BOOK REVIEWS

SURFACE ACTIVE AGENTS AND DETERGENTS, Volume II, by Anthony M. Schwartz, James W. Perry and Julian Berch. Interscience Publishers, Inc., New York 1, N. Y. 1957. 860 pages, illustrated and indexed. Price $17.50.

An earlier volume published in 1949 is Volume I of this set.

The present volume brings up to date material appearing since publication of the earlier volume. The work is divided into four parts, the processes of synthesizing and manufacturing surfactants, special function of surfactants and compositions, physical and colloidal chemistry of surfactants and practical applications of surfactants.

New trade names are used wherever possible. Patents, literature and manufacturers data are carefully footnoted on each page.

Ampholytes, the most recent surfactants to gain usage are described in a number of places, but mainly on pages 171, 138–143 and 227.

A portion of the section on applications covers cosmetics in some ten pages or so.

However, the inactivation of germicides by nonionics does not appear to be included.

The book is well made. No errors were noticed during examination of many of the pages.

This companion volume cannot be recommended too highly to set beside its earlier Volume I.—M. G. DENAVARRE.

MOLECULAR STRUCTURE AND ORGANOLEPTIC QUALITY, comprising papers read at a symposium organized by the Overseas Section, Society of Chemical Industry, Geneva, Switzerland, May 2–3, 1957. S. C. I. Monograph No. 1. The Macmillan Co., New York. 1957. 124 pages. Price $3.75.

In May, 1957, several of the world's outstanding scientists in the field of odor chemistry read papers at a symposium of the Society of Chemical Industry in Geneva, Switzerland. These papers, and the brief but significant discussion, are gathered and published in book form as S. C. I. Monograph No. 1.

The literature of olfaction has been marked by unproven assertions, contradictions and conjectures constituting an obstacle facing workers seeking to construct scientifically valid concepts. The inability to classify odors, the contradictions between the reports of diverse investigators, the reactions of single individuals reported as if they were reproducible, the lack of an accepted theory of the mechanism by which the animal (human and infrahuman) smells. These are factors militating against progress in an understanding of odor. Despite the caliber of the contributors to this symposium (Ruzicka, Stoll, Beets, Naves, among others), the difficulties of contradiction and conjecture are seldom avoided and occasionally aggravated in these

papers. In fact, Ruzicka (his summary essay is typically brilliant) takes note of the diversity of viewpoints among the writers.

The book consists of eight brief papers, with Stoll delivering an opening discourse on molecular structure and odor. How tortuous are the theories necessary to fit odor and structure into a pattern, and how numerous are the exceptions necessary to permit such theories to stand. Kalmus, in the second paper, deals with physiology and genetics; Sfiras and Demeillers write on the measurement of odor intensity; Naves followed by Beets (these chapters are, to this reader, the highlights of the book) on stereochemistry and odor, and on structure and odor, respectively; Wright puts forth his theory of molecular vibration, and is followed by Thompson, who refutes it; and Ruzicka summarizes.

That there should be clashes of opinion in a work of this sort is expected, and the Wright-Thompson debate, in that respect, is of great interest. But that there should be conflict of factual testimony is disconcerting, for it indicates that even amongst the best chemists, the reporting of work in odor continues to suffer from severe limitations. Two instances of such conflict between Stoll and Naves will be cited. Stoll: "No odorous substance is known with a molecular weight above 300." Naves: "We know that organic substances with a molecular weight of 600 to 800 or more are odorous." Again, Stoll: "When isomerism is produced by an asymmetric carbon atom, i.e., as in optical isomers, the odor of the isomers is generally the same." Naves: "Enantiomers have different odors and (that) the odor of the racemic substance is different again."

Two ambiguities that may lead to serious misunderstanding should be cleared up. They are from the same contributors, Stoll and Naves. The former states: "Colorists have much more difficulty in identifying a molecular structure by means of color than perfumer-chemists have when smelling an odor." If by "identifying" one means the recognition of a known substance, this is true; if it means the elucidation of the structure of that substance, it is obviously not so. From Naves: "Whilst a substance appears to be pure whatever the physical or chemical tests to which it is submitted, it can exhibit olfactory characteristics according to its origin." Here, the author would surely emphasize "appears to be" as the key words, admitting that there must be trace substances contributing to the odor, but not identifiable by physical and chemical tests.

What is admirable about the work of Naves is not only the documentary evidence submitted for all assertions, but his critical evaluation of previous workers. He recognizes the difficulties that have beset odor chemists in the past because of false contentions, and with characteristic courage he names those whose work he rejects and cites reasons for such rejection.

