New Books

ORGANIC COATINGS IN THEORY AND PRACTICE, by A. V. Blom (Elsevier Publishing Company Inc., New York, 1949, 287 pages with index, price $4.75). This book, by the former head of the Paint and Varnish Research Station of the Swiss Institute for Testing Materials, is an important addition to the literature on organic coatings and fills a much needed field. In spite of the title the whole emphasis is on theory with only an occasional mention of practice, and this little would have been better omitted.

The whole is an advanced text which assumes considerable familiarity by the student with the general field and with physical chemistry. After a brief consideration of some of the fundamental conceptions of colloidal chemistry, plasticizing action, and the film formation process, an extensive review of natural and synthetic film-forming materials is given. This is followed by a detailed consideration of the process of film formation, both physical and chemical, a brief consideration of the role of pigments in film formation, and a discussion of certain film properties and testing methods.

Particularly, in the latter part, only a few advanced features are chosen for discussion, and the result is a somewhat disconnected approach. The organization of all the material could be improved since what is essentially the same subject may recur at several places.

Two serious drawbacks make the book of doubtful utility to any except the advanced researcher. Even in highly controversial fields one theory is presented as if it were the accepted answer to the problem, and few of the difficulties or failures of the theory to conform with facts are mentioned. This may easily lead the uninformed student to the assumption that more is known about the mechanism of film formation than is in fact the case.

The other difficulty lies in the translation. This was obviously performed by one unacquainted with much of the English idiom, and while this rarely results in serious errors, it makes reading difficult and adds to the difficulty of understanding an already complex subject.

In spite of these defects this book is undoubtedly the best of its kind yet published. It contains many new and provocative ideas and is an essential part of the library of anyone engaged in the theoretical aspects of protective coatings.

FRANCIS SCOFIELD
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NUTRITIONAL DATA, compiled by H. A. Wooster Jr. and F. C. Blanck (The Republic Press, Pittsburgh, Pa., 114 pages, 1949, gratis by H. J. Heinz Company). This book represents the very popular "Heinz Chart" in modern dress and content. It provides in convenient size and shape reference material on the vitamins, minerals, proteins, and amino acids. Brief discussions on the metabolism, availability of nutrients, signs and symptoms of malnutrition as well as human nutritive requirements are presented. All of these sections combined with the tables of food composition and nutritive value make this publication most useful to the student of nutrition, be he physician, dietician, nurse, biochemist, or food-faddist.

L. J. FILER JR.
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Rochester, N. Y.

PROGRESS IN BIOCHEMISTRY (a report on biochemical problems and on biochemical research since 1939), by Felix Haurowitz, M.D., Sc.D. (Interscience Publishers Inc., New York, 405 pages, 1950, price $7.50). In 24 chapters ranging from four to 41 pages in length the author discusses the following subject material: The Use of Isotopes in Biochemistry; Mineral Metabolism; Formation of Organic Compounds from Inorganic Substances; Carbohydrates; Polysaccharidic Acids, Aminopolysaccharides, and Glucoproteins; Fatty Acids and Their Derivatives; Carotenoids; Sterols and Steroids; The Chemistry of Proteins; Protein Metabolism; Hemoglobin and Its Derivatives; Protein Hormones; Vitamins and Growth Factors; Biologically Active Substances and Bacteria, Molds and Plants, Nucleic Acids and Their Derivatives; Intermolecular Forces in Living Matter; Nonoxidative Enzymes; Oxidoreductions; Thermodynamics and Kinetics in Biochemical Reactions; The Muscle and Muscular Contraction; Chemistry of the Nervous Excitation; Immunochemistry; Cytochemistry; Biochemical methods.

The inclusion of sections on "intermolecular forces in living matter, immunochemistry, cytochemistry" and "ther-

modynamics and kinetics in biochemical reactions" makes the book valuable reading to the student of biochemistry, physiology, and pharmacology. Key publications from abroad during the past decade comprise a fair proportion of the references.

The number of typographical errors observed in the running text and references is unfortunate:

Page 54 ovarian misspelled
Page 71 reference (23) R. T. Holman not L. T. Holman
Page 82 reference (53) K. Hickman not K. Dickman
Page 97 third line from bottom
crystalline not cristalline
Page 110 line 16 crystalline
Page 113 Data on horse serum albumin are misquoted, i.e., the larger dimensions go with the wet crystals.
a 96.7A° C 145A° in wet state not dry
Page 114 line 1 heigh should be high
Page 135 reference (99) Ann. Rev. Biochem. *14*, 207 (1945), not *14*, 233 (1945).
Page 214 The international unit is 1 mg. of
dl-α-tocopheryl acetate not 1 mg.
dl-α-tocopherol
Page 247 Inconsistent use of terms lipoid and lipid.
Lipid is the preferable term.
Page 362 Caspersson not Casperson
Page 392 reference (109) Axelrod not Axelrodt

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NEW ATOMS, by Otto Hahn (Elsevier Publishing Company, Inc., 183 pp. 1950, $1.75). This excellent volume describes clearly and concisely the recent advances in nuclear science. The book is divided into three main sections, including the author's Nobel lecture in 1944 on the artificial fission of uranium, a description of the new elements including Berkelium and Californium which were discovered as a direct result of nuclear fission studies, and personal reminiscences of the author concerning the historical development of knowledge about nuclear fission of uranium and thorium. Throughout the book it is evident that the author has complete command of the subject and thus is able to present it in a most interesting and authoritative manner.

