Book Reviews

Textbook of Electrochemistry. G. Kortüm and J. O'M. Bockris. Elsevier, Houston–Amsterdam, 1951. vol. I, 352 pp. $7; vol. II, 544 pp. $10.

The appearance of an English edition of Kortüm's *Lehrbuch der Elektrochemie* is indeed a welcome event, for the widespread application of electrochemical methods in the chemical and biological sciences during the postwar period has made the need for a work of this character greater than ever before. It is also a pleasure to note that the masterly organization and presentation of the subject matter in the original German text has been retained in an idiomatic and concise translation. A comparison with the original shows, however, that considerably more than merely a faithful translation has been achieved. Not only is there evidence of critical revision, particularly in the chapter on the essentials of chemical thermodynamics, but two entirely new chapters have been added which, respectively, give a detailed account of experimental methods and present numerous useful tables of physicochemical quantities relevant to electrochemistry. In addition, a list of problems, graded in difficulty, together with solutions and explanatory notes, has been supplied to adapt the book for use by university students. The final result, which brings together in two volumes a lucid exposition of fundamentals, a comprehensive summary of modern electrochemistry, and a tabulation of up-to-date reference material. will appeal especially to research workers. Those who desire to gain an introduction to electrochemistry by means of self-study will also find this excellent textbook well adapted for such a purpose.

The enlargement of the scope of the book so that two volumes are now required has led, however, to difficulties in the division of the subject matter and in the indexing which are perhaps not ideally resolved. Thus, the average student who may not want or feel able to buy the complete work, unfortunately, may also be reluctant to buy the first volume, since both the index and the illustrative problems that go with it are in the second volume. This possible defect could easily be remedied by including the relevant problems and index in the first volume, thereby increasing the present 350-page length to only approximately 430 pages at most.

The copy is relatively free from errors, typographic or otherwise. Some readers, however, may find amusement in the discussion of redox systems (p. 305) in which a German bear has become an Irish bull: "In cells of this type it is immaterial whether the oxidizing agent is added to the cell, or *vice versa*." Certain other differences in terminology and convention may give pause to the American audience for this book. Thus (p. 75) the constant pressure, Gibbs free energy G, is termed: "the free heat content." More important, perhaps, is that the European convention for the sign of the electrode potential was preserved in the translation. Of course, this convention need not be a source of confusion on this side of the Atlantic, provided that a consistent formalism is followed in the writing of the cell equations.

In the second volume the more advanced, specialized topics of electric phenomena at interfaces, irreversible electrode processes, and the electrochemistry of gases have received relatively greater attention than in previous electrochemical textbooks, in keeping with the important developments in this branch of the subject during the past decade. The second of these chapters, 88 pages, is especially noteworthy. In the future, doubtless an exposition of the thermodynamics of irreversible processes will supply a foundation for the discussion of many of the transport processes in electrochemistry. It also seems probable that many of the discussions of electrokinetic phenomena may then be treated in a coherent and quantitative fashion .

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Introduction to Opinion and Attitude Measurement. H. H. Remmers. Harper, New York, 1954. viii + 437 pp. $5.

As a comprehensive survey of the attitude measurement field, this book has a good deal to recommend it. It at least touches on nearly every phase of the field and treats some subjects in considerable detail.

The first section is devoted to the techniques of measurement, with chapters on sampling, statistics, scaling, and questioning techniques. The second section is concerned with applications of opinion and attitude measurement to business, government, education, and the community.

According to the publisher's statement, "this is, we believe, the first suitable textbook prepared for college courses in the subject." While I can think of one or two other textbook candidates, the fact remains that Remmers has written a thorough and inclusive introduction to the theory and practice of attitude measurement.

A book that attempts to cover an entire field in the space of a few hundred pages inevitably suffers from some shortcomings. One is a tendency to move from one subject to another with a minimum of delay. Thus question wording, one of the crucial phases of opinion measurement, is disposed of in about five pages. Another weakness is the occasional introduction of terms and concepts without thorough explanation of them. In general, the chapters on sampling, statistics, and scaling are quite good, but they do employ terminology and concepts that will be difficult for the beginning student to master, particularly for one without a statistical background.

Finally, the attempt to cover everything in the field has resulted in a mass of briefly summarized studies, particularly in the "applications" section of the book.

It is quite difficult to retain, digest, and extract the significance of these many studies. The brief summaries at the end of each chapter do not accomplish this function.

