

The diffusion constant of the active substance (using rice polish and beef liver as sources) indicates that its molecular weight is about 200. The acid (rice polish was the source) has no primary or secondary amino group (nitrous acid anhydride treatment). It has been esterified with both methyl and ethyl alcohols. The esters are not basic (fractional electrolysis), hence the acid is not amphoteric. The presence of several hydroxy groups is indicated by (1) complete destruction of the active substance by treatment with dimethyl sulfate in the cold, (2) complete non-volatility of the methyl ester at a pressure of 10^{-3} mm., (3) solubility of the esters in water and comparatively slight solubility in ether. The activity is not destroyed by hydrogenation following the methods of Roger Adams *et al.*, indicating that the substance is not olefinic and contains no aldehyde nor ketone group nor aromatic nucleus.

The possibility of the universal occurrence of a single acid substance of the character we have indicated opens up some very interesting questions. There is fragmentary evidence that the same acid may function in the growth stimulation of certain bacteria, molds and mushrooms and that it is one of the substances involved in the growth stimulation of other yeasts such as Wildiers' and No. 578 (American Type Culture Collection). The presence of this acidic substance in soils and composts suggests the possibility that it may function in the stimulation of the growth of green plants. It is synthesized by the mold *Aspergillus niger*, and seems to be more widely and evenly distributed in tissues than any known vitamin.

Because of their rather far reaching interest we wish at present to emphasize the tentative character of our conclusions [THIS JOURNAL, 53, 4171 (1931)].

CHEMICAL LABORATORY
UNIVERSITY OF OREGON
EUGENE, OREGON

ROGER J. WILLIAMS
CARL M. LYMAN
GEORGE H. GOODYEAR
JOHN H. TRUESDAIL

RECEIVED JULY 1, 1932
PUBLISHED AUGUST 5, 1932

NEW BOOKS

Quantitative Chemical Analysis. An Intermediate Textbook. By FRANK CLOWES and J. BERNARD COLEMAN. Revised by D. STOCKDALE and J. DEXTER. Thirteenth edition. P. Blakiston's Son and Co., Inc., 1012 Walnut St., Philadelphia, Pa., 1931. xiv + 605 pp. Illustrated. 14.5 × 23 cm.

Analytical Factors and their Logarithms. By EARLE RADCLIFFE CALEY, M.Sc., Ph.D., Assistant Professor of Chemistry in Princeton University. John Wiley and Sons, Inc., 440 Fourth Ave., New York, 1932. v + 112 pp. 13 × 20 cm. Price, \$2.00.

The first of these volumes, originally published forty-one years ago as a laboratory textbook, is now a rather complete manual on the art of quantitative analysis. The book is divided into eight parts: (I) (65 pages) general processes; (II) (58 pages) simple gravimetric estimations; (III)

(93 pages) volumetric analysis; (IV) (38 pages) miscellaneous methods of analysis; (V) (216 pages) general quantitative analysis; (VI) (32 pages) organic analysis and determination of molecular weights; (VII) (43 pages) gas analysis; (VIII) (60 pages) tables of reference and a table of four place logarithms.

Despite its size the book is designed primarily for student use. Not only are the directions for carrying out the various analyses admirably clear and complete but the arrangement of the experiments is, in general, one of progressive complexity and difficulty. Parts I-III cover the ground of the elementary first course in quantitative analysis as it is usually given in this country. However, instead of the few typical experiments there is described a variety of experiments of the same type. Thus, for example, in Part II directions are given for about forty simple gravimetric determinations. Part IV contains descriptions of electrolytic determinations, electrometric measurements with the hydrogen electrode and by oxidation-reduction methods, colorimetric measurements, and a bare mention of spectrum and x-ray analysis. The remainder of the book—slightly more than half—is devoted to standard methods of analysis which are essentially technical in character. To illustrate the nature of this section, some of the material included in Part V may be mentioned: analysis of ores and coal, water analysis, food analysis, and the estimation of oils and fats.

