Erik Blomgren's activities were widespread, not only in fundamental electrochemistry but in areas of applied chemistry, and he was the owner of a number of patents relating to batteries, corrosion, and water detection. He and his work were well known throughout the world, and he was a frequent and welcome visitor at laboratories in Germany, England, France, Italy, Sweden, and the United States.

These facts give a quite inadequate picture of the man. Quick, incisive, energetic to an extreme, and with a determination and will power which have yet to be equalled in the experience of the writer. He was a master of attack in research and a scientist of rare qualities. His dynamic and lighting comprehension would have brought him to an outstanding position in any field. Coupled with his remarkable characterological properties, they made him recognized as a remarkable phenomenon by his colleagues.

These qualities fitted him perfectly to the work he chose to do. Not only did he lead a large research team in energy conversion by electrochemical means and carried out work which may change the future nature of transportation and affect the character of lunar vehicles, but he frequently acted as a consultant in these rapidly advancing research areas. At the time of his death he had been called on to contribute his talents to the Dept. of Defense. Dr. Blomgren, in conjunction with Professor Ernest B. Yeager, had recently organized and conducted a course in Electrochemistry Conversion at the University of California at Los Angeles. His death is a most untimely blow to the tiny band of men in the United States schooled or active in the field of fundamental electrochemistry.

Of the many who met Erik Blomgren, few knew the quality and devotion of the man to his ideals. With a working day of 13 to 14 hours, and a total projection of all his talents and energy, he had simply given his whole self to science and the goal of contributing to the welfare of the world community. It may perhaps be said that the completely successful man is one who gives all his ability and strength to a worthy goal. Erik Blomgren was, then, a completely successful man.

John O'M. Bockris
Univ. of Pennsylvania

Book Reviews

Physicochemical Hydrodynamics, V. G. Levich. Published by Prentice-Hall, Inc., New Jersey, 1962. 700 pages; $20.00.

This monograph is concerned with the development of quantitative theory describing the interaction between fluid motion and physicochemical transformations. Levich is a pioneer in this field, and much of the material in this volume represents his own creative accomplishments. These are considerable in scope, and of great practical significance.

Not revealed by the title is the fortunate circumstance that nearly half of the 700 pages in this book are of direct concern to theoretical and applied electrochemists.

Following a brief introductory chapter outlining the basic concepts of hydrodynamics, intensive description is given of the nature of convective diffusion in liquids in Chapters II and III. Heat transfer, coagulation and dispersion phenomena are covered briefly in Chapters IV and V.

In "Passage of Current through Electrolytic Solutions," Chapter VI, Levich goes considerably beyond the scope of hydrodynamics largely because he wishes to introduce the correct formulation of the essential feature of phenomena occurring during electrolysis. The sections in this treatment ["State of Quasi Equilibrium in an Electrolytic Cell," "Current Flow in an Electrolytic Cell," "Concentration Overpotential," "Chemical Overpotential," "Comparison of Various Factors that Determine the Value of Current in a Cell," "Current Distribution in an Electrolytic Cell in the Absence of Concentration Overpotential," "Flow in Current in an Agitated Electrolyte," "Theory of Disk Electrode," "Comparison of Theory and Experiment," "Quantitative Verification of Theory," "Application of the Theory of Convective Diffusion to the Solution of Electrochemical Problems," "Dissolution of Homogeneous Metals in Acids," "Study of Kinetic and Catalytic Electrochemical Processes by Means of a Rotating Disk Electrode," "Nonstationary Convective Diffusion," "The Case of Given Surface Concentration," and "Establishment of Regime at a Given Current Density,"] represent a

Manuscripts and Abstracts for Spring 1964 Meeting

Papers are now being solicited for the Spring Meeting of the Society, to be held at the Royal York Hotel, in Toronto, Ont., Canada, May 3, 4, 5, 6, and 7, 1964. Technical sessions probably will be scheduled on: Electric Insulation, Electronics (including Luminescence and Semiconductors), Electrothermics and Metallurgy, Industrial Electrolytic, Theoretical Electrochemistry

To be considered for this meeting, **triplicate copies of the usual 75-word abstract, as well as of an extended abstract of 500-1000 words** (see notice on page 246C of this issue), must be received at Society Headquarters, 30 East 42 St., Rm. 1806, New York, N. Y., 10017, *not later than December 13, 1963. Please indicate on 75 word abstract for which Division's symposium the paper is to be scheduled, and underline the name of the author who will present the paper.* No paper will be placed on the program unless one of the authors, or a qualified person designated by the authors, has agreed to present it in person. Clearance for presentation of a paper at the meeting should be obtained before the abstract is submitted. An author who wishes his paper considered for publication in the JOURNAL or ELECTROCHEMICAL TECHNOLOGY should send triplicate copies of the manuscript to the Managing Editor of the appropriate publication, 30 East 42 St., Rm. 1806, New York 17, N. Y.