The subject is exceedingly timely for in this small volume the fundamentals of atomic bomb and of hydrogen bomb production are clearly set forth. Thermodynamic relationships involved are discussed quantitatively, which lead to the conclusion that atom bombs could, as it is well recognized, be used for peacetime power production. However hydrogen bomb development is not likely ever to be used for peaceful purposes on account of the necessary high temperature of the order of 20 million degrees required to initiate the triggering action, which is followed by an uncontrollable conversion of deuterium and tritium energy.

This book is highly recommended to all persons interested in nuclear fission and its impact on modern science and on modern warfare.

FRANK L. JACKSON
Procter and Gamble Company
Cincinnati, Ohio

ION EXCHANGE RESINS, by Robert Kunin and Robert J. Meyers (John Wiley and Sons Inc., 440 Fourth avenue, New York City, 212 pages, 1950, $4.75). The 12 chapters comprising this volume deal with the subject of ion exchange resins from the standpoint of both theory and practice. Included are descriptions of characteristics and methods of synthesis, applications to water softening and other processes, their use as an analytical tool, methods of evaluating, and design of ion exchange units. The book contains a comprehensive list of references and an appendix of data useful to the engineer and operator and is adequately indexed.

Publication of this book testifies to the growing importance of ion exchange as a unit process. Despite the comparatively short history of synthetic ion exchange resins, their investigation by a large number of workers has resulted in an extensive literature. The present volume is smaller but more up-to-date than the one published by F. C. Nachod in 1949. It serves the purpose of presenting a condensed review of the literature and is an excellent, though brief, summary of the present state of knowledge of ion exchange resins and their uses in a wide variety of processes. The authors included a considerable

amount of previously unpublished data, which elucidate the behavior of ion exchange resins in the deionization of water.

The first chapter presents a good short historical review, which perhaps sets the tenor of the volume. Brief treatment of all phases of ion exchange technology should make this book a valuable reference volume for both laboratory scientists and engineers. Chapter 5, dealing with the synthesis of ion exchange resins, contains a useful list of available resins together with some of their properties. The usefulness of this table could probably have been extended by inclusion of more specific information with respect to the chemical constitution of the anion exchange resins listed.

The mechanism and kinetics of ion exchange are adequately treated in Chapters 2, 3, and 4, and this presentation should serve as a satisfactory introduction to the subject for research workers entering the field. Methods of treating design problems and economic factors illustrated in the last chapter should be of value to engineers concerned with the design and operation of ion exchange systems. Sufficient data are presented to enable engineers to determine most efficient conditions for operation of existing installations.

J. B. GOTTFRIED
Corn Products Refining Company
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COLLOIDAL DISPERSIONS, by Earl K. Fischer (John Wiley and Sons Inc., New York. Chapman & Hall Ltd., London, October, 1950, $7.50, 387 pages). This is a medium-sized volume 6 in. x 9¼ in., intended primarily to supplement available textbooks on colloid chemistry. This book is unique in that it covers both the theoretical and practical aspects of colloidal dispersions, as can be seen from the following chapter headings: Particle Size; The Solid-liquid Interface and Wetting; The State of the Dispersed Solid; Rheological Properties of Dispersions; Surface-Active Agents: The Process of Comminution; Mixing; Roll Mills; Ball and Pebble Mills; Disc, Cone, and Colloid Mills; Dispersion by Phase Transfer—the Flushing Process.

Dr. Fischer's approach is that of a physical chemist and practicing engineer and, coupled with his excellent background in general colloid chemistry, has resulted in very competent and authoritative treatment of the subject at hand.

This book is particularly attractive for anyone connected with the printing or paint industry. On account of the author's policy of providing extensive literature references and an excellent chapter on rheology "Colloidal Dispersions" is a worthwhile addition to the library of anyone dealing with oils and fats.

