

Book Reviews

Analytical Absorption Spectroscopy: Absorptimetry and Colorimetry. M. G. Mellon, Ed. New York: John Wiley; London: Chapman & Hall, 1950. 618 pp. \$9.00.

In the words of the editor, "The present volume on absorptimetry and colorimetry has been written almost entirely from the viewpoint of what seems of most practical concern in a modern chemical testing and analytical laboratory." The nine chapters with their contributing authors include:

"Chemistry: Preparation of Systems for Absorptimetric Measurement," M. L. Moss; "Physics: General Principles of Absorptimetric Measurements," M. G. Mellon; "Color Comparimeters," W. B. Fortune; "Filter Photometers," R. H. Muller; "Spectrophotometers: Ultraviolet and Visible Regions," K. S. Gibson; "Photographic Methods," E. R. Holliday; "Applications of Ultraviolet and Visual Spectrophotometric Data," E. I. Stearns; "Spectrophotometers: Infrared Region," L. J. Brady; and "Measurement and Specification of Color," Deane B. Judd.

The reader will find that, in general, the discussions are limited to applications of the methods with little more than a brief introduction to the underlying theories. Ample references are given, however, if it is necessary to obtain information in greater detail than is justified in a general reference book of this type. Of special importance to the analytical chemist is the careful consideration given to the sources of errors that may be encountered and the proper means for minimizing their effects on analytical results.

Another indication that the authors had the welfare of the analytical chemists at heart is the attention given to the standardization of nomenclature. Workers in the field can appreciate the task involved in compiling a book of this type when the situation is one which may be described as virtually a state of anarchy, with each worker steadfastly adhering to his own code. Throughout all this the analyst has been but a voice crying in the wilderness. It is hoped that he may derive some comfort from the care with which the nomenclature has been handled here. Even so, one complete chapter is based on another system (chapter 6).

Obviously, one may expect considerable overlapping in subject matter from chapter to chapter when each is written by a different author, but it is sufficiently extensive in this case to suggest that more care could have been exercised in the editing. As a case in point, there is little reason that one should find a more complete description of filters in the chapter on spectrometers than he finds in the chapter on filter photometers. The net result, then, is that each chapter is more or less complete unto itself which, after all, may be of some advantage.

For the most part, the volume is up to date, with references as recent as 1949, and the subject matter is, on the

whole, well presented. It is regrettable, however, that more recent information is not included in the chapter on infrared spectroscopy. For example, one is disappointed to find that the discussion on nondispersive analyzers is limited to the negative filter type, with no mention of the later use of pneumatic detectors. Similarly, the Golay infrared detector, which has met favor with many workers, has been neglected. The discussion of techniques involved in applications of the method might also have been developed more thoroughly.

Although these and other minor shortcomings may be found, the various aspects of the field have been well summarized. This is especially true of the chapters on chemistry, spectrophotometers (VS and UV), spectrophotometric data, and the measurement and specification of color. It is also gratifying to find that the photographic method has not been overlooked and that its usage has been ably covered. For these reasons, the analyst will find this to be a useful reference book on the application of absorption spectroscopy.

ROBERT E. TORLEY

*Analytical and Testing Division
American Cyanamid Company*

Das Polarisationsmikroskop als Messinstrument in Biologie und Medizin. Hans H. Pfeiffer. Braunschweig, Germany: Friedr. Vieweg, 1949. 94 pp. DM 8.50.

Chemische Spektralanalyse, Vol. I. 4th ed. Wolfgang Seith and Konrad Ruthardt. Berlin, Germany: Springer-Verlag, 1949. 173 pp. DM 16.50.

The polarizing microscope, long an indispensable instrument for petrographic research, has become of increasing importance in other fields of science. The present brief monograph was written to acquaint biologists with qualitative and quantitative methods of polarizing microscopy as employed in the study of biological objects. In the restricted space of 94 pages the author gives a competent treatment of the subject which, as he sees it, will become of steadily increasing importance.

After a discussion of fundamental concepts and definitions and of the different types of birefringence, especially those produced by oriented submicroscopic elements, the construction and operation of the polarizing microscope are described in some detail. The second chapter, representing methodology, deals with the preparation of biological samples for measurements with polarized light. The third chapter contains metronomic details regarding quantitative measurements and the use of different types of compensators for the exact determination of phase differences.

This handy little volume may be of great value for biologists who want to obtain reliable information in this field.