Of the stimulating debate between Wright and Thompson, one is impressed, as is so often the case in olfactory theories, with the difficulties of proving one's assertions, and the ease with which they are disproved.

Sfiras and Demeillers describe an apparatus for the determination of odor intensity. The apparatus is based on a system of air dilution. Some of their reports, in this reviewer's opinion, should have been excluded, because they are studies

of mixtures of undisclosed composition. The use of three observers and the averaging of their results, would leave much to be desired from the statistical viewpoint.

Among the stimulants for thought and study, one finds a statement by Stoll that nerol and geraniol have very different odor strengths, but their thresholds of perception are rather close. Having assumed, without question or challenge, that odor strength and threshold of perception are directly proportional, this statement offers a new vista for experiment. In fact, this entire book offers a broadened field for study. The facts so difficult to verify and correlate, the viewpoints so openly divergent, the searching and the groping, are healthy symptoms of the struggle to forge a science of olfaction. In this struggle the achievement of Naves transcends his work of analysis and synthesis (elucidation of the structure of the irones and their synthetic reproduction), his incredible prolificacy, and his co-authorship of *Natural Perfume Materials;* the great achievement of Naves is that he has brought rigorous and disciplined scientific methodology into a field in which its absence was frequently distressing.

This is a bilingual book, part of it being in French, which is rather curious in view of the fact that most of the papers published in English were probably delivered in French, German, or perhaps Dutch. Why one paper and fragments of the discussion were not translated, while the remaining parts of the book were rendered into English, is not explained.

These are lengthy but minor exceptions to a book indispensable to those interested in olfaction.—EDWARD SAGARIN, Embassy Laboratories.

DIE ÄTHERISCHEN ÖLE, Volume I, by E. Gildemeister and F. Hoffmann Akademie Verlag, GmbH., Berlin W. 8, Germany. 1956. 500 pages, $6\frac{1}{2} \times 9\frac{1}{2}$ inches, illustrated and indexed. Price 33.50 D.M. Volume IV, 720 pages, Price 55 D.M.

It is twenty-five years since the earlier edition of this classical work has appeared. The work is brought up to date by Wilhelm Treibs.

Volume I is a historical introduction, discussion of production in the most modern producing areas, possible uses and physiological properties of essential oils.

Volumes II and III will discuss analytical methods. The remaining volumes of the set of seven will cover the individual essential oils.

Volume IV deals with the oils derived from cryptogams, gymnosperms, monocotyledons and part of the dicotyledons including monimiaceal.

The monographs follow a uniform pattern giving origin, extraction, characteristics and composition among the principal properties of each oil. Some monographs dealing with the more commercially important oils are much longer than others. The data appear adequate.

When completed, these useful volumes will enrich the knowledge of the volatile oils.—M. G. DE-NAVARRE.

ORGANIC COLLOIDS, by Bruno Jirgensons. D. Van Nostrand Co., Inc., Princeton, N. J. 1958. 900 pages, 6 × 9 inches, illustrated and indexed. Price $16.75.

The book is divided into two parts, a general description of methods of preparation with a study of organic colloids and a "systematic survey of the most important classes of molecular and micellar colloids" in a condensed

form. Indeed, the first 278 pages are a practical exposition of colloidal behavior brought up to date.

The title of this book is somewhat misleading. It is hoped it will not affect its use and sale. Indeed, one would think it a book on gums and closely related products. While it does include a brief discussion of a number of gums, this subject is only minor subject in the volume. Instead, colloidal phenomena in all its organic manifestations—hormones, fibrous proteins, synthetic macromolecules (nylon), P-VP, emulsions, nucleic acids, starch and milk are samples of the wide range of subjects discussed.

The author makes good use of illustrations and tables to elaborate his text.

This is one of the most unusual and undoubtedly most useful books this reviewer has been privileged to read. It is recommended to all in this industry.—M. G. DE-NAVARRE.

ION EXCHANGERS IN ORGANIC AND BIOCHEMISTRY, edited by Calvin Calmon and T. R. E. Kressman. Interscience Publishers, Inc., New York 1, N. Y. 1957. 761 pages, size $6^1/_4 \times 9^1/_4$ inches, indexed and illustrated. Price $15.00.

The importance of ion exchange phenomena and techniques in various phases of biochemistry and organic chemistry needs very little emphasis. Living systems exhibit many, many ion exchange phenomena and investigators, studying the chemistry of such systems employ many ion exchange techniques in the course of their studies. The volume, "Ion Exchangers In Organic & Biochemistry," is therefore a most welcome addition to the literature. The editors of this book, Calmon and Kressman, experts in their own right, have assembled an impressive array of talent in their efforts to summarize the principles and practices of ion exchange in the fields of organic chemistry and biochemistry.

