

## BOOK REVIEWS

**AN INTRODUCTION TO CLAY COLLOID CHEMISTRY FOR CLAY TECHNOLOGISTS, GEOLOGISTS, AND SOIL SCIENTISTS**, by H. van Olphen. John Wiley & Sons, Interscience Division, New York, N. Y. 1963. 301 pages, illustrated and indexed. Price \$10.

Despite the fact that the title of this book appears to limit its readers to only a few groups, the cosmetic chemist will do well to add it to his library.

Anyone who has attempted to cope with the literature dealing with colloidal states or suspension systems soon becomes aware of the state of confusion which exists in the terms, definitions, and explanation of concepts and theories in this area. The author recognizes the misleading aspects of this situation and makes a positive effort to describe the proper usage of each term at the time he introduces it in his book.

The first five chapters are devoted to lucid explanations of concepts concerning colloidal systems in general and clay suspensions as related to the properties and stability of hydrophobic sols. Dr. van Olphen leads his readers through excellent discussions of the theories of settling, aging, and flocculation of suspensions. He deals with the origin of electric charges on particles which contribute to the stability of the system or detract from it.

The theories which exist on the stability of hydrophobic sols are presented and discussed, including a summation of the forces of

repulsion and attraction which affect stability. Although the balance of the book deals almost exclusively with clay mineralogy and clay suspensions, the sections dealing with theories of stability and those concerned with technological application of stability control should prove valuable to the research chemist who must cope with the manifold problems in the development of a stable suspension of any sort.

A valuable feature of the book is the inclusion of several appendixes which present information on the preparation of clay suspensions, electric double-layer computations, van der Waals attraction energy between two unit layers, and references to books, monographs and periodic publications on clay literature.

The illustrations nicely augment the text and help in clarifying most of the basic principles involved. The only major criticism in this respect is that more of such illustrations could have been employed throughout the book. The index is good, and the text is free of typographical errors.—JOSEPH L. KANIG, Columbia University, College of Pharmacy.

**ELASTOLYSIS AND AGING**, by David A. Hall. Charles C Thomas, Springfield, Ill. 1964. xiii + 160 pages, illustrated and indexed. Price \$6.75.

The aging of elastic tissues is a subject of prime interest to the cosmetic chemist. This is a highly

specialized book, as indicated by the author in the foreword:

"Full coverage of the whole question of elastase action has recently appeared in two admirable reviews by Mandl (*Adv. Enzymol.*, **23**, 163-264 (1961)) and Loeven ("The Enzymes of the Elastase Complex," in *Internat. Reviews Connective Research* **1**, 1963, D. A. Hall, ed., Academic Press, N. Y.). By their very nature, however, these reviews were truly impartial and it is my hope that the admittedly more partisan approach which I have made in the present monograph will, if only by posing controversial hypotheses, act as a starting point for further discussion."

It is thus evident that the complex problem of the composition of elastase and of its role in aging phenomena in connective tissue is assessed differently by various workers. The book here reviewed devotes only 18 pages to discussion of elastolysis and the aging process. The remainder of the text concerns itself with the nature of elastic tissue, the elastolytic enzymes, and the inhibitors of such enzymes.

Most studies of elastolysis have been carried out on the elastic tissue of the intima, or innermost layer, of arteries. As noted by the author (p. 43), the tissue component called elastin, on the basis of its histological appearance, may have a highly varied composition. Most studies on the composition of elastin have been made on material derived from the nuchal ligaments of beef cattle. It is questionable how much of the data reported for arterial intima and for nuchal ligaments could be utilized in studies of the elastic tissue of the skin.

An understanding of the changes occurring in aging skin would, of

course, be of immense value to the cosmetic chemist. The work under review makes it painfully clear that such understanding is likely to come only after the cosmetic industry has undertaken its own investigation of the aging process in skin. Hall's book would be of great value in preparing for such work.

Most cosmetic chemists would probably obtain a broader background by reading first the 1963 book edited by Hall (cited above), which examines all components of connective tissue. The 1964 book, here under review, would then round out the picture of the tissue that underlies so many of our efforts.—PAUL G. I. LAUFFER, Cheesebrough-Pond's Inc.

VISCOSITY AND FLOW MEASUREMENT—A LABORATORY HANDBOOK OF RHEOLOGY by J. R. van Wazer, J. W. Lyons, K. V. Kim, and R. E. Colwell. Interscience Publishers, Inc., New York, N. Y. 1963. 406 pages. Price \$14.00

The apparent purpose of this book was to present rheological theory, not comprehensively but as a background for a better understanding of basic principles involved in laboratory rheology instrumentation and practice. To this extent, the book is more than moderately successful. The first chapter, entitled "Fundamentals of Rheology," deals with basic theory of elasticity, viscosity and the mathematical theory of flow. The discussion of elasticity is a noteworthy achievement of conciseness and clarity. The concepts of viscosity are explained in a somewhat less complete manner but are still lucid and thorough. The mathematical theory of flow, which follows, is too brief, probably in an attempt to avoid lengthy derivations. As a result, it serves more as a distraction than an aid to understanding.

