be useful as a text in advanced courses, where the instructor can supplement it with lectures on current developments. It can be recommended to older chemists in other fields who would like to enlarge their horizons.

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About the Reviewer: Richard H. Wiswall, Jr. is a group leader in the Nuclear Engineering Department of the Brookhaven National Laboratory, where he has been since 1949. He received the Ph.D. in chemistry from Princeton in 1941, and first entered the nuclear field in 1943, at the S.A.M. Laboratory of Columbia University.

Russian-English Physics Dictionary. By Irving Emin. John Wiley & Sons, Inc., New York and London, (1963). 554 pp., $14.00.

The increase in communications between American scientists and Soviet scientists has been one of the wholesome characteristics of the late fifties and sixties of this century. The evidence presented to the world that citizens of two different ideologies can find in science something they agree on, something that they can discuss, something that they can argue about without emotional political overtones is an inspiration to others who are working in more difficult, controversial political relationships between the United States and the Soviet Union. To carry out this dialogue between physicists requires many aids, not the least of which is a good dictionary.

Dr. Irving Emin and the staff of physicist-translators associated with the Consultants Bureau have produced a fine "Russian-English Physics Dictionary." It took them seven years to compile it. It is based on practical experience of translating over 10,000 pages of Soviet physics journals published from 1955 to 1962. There can be no question that this dictionary is unique in that it is compiled not by academic scholars but by professional translators. The dictionary contains many useful features. Aside from the main body of physics terms in Russian and their English counterparts, it contains Russian abbreviations, Russian transliterations, basic vocabulary on chemistry, electronics, astronomy and geophysics, a grammatical reference section, and conveniently at the end of the book, a standard transliteration scheme. Dr. Emin and his colleagues are to be thanked for a useful aid and congratulated on producing a fine dictionary. Theirs should be the satisfaction of helping to keep up the dialogue between the English reading scientists and Russian writing scientists.

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About the Reviewer: John Turkevich received his Ph.D. degree in Chemistry from Princeton University in 1934 where he has taught since 1936 and where he is now the Eugene Higgins Professor of Chemistry. His service, in 1958, as Chairman of a U. S. Delegation of Educators to the USSR and as Acting Science Attache in the U. S. Embassy, Moscow in 1960-61 makes him exceptionally well qualified as the reviewer of Dr. Emin's dictionary.

The Nuclear Reactor. By Alan Salmon. John Wiley, N. Y. City. 144 pp., $3.00.

Reorganized and rewritten, this pocket-sized reference could become an indispensable guide for the young engineer and executive. Unfortunately, misplaced emphasis and simple error render this little British book worthless and misleading. A few random examples bring out its deficiencies:

(a) Though British practice should be highlighted, this statement on page 12 came as a surprise:

> "-a fission reactor first operated on December 2nd, 1942, in Chicago. The next step was also aided by military requirements, in 1956 the first large nuclear power station operated at Calder Hall."

(b) The uranium prices on page 31 appear to be a composite of two AEC schedules, issued at different times. Evidently the old (1955) figure of $40 per kg. was used for natural uranium along with the 1962 price of $12 per gram of U^{235} content in highly-enriched fuel.

(c) Down to earth concepts and simple numerical problems should have enlivened this book. For instance, I could find no discussion of critical mass or approach to critical loading, nor are these topics included in the brief index. Numerical calculations are needed to elucidate such formulae as for mean free paths in mixtures, buckling, and criticality.

(d) Discussion of heat transfer is largely limited to conduction, and scant space is given to heat-transfer coefficients. Many monographs become engrossed in elaborate

comparisons between coolants. This book avoids the question in a truly Spartan manner, by presenting no comparative data whatsoever.

(e) Precious space is freely allotted to discussing the future role of nuclear power, but little attention is given to specific non-British power-plant prospects. A fuller discussion of U.S.A., French, U.S.S.R., and Canadian reactor plans seems mandatory in view of the current reappraisal of the U.K. program. This reviewer agrees with the author (p. 136) that this book cannot do justice to developments in power reactors, but it is doubtful whether even adequate signposts and data have been provided.

This book cannot be recommended in its present form.

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About the Reviewer: Mr. Untermyer is a Technical Consultant in the Atomic Products Division of the General Electric Company. He is a Fellow and former Director of ANS. His career at Oak Ridge, Argonne, and General Electric has been identified with the development of water-cooled power reactors. He prepared the initial, conceptual designs for the water-cooled Naval reactor, (including pioneering the use of zirconium), the heavy water-production reactors at Savannah River, and all the early boiling water reactors. He developed and demonstrated the BWR concept and was in charge of the construction of the VBWR. He also conducted the earliest measurement of conversion (breeding gain) in the EBR-I and contributed to resonance integral and to fast effect measurement in uranium lumps.

Man-Made Transuranium Elements. By Glenn T. Seaborg. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, (1963). VIII + 120 pp. $3.95 cloth, $1.50 paper.

This book has been written primarily to be used with the *Chemical Education Materials Study* better known as the CHEM Study, of which the author, Dr. Seaborg, is the Chairman. This Study is a High School Course Content Improvement Study supported by the National Science Foundation and centered at the University of California (Berkeley) and Harvey Mudd College, Claremont, California. It supplements Chapter 23 of the CHEM Study textbook entitled "Chemistry—and Experimental Science." Also, it is a contribution to the Foundations of Modern General Chemistry Series (Robert W. Parry and Henry Taube, editors).

Part I includes, in addition to an introduction, chapters on the discovery of the transuranium elements, their position in the periodic table, experimental chemical methods, applications and future transuranium elements.

Part II is devoted to such topics as the source of the actinide elements, their electronic structure and their chemical, physical and nuclear properties. The Appendix contains a valuable and useful table entitled "Radioactive Decay Properties of Transuranium Nuclides," totaling in number more than 100 isotopes of these eleven elements.

It is remarkable what has been done in the past twenty-four years since the discovery of neptunium and plutonium in 1940. In this program the author and co-workers have played a predominant role in bringing to light an entirely new field of chemistry that has had a pronounced effect not only in many fields of basic chemistry and physics but on our international posture and our national security. The availability of plutonium and some of the other transuranium isotopes was of great importance during the war. Since the war, the peaceful applications of atomic energy in its many aspects and the uses of isotopes in the basic sciences have developed beyond imagination because of transuranium chemistry. The chemistry and applications of the transuranium elements certainly represent one of the most significant achievements of science in the past fifty years or more.

Man-Made Transuranium Elements brings to the beginning student, whether he be interested in chemistry, physics, or general science, an exciting and stimulating account of how new fields of science develop. In addition, the more advanced student and the teacher of elementary science will find the book to be equally exciting and useful.

The author is to be congratulated for making available in a very compact but readable form *Man-Made Transuranium Elements.*

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About the Reviewer: Warren C. Johnson has been with the University of Chicago since 1927. He is presently Professor of Chemistry.

Dr. Johnson was the Director of the Chemistry Division at the Clinton Laboratories (now ORNL) during the years 1943-1946. He has been on the General Advisory Committee of the USAEC since 1954 and was chairman from 1956-1960. He is a member of the Chemical Society and of the ANS.