Book Reviews

Dictionary of Russian Technical and Scientific Abbreviations. Compiled by Henryk Zalucki. Elsevier Publishing Company, Amsterdam, London, New York (1968). 387 pp. $16.50.

The English-speaking reader who has managed to learn enough Russian to follow the literature in his field encounters another barrier that often prevents him from understanding the text: modern, technical Russian is filled with abbreviations, acronyms, and telescoped words. Very often, these obscure but important groups of letters are ignored by dictionary compilers. It is therefore a pleasant surprise to have in hand the recently published *Dictionary of Russian Technical and Scientific Abbreviations*, compiled by a Polish engineer with a strong interest in linguistics and lexicography.

Russian nuclear engineers save space and effort, using, for instance, instead of the mouthful expression *teplovydelyayushchii element* (heat-releasing or fuel element), the acronym *tvel*, unlisted in most technical dictionaries. On the other hand, the name of The State Publishing House of Literature on Nucleonics, "*Gosatomizdat*," may be more easily recognized because the elements of the components are visible: *gos* for *Gosudartsvennoe* (state), *izdat* for *izdatel'stvo* (publishing) and *atom*—well, for an old friend in every language; it is even spelled the same way in Russian characters.

Soviet research institutes have complicated-looking names, usually starting with NII which stands for Scientific Research Institute. This is followed by the designation of the scope of the institute and often by the name of a famous scientist or politician, after whom it is named. The declined form of the proper name often bears only a slight resemblance to the original; therefore, it is not easy for the beginner to realize that *imeni Gor'kogo* means "*named after Gorkii.*" The resulting acronyms are then pronounced as a word, as NASA, rather than AEC, in which each letter is pronounced separately.

Also of special interest for nuclear engineers are the names of national and international organizations, e.g., International Atomic Energy Agency (*MAGATE*) and the Dubna Institute (*OIYaI*), which sounds more Hawaiian than Russian. The name of this institute is given in the dictionary as "*United*," rather than *Joint Institute for Nuclear Research*, as it is generally known. Surprisingly, USAEC (*KAE-SShaA*) and its Soviet counterpart (*GKAE*) are not listed in the otherwise very complete compilation.

It would be very desirable if the translated names of the Soviet and Eastern European research institutes, laboratories, and organizations could be standardized. Several American groups, such as Battelle Memorial Institute and Georgia Institute of Technology, have examined this problem. A consistent listing of the institution, based on this dictionary and on some earlier collections, would be a great help to American readers of the many translated Soviet journals, *Nuclear Science Abstracts*, *Chemical Abstracts*, and the abstracts of Soviet and Eastern European technical literature prepared by the Joint Publication Research Service of the Department of Commerce, etc. The reader wants to know where the work has been carried out and often needs the correct name of the laboratory to request a reprint.

The less-experienced American reader of Russian scientific material may run into difficulties with abbreviations of well-known units. The Russian alphabet has no *w*; therefore, the Cyrillic *B* (*V*) stands for volt and *BT* (*VT*) must be used to designate watt. Therefore, I would advise the novice reader of Russian scientific texts to get hold of this dictionary, in addition to his regular one, and check every new term, abbreviation, and acronym until he is sure of the meaning.

Browsing through the book, one is rewarded by nuggets of unexpected information. Where else could you find out that *MIG* stands for *Mikoyan i Gurevich*, an aircraft designed by A. I. Mikoyan and M. I. Gurevich.

The Elsevier Publishing Company has an excellent record in the area of glossaries and dictionaries; its series of specialized multilingual dictionaries include one on atomic energy, with brief definitions of the terms.

The work is well printed, with the terms given in heavy characters. It contains the complete Russian expression and its English equivalent; its usefulness is further extended by giving also the German translation. The compilation will prove itself a valuable tool for engineers and scientists interested in the Russian technical literature.

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July 12, 1968

About the Reviewer: Francois Kertesz is presently very active at the Oak Ridge National Laboratory, where he has been a member of the staff since 1951, in coordinating the operation of various information centers not only within the Laboratory but nationally as well. A native of Roumania, Dr. Kertesz completed his graduate studies at the University of Paris. In addition to information retrieval, his interests are in high-temperature corrosion, reactor materials, and the chemistry of photographic emulsions. His linguistic ability is outstanding.

Modal Approximations: Theory and an Application to Reactor Physics. By Weston M. Stacey, Jr. MIT Press, Cambridge, Mass. (1967). 119 pp. $6.00.

During my career as a college teacher, I have been called upon by the college to read and evaluate any number

of doctoral theses. Now the editor of *Nuclear Science and Engineering* has also asked me to evaluate a thesis! Certainly Dr. Stacey's thesis is a nice scholarly piece of research. It first develops the formation of the general modal approximation in some detail and then makes a few interesting applications, particularly to fast-reactor systems. It should have been abstracted and published as a couple of interesting papers in this (or a similar) journal. A student who wished to delve into the highly specialized subject matter more deeply should have been able to obtain the thesis in some other form, for example, as a microfilm or soft-bound copy. I doubt that there will be enough such students to justify its publication as a book.

