

an interesting one: does it have a new or lively approach?

I must have read too many geology texts. Or perhaps one becomes hypercritical toward the end of an academic year, for the book has furnished me neither instruction nor interest. As to the latter, however, only you should be the judge. Remember, the instructor may shine by contrast!

LINCOLN DRYDEN

Department of Geology,
Bryn Mawr College

A Working Manual

Comprehensive Analytical Chemistry. vol. 1c, *Classical Analysis*. Gravimetric and titrimetric determination of the elements. Cecil L. Wilson and David W. Wilson, Eds. Elsevier, Amsterdam, 1962 (order from Van Nostrand, Princeton, N.J.). x + 728 pp. Illus. \$24.

This is the final part of volume 1 of the treatise; in all, five volumes are planned. Parts 1a and 1b dealt with general gravimetric and titrimetric analysis; part 1c gives gravimetric and titrimetric methods for each element, with references to other methods, such as absorptiometric or radiometric methods, where appropriate. Within its prescribed limits, the book certainly merits the "comprehensive" used in its title.

In the preface the editors "reiterate [their] aim . . . that *Comprehensive Analytical Chemistry* should be a *working* manual, offering as far as possible direct and immediate assistance." For each element a short review is given of its occurrence and general analytical characteristics; this is followed by a discussion of sample preparation, separation, and determination. Then selected procedures for separation and determination are given in sufficient detail for the reader to use the book directly at the laboratory bench.

The treatment of each element or group has its own bibliography, and in general each reference is followed by a descriptive sentence. The book is therefore an excellent starting point for literature searches. There is a good subject index, but no author index.

Very occasionally the text reads like a review in *Analytical Chemistry*, but it goes far beyond a mere list of references. The merits of different methods are critically discussed, and the 30 authors (seven are American, the others

British) draw on their own experiences for their recommendations. Methods such as ethylenediaminetetraacetic acid titration, precipitation from homogeneous solution, solvent extraction, and ion exchange are used freely but with critical evaluation. However, beginning with the first part of the book, the discussion of alkali metals, I was puzzled to find no mention of zirconium phosphate-type ion exchangers for separating rubidium and cesium and other elements in the alkali and alkaline earth groups. Then I looked at the bibliography that follows this section and found only one reference dated later than 1955.

In general the literature is well covered through 1954 and 1955, but no later. (The section on cobalt is an exception.) Thus, there is no mention of the Schöniger combustion technique for elementary analysis of organic compounds, though space is given to other, now antiquated, methods.

I know something of the difficulties of producing a cooperative work of this kind, and the editors are not to be envied. Nevertheless, it is a pity that so long a time seems to have elapsed between the preparation of the manuscripts and the publication of the volume.

HAROLD F. WALTON

Department of Chemistry,
University of Colorado

Inside the "Black Boxes"

Introduction to Chemical Instrumentation. Edward J. Bair. McGraw-Hill, New York, 1962. viii + 349 pp. Illus. \$10.75.

This new approach to chemical instrumentation will be a valuable addition to the book shelves of many scientists. In the past, existing commercial instruments have been described by treating them as "black boxes" and giving explicit instructions for their operations. Very little attention has been given to what is inside—that is, to how information is taken from the sample, converted to an electrical signal, sorted, analyzed, and then displayed in some sensible form. Up to now there has likewise been no book on electronics which is directed toward chemical applications. As a useful supplement to books on electronics and chemical instrumentation, Bair's book will be of especial use to scientists who must de-

sign their own chemical instruments and to those who must extend the use of existing instruments.

A knowledge of electronics, although helpful, is not required. Bair has included a chapter on electronic parts which serves as an introduction to a description of the elementary circuits or electronic components. These components are then treated as units in block diagrams. Thereafter the emphasis is placed on the flow of signals through block diagrams rather than on electronics.

Many helpful hints and instructions are given for the design and construction of new chemical instruments.

JOHN A. BORNEMANN

Department of Chemistry,
Northern Illinois University

Nuclear Reactors

Heavy Water Exponential Experiments Using ThO₂ and UO₂. J. A. Thie. Pergamon, New York, 1961. 170 pp. Illus. \$6.

Heavy water exponential experiments using uranium and thorium oxide fuels are discussed in this book's 11 chapters: (i) introduction; (ii) exponential method; (iii and iv) Scandinavian UO₂-D₂O lattice experiments and the interpretation of results; (v and vi) Saclay UO₂-D₂O lattice experiments and interpretation; (vii and viii) Savannah UO₂-D₂O lattice experiments and interpretation; (ix) Argonne UO₂-ThO₂-D₂O lattices; (x) theoretical interpretation of UO₂-ThO₂-D₂O lattices; and (xi) considerations in planning exponentials. Four appendices deal with symbols and units, counting corrections and statistics, a method for interpolation in moderator to fuel ratio dependent bucklings, and a list of nuclear properties of UO₂, ThO₂, Al, and D₂O.

This book treats the experimental arrangements and outlines the theoretical treatment of the data obtained. That the material has been drawn from a variety of laboratories is evident from the chapter headings. The experimental arrangements are reported in considerable detail, and Thie includes the lattice geometry with all the reported buckling information (something that other writers often fail to do). The book does not consist solely of a factual report of data, but a comparison and an interpretation of the different procedures of various laboratories are also made.