

resultant streptomycin sulfate<sup>2-4</sup> was characterized by its X-ray powder diffraction diagram, which was identical with that of an authentic specimen obtained from streptomycin. Streptomycin sulfate was treated with the stoichiometric amount of barium hydroxide and the resultant aqueous solution of the free base was heated at 70–80° for forty-eight hours with an equivalent amount (added in portions) of S-methylthiopseudourea sulfate.<sup>5</sup> A crystalline reaction product was ob-

(2) H. E. Carter, R. K. Clark, Jr., S. R. Dickman, Y. H. Loo, J. S. Meek, P. S. Skell, W. A. Strong, J. T. Alberi, Q. R. Bartz, S. B. Binkley, H. M. Crooks, Jr., I. R. Hooper and M. C. Rebstock, *Science*, **103**, 53 (1946).

(3) J. Fried, G. A. Boyack and O. Wintersteiner, *J. Biol. Chem.*, **162**, 391 (1946).

(4) R. L. Peck, C. E. Hoffhine, Jr., Elizabeth W. Peel, R. P. Graber, F. W. Holly, R. Mozingo and K. Folkers, *THIS JOURNAL*, **68**, 776 (1946).

(5) B. Rathke, *Ber.*, **14**, 1774 (1881); R. Phillips and H. T. Clarke, *THIS JOURNAL*, **45**, 1755 (1923).

tained which, when triturated with dilute ammonium hydroxide, yielded streptidine sulfate monohydrate,<sup>2,3,6,7</sup> identified by its X-ray powder diffraction diagram,<sup>8</sup> nitrogen analysis (calcd., 22.2%; found, 22.1) and octaacetyl derivative<sup>7</sup> (m. p. 259–261°, unchanged on admixture with an authentic specimen prepared from streptomycin).

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(6) N. G. Brink, F. A. Kuehl, Jr., and K. Folkers, *Science*, **102**, 506 (1945).

(7) R. L. Peck, R. P. Graber, A. Walti, Elizabeth W. Peel, C. E. Hoffhine, Jr., and K. Folkers, *THIS JOURNAL*, **68**, 29 (1946).

(8) I. R. Hooper, L. H. Klemm, W. J. Polglase and M. L. Wolfrom, *ibid.*, **69**, 1052 (1947).

(9) Bristol Laboratories Research Fellow of The Ohio State University Research Foundation (Project 224).

## NEW BOOKS

**Quantitative Organische Mikroanalyse.** Fifth Austrian Edition. By F. PREGL and H. ROTH. Springer-Verlag, Vienna, 1947. 317 pp. 80 Figs. 16 × 23.5 cm. Price \$7.40 (Swiss Francs 32.--).

F. Pregl's "Die quantitative organische Mikroanalyse" has had three original editions (1st, 1916, 2nd, 1922, and 3rd, 1929). Since Pregl's death on Dec. 13, 1930, two revisions by H. Roth have appeared: the first in 1935 and the second, or present fifth edition, in 1947.

Since neither the fourth nor the present fifth edition have been previously discussed in *THIS JOURNAL*, it was thought expedient to not only examine these two revisions but also compare them with the third and last original Pregl edition. This is being done in the table given herewith.

TABLE I

| Chapters                        | Number of pages |             |             |
|---------------------------------|-----------------|-------------|-------------|
|                                 | 3rd edition     | 4th edition | 5th edition |
| Balances                        | 14              | 16          | 14          |
| Methods of elementary analysis  | 175             | 164         | 175         |
| Carbon and hydrogen             | 69              | 66          | 59          |
| Oxygen                          | ...             | ...         | 11          |
| Nitrogen (Dumas)                | 30              | 20          | 20          |
| Nitrogen (Kjeldahl)             | 11              | 8           | 7           |
| Halogen                         | 21              | 28          | 25          |
| Sulfur                          | 15              | 12          | 19          |
| Miscellaneous                   | 28              | 26          | 28          |
| Methods of structure analysis   | 29              | 86          | 78          |
| Molecular weight determinations | 15              | 24          | 16          |
| Determ. of physical constants   | 2               | 25          | 20          |
| Total                           | 256             | 328         | 317         |

As can be seen from the table, the two revisions differ from the last and original Pregl edition chiefly by an enlargement in the structure analytical section. Thus, in this field, there have been added the well-known iodometric determination of O-, S- and N-alkyls by F. Vie-

boeck and C. Brecher and three methods by R. Kuhn and co-workers, such as a gasometric determination of active hydrogen, an oxidation procedure (acetic acid) and a method of ozonolysis (acetone). In the field of elementary analysis the additions involve iodometric methods for the determination of oxygen (J. Unterzaucher) and of sulfur (W. Zimmermann), a hydrogenation method for nitrogen (A. Lacourt) and an alkalimetric determination for chlorine and bromine (M. K. Zacherl).

The fifth edition differs from the fourth by the iodometric methods for the determination of oxygen (1940) and sulfur (1943) and the determination of nitrogen by hydrogenation (1940) cited above. On the other hand, the chapter on molecular weight determinations has been weakened by the omission of any and all ebullioscopic methods. The literature references are incomplete and none goes beyond 1943. There is no author index, nor does the book contain any log or nitrogen reduction tables. Use of ordinary balances in quantitative organic microanalysis is not mentioned.

In view of the foregoing, which at the same time might also be regarded as an indication of the progress of organic microchemistry in Central Europe for the last twelve years, the present edition appears to be rather a "Second Printing" of the fourth edition, or first revision. The bypassing of Pregl's original and still active laboratory at the University of Graz, Austria, his successor and original co-workers as co-authors appears inexcusable and is most unfortunate.