Presentation of a paper at a technical meeting of the Society does not guarantee publication in the JOURNAL or in ELECTROCHEMICAL TECHNOLOGY. However, all papers so presented become the property of The Electrochemical Society, and may not be published elsewhere, either in whole or in part, unless permission for release is requested of and granted by the Editor. Papers already published elsewhere, or submitted for publication elsewhere, are not acceptable for oral presentation except on invitation by a Divisional program Chairman.

logical sequence in which rigorous formulation of the essential features of cell phenomena is given. Brief physical description is followed by concise mathematical statements and appropriate solutions of specific problems. Attention is focused on what is relevant, and the simplifications introduced are carefully stated. The author lives up to his statement: "We have not attempted a complete presentation but one that brings out the most important aspects of the subject." As a true teacher, Levich points out some popular fallacies and regrettable misconceptions that appear in some of the most widely accepted textbooks on electrochemistry. Much of the material in this excellent and extensive (140 pp) chapter represents the original contributions of Levich. Omission of some significant contributions that appeared in the non-Russian scientific literature in the past 15 years does not materially impair the value of his exposition.

"Motion Induced by Capillarity," and "Motion of Drops and Bubbles in Fluid Media" (Chapters VII and VII) are followed in logical sequence by "Motion of Particles in Electrolytic Solutions" (Chapter IX). Levich considers the case when particles are much larger than the thickness of the electric double layer. The basic phenomena are analyzed in the sections "Electrophoretic Motion near a Plane Surface," "Electrophoresis of Solid Dielectric Particles," "Electrophoresis of Ideally Polarizable Metal Particles," "Electrocapillary Motion of Mercury Drops in an Electric Field," "Motion of Liquid Metal Drops in an Electric Field," "Motion of Nonideally Polarizable Drops in an Electric Field," "Comparison of Theory and Experiment," "Fall of Mercury and Emulsified Drops in a Gravitational Field," "Potentials of Falling Drops," "Effect of Magnetic Field on the Fall of Drops of Mercury."

In Chapter X, "Theory of the Polarographic Method," Levich considers the liquid motion in a hanging mercury drop, before developing the equations for the diffusion current in the presence and in the absence of supporting electrolytes. Special sections are devoted to the discussion of complex hydrodynamic effects associated with the maxima of the first and second kind, and to the analysis of methods by which these maxima may be suppressed.

In Chapter XI, waves on a liquid surface are analyzed. The book is concluded by a very interesting brief chapter on motion and diffusion in thin liquid films.

This work is the product of an exceptionally gifted theoretical physicist, who shows unusual concern with problems of direct practical significance. The methods used are those of mathematical physics; precision and rigor are not sacrificed for momentary convenience or to cover up lack of understanding. Assumptions are clearly stated, and simplifications are made judiciously. On many occasions the author reveals remarkable physical insight and originality of perception. His mathematical technique is deft and elegant and serves his objectives well.

As it is with many outstanding books in science, readers of various levels of preparation may equally find this work of great value. Although the language of mathematics is used throughout and without compromise, and detailed steps in derivations are not generally indicated, the author describes his premises and conclusions in adequate detail, so that even those less familiar with advanced mathematics should be able to benefit from careful reading of this work.

The "raw" translation of this book was thoroughly revised by a group of devoted scholars in the United States. Major credit is due to Professor L. E. Scriven for the work of overall editing, and electrochemists should be particularly indebted to Professor J. Newman for his expert revision of the chapters on the Passage of Current through Electrolytic Solutions, and on the Motion of Particles in Electrolytic Solutions; and to Professor S. Bruckenstein for his work on the chapter on the Theory of the Polarographic Method. The language and typography are commendable, and the book contains relatively few misprints.

Electrochemists and engineers will find this book as a most worthwhile addition to their library. Equally well justified would be the selection of this book a text for graduate instruction in electrochemistry and chemical engineering.

Charles W. Tobias
Univ. of California

Announcements from Publishers

OTS Reports

"Research on Solar-Energy Conversion Employing Cadmium Sulfide," F. A. Shirland *et al.*, Harshaw Chemical Co., for the U. S. Air Force, Dec. 1962. Report AD 295 485,* 72 pages; $2.00.

"Solar Cell Array Optimization," Radio Corp. of America, for the U. S. Air Force, Dec. 1962. Report AD 295 558,* 104 pages; $2.50.

"Mercury Cell Battery Investigation," J. M. Booe and R. E. Ralston, P. R. Mallory & Co., for the U. S. Air Force, Jan. 1963. Report AD 296 906,* 66 pages; $1.75.

"Effect of Heat Transfer on Corrosion of Ferrous Alloys in Boiler Waters," W. E. Berry and F. W. Fink, Battelle Memorial Institute, for the U. S. Atomic Energy Commission, Apr. 1963. Report BMI 1626,* 30 pages; 75 cents.

"Preparation and Characterization of High-Purity Single-Crystal Boron," I. R. King, *et al.*, Texaco Experiment Inc., for the U. S. Air Force, Jan. 1963. Report AD 297 801,* 48 pages; $1.25.

* Order from Office of Technical Services, Business and Defense Services Administration, U.S. Dept. of Commerce, Washington 25, D. C.

Positions Wanted

Corrosion Chemist, Ph.D.—Seeks position in corrosion or related fields. Over twelve years experience in the various aspects of corrosion of a wide variety of metals and alloys. Numerous publications, honor societies, and patents pending. Metropolitan New Jersey area desired. *Reply to Box A 298, c/o The Electrochemical Society, Inc., 30 E. 42 St., New York, N. Y., 10017.*

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