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About the Reviewer: Paul Zweifel, who is Professor of Physics at VPI, has contributed to these columns in the past, most recently in 1966. His career, following completion of his graduate studies at Carnegie Tech and Duke, has been divided among laboratories and academic institutions. He has served at KAPL, the Middle East Technical University, and, more recently, at the University of Michigan.

Nuclear Chemistry, Vol. I. Edited by L. Yaffe. Academic Press, New York (1968). 465 pp. $22.00.

A recent elucidation of the term "nuclear chemistry," offered by A. M. Weinberg, suggests that nuclear chemistry began as nuclear physics, ceased to command the interest of physicists, and was taken over by chemists. *Nuclear Chemistry* offers further exposition of the term and is an ambitious attempt to cover, in a series of topical review articles, much of the research that is of interest to nuclear chemists. The topical review articles are written by experts, mostly by nuclear chemists who are actively engaged in these subcategories of nuclear chemistry.

Volume I of the series, which is being reviewed here, treats the study of nuclear reactions extensively. Chapters on experimental nuclear spectroscopy and nuclear models are also included.

Chapter 1, "Nuclear Models" by T. D. Newton, presents the basic assumptions underlying particular nuclear models and develops these assumptions into working form. Although some subjects are treated extensively, e.g., transformation of the collective Hamiltonian from the space-fixed frame to the intrinsic frame, the chapter is extremely brief. The reader could best find this information elsewhere.

"Low Energy Nuclear Reactions" by N. T. Porile, as the second chapter, "discusses those features of low-energy nuclear reactions that are of particular relevance to nuclear chemistry." Accordingly, the compound nucleus and the statistical theory of nuclear reactions are covered well and in great detail. Unfortunately, direct nuclear reactions are not considered to be particularly relevant judging from the space devoted to them. Much emphasis is placed on the Butler plane-wave theory, now out of vogue, instead of the more successful distorted-wave theory, which is mentioned only briefly.

The third chapter, "High Energy Nuclear Reactions" by J. Hudis, discusses a field almost exclusively reserved for nuclear chemists. An excellent discussion of experimental techniques related to the study of high-energy nuclear reactions is presented, as well as a detailed treatment of the calculation of the nucleon cascade and subsequent evaporation path. A well-balanced presentation, outlining the interplay of theoretical predictions with experimental results, mostly those of the Brookhaven group, is given.

J. M. Alexander presents in Chap. 4, "Nuclear Reactions by Recoil Techniques," an extremely comprehensive survey of the field. Recoil ranges and angular distributions are extremely powerful tools in studying nuclear-reaction kinetics and mechanisms, as is shown in this chapter. Innumerable references to original works and relations for use in the analysis of recoil experiments will be useful to the researcher and student alike.

A necessarily brief resume of the techniques used in "Experimental Nuclear Spectroscopy" is offered in the fifth chapter by J. M. Hollander. This chapter effectively summarizes the use of high-resolution semiconductor detectors for electrons, alpha particles, and gamma rays and the use of magnetic spectrometers. The measurement of the properties of the nuclear ground state and excited states via directional correlations and internal conversion electron spectroscopy is also given some consideration.

A. Zucker and K. S. Toth present in the last chapter, "Heavy-Ion Induced Reactions," a complete survey of heavy-ion evaporation and transfer reactions; but, unfortunately, do not cover "in-beam" spectroscopy, an area of great research interest to nuclear chemists. The short subchapter devoted to transuranium element production and identification is particularly timely in light of the clamor for new heavy-ion accelerators and the search for elements 114 and 126.

In summary, *Nuclear Chemistry* contains several scholarly, well-written reviews, the titles of which are perhaps too general for the material presented. The book should prove useful not only to the nuclear chemist but to the student and researchers in other related fields as well.

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About the Reviewers: Curtis E. Bemis, a nuclear chemist in the Transuranium Research Laboratory at Oak Ridge National Laboratory, is engaged in studies of the nuclear properties of the heavy elements as well as the production and identification of new transuranium element isotopes. He received the BS degree from the University of New Hampshire and the PhD degree from M.I.T. in 1964, and did post-doctoral work at the Research Institute for Physics, Stockholm, in 1965.

Richard L. Hahn is also a nuclear chemist at the Transuranium Research Laboratory of Oak Ridge National Laboratory. He graduated from Brooklyn College and did graduate work at Columbia University, receiving the PhD degree in 1960. Dr. Hahn has had extensive experience in the study of nuclear-reaction mechanisms and in the characterization of alpha-active nuclides.