JOSEPH B. NIEDERL

**Violin Varnish.** A Plausible Re-creation of the Varnish Used by the Italian Violin Makers between the Years 1550 and 1750, A. D. By JOSEPH MICHELMAN. Published by Joseph Michelman, 5050 Oberlin Boulevard, Cincinnati, Ohio, 1946. 185 pp. 14 × 21 cm. Price, \$3.75.

The question of the varnishes used by the great Italian violin makers of the mid-sixteenth to the mid-eighteenth centuries has always provoked great curiosity and specula-

tion. Violin makers and scientists still disagree about the actual contribution of varnish to the tonal qualities of the violin, but most consider that it is an important one. Unfortunately, the varnish formulas used by the master violin makers were shop secrets and little opportunity has been found to analyze, even on a micro scale, the varnish on the very few instruments that have come down to us. In this brief volume the author, who apparently is well versed in modern varnish technology, has attempted to reconstruct the work-shop receipts of the famous violin artisans from a study of the materials then available, and to analyze the properties of the finishes produced thereby.

After carefully surveying the existing literature on violin varnish, the author discusses the materials used in its manufacture by the master Italian violin makers, which included Venetian turpentine (oleoresin from the European larch), potash, alum, copperas, linseed oil, alcohol, and red dye obtained from the madder root and the different mordant salts used to fix it. Next follow several chapters describing in detail numerous experiments with these materials to establish the old formulas, without the aid of modern laboratory devices, and possible receipts that the violin makers might have used. In these experiments small batches, comprising often only a few grams or cubic centimeters of the principal ingredients, were employed. One wonders whether proper conditions for varnish making can be established on such a small scale. Many of the experiments involve the preparation of metal rosins which, combined with linseed oil, the author believes were used for under-coats or sub-varnishes. Combinations of aluminum and iron rosins made from potassium rosinate could have been used to produce the brown undertone so frequently seen. The color of top varnishes could have been obtained by combining various natural dyes with metal rosins and linseed oil; among them the extract from madder root or modern alizarin gives best results. The author then lists a series of simple formulas for violin varnishes for the use of the amateur, followed by a discussion of materials and methods which the modern varnish technologist might employ.

The collector of old violins and the modern amateur violin maker will find this volume of much interest. The subject matter is well organized and the book is attractively printed.

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## BOOKS RECEIVED

February 10, 1948-March 10, 1948

- TURNER ALFREY, JR. "Mechanical Behavior of High Polymers." Vol. VI. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, New York, 1948. 581 pp. \$9.50.
- D. J. BELL. "Introduction to Carbohydrate Biochemistry". Second Edition 1948; published 1940, reprinted 1943. Clifton House, Publishers, Euston Road, London, N.W.1, England. 107 pp. 6s.
- WILLIAM MANSFIELD CLARK. "Topics in Physical Chemistry". The Williams and Wilkins Company, Baltimore 2, Maryland, 1948. 738 pp. \$10.00.
- ROBERT B. DEAN. "Modern Colloids. An Introduction to the Physical Chemistry of Large Molecules and Small Particles." D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York, N. Y., 1948. 303 pp. \$3.75.
- C. C. FURNAS. "Research In Industry. Its Organization and Management." D. Van Nostrand Company, Inc., 250 Fourth Ave., New York, N. Y., 1948. 574 pp. \$6.50.
- A. G. GAYDON. "Dissociation Energies and Spectra of Diatomic Molecules." John Wiley and Sons, Inc., 440 Fourth Ave., New York, N. Y., 1947. 239 pp. \$5.00.
- W. K. RIEBEN. "Über die Kaliumbestimmung in Biologischer Substanz." Benno Schwabe and Co., Verlag, Basel, Switzerland. Imported by Grune and Stratton, Inc., Medical Publishers, New York City, 1947. 73 pp. \$9.00 (paper); \$12.00 (bound).
- FOSTER DEE SNELL and CORNELIA T. SNELL. "Colorimetric Methods of Analysis." D. Van Nostrand Company, Inc., 250 Fourth Ave., New York, N. Y., 1948. 239 pp. \$4.50.
- A. SZENT-GYÖRGYI. "Nature of Life. A Study of Muscle." Academic Press, Inc., 125 E. 23rd St., New York 10, N. Y., copyright 1948. 91 pp. \$3.00.
- WILLIAM MAYO VENABLE. "The Interpretation of Spectra." Reinhold Publishing Corporation, 330 West 42nd St., New York 18, N. Y., 1948. 200 pp. \$6.00.
- R. TECWYN WILLIAMS. "Detoxication Mechanisms." John Wiley and Sons, Inc., 440 Fourth Ave., New York, N. Y., 1947. 288 pp. \$5.50.
- ALFRED VON ZEERLEDER. "Technologie der Leichtmetalle." Rascher, Verlag, Zürich, Switzerland, 1947. 364 pp.
- "Abridged Scientific Publications from the Kodak Research Laboratories." Vol. XXVIII. Eastman Kodak Company, Publishers, Rochester, New York. 280 pp.
- "Lignin. Chemistry and Utilization." Bulletin No. 19, January, 1948. (Report of Conference at New Haven, Connecticut, September, 1947.) Northeastern Wood Utilization Council, P. O. Box 1577, New Haven 6, Conn. 135 pp. \$2.00.
- "Newer Methods of Preparative Organic Chemistry." First American Edition. Translated and revised from the German. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. 657 pp. \$8.50.