design, construction, and initial operation of the Vallecitos Boiling Water Reactor and was manager of the Reactor Technical Operation unit. Before joining GE, he spent nine years at the Enrico Fermi Institute for Nuclear Studies, University of Chicago, where he was Chief Engineer and was responsible for the design, construction, operation, and maintenance of a 170-inch synchrocyclotron. A graduate of MIT, he is currently Secretary of the Reactor Operations Division of ANS.

A LIMITED AID TO TRANSLATION

Title Dictionary of Nuclear Physics and Nuclear Chemistry

Editor Hans Rau

Publisher Reinhold Publishing Corp., 1965, second edition

Pages 350

Price $8.75

Reviewer Hartmut Wiedersich

A rapidly expanding field such as nuclear science and technology creates a multitude of new and highly specialized terms. Thus, specialized and up-to-date dictionaries are desirable. The present German-English/English-German dictionary, an enlarged and revised edition of a previous one, was intended to serve this need. Despite the title, it appears primarily directed toward engineers concerned with reactor technology and uranium mining, since the areas of engineering, mining, and minerals are covered especially well.

However, some areas lack complete coverage. A quick check revealed as missing: exclusion principle, epithermal, laws of thermodynamics, parity, quadrupole, statistics, straggling, scavenger, and many more. Nevertheless, about 8000 terms (according to the preface) are included. The dictionary has limited value for engineers with interests in materials since few metallurgical and radiation damage terms are included. For example, some words from these fields, which are not found in the book include: anneal, forging, precipitation hardening, steel, knock-on, interstitial, thermal spike, and displacement spike.

In general, the translations are precise. Yet, it is news to me that "metallurgical engineering" is "Eisenhüttenwerk" (steel works) or that the deuteron has the atomic number 2. There are cases where additional translations should have been added, e.g. "dislocation" is given only as "Verlagerung" (geologic) but not as "Verseztung" (crystal defect).

An extensive section containing symbols and abbreviations is useful. The excessive employment of abbreviations in our time is reflected by this section which requires 80 pages—more than 20% of the volume. Whereas usually only the full name of an object is given in the English column, frequently the item is characterized briefly in German. For example, BEPO reads British Experimental Pile Operation in the English column, while the German column contains the equivalent of: graphite-moderated, gas-cooled uranium reactor, 6 MW, in Harwell, Berkshire, England.

As with all specialized dictionaries, a good general knowledge of the language (or a general dictionary) is required for profitable use.

Hartmut Wiedersich, technical staff member of the North American Aviation Science Center's Theoretical Chemistry Group since the Center's inception in 1962, has been in research with Westinghouse Electric (1954-60) and Atomics International (1960-62) since receiving his PhD in Physics and Metallurgy from the University of Göttingen, Germany, 1954. His best-known scientific contributions are in the fields of plastic deformation and of applications of the Mössbauer effect to magnetic and metallurgic problems. He has co-authored a review article on radiation damage in reactor materials which will soon be published by ASTM.

GRACEFUL AND COMPENDIOUS

Title Electrodeposition and Corrosion Processes

Author J. M. West

Publisher D. Van Nostrand Co., Inc., 1965

Pages xii + 189

Price $7.50

Reviewer Clemens Auerbach

The stated purpose of this short book is to present a unified picture of the processes of electrodeposition and corrosion in terms of the same basic phenomenon: the transfer of a metal ion through an energy barrier existing at a metal-electrolyte interface. The author approaches this task by dividing the subject matter into seven chapters. The first two chapters present, respectively, a concise treatment of equilibrium at a metal-solution interface and of departures from such equilibrium. These chapters introduce such basic topics as exchange current density, the structure of the double layer, the role of adsorption, and the influence of structural features of the metal surface. The third chapter turns to the treatment of electrochemical corrosion, about half of it being devoted to a discussion of the major types of cathodic processes. The related topic of surface films, leading up to the subject of passivity, is presented in the following chapter, which makes liberal and effective use of potential-pH (Pourbaix) diagrams. Chapter 5 consists of a discussion of electropolishing and bright electrodeposition from the unifying viewpoint of random (noncrystallographic) dissolution and deposition. Chapter 6 deals systematically with corrosion prevention, and the final chapter gives an introduction to the complex and controversial field of phenomena involving stress. A few rather conventional numerical

problems are appended to each chapter. Elementary valence theory and metal deformation constitute the subject matter of two appendixes of three and two pages, respectively.

