

vulsions. So far as known, an *Erythrina* species has never been used in the preparation of curare. After many years, confirmation of the curare action of the crude extracts has been reported [Ramirez and Rivero, *Añales inst. biol.* (Mex.), 6, 301 (1935); Lehman, *Proc. Soc. Exptl. Biol. Med.*, 33, 501 (1936); *J. Pharmacol.*, 60, 71 (1937)].

Although certain manipulations with the plant material were described by Altamirano and his chemist associates, there was but little real knowledge of the alkaloids present, and all the pharmacological studies were made with crude extracts, or preparations.

In connection with a study of the botanical and chemical components of curare, a chemical examination of the seeds of *Erythrina americana* Mill. was made, and we wish to report the isolation of a pure crystalline alkaloid, from the bases present, which produces the curare-like action. The name, erythroidine, has been retained for it, since Altamirano referred to the unknown active principle by this name.

Acknowledgment is made to Dr. Hans Molitor and Mr. Albert Latvin for a preliminary pharmacological investigation of erythroidine hydrochloride in the Merck Institute of Therapeutic Research.

The toxicity of erythroidine hydrochloride was determined in white mice by the method of Trevan, and the following values were established: after peroral administration (0.5% aqueous solution): L. D. O.: 80 mg./kg.; L. D. 50: 120

mg./kg.; L. D. 100: 140 mg./kg.; after subcutaneous administration: L. D. O: 30 mg./kg.; L. D. 50: 45 mg./kg.; L. D. 100: 50 mg./kg.

The curare action was tested on frogs by a modified Claude-Bernard test. It was found that 0.1-0.15 mg. per frog caused complete motor paralysis when injected into the lymph sac.

Erythroidine, in contrast to curare, is also effective when given perorally.

Certain clinical tests with erythroidine hydrochloride are in progress, and will be reported in the near future.

Erythroidine hydrochloride needles melted at 228-229° with decomp., and showed $(\alpha)^{25}_D +109.7^\circ$, $C = 0.501$, H₂O. *Anal.* Found: C, 61.91; H, 6.57; N, 4.49; Cl, 11.78. Calcd. for C₁₆H₁₉NO₃·HCl: C, 62.03; H, 6.50; N, 4.52; Cl, 11.44. Crystalline erythroidine base melted at 94-96°, and was soluble in water, benzene, chloroform, methanol, ethanol, and was moderately soluble in diethyl ether; yield, 0.7-0.9% of seed weight. *Anal.* Found: C, 70.25; H, 7.14; mol. wt. (Rast), 285, 294. Calcd. for C₁₆H₁₉NO₃: C, 70.31; H, 7.00; mol. wt., 273. The empirical formula C₁₆H₁₉NO₃ has been assigned after many analyses, etc. The details of the isolation and separation of the alkaloids, etc., will be described in a forthcoming paper. The chemical structure of this new and interesting alkaloid is under investigation.

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RECEIVED JULY 21, 1937

NEW BOOKS

Quantitative Pharmaceutical Chemistry, Containing Theory and Practice of Quantitative Analysis Applied to Pharmacy. By GLENN L. JENKINS, Ph.D., University of Minnesota, and ANDREW G. DUMEZ, Ph.D., University of Maryland. Second edition. McGraw-Hill Book Company, Inc., 330 West 42d St., New York. N. Y., 1937. xxv + 466 pp. 67 figs. Price, \$3.50.

The book is divided into three parts. Part I deals with general methods of gravimetric and volumetric analysis, Part II with physico-chemical procedures, and Part III is devoted to special methods of pharmaceutical analysis such as are employed in the assay of fats, volatile oils, alkaloids and enzyme-containing substances.

The procedures described are thoroughly modern ones and the inherent errors and analytical principles are discussed in considerable detail.

As far as the writer is aware, the book is the only comprehensive English text on the subject and it serves not only as an excellent manual for a laboratory course in pharmaceutical analysis but represents a valuable reference book.

The bibliography of textbooks which deal with various phases of analytical chemistry and the questions and problems which are found at the end of each chapter are commendable features.

F. F. BLICKE

The Avitaminoses. The Chemical, Clinical and Pathological Aspects of the Vitamin Deficiency Diseases. By WALTER H. EDDY, Ph.D., Professor of Physiological Chemistry, Teachers College, Columbia University, and GILBERT DALLDORF, M.D., Pathologist to the Grasslands and Northern Westchester Hospitals, Westchester County, New York. The Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore, Maryland, 1937. 338 pp. Illustrated. 15.5 × 23.5 cm. Price, \$4.50.

