

The test for the efficiency of any fungicide is its ability to destroy or prevent the growth of organisms. The most reliable procedure would be to add definite amounts of fungi to the solutions being tested in order to be certain of the activity of the fungicide. In the second part of this study, foot-bath solutions of 500-ml. volume were prepared containing sodium hypochlorite in concentrations ranging from 0.2% to 0.6%.

Specific amounts of inoculi (1 ml. and 5 ml.) were added to these foot-bath solutions. The larger amount would contain more of the organism than a foot bath which had been in use for 24 hrs.

The baths were vigorously stirred from the time the inoculum was added until the end of the test. Two 4-mm. loopfuls of the solution were removed after 10, 30, and 60 seconds' exposure to the chemical, and placed in subcultures of beef broth, with the following results. Table II shows the results after adding 1 ml. of inoculum to each bath while Table III shows the results after adding 5 ml. of inoculum to each bath.

The third part of this experimentation was to determine the activity of the fungicide on foot baths containing definite percentages of sodium hypochlorite and known amounts of inoculum together with organic matter in the form of hide

powder, thereby more nearly approaching the conditions of the foot bath which had been in use.

Foot baths were prepared containing sodium hypochlorite ranging from 0.1% to 0.6%. These baths also contained 1 ml. and 5 ml. of inoculum together with 0.5 Gm. of hide powder to each 500 cc. of solution. Table IV gives the results for 1 ml. of inoculum and Table V gives the results for 5 ml. of inoculum.

A study of Tables II to V, inclusive, shows that the amount of inoculum and the presence of organic matter do have a definite effect upon the activity of the fungicide.

SUMMARY

Foot baths containing 0.3% of sodium hypochlorite will prevent the growth of *Trichophyton rosaceum*, *Trichophyton interdigitale*, *Microsporon lanosum*, *Achorion schoenleinii* and *Trichophyton gypsum asteroides* after 30 seconds' exposure and baths containing 0.5% of sodium hypochlorite will prevent the growth of these fungi after 10 seconds' exposure.

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Book Reviews

Chemical Analysis. Volume II, Chromatographic Adsorption Analysis, by HAROLD H. STRAIN, Ph.D. Interscience Publishers, Inc., 215 Fourth Avenue, New York, 1941. x + 222 pp., 37 figs., 15 x 22.5 cm. Price, \$3.75.

The aim of this book according to the preface, is to present a summary of the present knowledge concerning applications of the chromatographic adsorption method of analysis. Experimental procedures and applications of the method to problems involving the detection and isolation of natural products in a pure form are especially emphasized. Fundamental theories are also stressed. Different types of apparatus used in chromatographic adsorption methods are adequately described and clearly illustrated by means of diagrams, so that they may be readily assembled from apparatus at hand in any well-equipped laboratory. Information

on adsorbents, solvents and eluants is unusually concise, but at the same time complete enough to serve as a guide to the research worker who is using the method for the first time.

The section on the chromatography of organic compounds is particularly interesting. It should serve as a stimulus to pharmaceutical chemists working with plant or animal material to attempt the application of chromatic adsorption methods where more conventional procedures have failed. A few of the topics covered are the applications of the method to the separation and isolation of hydrocarbons, acids, fats, amino acids, carbohydrates, terpenes, benzene derivatives, sterols and steroids, heterocyclic nitrogenous bases, vitamins, hormones, enzymes and plant pigments.

The book is excellently written and well documented throughout. The bibliography is quite extensive, but no claim to completeness is made by the

author because many of the important foreign scientific journals have not been available since 1939. The utility of the book is further enhanced by good author and subject indexes.

The volume should be interesting to any pharmaceutical chemist, and indispensable to any investigator whose work involves the isolation of organic plant principles.—JUSTIN L. POWERS.

Minerals in Nutrition, by ZOLTON T. WIRTSCHAFTER, M.D. Reinhold Publishing Corporation, 330 West Forty-second Street, New York, 1942. 175 pp., 8 illus., 12.5 x 18.5 cm. Price, \$1.75.

