

3. An improved method for the preparation of pure β -phenoxyethyl and γ -phenoxypropyl chloride in good yields has been developed.
4. γ -Chloropropyl benzoate has been prepared for the first time and its properties have been described.

HOUSTON, TEXAS

NEW BOOKS

Physikochemisches Praktikum für Chemiker und andere Naturwissenschaftler. (Physicochemical Practice for Chemists and other Scientists.) Dr. A. THIEL, Professor of Physical Chemistry at the University of Marburg. Gebrüder Borntraeger, W 35 Schöneberger Ufer 12 a, Berlin, Germany, 1926. xv + 380 pp. 70 figs. 25 × 16 cm. Price, 16.80 G. M.

Professor Thiel justifies the publication of this laboratory guide in physical chemistry on the ground of the failure of all previous manuals to meet his own particular needs. For the same reason all instructors of physical chemistry will find much to criticize in the present volume.

We are told that the general student in chemistry having the necessary apparatus at his disposal can perform the described experiments in a period of six weeks, spending the whole of every day in the laboratory. It is seldom that American university conditions allow for a period of 240 continuous laboratory working hours.

The value of physical-chemical laboratory work is seen as a balance wheel at the time when the student, throwing aside the burdensome load of quantitative analysis, proceeds to "mess" in organic chemistry.

The table of contents reads surprisingly like those of similar books of the past three decades. Indeed, this fact may be taken as an indication that physical chemistry at present is content with the achievements of the past. Should not even the "general student" have experimental acquaintance with such phenomena as adsorption, gaseous equilibrium involving thermodynamical calculations, photochemical changes and heterogeneous catalysis?

The experiments are described in great detail, each group being introduced by a satisfactory explanation of the fundamentals involved. One feature that will find much favor with some is the presence, at the end of each experiment, of actual laboratory data together with the necessary numerical calculations that are required. A weakness common to most laboratory manuals is detected here, that is, insufficient use is made of the measurements. For example, an experiment measuring the heat of neutralization is performed. The result is a bare, uninspiring number. Let a few such measurements be made with acids and bases of various strengths, and the results interpreted in terms of heats of ionization and hydrolysis of salts, and the dull heat of reaction will then be transformed into a phenomenon of interest.

W. A. PATRICK

Applied Biochemistry. By WITHROW MORSE, Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadelphia. W. B. Saunders Company, Philadelphia and London, 1925. 958 pp. 257 figs. 25 × 16.5 cm. Price \$7.00 net.

The idea uppermost in the author's mind, it seems, has been to produce a textbook especially designed to meet the needs of medical students. The rather unusual title is thus explained, but whether the treatment is sufficiently out of the ordinary to justify the term "applied" is somewhat doubtful. On a few such matters as the examination of the gastric contents there is rather more attention paid to clinical applications than one finds in most textbooks of biochemistry, but on the whole the subject matter has about the customary trend.

The last nine chapters, comprising something more than half the book, are occupied with the subject of metabolism, including the principal analytical methods for the study of this phase of biochemistry. The material is, generally speaking, well selected, but errs, if such a thing is possible, on the side of being too thoroughly up to date. This may seem an odd objection to raise against a textbook, considering that so many of them fall short in the opposite direction. Nevertheless, nearly all the original papers cited in the footnotes are less than five years old, and the text in spots gives the appearance of having been founded on the contents of the last few volumes of American and British journals.

Each chapter is followed by a bibliography, including references mainly to books and brief reviews. This is a valuable addition, but will hardly offset the undesirable effects of the author's tendency to disregard the background of the science. Among these is a certain lack of balance. The earlier foundations of dynamic biochemistry are presented, if at all, as a series of dogmatic statements, virtually devoid of any stimulus to thought. Another inevitable result is, in the case of controversial points, an over emphasis on the very latest word, which in one or two instances at least has already given signs, since the book was sent to press, of its inability to stand the test of time.