The book is composed of three major sections. The first two parts deal with material of a general nature and the third deals with specific applications.

Part 1 includes discussions on the nature and types of ion exchange materials, swelling and equilibria, kinetics and adsorption of non-electrolytes and chromatographic phenomena in columns.

Part 2 deals with materials, techniques and apparatus, including commercial materials, simple procedures, techniques of ion exchange chromatography, ion exclusion and membranes.

Part 3, the major portion of the book, deals with specific applications including bone as an ion exchange system, ion exchange properties of cells and tissues, bacteriology, virology, separation of amino acids and peptides, chromatography of proteins and nucleic acids, nucleic acid derivatives, chromatographic investigations of non-steroid hormones, separation of carbohydrates, isolation and analysis of urine, application in blood, sodium-potassium removal in the body, gastric acidity, miscellaneous medical and pharmaceutical applications, exchange adsorption in man, isolation and purification of antibiotics, vitamins, alkaloids, ion exchangers of plant origin, ion exchange in plant physiology, purification of sugars and alcohols, treatment of alcoholic beverages and fruit juices, milk and milk products, ion exchangers in organic chemistry, ion exchangers as catalysts and water treatment.

The only criticism the reviewer has of this book is that some of the material contained in Part 1, 2 and

the end of Part 3 are well described in several general books on ion exchange and might have been deleted. However, the inclusion of this material will probably be welcomed by those workers in biochemistry who are totally unfamiliar with ion exchange.

The chapters on the separations and chromatography of amino acids, peptides, proteins, nucleic acids and their derivatives, and carbohydrates deserve special mention because of their thoroughness. Each chapter has an excellent bibliography.

The book will be a "must" for most workers active in biochemical research.—ROBERT KUNIN, Rohm & Haas Co.

PURITY CONTROL BY THERMAL ANALYSIS, edited by W. M. Smit. Elsevier Publishing Co., Amsterdam, D. Van Nostrand Co., Inc., Princeton, U. S. Dist. size $9^1/_4 \times 6^1/_4$ inches, indexed and illustrated. Price $4.75.

This book is a collection of sixteen papers which were delivered at the International Symposium on Purity Control by Thermal Analysis held at Amsterdam in 1957. The papers cover theory, applications and apparatus for thermal analysis. Two of the papers are in German; however, all have a compendium at the end in English, French and German. The book includes a digest of discussions listing the participants.

The theoretical papers begin with a discussion of the mechanisms of melting and the formation of solid solutions. This is followed by a discussion of the behavior of highly branched hydrocarbons in the solid state. One of the theoretical papers is concerned with some of the factors which govern the choice of method for purity determinations by cryoscopy. The editor's paper discusses the errors occurring in the determination of temperature-heat content curves. Three of the papers deal with the calculations and accuracy of cryoscopic data.

Papers on applications of thermal analysis include: determination of purity of benzene, melting point purity determinations, thermal analysis of normal alkanes, and freezing point and heating curve behavior for an organic reciprocal salt pair system. Two papers are concerned with experimental methods and evaluation of constants for the determination of purity by cryoscopy.

The three papers on apparatus described the equipment and electrical circuits for an automatic adiabatic low temperature calorimeter, a simplified calorimeter for the precise determination of purity, and an automatic apparatus for the determination of melting curves.

This book should prove helpful to those concerned with the analysis of pure substances from a scientific as well as a quality control consideration. It also serves as a good basis of comparison with other methods of analysis such as chromatographic and dilatometric.—MORRIS J. ROOT, G. Barr and Co.

TEXTILE CHEMICALS AND AUXILIARIES, edited by H. C. Speel and E. W. K. Schwarz. Reinhold Publishing Corp., New York 22, N. Y. 545 pages, size $9^1/_4 \times 6$ inches, illustrated and indexed. Price $13.50.

This second revised edition has an additional editor, E. W. K. Schwarz, over the one editing the original edition. It also contains market research data, so important in today's chemical progress.

The material appears to be thoroughly revised and brought up to date. There is a generous use of trade names, so helpful under the present marketing conditions.

Longley and Hansen's chapter on surfactants fails to recognize original workers in the fields they cover. There is an inconsistency in type used for the heading of the different groups of cationic finishes on page 399.

The various chapters seem quite adequate. Coverage of respective material gives every impression of thoroughness. Some chapters, as always, seem better than others, in an effort to which a number contributed.

A valuable tool for those in the textile and related industries, as well as for cosmetic chemists who have utilized so many ideas from textile practice to their own industry needs.—M. G. deNAVARRE.