The broad scope and viewpoint of the book together make it particularly well suited to the requirements of the advanced student or graduate who has frequent occasion to refer to standard methods of analysis with which he is not familiar. For this purpose especially the book can be highly recommended.

The second of the volumes listed above is a collection of tables planned to meet the needs of the analytical chemist. The tables of gravimetric factors which occupy the first two-thirds of the book comprise factors for metallo-organic as well as inorganic precipitates, and also, briefly, factors necessary for the more common indirect weighings, indirect analyses, and weight conversions. A serviceable feature of these tables is the inclusion of the correct temperatures for the drying or ignition of the various precipitates. Furthermore, for most of the metallo-organic precipitates reference is given to leading papers bearing on their use. The last third of the book is given over to tables of volumetric factors, a "convenient generic term" which is employed to denote, "in general, the grams of substance present in a cubic centimeter of normal solutions of the elements or compounds listed." These factors include those elements and substances which can be determined by standard methods of volumetric analysis. At the end of the book is a table of five place logarithms and a series of explanatory notes indicating the use and possibilities of the different tables.

The tables are quite comprehensive and are very conveniently arranged. The book, as the reviewer already has had the opportunity to discover, will be practically valuable as a time saver in the analytical laboratory.

ARTHUR F. SCOTT

Microchemical Laboratory Manual. By FRIEDRICH EMICH. With a Section on Spot Analysis by Dr. FRITZ FEIGL. Translated by FRANK SCHNEIDER, Sc.M. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, 1932. xvi + 180 pp. 88 figs. 15.5 × 23.5 cm. Price, \$2.75.

The appearance of Emich's admirable little text in English will meet with a ready welcome. This book is intended as an introduction to microchemical practice and presents sufficient material for a course of one semester. While many will not agree with the translator's prefatory statement regarding "the lack of an adequate text on the subject in English" in view of Chamot and Mason's excellent manual (to which Emich repeatedly refers in the text), there is ample room in this rapidly growing field for fresh points of view. The translation has an easy, readable style and the translator deserves credit for making the book available in English.

LAWRENCE T. FAIRHALL

Colloids. By ERNEST S. HEDGES, M.Sc., Ph.D. (Manchester), D.Sc.(London), A. I. C. Longmans, Green and Co., 55 Fifth Ave., New York, 1931. vii + 272 pp. Illustrated. 14 × 22 cm. Price, \$4.50.

Hedges has produced a fresh and distinctive treatment of the subject of Colloids which takes its place with the other introductions to that important field. The book is based to a large extent upon recent papers which have attracted the author's interest, although there is a refreshing number of references to important papers in the older literature. It is remarkable for its studious avoidance of quantitative formulations. The attempt is made rather to give a vivid mental image of the structure and behavior of colloidal systems, an object which is eminently desirable. Indeed if pushed still further it would help in the logical discrimination between confused or conflicting conceptions. In other words, the development of colloid science would benefit greatly from the setting up of models as working hypotheses and there is a much greater probability of such models possessing permanent validity than those used in the elucidation of atomic structure.

If the author had only pursued this method more consistently he would not have stated (p. 5) that "colloidal gold is a physical system composed of water and of gold in a certain state of subdivision," when from certain later pages it is evident that the author is aware that there is likewise an essential, partly dissociated, stabilizing agent present. The author has rightfully emphasized the properties of gels "because natural colloids

appear more often in the form of gels than sols." His description faithfully reflects the muddled state of the subject, which may be summarized in his opening sentence on the structure of gels (p. 207), "There is still considerable divergence of opinion about the structure of gels, but several of the accepted views approximate closely to the same thing when studied seriously."

The book is attractive, with good print and diagrams. Although many statements are debatable, Hedges' introductory presentation may be warmly recommended as being modern, stimulating, and original in its selection of subject matter.

JAMES W. MCBAIN

Annual Review of Biochemistry. Volume I. Edited by JAMES MURRAY LUCK, Stanford University. Stanford University Press, Stanford University, California, 1932. vii + 724 pp. 15.5 × 23 cm. Price, \$5.00.

