Mössbauer scattering) and x rays in radioactive decay may seem superficial to the experts, but I believe they provide a good perspective for the beginner.

The most useful chapter of this experimentally oriented book may be the one that introduces basic laboratory techniques: x-ray tubes and sources (including accelerators), spectrometers, filters (including Ross's "balanced filters"), detectors, fluorescence yields and radiation dosimetry. There is a minor error in an otherwise excellent introduction to the proportional counter. Figure 4.14 shows the counter anode wire isolated from the high voltage lead by a misplaced blocking capacitor.

A selective chapter-by-chapter bibliography leads the reader quite painlessly into more specialized reviews and research papers from 1896 up to 1971. Five appendices give basic reference data in a convenient form.

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Nuclear Power Plant Design Analysis

A. Sesonske
486 pp. NTIS, US Dept. of Commerce, Springfield, Va., 1973. $10.60

Nuclear electric power is beginning to emerge as a significant and mature technological industry. The industry has had some severe growing pains, and there are more to come. Public attention is increasing rapidly, amid debates about safety and environmental effects. Meanwhile, the demand for graduate nuclear engineers is greater than ever.

Alexander Sesonske has written a nuclear-engineering textbook of unique breadth and scope, encompassing nuclear-power economics, reactor heat-transfer engineering, nuclear-analysis methods for reactor-core design, reactor safety and methods for system design (including the interplay of economics, materials limitations, safety considerations, and uncertainties).

This book evolved from material used in design-oriented nuclear-engineering courses at Purdue University. It is intended to fill the gap between the engineering-science type of textbook and the "real world" of the practicing engineer. It will be very useful in senior-level or graduate design courses in nuclear engineering. A graduate physicist or a practicing engineer without some background in nuclear reactors may find this book difficult to digest, at least without extensive supplementary reading.

Sesonske is already widely known for his other textbooks in nuclear engineering. In this book, he has tried to condense a five-volume set into one volume. The resulting loss of depth is partially compensated by abundant references, but in many places the book reads more like a handbook than a textbook. Undefined symbols appear in several equations, and there is some unexplained jargon (such as "spoiled core," "lethargy group," "age approach," "alpha search"). Another drawback, for which the author apologizes, is the incomplete updating; the most recent reference to the "loss-of-coolant accident" is dated 1968, and the discussion of the fuel configuration in high-temperature graphite reactors is obsolete. Projections of costs, made at the time the first three chapters were written, are incongruous today. Projections of power demand, and of its allocation among various types of energy sources, are also outdated.

The discussion of safety analysis, though somewhat dated, is generally good and well balanced. The author might have amplified his comments (page 300) about "mechanistic approaches and nonmechanistic assumptions which are not always consistent." There is much lively controversy today about the proper role of Maxwell demons in setting design constraints and safety limits.

This book, which could have been improved by more careful editing and updating, is nevertheless a major contribution to the literature of nuclear engineering. The collection of material from such a broad area and its integration into a unified approach for engineering design is extremely valuable.

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Applications of Laser Raman Spectroscopy

S. K. Freeman
336 pp. Wiley, New York, 1974. $17.50

A more meaningful title of this book for readers of PHYSICS TODAY would have been "Applications of Laser Raman Spectroscopy to Organic Chemistry." It does not mention applications to solid-state physics nor to problems in molecular physics. It is in the tradition of treatises like K. W. F. Kohlrausch's *Der Smekal-Raman Effekt* (1931), James Hibben's *The Raman Effect and Its Chemical Applications* (1939) and Lionel Bellamy's *The Infrared Spectra of Complex Molecules* (1958), though it is not nearly so comprehensive as the earlier works (about 300 references in all compared with 2000 in Hibben and a similar number in Bellamy's 1958 edition). Part of this is due to the short lifetime of laser Raman spectroscopy in organic chemistry (about six years), but it must also be said that the book does not compare with the earlier works in depth.

The author is an organic chemist by training and he has clearly directed this volume to the experimental chemist. The introduction gives a general account of Raman spectroscopy in qualitative terms that would not appeal to physicists. There follows a brief survey of experimental methods (mainly the details of preparing chemical samples for spectroscopic study) that is the best feature of the work. The remainder of the text consists of a survey of the relationships between Raman frequencies and the chemical subgroups from which organic molecules are constructed. There are good chapters on the Raman spectra of polymers and biological materials, and a concluding one on the remote detection of air and water pollutants by Raman techniques.

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Nuclear Physics

M. G. Bowler
420 pp. Pergamon, New York, 1973. $18.00

As the outgrowth of teaching nuclear physics at Oxford for the last ten years, M. G. Bowler has written a very good, basic introductory text for a first semester of nuclear physics either at the advanced-undergraduate or beginning-graduate student level. A good one semester of quantum mechanics is certainly a necessary and probably a sufficient prerequisite for the scope of this text.

The text makes no claim to being a complete encylopedia for nuclear physics. It is not. Instead it concentrates on the fundamental properties of nuclei and their decays, examining in depth the roles of angular momentum and isospin. Fermi's golden rule forms the backbone of the book and Bowler uses it as the starting point for the discussion of various nuclear decays and their various transition probabilities and selection rules. Nuclear reactions are also approached in this way, with the emphasis in this area on quantum mechanics in the two-body problem, barrier penetration, structure resonances and partial-wave analysis.

There is virtually no discussion of topics such as direct reactions and nuclear models, so that this text is cer-