Kräft und Strukturen bei Kolloiden. Sonderausgabe der Kolloid-Zeitschrift, Band 136. Vorträge und Diskussionen. Gehalten auf der 16 Hauptversammlung in Hamburg am 19 und 20, September, 1953. Herausgegeben von Prof. Dr. HANS ERBRING, Vorsitzender der Kolloid-Gesellschaft, Köln/Rhein, und Prof. Dr. F. HORST MÜLLER, Herausgeber der Kolloid-Zeitschrift, Marburg/Lahn. (Powers and Structures of Colloids. Lectures and discussions offered at the 16th General Assembly of the Kolloid-Gesellschaft in Hamburg on September 19 and 20, 1953. Special issue of Kolloid-Zeitschrift, Vol. 136, 1954.) Verlag Dr. Dietrich Steinkopff, Darmstadt, Holzhof-Allee 35, Germany. 1954. 174 pp. 19.5 × 27 cm. Price, kart, DM 26.--.

Dr. H. Erbring, Chairman of the Kolloid-Gesellschaft, opened the meeting by greeting all foreign guests, and then he paid special tribute to the memory of the founder of colloid science, Wolfgang Ostwald.

Instead of discussing every paper, the reviewer will limit himself to those of most general interest.

Dervichian, Joly and Titchen of the Pasteur Institute in Paris discuss "Mechanical and Optical Investigations of the Structure of Colloidal Solutions." They used potassium laurate in combination with potassium carbonate and chloride, and found isotropic phases in a large field of concentrations, the phase changes becoming noticeable only with a sudden change in viscosity. Their results are comparable with the deformation of high polymer substances when present in the plastic condition.

Bourgoin and Joly of the Pasteur Institute reported "New Research on the Mechanisms of Gelification." By the use of stream double refraction they studied the sol-gel changes of several colloids under various conditions, and found that one must differentiate between two phases of the sol-gel transformation, namely, the formation of ordered regions in the solution, followed by solidification in the mass.

Per Ekwall of the Physico-Chemical Institute of the Abo Akademi in Abo, Finland, reported on "Limits of Concentration in Solutions of Association Colloids." He offered proof that substances like soaps differ pronouncedly in their water content when present in different concentrations and that these fields of concentration are more or less separated by concentration limits. Above or below them, changes take place more or less suddenly. Only below the lowest concentration limits do the association colloids act in every respect as normal, monovalent electrolytes.

Verwey of Eindhoven, Netherlands, spoke on the "Play of Forces Between Particles in Lyophobic Colloidal Systems," referring mainly to his contribution on "The Role of the Electric Double Layer in the Behavior of Lyophobic Colloids" in J. Alexander's "Colloid Chemistry." Although most of his material has already been published, his contribution certainly deserves the attention of all those interested in this topic.

K. Heckmann of the Max Planck Institute at Göttingen, Germany, discusses "Conductance and Activity Determinations on Soaps." He found that hexyl alcohol in general causes an increase in the ion activity and conductance and that a sharp maximum in the equivalent conductance curve of Na-cetyl-sulfate is always found. He believes that the cause is the formation of mixed micelles of soap and alcohol, and he offers a new theory to explain these maxima.

H. Thiele of Kiel, Germany, discusses some interesting and important "model experiments" for the synthesis of micellar structures, drawing specific attention to biological structures and how they can be studied and interpreted by this method.

In a paper on "Molecular Interactions at the Solid-Liquid Interface with Special Reference to Flotation and Solid Particle Stabilized Emulsions," Schulman and Leja of the University of Cambridge, England, discuss experiments carried out with a variety of pure surface-active agents usually used in ore flotation as collectors or frothers. The measurements of air/water/solid and oil/water/solid contact angles revealed the importance of the density of collector-coverage. This work indicates that there is a direct correlation between: molecular association, adsorption onto solid surfaces by collector and frother molecules, solidification of monolayers of collector molecules, emulsification of oil-water systems stabilized by coated solid particles, and boundary lubrication by mixed films.

The reviewer feels that we owe Prof. Dr. Hans Erbring a special vote of thanks for the way he organized and conducted this symposium of varied and valuable contributions.

MASS. INST. TECH.
CAMBRIDGE 39, MASS. ERNST A. HAUSER

Fortschritte der Chemie Organischer Naturstoffe, Volume XI. **(Progress in the Chemistry of Organic Natural Products).** Edited by L. ZECHMEISTER, California Institute of Technology, Pasadena. Springer-Verlag, Mölkerbastei 5, Wien 1, Austria. 1954. viii + 457 pp. 16.5 × 23.5 cm. Price, $17.20, Ganzleinen, $18.00.

For the eleventh volume of this series, Dr. Zechmeister has again assembled a group of outstanding collaborators, who treat a number of subjects among which are many of biochemical interest.