The fundamental approach adopted by the author is as sound as it is timely; the underlying theory encompasses a vast area of physico-chemical knowledge, and our understanding of the subject as a unified whole has lagged behind its enormous and ever-growing practical ramifications. However, it is precisely for this reason that the author of a book, as modest in size as this one, faces a formidable challenge in terms of knowledge, organizational ability, conciseness, clarity and, above all, perspective and judgement as to "what to omit".

In my opinion, the author has been only partially successful. On the positive side, he has produced an eminently readable volume, written with more style and grace than one is accustomed to in books of this sort. He has presented some of the basic theory in a concise, personal, and refreshing, if somewhat unorthodox, manner; I refer here especially to the thermodynamic material in the first chapter. He adheres rigidly to his unified viewpoint, and he succeeds in incorporating practical aspects into the framework of the basic discussions. The weakness of the book derives from the fact that the author has attempted too much for the space he has allowed himself. Some of the more intricate theory is treated with such conciseness that the result tends to be more than unorthodox, i.e. superficial and even misleading. This applies especially to the question of metal complexes, which is brought up in a number of places, and even more to the breathtakingly brief appendixes. Again, so much material is presented that the main line of the discussion is frequently interrupted and the perspective lost.

In the author's words, "The book is aimed largely at second and final-year students in English universities and colleges of advanced technology". I feel that this volume will be appreciated mainly by persons of substantial physico-chemical maturity, who will derive benefit and even pleasure from its undeniable virtues. However, the book largely confirms my opinion that a complex subject of this sort demands exhaustive, specialized treatment—and thus, inevitably, a more voluminous (and I am afraid less gracefully written!) book.

The book is well-produced, and I have not been able to detect major typographical errors except in line 2, page 12 which, I presume, should read "0.1 *M* $AgNO_3$".

Clemens Auerbach has been a member of the Analytical Chemistry Group in the Nuclear Engineering Department of Brookhaven National Laboratory since 1956. He received his BS degree in 1943 at Robert College, Istanbul, Turkey and did graduate work under the direction of Professor J. J. Lingane at Harvard University, where he received his PhD degree in chemistry in 1951. After three years of postdoctoral work at the University of Minnesota, with Professor I. M. Kolthoff, he held a faculty position at the University of Buffalo from 1953 to 1956. His specialty is electroanalytical chemistry with emphasis on polarography and coulometry.

A BIRD'S-EYE VIEW

Title Chemical Processing in the Atomic Energy Industry

Author A. R. Cooper

Publisher Iliffe Books, Ltd., 1964

Pages ix + 160, including 44 figures, 10 tables

Price 38 shillings 6 pence in the United Kingdom

Reviewer Walter O. Haas, Jr.

This small volume is one of a series designed for a general postgraduate course in nuclear engineering, in particular as an introductory part of the Harwell Reactor School Standard Course. The author, and authors of other books in the series, teach their specialities at the colleges of Advanced Technology at Birmingham, Bradford, and Salford.

The Harwell school course is attended by chemists, physicists, metallurgists, engineers, and senior executives, who are concerned with the development and construction of nuclear reactors. The students are expected to be well grounded in the fundamentals of science and engineering, and introductory lectures are given in mathematics and atomic and nuclear physics before proceeding to more specialized subjects. Chemical processing, metallurgy, heat transfer, and radiation protection are among the disciplines covered in the course, but the emphasis remains on nuclear and reactor physics. The intent of introducing the associated disciplines is to create an awareness of the extent to which these affect reactor design, operation, and economics, rather than to train personnel for work in these fields.

Considered in this context the book does provide an overall, if somewhat sketchy, summary of the part chemical processing plays in the atomic energy industry. The short introduction discusses the material requirements of a nuclear reactor, the behavior and compatibility of these materials under reactor operating conditions, and the need of chemical processing to obtain the materials of required purity. A second chapter touches on the various processing techniques in use and mentions the problem of criticality encountered in processing plutonium and enriched uranium. Each of the next seven chapters is devoted to individual elements: uranium, plutonium, thorium, zirconium, beryllium, niobium, and graphite; outlined are their important physical and chemical properties, the processes considered and used in their isolation, their fabrication into reactor components, and, when pertinent, the mode of reduction from ore. The last two chapters cover the reprocessing of fuel and isotope separation.

It would be surprising if a book of this size were to be completely successful in achieving its purpose. The difficulty of summarizing a complex industry for a mixed audience is probably best illustrated by the fact that the author felt it desirable to define such terms as "ion" and