ciated Universities, and has been Executive Director since its inception. He is a priest serving St. Stephens Episcopal Church in Oak Ridge.

Dr. Pollard did his graduate work at Rice and has authored many papers and books, the latest being Man on a Spaceship.

The Technical Applications of Radioactivity. By Engelbert Broda and Thomas Schönfeld. Pergamon Press (1966). 336 pp. $15.00.

This volume is the English translation of the third German edition of *Die technischen Anwendungen der Radioaktivität*, Band I. The first and second German editions (1956, 1957) relied heavily on the papers from the 1955 Geneva Conference. The third German edition, essentially rewritten, appeared in 1962, and included material from the 1958 Geneva Conference along with work from the Paris (1957) and Copenhagen (1960) Conferences. It is perhaps unfortunate that the English translation has been delayed (copyright 1966). In many fields, this delay would have meant that the work was hopelessly outdated. In this case, there have been no major breakthroughs in technology or applications, and the usefulness of the work does not necessarily suffer from this delay.

The first 70 pages are devoted to a survey of fundamentals and measurement. This offers only the advantage of having this material included in the same volume as the applications themselves since the approach is conventional. This is followed by about 40 pages of laboratory-oriented techniques in chemical analysis. The remaining 220 pages sketch in a hurried fashion a very broad spectrum of applications to industry. Chapter headings include mining and oil production, metallurgical, engineering and electrical industries, chemical industry (70 pages), agriculture and forestry, and hydrology. Appendixes include a list of important isotopes and a page of conversion units.

The striking feature of the book is the reference list containing over 2500 papers. Since many references are papers presented to conferences held in Europe, or were included in their bibliographies, the book contains multitudinous references to Russian and other European literature. This offers the advantage of having references to applications which are not often seen in US bibliographies. However, the unavailability of these papers in the US means that there is little to be gained except the statement that a given technique was used to attack a particular problem.

The other salient feature of the book is the brevity with which each of the applications is mentioned. It has such a wide coverage that several techniques, each with its references, are included in a single paragraph. The effect produced is that of an annotated catalog of uses. Little description of the methodology of the technique is included except in the general sections of the first few chapters. A comparison with the standard US reference by Kohl, Zentner, and Lukens (*Radioisotope Applications Engineering*) shows considerably more emphasis on methodology by the latter authors.

The book is very useful for cross-fertilization purposes since it does list such a wide variety of applications. It belongs in the library of any radioisotope worker in industry or one who has interests in industrial isotope uses. Although not a book that he would use regularly in his ordinary practice, it will be a useful addition to the reference volumes of any serious worker who wants a broad-band treatment of the field.

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About the Reviewer: An early worker in the radioisotope and radiation field, Ralph Overman has been active in a variety of research and educational activities in the nuclear field. He was associated with the thermal-diffusion uranium-isotope separation project and the Oak Ridge National Laboratories during and after World War II, and in 1948 established the Training Division of the Oak Ridge Institute of Nuclear Studies. Dr. Overman now heads his own consulting firm in Oak Ridge. He is a Fellow of the American Nuclear Society and a member of the Editorial Advisory Committee of Nuclear Science and Engineering, *and has published two books in the field of radioactivity and experimental radiochemistry.*

Proceedings of a Symposium on Neutron Monitoring for Radiological Protection. Sponsored by the International Atomic Energy Agency and convened in Vienna, August 29-September 2, 1966. Printed by the IAEA in Austria (January 1967). Available thru the National Agency for International Publications, Inc., 317 East 34th Street, New York. 702 pp. $14.50.

The text is timely and important, particularly to individuals concerned with radiological protection, because it focuses on a highly specialized area where certain difficulties exist both from the standpoint of theory as well as instrumentation and measurement techniques. The reviewers feel that the book would be useful to the application specialist as well as to the erudite researcher who is desirous of finding answers to uncertainties existing in neutron dose assessment.

The very broad range of papers categorically fall under the following topic headings:

1) Physical Aspects of Neutron Dosimetry
2) Liquid Dielectric and Scintillation Detectors
3) Semi-Conductor Detectors, Single Sphere and Multisphere Systems
4) Dosimetry Experience and Problems in Various Installations
5) Developments in Personnel Monitoring
6) Dosimetry Studies for Accidents
7) Standardization and Calibration.

The major portion of the text is devoted to work presented by representatives of the Soviet Union, United Kingdom, Norway, Sweden, France, Federal Republic of Germany, Czechoslovakia, Canada, Italy, Poland, Yugoslavia, and the United States. About 25% of the total work reported in the text represents a fair approximation of what one may consider as "new developments." However, the chief advantage of the text is that it embodies within a single document the status of the art and descriptions of available

dosimetry systems and techniques for assessing the neutron component of a radiation field.

The introductory paper in the text contains some background as to the significant advances during the past 20 years in the physical dosimetry of neutrons, and a brief but worthwhile discussion of active and passive type solid-state detectors and their role in future dosimetry systems.

The reader may find some interesting developments in ultra fast electronics, pulse shape discrimination scintillation detectors. A presumably practical method for determining dose equivalent, quality factor, and dose distribution as a function of LET at various depths in tissue is reported. The method uses a plastic scintillator dosimeter for the measurement of the proton recoil dose at depth in tissue for an unknown incident fast-neutron spectrum. This is an important piece of work. There are also several interesting papers under the section entitled "Dosimetry Experience and Problems in Various Installations." Many of the authors emphasized their concern for the need for more work in the intermediate-neutron energy region, below about 0.5 MeV (0.5 MeV to 100 keV). Several authors reported 40 to 90% contributions to total dose from neutron radiation in this energy region from reactors and certain accelerators.

On reading this text, one will note almost immediately that in many cases calibration was done at relatively few energies with questionable "monoenergetic" sources. Many of the investigators provided unrealistic conclusions based on dosimeter calibrations with broad spectrum neutron sources, such as Po-Be, where the energy dependence of the instrument was completely ignored.

The reviewers were pleased to note that the United Kingdom proposed an intelligent solution to this problem (which the United States should emulate), a neutron flux density facility consisting of a 3 MeV Van de Graaff positive ion accelerator. The facility would provide monoenergetic neutron fluxes of fixed energies in the range from thermal to 19 MeV.

To the inquisitive researcher, the book not only provides a compendium of literature on the subject of neutron dosimetry, but also identifies areas needing emphasis and further investigation. The book is a questionable item for those with merely a general interest in nuclear technology.

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James E. McLaughlin is Director of the Radiation Physics Division, Health and Safety Laboratory, U.S. Atomic Energy Commission. He graduated from Boston College in 1951 followed by graduate studies at several schools, including the University of Rochester as an AEC Fellow, and he has been engaged in dosimetry, shielding, nuclear safety, and nuclear standards.