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 industial 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