The second chapter covers the principles of rotational viscometry thoroughly and well. The section on general design principles is especially valuable to the rheologist as a check-list for instrument evaluation. The third, fourth and fifth chapters describe and compare commercial rotational, capillary and miscellaneous types of viscometers, respectively. The treatment is full and detailed, including the usual experimental procedure for each, suggested modifications and intended uses. The disadvantage of the description is that not all points of comparison are touched for all instruments.

The final chapter discusses viscoelastic phenomena. The handling of this subject is quite capable. It will probably not be of value to the cosmetic chemist unless he has reduced his knowledge of the basic concepts of simpler types of flow to familiarity.

The cosmetic chemist will find the major deficiency of the book to be the emphasis on mathematical treatment at the expense of an explanation of flow phenomena on a molecular structure basis (an emphasis intentionally placed by the authors). Also, the description of emulsion types and problems associated with different flow and viscosity patterns is hardly touched. The point of view is generally not that of the emulsion chemist, as is to be expected by the background and aims of the authors. Nevertheless, the book is valuable for its clear, concise treatment of rheology from theoretical and instrumental aspects. Other good features are its freedom from errors, an explanatory table of symbols, a comprehensive bibliography and a fair index. It is a text worth having.—H. JASS, Revlon, Inc.

NEW GERMAN-ENGLISH DICTIONARY

FOR CHEMISTS by H. H. Neville, M. C. Johnston and G. B. Boyd, D. Van Nostrand Co., Inc., Princeton, N. J. 1964. 330 pages. Price \$8.95.

Despite the similarity of titles, this dictionary differs from most German-English dictionaries for chemists because it includes an unusually large number of non-technical German words. In order to keep the size of the dictionary within practical limits, some technical terms were necessarily deleted from this volume. In the opinion of the reviewer this reduction in size has been achieved by deletion of words which are practically identical in both languages and thus does not detract from the comprehensive scope of this dictionary.

A quick count indicates that there are approximately 35,000–40,000 entries, significantly fewer than those in many standard dictionaries designed for use by chemists. Nevertheless, this dictionary should be satisfactory for the needs of all chemists who have only a passing acquaintance with the German language.

The readability of the dictionary might have been improved through use of larger type, and a slightly better grade of paper might have been used. These comments in no way impair the utility of this volume, and it can be unequivocally recommended to those who have need for a German-English dictionary.—M. M. RIEGER, Warner-Lambert.

THE PROTEINS—COMPOSITION, STRUCTURE AND FUNCTION, Vol. I., edited by Hans Neurath, Academic Press, New York 3, N. Y. 1963. 665 pages illustrated and indexed. Price \$22.

To classify this book as the second edition of this classic by Neurath is

doing this work an injustice. This is not a second edition but primarily a collection of essays on important aspects of protein chemistry which had not previously appeared in the first edition. The editor must be congratulated on having excluded from this "second edition" most material which had been presented in the first edition.

The book is made up of six chapters, all of them written by experts in their respective fields. The first of these, by Light and E. L. Smith, is concerned with the analysis of amino acids in peptides and proteins. This chapter, together with the addendum by Tristram and R. H. Smith, is a brief introduction to problems and new techniques of amino acid analysis.

Chapter II by Hoffmann and Katsoyannis discusses the laboratory synthesis of peptides of biological chemistry. This chapter is the first comprehensive review of this important subject and should be a primary source of information for all who are interested in this field.

In contrast, Chapter III is concerned with the synthesis of proteins in biological organisms. This chapter, by Fenton, is a most important addition to the volume because it summarizes up-to-date knowledge of the problem of the pathways of protein synthesis in living systems and how they are influenced by nucleic acids.

Chapter IV, which discusses the determination of the primary structure of proteins, should really have preceded Chapter II because without knowledge of the amino acid sequence the synthesis or duplication of biologically active poly-

peptides in the laboratory is, of course, impossible. This field of investigation has attracted a large number of investigators during the last decade, and this review by Canfield and Anfinsen discusses the methods of cleavage of proteins and details the amino sequences of a number of proteins.

Chapters V and VI are concerned with intramolecular bonds in proteins. Chapter V discusses "The Role of Sulfur in Proteins." This title is somewhat misleading because this chapter by Cecil discusses only the role of sulfur in *soluble* proteins and makes no mention of the contribution to the sulfur chemistry of fibrous proteins made by the Australian group. The primary emphasis in this chapter is on analytical methods and chemistry of the SH or SS function in protein molecules.

The final chapter is concerned with noncovalent bonds in proteins. This mathematically oriented contribution by Sheraga is one that most chemists and biochemists will have great difficulty in following. The contribution of hydrogen bonds, ionic bonds and hydrophobic bonds to protein structure is discussed from a statistical-mechanical point of view. The major portion of this chapter presupposes a working knowledge of thermodynamics and statistical mechanics. The important effect of noncovalent bonds on the structure, denaturation and modification of proteins cannot be over-emphasized.

Extensive up-to-date references follow each chapter, and the volume includes an author index and a very comprehensive subject index.—M. M. RIEGER, Warner-Lambert.