TEXT-BOOK OF PHARMACEUTICAL CHEMISTRY, Sixth Edition, by J. E. Driver. Oxford University Press, New York 11, N. Y. 751 pages, size 9 × 5½ inches, illustrated and indexed. Price $17.75.

The present revision is brought up to date with the "British Pharmacopoeia" (1953). The volume has gone through six editions in thirty years.

The book is divided into three parts, analytical methods, inorganic and organic; with 20 pages of appendices. It is intended for students of pharmacy studying chemistry.

It is not exactly true that stearic acid of commerce is chiefly stearic acid—sometimes it contained more palmitic than stearic acid, and usually contained equal parts of each along with small amounts of oleic acid (page 200).

The definition and explanation of saponins could be better.

In general, the book is adequate for teaching pharmaceutical chemistry.—M. G. deNAVARRE.

THE NEW URGUENT BASES AND LOTIONS, by I. K. Hoffman. Chemical Publishing Co., Inc., New York 10, N. Y. 1957. 152 pages, size 8¾ × 5 inches, indexed. Price $4.75.

This is a mediocre formulary of numerous water-in-oil and oil-in-water liquid and solid emulsions along with some anhydrous ointment bases.

The classification of surface-active agents is confused. Certainly, triethanolamine soaps are not nonionic as indicated. It is doubtful if acacia is nonionic. Sodium borate is hardly cationic. The definitions anionic and cationic are incomplete. The example of sodium sulfethyl oleate is poor and not typical.

The amount of preservative used is too little throughout the book for adequate protection, by almost tenfold.

Had the author paid more attention to emulsifiers other than sodium lauryl sulfate and self-emulsifying glyceryl monostearate, the book may have been more useful, for sodium lauryl sulfate tends to be irritating to some skins.

In the bibliography, the "Pharmacopoeia Danica" is misspelled. What does the author mean by "Dansk Farmaceutforening (1946)?" This is the name of a Danish union of chemists.

There is too much attention given to product names that look like a listing of trade-named products, and too little attention to diversifying the formulations.—M. G. deNAVARRE.

SOLVENTS, Seventh Edition, by

Thomas H. Durrans. D. Van Nostrand Co., Inc., Princeton, N. J. 1957. 244 pages, size $8^3/_4 \times 5^1/_2$ inches, illustrated. Price $8.00.

The well-known and widely used previous editions are further expanded and brought up to date. The usefulness of this reference is quickly recognized from the fact that the first edition was published in 1930, then, revised seven times up through 1957.

An interesting section on toxicity of solvents is completed with a listing of solvents of low, moderate and dangerous toxicity. This is followed by a section, descriptive of the numerous common solvents. Only one butylene glycol is mentioned. Hexylene glycol of commerce is not mentioned. The composition of Diluol 3 appears to be misspelled.

The appendix gives a list of trade-named solvents with their probable composition. Unfortunately, the suppliers' names are not given.

The main drawback to the present edition as with the earlier ones, is that the solvents and plasticizers listed are principally those used in lacquers.

Even so, the book is a compact reference and a valuable inclusion in any cosmetic library.—M. G. DENAVARRE.

ORGANIC ANALYSIS, Volume III, edited by J. Mitchell, Jr., I. M. Kolthoff, E. S. Proskauer and A. Weissberger. Interscience Publishers, Inc., New York 1, N. Y. 554 pages, size $9^1/_4 \times 6$ inches, illustrated and indexed. Price $11.50.

The third in a series of volumes on organic analysis covers the determinatoin of organic acids, acid anhydrides, amines, amides and olefinic unsaturation. A chapter brings up to date material on analytical mass spectrometry. Another chapter discusses synthetic coating resins. Finally, an index for Volumes I–III completes the book. Each determination is considered in the light of all known useful techniques.—M. G. DE-NAVARRE.

THE LIPIDS, THEIR CHEMISTRY AND BIOCHEMISTRY, Volume III, by Harry J. Deuel, Jr. Interscience Publishers, Inc., New York 1, N. Y. 1957. 1065 pages, size $6^1/_4 \times 9^1/_4$ inches, illustrated and indexed. Price $25.

This volume completes a gigantic task for which all who are interested in chemistry or biochemistry of the lipids, are everlastingly grateful.

Volume III was completed after the author's death by friends and colleagues. It is a memorial to both author and those who completed his task.

The present work is concerned mainly with the fate of lipids when consumed by man as sometimes determined on animals. The nutritional value and metabolism of vitamins A, D, E, K and the essential fatty acids are included in the discussion.

Volume III is a fitting last act to this mammoth work on lipids. This reviewer highly recommends the set for all cosmetic libraries.—M. D. DENAVARRE.