Minerals in Nutrition is intended to be a popular treatise comparable to similar books on the vitamins. While many interesting facts are told, often the language is too technical for the layman. Admittedly, the minerals are not so dramatic as the vitamins, yet it is believed that the story of the important function of these elements in human physiology could be told in a more vivid manner. Certainly the discovery of the role of iodine in endemic goiter is on a par with that of nicotinic acid in pellagra.

The more serious-minded student of nutrition will be interested in the many tables and the references to more extended discussions.—M. W. GREEN.

Chemistry and Physiology of the Vitamins, by H. R. ROSENBERG, Sc.D. Interscience Publishers, Inc., 215 Fourth Avenue, New York, 1942. xix + 674 pp., 15 x 23 cm. Price, \$12.00.

There are several books available on special topics relating to vitamins, and monographs on single vitamins, but in this volume there is presented a comprehensive treatment of the chemistry and physiology of all the known vitamins. According to the preface, an attempt has been made to cover all topics of vitamin research and especially the chemistry and physiology of the vitamins. This volume is presented with the hope that it may guide the student and scholar through our present-day knowledge of the field, and inspire further development. Both of these aims of the author should be more than realized by this excellent treatise on the vitamins.

The text of the volume is divided into sixteen chapters and an appendix. For the want of a better classification, the vitamins are presented in alphabetical order of nomenclature. The book begins with a chapter devoted to a general discussion of the vitamins in which this class of compounds is defined and sharply differentiated from the hormones and from other essential and nonessential food constituents.

In general, the same arrangement of subject matter relating to individual vitamins is followed in each succeeding chapter. The arrangement of the chapter on vitamin B₁—thiamin—may be used as an example of the general arrangement of the chapters. The first section, devoted to nomenclature and survey, lists the names which have been applied to thiamin and includes the chemical name, the struc-

ture, the empirical formula and the number of international units of vitamin B₁ per gram. The succeeding sections discuss in order the chronology, occurrence, isolation, properties, chemical constitution and synthesis, industrial methods of preparation, biogenesis, thiochrome, vitamin B₁-pyrophosphate, specificity of vitamin B₁ action, methods of determination, standards, physiology of plants and microorganisms, animal physiology, avitaminosis and hypovitaminosis, hypervitaminosis, and requirements for thiamin. This chapter includes 339 literature citations and is representative of the completeness of documentation throughout the book.

The appendix includes a brief chapter on the "vitagens," in which the essential fatty acids, amino acids, carbohydrates and organic sulfur-containing compounds are discussed briefly. Another valuable feature of the appendix is a list and abstracts of vitamin patents which have been issued in the United States, Great Britain, France and Germany.

From a glance at the physiological sections of this book, it is evident that the author is a chemist and not a physiologist. These sections do not suffer from a lack of completeness, but rather from a failure to evaluate the information. This may be seen, for example, in the case of ascorbic acid, where the alleged carrier role of the ascorbate is overly emphasized and the obscure actions of this vitamin on many enzyme systems are catalogued with no coordinated viewpoint. However, since there are many other monographs available which present the vitamins from the physiological and medical viewpoint, this is not a particularly grievous fault and the quality of the other portions of the book well compensate for it.

While this volume represents a scholarly presentation of all information relating to the vitamins which will appeal most strongly to teachers and investigators in the vitamin field and related fields, it should also prove of inestimable value to the pharmacist. It should appeal to the pharmacist because the vitamins constitute a class of products more widely distributed by pharmacists than any other single group of substances. As the final distributor, the pharmacist must be informed upon all phases of the chemistry and physiology of vitamins so that he may advise the ultimate consumer intelligently. In this book will be found the answer to practically any conceivable question relating to vitamins for which an answer exists.—JUSTIN L. POWERS.

The Rat in Laboratory Investigation, edited by JOHN Q. GRIFFITH, JR., and EDMOND J. FARRIS. J. B. Lippincott Company, Philadelphia, 1942. xiv + 488 pp., 178 illus., 15 x 23 cm. Price, \$7.50.

The Rat in Laboratory Investigation is a "must" book for every person doing animal experimentation involving the use of rats. This book is a compilation of the practical experiences of 30 different