S. Peat presents a concise survey on the constitution, enzymic synthesis and degradation of starch. With proper historical perspective, the reader is led safely through the maze of terms, definitions and concepts that have become outdated or altered in the light of current knowledge, in order to arrive at the main theme of the chapter: starch enzymology, a field to which the author has notably contributed.

K. Freudenberg interprets recent results from synthetic, analytical and physical findings on lignin, its degradation and biosynthesis, and notes that "lignin, in spite of its great variegation, is a polymeric natural product like so many others, and the principle of its construction has become lucid."

The complicated changes attending ultraviolet irradiation of $\Delta^{5,7}$-dienoid steroids have undergone further elucidation, as reported by H. H. Inhoffen and K. Brückner in a well balanced chapter on the chemistry of Vitamin D, which also covers new preparative routes to D, pharmacological-structural work, and a discussion of the problem of absolute steroid configuration in the light of Reichstein's α-methoxyadipic acid. An extensive review of model substance syntheses, aimed at construction of the A/C as well as the C/D ring systems is included, and the problem of the isomerization of Vitamin D is treated extensively; a number of very interesting partial syntheses of Vitamin D isomers are described.

In recent years, naturally occurring chromones have attracted considerable interest because they are hypotensive, spasmolytic, and cause coronary dilatation. H. Schmid has provided a thorough review of the degradative and synthetic work on the extractives of *Ammi visnaga*, *Peucedanum Ostruthium*, *Eugenia caryophyllata*, and *Eleutherine bulbosa*. Pharmacology and clinical applications are briefly described. An appendix is devoted to certain naphthalene derivatives of natural origin which accompany the naphthopyrone, eleutherinol, and to the fungus pigment, fusarubin.

Two chapters are devoted to a discussion of the remarkable progress made in the chemistry of proteins. L. Pauling and R. B. Corey present results from crystallographic work; accurate measurements of the dimensions of single amino acids and peptides lead to the construction of the ingenious α-helix model of polypeptides, and further to detailed models for fibrous, and interesting suggestions about globular proteins. The models are represented by reproductions of the excellent perspective and projection drawings which appeared in the original publications. W. A. Schroeder has collected the advances made in the use of column chromatography for analytical and preparative work on amino acids, peptides and proteins. The limited field chosen by the reviewer allowed him to evaluate in detail many of the published methods and data, and the review will be of great value to investigators in need of orientation, as well as of practical advice.

Apart from advances in the structural and physiological chemistry of natural porphyrins, which are thoroughly described by P. Lemberg, the reader will be fascinated by the section on porphyrin biosynthesis included in this section. The last contribution to the collection is A. Albert's chapter on the natural pteridines. There is an outline of physical and chemical properties of the substituted members of the series that have become known since the last review in 1945. Then follows a section on naturally occurring pteridines, including a helpful table juxtaposing the exact chemical names with various common names and synonyms. The folic acid series is discussed separately and includes a résumé of the physiological actions of the substances, as well as of possible biosynthetic routes.

In keeping with the tradition of this series, excellent bibliography, author and subject indexes are supplied, and the physical appearance of the volume is of a high caliber. Chemists and biologists alike will welcome the volume as an addition to their libraries.

RESEARCH DEPARTMENT
CIBA PHARMACEUTICAL PRODUCTS, INC. HANS HEYMANN
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Heterocyclic Compounds with Indole and Carbazole Systems. The Chemistry of Heterocyclic Compounds. Volume VIII. ARNOLD WEISSBERGER, Consulting Editor. By WARD C. SUMPTER, Western Kentucky State College, Bowling Green, Ky., and F. M. MILLER, University of Maryland, Baltimore, Md. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. xii + 307 pp. 16 × 23.5 cm. Price, $10.00 single copy, $9.00 subscription price.

This book, dealing with indole and carbazole systems, contains a review of the methods of synthesis of the simpler compounds such as indole, carbazole, isatin, oxindole, isatogens and indoxyl, and an account of the properties and reactions of these compounds and their more complex derivatives. A résumé of the highly complex naturally-occurring indole derivatives also is included. The material is systematically presented and the reader obtains a good idea of the methods of preparation and the reactions of the indolic type of compounds although, as the authors mention, they have not attempted to duplicate Beilstein in listing every compound. The chapter on indigo, for instance, does not delve at length into the details, yet it supplies an over-all picture of the problem at hand and the way it was solved.

It is stated in the preface that the literature up to the end of 1952 has been consulted and that several important papers of 1953 have been included. Some omissions such as the structure of corynantheine, based on work published in 1950–1952, and the latest structure of alstonine, published in 1952, lead one to the conclusion, however, that the literature survey for 1950–1952 at least has not been too thorough. Furthermore, under the heading tryptophan, one would have expected to find some mention of kynurenine, and the biochemical relationship of these two substances. It is also regrettable that the book is marred by numerous typographical errors that careful proof-reading would have avoided.