In *Chemische Spektralanalyse* the authors' purpose is to give chemistry students or industrial chemists sufficient information for handling spectrographic equipment and auxiliary apparatus and to familiarize them with the most important methods of qualitative and quantitative spectroscopic analysis. This goal is reached by detailed discussion of about thirty typical laboratory experiments. Clear drawings and photographic reproductions facilitate easy understanding.

The treatment is confined to methods and equipment developed and used in Germany. The authors are aware of this deficiency and intend to include discussions of the progress of English and American research in the next edition. Indeed, this would greatly increase the value of this manual and would automatically bring the treatment of grating spectrographs into the scope of the text. The fact that the book came out in its fourth edition is sufficient proof of its usefulness for instructing students at German universities. Instructors in spectrography at American universities may also profit from the study of this book, which is written in a clear and easy German.

K. W. MEISSNER

Department of Physics
Purdue University

Industrial Instrumentation. Donald P. Eckman. New York: Wiley; London: Chapman & Hall, 1950. 396 pp. \$5.00.

As the author states in his preface this is an introduction to the science of measurement rather than to the detailed study of the mechanism to accomplish the measurement. A single volume with a thorough coverage of instrument types is quite welcome. Illustrative of this coverage is the chapter on mechanical measurements, which includes displacement gauges, strain gauges, force meters, velocimeters, and accelerometers. We can find in this book electrical, mechanical, and pneumatic measuring means for measuring pressure or differential pressure, as well as such diverse instruments as the mass spectrometer and the polar planimeter. The large number of illustrations, all of which are schematic, add materially to the written word.

The book collects in one volume practically all the conventional methods for the measurement of physical phenomena. Many of these are in general industrial use today, but others find application only in research and testing laboratories. In that the laboratory instruments of today will become the industrial instruments of tomorrow, this volume should be of interest to all industrial instrument engineers. The chapter on "Methods for Composition Analysis" is indicative of this fact, for it will introduce to many readers new measurement methods based on well-known physical phenomena. The author has often departed from instrument methods to delve into the fundamental physics pertaining to the particular measuring problem. These departures extend from the entire first chapter on "Qualities of Measurement" to the next to the last chapter on "Flow Metering." *Industrial Instrumentation* should be a welcome addition

to the schools and colleges that have or are adding courses in industrial instrumentation and control. The problems included in each chapter will extend the book's usefulness in classroom work. Many of these require an analytical approach through fundamental physics before the answer can be determined. An appendix of 23 tables is of added interest to both the student and the instrument engineer. The author has done an excellent job in presenting the many means for measuring physical phenomena. As a companion volume to Eckman's first book, *Principles of Industrial Process Control*, it is a continuation of the author's clear presentation of the fundamentals involved.

WALTER P. WILLS

Brown Instruments Division
Minneapolis-Honeywell Regulator Company

Metallurgical Applications of the Electron Microscope. London, England: Institute of Metals, 1950. 164 pp. \$3.50.

This volume consists of 14 papers presented at a symposium organized by the Institute of Metals and held at the Royal Institution, London, on November 16, 1949. The purpose of the symposium was to draw together workers from all parts of the world to review and discuss the present state of the field of electron microscopy as applied to metallurgy. Among the countries represented were England, France, United States, Belgium, and Germany.

Since the volume comprises the separate papers presented at the symposium, there is some repetition, particularly in the introductory discussion of electron microscopy. The arrangement of the book places the more general papers concerned with instruments and associated techniques at the beginning, followed by those dealing with specific problems and applications.

The subject matter will be of interest primarily to those actively engaged in the electron microscopy of solid surfaces. The standard replication techniques and variations thereof are quite fully treated and the results obtained by them compared and criticized. The applications of interest to metallurgists include brasses and bronzes, steels, aluminum alloys, and nickel-chromium alloys. Precipitation and age-hardening problems represent the bulk of the applications, although the etching of pure aluminum, studies of slip lines, fracture, and metal powders are also presented. The papers are all well illustrated with high-quality reproductions of electron micrographs.

The concluding General Discussion should be of considerable interest, with its pertinent questions concerning replicas and their interpretation and the recognition of etching reactions as a little-understood phenomenon. One or two short contributions not included in the symposium proper are found in the discussion.

It is hoped that such symposia will be held in the future and that the subject matter will be published in as effective a manner as was this one.

ROBERT D. HEIDENREICH
Bell Telephone Laboratories