This volume, which contains a foreword by Dr. James Ewing, is an outgrowth of the "Vitamine Manual" published by the senior author in 1921. In the preface the authors state that it has been their desire to prepare "a helpful manual rather than a complete treatise," covering the more important developments concerning the nature and functions of the vitamins. The collaboration of Eddy and Dalldorf brings to the reader the viewpoints of a biochemist with a rich experience in the vitamin research field and the viewpoints of a physician experienced in laboratory and clinical research.

As the title indicates, the book stresses the pathology of vitamin deficiency, since it is by means of pathological studies and the production and cure of deficiency diseases that it is possible to obtain a clear idea of vitamin function.

Chapter I, consisting of eleven pages, is devoted to an introduction to the subject; while chapters II to VI, inclusive, consist of 46 pages devoted to vitamin A (and its parent substance carotene). In this small space the authors have condensed an unusually large amount of information regarding the chemistry and functions of vitamin A and vitamin A unitage as well as clinical, anatomical and subclinical manifestations of vitamin A deficiency.

Chapters VII to XV, inclusive, contain 92 pages devoted to the nature and functions of the recognized constituents of the vitamin B complex. The chemistry of B (B₁) and flavin are discussed briefly, while considerable space is devoted to the pathological and clinical aspects of beriberi and pellagra. A brief outline of the somewhat controversial evidence for the other B factors is also included, as well as a description of attempts at establishing units of measurement of vitamin potency.

Chapters XVI to XIX, inclusive, consist of 44 pages devoted to vitamin C with discussions pertaining to chemical properties and the configuration of ascorbic acid and anatomical, clinical and sub-clinical manifestations of scurvy.

Three chapters (XX, XXI and XXII), consisting of 34 pages, are devoted to vitamin D and rickets, while two chapters (XXIII and XXIV) consist of 14 pages devoted to vitamin E and vitamin E deficiency. The remaining chapters, XXV, XXVI and XXVII, contain brief discussions of such topics as the relation of "vitamins to resistance and infection," "morbid effects of certain complicated dietary experiments" and "vitamins and blood regeneration."

An appendix, designated as Part II, contains 30 pages covering such topics as "standard methods for vitamin bio-assay" and "clinical tests for evidence of vitamin de-

fiency in humans." A table of vitamin values for food is also included. The book contains author and subject indices.

The reviewer feels that the book would have been strengthened by more detailed discussions of certain topics. In an attempt at brevity, the authors have been forced to omit many important details of value. The book is illustrated with an unusually fine collection of photographs portraying pathological and clinical aspects of vitamin deficiency diseases. Each chapter, except those in Part II, is followed by bibliographical references to original literature, to which the reader may refer if further details are desired.

There are a number of typographical errors which will undoubtedly be corrected in future reprintings. These are confined largely to chemical formulas such as the formula for vitamin B₁ on page 69, for dehydroascorbic acid on page 167 and for ergosterol on page 212.

While "The Avitaminoses. The Chemical, Clinical and Pathological Aspects of the Vitamin Deficiency Diseases" cannot be considered a comprehensive treatise, it can be read with pleasure and profit by specialists working in the field of nutrition. The reviewer predicts that the book will find wide use by busy physicians, dietitians and students of nutrition because it contains a wealth of physiological and clinical material which can only be found in the original research literature.

R. ADAMS DUTCHER

BOOKS RECEIVED

June 15, 1937-July 15, 1937

GÜNTHER BRIEGLEB. "Zwischenmolekulare Kräfte und Molekülstruktur." Ferdinand Enke Verlag, Hasenbergsteige 3, Stuttgart-W, Germany. 308 pp. RM. 22; bound, RM. 23.80.

PAUL KARRER. "Lehrbuch der organischen Chemie." Fifth edition. Georg Thieme Verlag, Rossplatz 12, Leipzig C 1, Germany. 973 pp. RM. 34; bound, RM. 36.

JAMES MURRAY LUCK, Editor. "Annual Review of Biochemistry." Vol. VI. Annual Review of Biochemistry Ltd., Stanford Univ. P. O., Calif. 708 pp. \$5.00.

ROBERT MÜLLER. "Allgemeine und technische Elektrochemie nichtmetallischer Stoffe." Verlag von Julius Springer, Schottengasse 4, Wien I, Austria. 440 pp. RM. 30.

V. A. PERTZOFF. "Pouvoir Rotatoire des Ions de l'Acide *d*-Glutamique." Librairie Coulet, Dubois et Poulain, Sucrs., Montpellier, France. 171 pp. Fr. 25.

HAROLD RICHARDS. "The Universe Surveyed: Physics, Chemistry, Astronomy, Geology." D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, N. Y. 722 pp.

EMMERICH VALKÓ. "Kolloidchemische Grundlagen der Textilveredlung." Verlag von Julius Springer, Linkstrasse 23-24, Berlin W 9, Germany. 701 pp. RM. 57; bound, RM. 60.