, covers an introductory chapter on the engineer and nuclear energy, nuclei and nuclear reactions, and radiation. In Section II, covering 77 pages, reactor theory and engineering considerations of nuclear power are treated. Section III contains 49 pages devoted to radiation detection, shielding, radiation effects, and industrial uses of radioisotopes.

It appears to me that this division does an injustice to the chemical engineering aspect of nuclear engineering. A closer look reveals that slightly less than two pages are devoted to the topics of fuel reprocessing and the control of radioactive wastes. At the risk of appearing to be a traitor to my own interests in the field, I am persuaded that the problems encountered in waste control and fuel reprocessing are at least as difficult and challenging as those of reactor physics, for example. Therefore, the two pages (comprising 1% of the total) devoted to fuel reprocessing and waste

* E. HELLSTRAND, T. BLOMBERG, AND S. HORNER, The temperature coefficient of the resonance integral for uranium metal and oxide. *Nuclear Sci. and Eng.* **8**, 497–506 (1960).