The extremely rapid development of most of the sciences since the beginning of the century has brought along with it an enormous increase in the periodical literature pertaining thereto. This is conspicuously true of the so-called "borderline" sciences, like biochemistry, that present overlapping fields of interest to their devotees. The day has long since passed when even the most assiduous student could be expected to become familiar at first hand with the thousands of pages contributed each year to the scientific journals concerned with research in his department of knowledge. The development of abstract journals and reviews has thus become both inevitable and highly essential.

The newly launched enterprise, *The Annual Review of Biochemistry*, sponsored so vigorously by Professor J. M. Luck and his colleagues: C. L. Alsborg, D. R. Hoagland and C. L. A. Schmidt, on the Pacific coast, is not entirely a novelty in its conception. It surpasses most of the other review journals or books in breadth of scope and in the noteworthy success with which so many collaborators of unusual competence have been secured. The new volume gives evidence of the never-to-be-forgotten fact that science transcends the boundaries of nations. Thus there are critical essays by R. Wurmser of France; I. Smedley-MacLean, L. J. Harris, E. G. Holmes, J. Needham and M. Stephenson, of England; R. Hoerber, A. Windaus and H. Fischer of Germany; J. K. Parnas of Poland; E. Waldschmidt-Leitz of Czechoslovakia; N. N. Ivanoff of Russia; H. D. Kay and J. B. Collip of Canada; P. Karrer and L. Ruzicka of Switzerland; in addition to fourteen reviews by American experts. This truly represents an international endeavor.

It would be futile to attempt any really critical comments in the confines of this necessarily brief notice of these very useful—and for the most part readable—seven hundred pages. To single out individual essays for special

mention seems presumptuous when so many masters of research have summarized the recent development in the domains of their own endeavors. A few themes have been treated somewhat scantily; but subsequent volumes are promised to remedy such temporary omissions. One can imagine the surprise awakened in some of the early contributors to another pioneer effort in reviewing the literature of physiological chemistry—Maly's *Jahresbericht ueber die Fortschritte der Thierchemie*—if they were to study this latest volume portraying the current state of the science. There would be vitamins and hormones and immunochemistry to perplex those older chemists by the utter novelty of the topics. The chemistry of muscle would give new meanings to old observations. The animal and plant pigments would present surprises of a new order. The physical chemistry of protoplasm would reveal old facts in new interpretations. *Tempora mutantur!*

LAFAYETTE B. MENDEL

BOOKS RECEIVED

June 15, 1932–July 15, 1932

- FRITZ ARNDT. "Kurzes chemisches Praktikum für Mediziner und Landwirte." 14–17th edition. Verlag Walter de Gruyter, Genthiner Strasse 38, Berlin W 10, Germany. 100 pp. RM. 4.
- MARCEL BOLL. "L'Idée Générale de la Mécanique Ondulatoire et de ses Premières Applications." Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 74 pp. Fr. 15.
- MARCEL BOLL. "Exposé Électronique des Lois de l'Électricité." Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 72 pp. Fr. 15.
- LOUIS DE BROGLIE. "Relations d'Incertitude." Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 24 pp. Fr. 6.
- LOUIS DE BROGLIE. "Théorie de la Quantification dans la Nouvelle Mécanique." Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 250 pp. Fr. 70.
- IRENE CURIE AND F. JOLIOT. "L'Existence du Neutron." Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 22 pp. Fr. 6.
- HARRY A. CURTIS, Editor. "Fixed Nitrogen." American Chemical Society Monograph. The Chemical Catalog Co., Inc., 419 Fourth Ave., New York. 517 pp. \$12.00.
- VICTOR FISCHL AND HANS SCHLOSSBERGER. "Handbuch der Chemotherapie." Part 1. Metal-Free Organic Compounds. Fischers Medizinische Buchhandlung, Antonstrasse 15/19, Leipzig C 1, Germany. 357 pp. M. 34; subscription, M. 29.
- ADOLF JOLLES. "Die Vitamine nebst einer Einleitung über chemische Dynamik biologischer Vorgänge." Verlagsbuchhandlung Franz Deuticke, Wien, Austria. 157 pp. M. 10.