

acid and continuing with an extensive discussion of the physico-chemical literature which led to our present views of solutions in acetic acid. A convenient table of titrations performed in acetic acid is included.

Chapter 2, "Chemie in Essigsäureanhydrid" by Horst Surawski (70 pp.), has a pattern quite similar to the first chapter. Considerable conductance data are presented including the interpretation of phoreograms using Shedlovsky's modification of the Fuoss-Kraus method. A review of conductimetric, potentiometric, and indicated titrations is given. Also included is a summary of displacement and precipitation reactions.

Chapter 3, "Chemie in geschmolzenem Acetamid" by Gerhard Winkler (19 pp.), and Chapter 4, "Chemie in wasserfreier Ameisensäure" by Herbert Knauer (28 pp.), are considerably shorter than the preceding chapters. Both follow the patterns of the previous chapters and are of high over-all quality.

The last chapter, by Lyle R. Dawson, "Chemistry in Formamide and Derivatives of Amides" (40 pp.), is a comprehensive summary of conductimetric data and their significance. The author is well known for his contributions to this area.

As in all books of such wide scope, omissions have occurred. A discussion of photometric and thermometric titrations in *glacial acetic acid* is absent. In Chapter 5 no discussion of acid-base titrations or polarography is given. These and other minor omissions detract slightly from this book's value.

The editors and authors of this volume have filled a void in the nonaqueous chemical literature and have produced a book which will undoubtedly find its way into the libraries of those seriously interested in this field.

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Experimental Methods in Gas Reactions. By SIR HARRY MELVILLE and B. G. GOWENLOCK. St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y. 1964. 446 pp. + vii. 15.5 × 22.5 cm. Price, \$17.00.

Workers in the field of gas reactions are familiar with the book by Farkas and Melville, "Experimental Methods in Gas Reactions." New materials of construction, commercial equipment and components, and experimental techniques in the 25 years since this book was written have made necessary this revision. The authors claim that about half of the book consists of new material, and half contains standard information from the first edition which is of value. The book is divided into broad sections on kinetic theory of gases, pressure control and measurement, temperature control and measurement, the preparation and purification of gases and volatile compounds, gas analysis, photochemical techniques, and a concluding general chapter on the assembly of assorted varieties of apparatus. Material on classical (pregas chromatography) gas analysis is still retained in detail because the authors felt that in some instances these techniques may be more convenient or accurate than chromatographic techniques; there do not exist separate recent works listing these methods in detail for the benefit of people new to the subject. Gas chromatography warrants only about six pages of discussion, probably because there are numerous small and large books now available on the subject. The same is true for mass spectrometry. Many drawings and more detailed discussions are found of special techniques and apparatus which would not be obvious or readily found elsewhere by a person who is not already conversant with the material. An example of such an item is the inefficiency of many common cold traps in the trapping of samples from the effluent gas of a gas chromatography; this is not mentioned in many sources on gas chromatography, although it is found here. Probably the greatest value of the book is the utility as a catalog for a tremendous number of references for items or methods which can only be cited in passing in the text. The equipment items and manufacturers mentioned are almost solely of British origin. The knowledge that an item is available commercially in another country usually encourages the interested experimenter to look for a more readily available domestic counterpart, so this is not a serious hindrance in the use of the book.

The authors are to be commended for their work.

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The Mitochondrion. Molecular Basis of Structure and Function. By ALBERT L. LEHNINGER, Department of Physiological Chemistry, The Johns Hopkins University School of Medicine. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1964. 263 pp + xx. 16 × 24 cm. Price, \$9.00.

This monograph is first of a series in microbial and molecular biology, designed, as stated in the foreword and preface, to present a comprehensive review in broad perspective that will permit the advanced student or research worker to obtain an up-to-date grasp of an actively developing area without having to refer extensively to original papers. It was also the intent to present not an exhaustively documented classical monograph but an easily readable account of many contributions and points of view, coupled with additional interpretations and speculations about developments in the future.

This book does a remarkable job of accomplishing just what is proposed by the editor and the author. The narrative account is thoroughly and easily readable, with clear exposition. The description of the past history, the analysis of our present knowledge, and the looks into the future are well done. One may disagree with some speculations or not favor some given considerable space by the author, but they are all worth careful consideration. The author presents some imaginative ideas and has a keen sense of what may be a significant lead. He has pointed out many of these in his interesting discussions of problems to be faced. There is only an occasional uncritical evaluation of a correlation and essentially no omissions. Possibly there could have been a little more speculation concerning the ferredoxin type of enzyme (non-heme Fe) as an area for future development.

The book should be very useful for students, and it is a wonderful book for the experienced person to use in broadening his appreciation, refreshing his memory, or as a lead back into literature on less familiar points. A careful reading of the foreword and preface should prevent anyone from being misled seriously by any unwarranted generalizations. Although the author clearly understands the importance of separating fact from speculation (p. ix), in such a narrative account it is difficult to avoid a mistake we all commonly make. Many correlated facts are cited as if cause and effect had been thoroughly established, although other explanations may exist. Although this might be slightly misleading to the inexperienced, we must weigh against this possibility the considerable probability that the suggested relationships are close to the true ones. As in any field where developments are rapid, some speculations may be out of date by the time a book gets into print.

The danger that a book of this type might present a decidedly one-sided point of view and interpretation has been avoided. As is to be expected in this type of account, the author at times draws heavily on the work of his own laboratory, but the full picture is completed with accounts of the work in other laboratories. Areas in which there has been considerable controversy are summarized and discussed with a clarity and brevity that should be most rewarding for the reader not actually working in the field. In considering his own work, the author makes several excellent analyses about what has and has not been proven by the experiments to date; for example, the contraction of mitochondria by added ATP.

Especially good or timely chapters are those on mitochondria in the intact cell, controls that may function in the citric acid cycle (such as the list of all possible reactions of oxalacetate on p. 146), and the origin of mitochondria. There is a good brief summary of the implications in one or two electron-transfer mechanisms in the respiratory chain (p. 117), and the explanation for considering reduced as well as oxidized carriers as high energy intermediates should help many who have not fully grasped the suggestions of B. Chance (pp. 120-125).

The bibliographic references, separated into reviews and a limited number of selected original papers, do serve admirably as starting points for anyone wanting to enter the literature to investigate some point in greater detail. Not only is the complete title of the paper included, but a word or two of comment in some cases lets the reader know which reference deals unusually well with a certain point, and whether papers in foreign journals are in English. The index is adequate; the table of contents, with the subheadings in all of the chapters, is very useful.

As in all books some errors have crept in. The usual minor ones, such as listing DNP as an electron-transport inhibitor (p.