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## BOOK REVIEWS

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**Instrumental Methods of Chemical Analysis.** By GALEN W. EWING, Associate Professor of Chemistry, Union College, Schenectady, New York. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1954. x + 434 pp. 16 × 23.5 cm. Price, \$6.50.

This book, as stated by the author in the preface, is designed as a textbook for an advanced undergraduate course or a first-year graduate course in Analytical Chemistry. The book is divided into two parts: Part I on Principles, covers 351 pages; Part II on Laboratory Experiments, which includes directions for 33 experiments, covers 57 pages. After the introduction, the next four chapters (100 pages) are devoted to electrical methods which include conductance, e.m.f. measurements, voltammetry and electro-deposition. The next seven chapters (150 pages) deal with optical methods and would appear to be the strongest and most thorough section of the book. Comparatively short chapters on Radioactivity, Mass Spectrometry, Analysis of Gases and Thermal Analysis then follow. The latter chapters of this section discuss the Determination of Water, Extraction Analysis, Chromatography and Ion Exchange even though these techniques do not necessarily require instrumental methods of analysis. Each chapter includes a set of problems and a series of references which should greatly increase the value of this book as a text in an advanced course in Analytical Chemistry.

The experimental part of the book gives directions for a rather wide variety of experiments. Even though several of the experiments seem simple and somewhat superficial, there would appear to be an adequate choice of experiments for most courses that include laboratory work and where a minimum amount of equipment is available.

A Table of Standard Oxidation Potentials, a list of 350 Isotopes which includes those available from the U. S. Atomic Energy Commission, and a Greek Alphabet are given in the Appendix.

The book, as a whole, is written in a rather descriptive manner. There are numerous drawings and pictures of commercially available instruments. References to advanced theory and derivations are made but little rigorous treatment is found in the text. The book, therefore, would appear to be very useful for the non-analytical chemist but probably will be insufficient, in itself, for the chemist specializing in Analytical Chemistry.

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CLARK E. BRICKER

**A Manual of Paper Chromatography and Paper Electrophoresis.** By RICHARD J. BLOCK, Department of Biochemistry, New York Medical College, New York, N. Y., and Director, Biochemical Laboratories, The Borden Company, Yonkers, N. Y., EMMETT L. DURRUM, Chief, Department of Pharmacology, Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C., and GUNTER ZWEIG, Research Biochemist, Charles F. Kettering Foundation, Yellow Springs, Ohio, and Associate Professor of Chemistry, Antioch College, with the cooperation of RAYMOND LESTRANGE, WINSTON H. WINGERD and KATHRYN W. WEISS. Academic Press Inc., Publishers, 125 East 32nd Street, New York 10, N. Y. 1955. 484 pp. 16 × 23 cm. Price, \$8.00.

The techniques of paper chromatography and paper electrophoresis are compiled and arranged in this book which is written as a manual for the growing number of investigators who employ these methods of analysis. The organization of the material is convenient and the descriptions of methods readable and explicit. The coverage of published material is quite extensive and probably as complete as it can be in such a rapidly developing field.

The section on paper chromatography (329 pp.) includes a short chapter on theory, two chapters on general and quantitative methods and nine chapters on specific procedures for

various classes of compounds. These procedures include solvent systems for separations, methods of detection of compounds on paper, group and specific tests for identification and other pertinent material.

This section is an expanded revision of the 1952 manual on Paper Chromatography by Richard J. Block, Raymond LeStrange and Gunter Zweig (195 pp.). The two chapters on methods are changed but slightly with the addition of some calculations and tables. The chapters on procedures for various classes of compounds have all been expanded, some greatly, with the addition of more methods, tables and enlargement of existing tables. The bibliography for this section has also been increased more than twofold, and will serve as a very useful reference to original work. Simplification of the table of contents seems an improvement since there is an extensive subject index.

The newly-added section on paper electrophoresis (76 pp.) includes general theory, general and quantitative methods, two-dimensional techniques and continuous flow methods.

This book will be useful both to the novice who needs a guide to materials and methods for getting started, and to the experienced user of these techniques who may be looking for new ways of accomplishing some difficult analysis. In either case, this manual will serve as a starting point from which improvements can be made as the investigator gains experience. In fact, most workers with some experience in chromatography will find areas in which they know of improved techniques already in use that for reasons of triviality have never been published. Some methods in the manual will be found to be unnecessarily difficult or cumbersome. A case in point is a direction (p. 40) for making radioautographs that requires loading in complete darkness and a complicated foam-rubber and heavy plywood frame, when in actuality a safe-light (yellow filter) and simple, inexpensive cardboard medical X-ray film holder are sufficient. Other pieces of overly-complicated equipment appear from time to time in the methods chapters.

In the section on paper electrophoresis it would have been worthwhile to mention the work of Karler which has led to a commercially-available (Microchemical Specialties Co., Berkeley, Calif.) continuous electrophoresis apparatus.

Despite minor limitations, some of which are imposed by the young and rapidly-growing state of the subject, this book will be a valuable addition to any laboratory employing these paper chromatographic or electrophoretic methods.

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**Annual Review of Nuclear Science.** Volume 4. By JAMES G. BECKERLEY, Editor, United States Atomic Energy Commission, MARTIN D. KAMEN, Associate Editor, Washington University Medical School, and LEONARD I. SCHIFF, Associate Editor, Stanford University. Annual Reviews, Inc., Stanford, California. 1954. ix + 483 pp. 16 × 23 cm. Price, \$7.00.

This volume follows the pattern established in the three preceding issues of the series in presenting a collection of summary papers on diverse topics connected with nuclear science. Several of the articles are particularly timely, for example Blewett's brief and clear description of Recent Developments in Proton Synchrotrons, and Pake's essay on Radiofrequency and Microwave Spectroscopy of Nuclei, a field in which rapid development continues. Each article should be interesting and valuable to specialists in the particular subject discussed; many readers who have a professional interest in nuclear physics or its applications will wish to own a copy of the book.

Chemists who have any direct concern with uses of isotopic tracers will find Inghram's paper on Stable Isotope Dilution as an Analytical Tool a clear and useful exposition. Those unfamiliar with the field may be surprised at the scope of the technique (Inghram lists 68 elements for which it is