the European Communities (Euratom) at the Laboratoire de Chimie Nucléaire, Université de Liège from 1960 to 1964; after a year at the Lawrence Radiation Laboratory of the University of California at Berkeley (1964-1965), he joined the European Institute for Transuranium Elements, where he is responsible for actinide research. In addition, he has been lecturing since 1971 at the Institute of Analytical Chemistry and Radiochemistry, University of Saarbrücken.

Introduction to Experimental Nuclear Physics. By R. M. Singru. John Wiley and Sons, Inc., New York (1975). 162 pp. $6.95.

Texts on experimental work in the nuclear field can be divided up into at least four categories. These are concerned with measurements in high-energy physics, lower energy physics measurements attempting to understand the various states and properties of matter, experiments involving the handling and application of radioisotopes, and experiments associated with reactor physics and design. Singru's book falls into the second category and is aimed at MS students who have had basic nuclear physics. It is intended to be an experimental companion piece to theoretical texts at this level. The reactor engineer will find little comfort or assistance from the text. There are no reactor experiments described.

The book is concerned with experimentation to determine the fundamental states of matter. The indicated parameters to be measured are energy, spin, parity, the magnetic dipole, the electric quadrapole, and particle lifetime. The principal tool is usually a spectrometer of some sort, and the output generally consists of interpretation of some form of multichannel analyzer. Emphasis is on techniques involving nuclear decay schemes.

In writing a text on experimentation, there are again at least two approaches. The first is to write a laboratory manual that describes the apparatus and procedure in step-by-step detail for each specific experiment. The second approach is to present broadly the theory and the type of apparatus that could be used and to leave the details to the experimenter. Again, Singru selects the second path. Generalized apparatus configurations are shown in block diagram form, and no procedures are given. Almost no detailed circuitry is presented, and breakdown of the black boxes into detailed electronics is not attempted.

This is a small book and the first half of it is spent in a review of nuclear physics and basic instrumentation for measuring various types of radiation. The first two chapters cover nuclear properties, nuclear decay, and a summary of the various kinds of conventional low-energy nuclear reactions. The third chapter is concerned with the interaction of radiation with matter and reviews the absorption of alpha and beta particles and gamma rays in matter. The treatment is simplified and standard.

Similarly, nuclear radiation detection is treated in the classical manner. In describing gas-filled counters, for example, the exposition is a condensation of Price (*Nuclear Radiation Detection*, 1958) and Korff (*Electron and Nuclear Counters*, 1955). The section on solid-state detectors is also short but does present some background on junction and surface barrier detectors.

The remainder of the book concentrates on various spectrometry experiments that have been available in the field for a number of years. Alpha, beta, and gamma spectroscopy setups are blocked out, and typical spectra for various radioisotopes are presented. The book concludes with a section on analyzing the data from spectroscopic experiments, and a final chapter covers special measurements such as positron annihilation studies, the Mossbauer effect, and perturbed angular correlations.

I liked the book as a quick summary of the field, but would have preferred considerably more detail on the electronics and the methods of measurement. For example, new techniques such as fast coincidence circuits that use crossover detectors are just barely mentioned in the book. It would also have been useful if there had been more comparison, pro and con, of the various means of measurement and some indication as to the relative difficulties and accuracies of comparative experiments.

And in conclusion, a pet peeve—after an author has spent so much time writing a book, it is a shame to have it end up on poor quality paper.

M. A. Schultz

The Pennsylvania State University
Department of Nuclear Engineering
University Park, Pennsylvania 16802

August 26, 1977

About the Reviewer: M. A. Schultz is a professor in the Nuclear Engineering Department at The Pennsylvania State University, where he teaches nuclear laboratory courses. He is the author of two laboratory manuals for undergraduate nuclear instrumentation and, as an early pioneer in the reactor field, wrote the first definitive text on Control of Nuclear Reactors and Power Plants.

The Chemistry of Americium. By Wallace W. Schulz. TID-26981, U.S. Energy Research and Development Administration, Technical Information Center (1976). 291 pp. $6.00.

This book is an extremely useful compilation of the descriptive chemistry of americium. It is the author's stated intention to collect and review in one place the essential features of americium chemistry. As such, the book fills an important need because it presents for the first time a comprehensive treatment of material that would otherwise be found only in a diverse assortment of references, many of which are not easily available to all segments of the scientific community. Americium chemistry is delineated here within the traditional "occurrence-properties-compounds-uses" framework. The subject matter is well ordered for ready reference, and the various topics are treated critically, thus providing the reader with insight of the subject matter not generally found in literature reviews. In addition, this work is useful as a reference source, because each chapter contains an extensive bibliography augmented by a collateral reading section at the end of the first chapter. The first 22 pages of the book are devoted to the discovery of americium, atomic and nuclear properties, and collateral reading (131 references). This is followed by 23 pages on production and uses (198 references), 75 pages on chemistry in aqueous solution (248 references), 62 pages on metal, alloys, and compounds (206 references), and 95 pages on recovery, separation, and purification (382 references). Both author and subject indexes are provided.

Chapters 1 and 2 are primarily concise summaries of the atomic and nuclear properties of americium and the production and uses of americium, respectively. Due to the extensive use of tables and figures, a considerable amount of information is summarized in these chapters.

Chapter 3 describes americium chemistry in aqueous