Not to end on a discordant note, however, the book should be very helpful to the chemist in supplying him with a bird's-eye view of a most complex field of organic chemistry and biochemistry in which research in recent years has been most active.

DIVISION OF PURE CHEMISTRY
NATIONAL RESEARCH COUNCIL LEO MARION
OTTAWA, CANADA

Grignard Reactions of Nonmetallic Substances. By M. S. KHARASCH, Professor of Chemistry, The University of Chicago, and Otto Reinmuth, Research Associate, The University of Chicago. Prentice-Hall, Inc., Publishers, 70 Fifth Avenue, New York 11, N. Y. 1954. xxii + 1384 pp. 15 × 23 cm. Price, $15.00.

Someone once remarked that if a speaker at a gathering would ask "Is there an economist in the house?" positive replies would come not only from the few followers of Adam Smith who might be present but also from bankers, merchants, brokers and industrialists. Similarly, a question put to a group of chemists "Is there someone here who knows about Grignard reactions?" might elicit almost universal response, for who among us has not carried out a Grignard reaction? If pinned down, however, few of us would care to be quizzed on the large area covered by Kharasch and Reinmuth. The fact that no modern comprehensive treatise is available on a subject as common as this is testimony to the tremendous literature on the subject. The authors would have performed a valuable service if they had prepared nothing but a bibliography, but the critical expository treatment combined with the judicious care in presentation make this a reference work of unusual importance.

The size of the book may discourage some persons from attempting to delve into its contents, but actually of the 1384 pages less than 450 pages represent text since there are over 900 pages of tables and 37 pages of index. The reviewer found the index useful for broad categories but not so helpful in locating specific compounds. So much of the information is tabular, however, that this would be expected.

A detailed chapter on preparation of Grignard reagents is followed by one on their constitution and dissociation, then one on some radical reactions of Grignard reagents, followed by eighteen chapters covering reactions with compounds containing the various functional groups. Much of this presentation, of course, is factual copy of published work, but the authors have been motivated throughout to explain the observations in terms of modern theory and to evaluate conflicting data in the light of their own experience.

A few of the topics dealing with Grignard reactions which are given this type of critical appraisal include the radical reactions, Grignard reagent enolate formation, α-halo ketone dehalogenation, the concept of a quasi 6-membered ring transition state in many Grignard reactions, constitutional factors affecting order of addition, mechanisms of carboxylic ester reactions, hindered alkyl esters, speculations on the reaction mechanisms with acyl halides and acid anhydrides, effective migratory aptitudes in epoxide ring opening, and reaction mechanisms with alkyl halides.

Although this book will be invaluable as a work of reference, it seems reasonable to predict that chemists, intending to use it only for reference purposes, will find themselves staying to read it long after the reference is located. It is that kind of book.

NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS CHARLES D. HURD

Solvents and Allied Substances Manual with Solubility Chart. Compiled and edited by C. MARSDEN, B.Sc., A.R.I.C., British Industrial Solvents, A Division of The Distillers Company Limited. Elsevier Press, 402 Lovett Boulevard, Houston, Texas. 1954. xii + 429 pp. 16.5 × 25 cm. Price, $12.95.

The author states in the preface that he "has necessarily accumulated a mass of information on solvents and allied chemicals currently in commercial production. . . . A careful and critical study of this conflicting data has been made and the outcome is offered in this volume. That all the information contained in it should be completely accurate is too much to hope but the more serious discrepancies and variations in published information and figures have been eliminated by careful selection in an effort to ensure that the data here presented are as accurate as possible in terms of present knowledge."

In a typical example of one of the more common solvents, such as acetone, where naturally fairly complete information was available, the following data are given. Under physical characteristics and properties are listed: mol. wt., b.p., m.p., flash point (closed and open cup), auto-ignition temperature, specific gravity, refractive index at 20 and at 25°. caloric value, specific heat at 20°, coefficient of cubic expansion at 20° and the mean from 0–100°, electrical conductivity at 20°, dielectric constant at 20°, explosive mixtures with air at 20° (upper and lower limits), latent heat of evaporation, latent heat of fusion, evaporation rate (for ether = 1 and for *n*-butyl acetate = 100), dilution ratios for cellulose nitrate solutions for water, toluene, xylene, petroleum naphtha and butanol, viscosity, surface tension at 20° and at 30°, vapor pressure, solubility in water, critical temperature, critical pressure and critical density. Other information given relates to methods of manufacture, industrial grades, azeotropes, physiological properties, and storage and handling. The main manufacturers both in the United States and in Britain are given for each solvent.

In other instances, particularly for very special proprietary solvents, comparatively very few data are given. For example, under "Intrasolvan E," a product whose manufacture is confined to Britain, only four physical characteristics are listed together with storage and handling.