The foregoing are minor flaws, however, in an otherwise commendable book. On the positive side, the author's thorough treatment of the technical and difficult subject of scale analysis, his chapter on the applications of attitude measurement to industry, and his review of indirect methods of measurement are excellent.

Extensive bibliographies at the end of each chapter are helpful for those interested in a more detailed exploration of the subjects treated.

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Ion Transport across Membranes. Papers presented at a symposium at the College of Physicians and Surgeons, Columbia University, Oct. 1953. Hans T. Clarke, Ed.; David Nachmansohn, Assoc. Ed. Academic Press, New York, 1954. xi + 298 pp. Illus. $7.50.

The papers presented at a symposium on *The Role of Proteins in Ion Transport across Membranes* are collected in this volume, together with six other contributions. In the first paper, Ussing gives a useful summary of the results of ion transport studies. In the second paper, by Hodgkin, electric processes in nerve conduction are described for the benefit of physicists and chemists rather than for physiologists. The summary is a highly abridged version of the explanations offered by the author for the relationship between membrane potential changes and transfers of Na^+ and K^+. "The generation of bioelectric potentials" is the title of a paper by Wilson and Nachmansohn, and this, perhaps more appropriately entitled "Studies on acetylcholine," contains the well-known views of these authors. Friess, Blum, and Morales, in an interesting note, show that a reacting mixture of ACh and its esterase has a greater ultraviolet absorption than the sum of its components, and that light-scattering measurements fail to demonstrate a change in the shape of the protein when it interacts with ACh.

Parpart and Hoffman in "Ion permeability of the red cell" provide an up-to-date summary of the various problems existing in this field. A paper by Mudge on "Renal mechanisms in electrolyte transport" contains much interesting material, especially at the cellular and histochemical level. Two very interesting theoretical contributions follow, the first by Parlin and Eyring on "Permeability and electric potential" and the second on "Transport of ions through biological membranes from the standpoint of irreversible thermodynamics" by Kirkwood. The use of ion-exchange membranes to secure electrodes where neither oxidation nor reduction takes place is discussed by Scatchard and also by Sollner, Dray, Grim, and Neihof. These latter authors also present a large amount of experimental data on collodion and other types of membranes, A paper by Hill, "Theory of protein solutions," is an application of statistical-mechanical considerations to the thermodynamic properties of protein solutions. "The interaction of proteins and ions, with special reference to mercury derivatives of mercaptalbumin," by Edsall, "The specificity of metal-protein interactions," by Gurd, and "Equilibrium and sedimentation of uncharged particles in inhomogeneous electric fields," by Debye, complete the volume.

By way of general comment, although the contributions are all of high quality, there seems little homogeneity to the subject matter of the volume. The original title of the symposium has been dropped as a title for this volume, presumably because none of the contributions deal with this problem; indeed, it has not been possible to connect proteins with the transport of sodium or potassium ions. Only four papers out of 14 deal with ion transport from an experimental point of view, two papers deal with theoretical problems in ion transport, and the rest are contributions to protein chemistry or high polymer chemistry.

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Histopathologic Technic and Practical Histochemistry. Rev. ed. of *Histopathologic Technic.* R. D. Lillie. Blakiston, New York, 1954. ix + 501 pp. $7.50.

This is a very personal book, in which a distinguished and able pathologist makes available to his fellow-workers the methods that he has found helpful or interesting during his many years of experience. The author has been a pioneer in the application of histochemical procedures for the study of pathologic tissue. His interest in histochemistry has been largely within the realm of those reactions that can be applied to sections or tissues on a slide rather than in exploitation of fragmentation and differential centrifugation methods or microchemistry of a test-tube nature applied to tiny tissue fragments or sections.

Within his chosen area Lillie has included many methods useful for localizing compounds, groups, or enzymes in tissue sections. These are presented more or less in cook-book fashion, each accompanied by a brief statement of the author's evaluation of and experience with the method and by adequate bibliographic references. The extensive citing of histochemical procedures is a feature of this new edition, which preserves from the previous edition the presentation of numerous methods for staining, fixing, sectioning, injecting, or otherwise preparing tissue for microscopic examination. The result is an impressive collection of methods, each presented in the light of Lillie's personal experience.

Useful features included at the end are tables of formulas, buffers, acids, and other data helpful in preparing solutions used in the methods cited. Perhaps useful for beginners is the opening chapter, dealing with Lillie's practices in using the microscope, although this section is not altogether sound from the