Loose statements and gross errors, of which the section on metabolism is comparatively free, unfortunately abound in the early chapters, devoted chiefly to descriptive chemistry. For example, the Sørensen value (P_H) of decinormal alkali is given as 14.0 (p. 39), and again (p. 177) the author speaks of *d*- and *l*-glucosides when he obviously means α and β . Similar mistakes are numerous, distressingly so even for a first edition, and many of the structural formulas are wrong. Otherwise the subject matter of these first eight chapters is for the most part very well presented, with the aid of diagrams and many illustrations. Parts of Chapters I and II (on Physical Chemistry), however, have been written carelessly, and as they stand will be a source of confusion rather than an aid to students not well trained in

chemistry beforehand. Some of the statements in these two chapters are almost unintelligible—the result, apparently, of a futile attempt to expound a scientific subject with the least possible use of scientific terms—while others are quite wrong. The discussion of osmotic pressure on p. 118 may be mentioned as an instance.

The book is intended to be used also as a laboratory manual. While there are objections to combining didactic and experimental material under one cover, this arrangement is undoubtedly preferred by some. In many books the experimental part is collected together at the end. A good deal can be said in support of the plan, adopted here, of scattering the experiments through the text, each in its appropriate place.

Textbooks of biochemistry in the English language are none too numerous, and no one will deny that there is room for more. The present one has several points distinctly in its favor. The excellence of the illustrations and the freedom from superfluous and highly speculative matter, for example, are features that will appeal to not a few. Freed from a few serious defects, this book should find a place for itself among the present scant supply.

CYRUS H. FISKE

A Systematic Qualitative Chemical Analysis: A Theoretical and Practical Study of Analytical Reactions of the More Common Ions of Inorganic Substances. By GEORGE W. SEARS, Ph.D., Professor of Chemistry, University of Nevada. Second edition, revised. John Wiley and Sons, Inc., New York, 1926. x + 165 pp. 4 figs. 23.5 × 15.5 cm. Price \$2.00 net.

Qualitative Analysis. By WILLIAM C. COOPER, Ph.D., Professor of Chemistry, De Paul University, Chicago, Illinois. New-World Science Series, Edited by John W. Ritchie. World Book Company, Yonkers-on-Hudson, New York, 1926. viii + 142 pp. 21 × 14 cm. Price \$1.52.

Hilfsbuch zur Ausführung der qualitativen Analyse. (Practical Guide to Quantitative Analysis.) By Professor Dr. K. W. ROSENMUND, Chemical Institute of the University, Kiel. Urban and Schwarzenberg, Friedrichstrasse 105B, Berlin, N 24, 1926. ii + 86 pp. 32 figs. 22 × 15 cm. Price, bound, M. 4.20.

These three manuals exemplify the differences in objectives in the teaching of elementary qualitative analysis.

Professor Sears' book appeared first in 1922, and is now entering its second edition. According to the plan of this manual, the student performs certain preliminary experiments on each group and then analyzes an "unknown" on that group. The preliminary experiments on each group are followed by a discussion of the chemistry involved and a group of questions to test the student's understanding of the significance of his results. The usual procedures for the analysis of cations are followed. The most distinctive part of the book is the treatment of the anions. They are separated into four groups, using as group reagents (1) silver nitrate in nitric acid solution, (2) hot nitric acid solution and (3) silver nitrate in a solution

made slightly alkaline with sodium hydroxide. The scheme provides for the systematic separation of each anion, just as in cation analysis. The question presents itself, could not valuable time be saved for the student by having him make specific tests for the anions that might possibly be present without carrying out the tedious separations required in this scheme? While the meticulous reader will find a few inaccuracies and may prefer other tests than certain that are given, he must concede that the book is eminently teachable. The student should carry out the work as outlined with a minimum amount of explaining and interpreting on the part of the instructor, giving the latter more opportunity to do real teaching in the laboratory.

In his manual, Professor Cooper appears to emphasize the mechanical side of analysis without insisting on its chemistry in the rigorous fashion followed in the book just reviewed. If in some place in the book the laboratory procedures were put in outline form, the student would have a much easier time in understanding the separations and tests. No preliminary experiments are required, no equations are called for, and no reference is made to the ionic theory and its applications to the reactions of analytical chemistry.

The German manual by Professor Rosenmund will make its strongest appeal to English readers as a concise little "Hilfsbuch" for use in the preparation of lectures and in review for examinations. The sections on the reactions of the ions are well suited to these uses. It gives a good introduction to analytical apparatus and technique, and besides the usual "wet" procedures, gives a discussion of bead, flame and ignition tests. The directions for the detection of the anions are too vague for a beginner, who probably would have trouble in following them satisfactorily without considerable supervision.

J. H. REEDY