W. H. SCHMIDT
Lever Brothers Company
Edgewater, N. J.

THE CHEMICAL FORMULARY, Volume IX, H. Bennett, editor-in-chief (Chemical Publishing Company Inc., Brooklyn, N. Y., 1950, 628 pages, 648 with index, price $7). This book has 20 major chapters containing formulas and directions for their use as follows: Adhesives; Cosmetics and Drugs; Ceramics, Glass, and Cement; Colloids; Farm and Garden Products; Food; Ink and Marking Compounds; Insecticides, Fungicides, and Weed Killers; Leather, Skins, and Furs; Lubricants and Oils; Metals and Their Treatment; Paint, Varnish, Lacquer, and Other Coatings; Paper; Photography; Polishes; Pyrotechnics and Explosives; Rubber, Resins, Plastics, and Waxes; Soaps and Cleaners; and Textiles. In addition, the introduction, which is similar in all volumes of this series, contains detailed directions for those unfamiliar with compounding art on how to mix formulas and to use them. The book contains also several conversion and reference tables, an acknowledgment, a list of chemicals and supplies and places to buy them, and an index.

The volume is the ninth in a series which has proved to be very helpful to many. It should be particularly useful to those who are called upon to develop suitable products for specific uses, especially if the specific application happens to be unfamiliar to them. This series will be helpful also to the "small" business operator who meets new situations that involve specific applications and to the "home" compounder who desires to economize.

The formulas are said to be entirely new to this series of books. An examination of some 25 identically indexed items in Volumes VIII and IX uncovered no repetitions of formulas. Although most of the chapters in Volumes VIII and IX are

on the same subjects, some are different or have a different emphasis. With Volume IX the board of editors, or more properly the board of experts, has been increased more than two-fold. The use of thinner paper for Volume IX makes it actually a thinner book than Volume VIII, although containing 200 pages more.

Sometimes the directions for preparing a particular formula leave much to be desired. Although a search in the introduction or in the same chapter does frequently reveal more detailed directions with somewhat similar formulas, this approach is inconvenient for the person unfamiliar with the art. The editor has apparently sacrificed details in directions for more new formulas for the users well acquainted with the art. This may be desirable, particularly where the series and not one volume is accessible to the reader.

Not only are the formulas new, they are pertinent to new developments during the past several years. Among formulas given are: lead-free, non-staining house paints; ammoniated tooth powder; extrudable polyethylene; glyceryl monostearate as a stabilizer for ice cream; propyl gallate as an antioxidant; use of lecithin with powdered Irish moss as a preservative food coating; use of tall oil in textile scouring compounds, cleaners, varnishes, and waxes; allyl starch for lacquers; Ethofats in washing compounds, cold rubber tires, and dyes for polystyrene. This up-to-dateness is apparently maintained by use of the large group of experts on the board of directors.

J. C. COWAN
Northern Regional Research
Laboratory, Peoria, Illinois

SOYBEANS AND SOYBEAN PRODUCTS, edited by K. S. Markley (Interscience Publishers, New York, London, Volume I, 1950, 558 pages, 123 illustrations, 92 tables, 1 plate, $11). This is the first of two volumes of equal size which will appear under this one title and with continuous pagination. It constitutes the fourth title in the series of monographs on Fats and Oils being issued by these publishers under the same distinguished board of editors. The same excellent paper, type, and illustrations that distinguished earlier volumes have again been used so that "Soybeans and Soybean Products" is quite comparable to "Cottonseed and Cottonseed Products." In this first volume 12 authors contribute 14 chapters covering the broad subjects of production, structure and composition, and processing. The history of soybean production, including agronomic phases, is discussed by W. J. Morse; E. L. Burtis writes on world soybean production and trade. Physical structure and genetic characteristics are described by L. F. Williams; chemical composition of soybean seed by W. J. Morse and of soybean oil by B. F. Daubert. Chemical characteristics of the oil are covered by S. T. Bauer and the physical properties by M. E. Jefferson.

The proteins and other nitrogenous constituents by S. J. Circle is the longest chapter in the volume. The discussion of other constituents of the soybean was prepared by B. F. Daubert. Nutritive factors in soybean products by H. H. Mitchell completes the section on structure and composition. For the four chapters on processing E. G. Freyer writes on grading and evaluation of soybeans and derived products; L. E. Holman on storage; Max Midner on biological processes in stored soybeans; and L. F. Langhurst on mechanical processing of soybeans. Volume II will contain another chapter by Langhurst on solvent extraction, and the remaining 10 chapters will deal with the utilization of soybean products.

Comparison with "Soybean Chemistry and Technology" is inevitable, especially since this earlier volume (1944) had as co-author the editor of the present book. The 1944 work had 260 pages, cited 684 references, and cost $3.50. The present set will have 1,145 larger pages, 3,364 references (1,864 in Volume I), and will cost $22. Perhaps the best tribute that can be paid the present two volumes is to say on the basis of price they will return as much to the purchaser as did the 1944 volume.

These volumes are so extensive and inclusive that everyone interested in any aspect of soybeans can find something of interest and value. As a reference book it should find wide use and will undoubtedly be cited extensively by future authors and research workers. Volume I can be recommended as the primary source of information for those interested in production or processing of this crop, and Volume II will undoubtedly fill the same role for utilization studies.

With the many excellent features and the wide coverage already mentioned, it is of minor concern to mention details which are common to all books of this nature. As the editor admits in his preface, duplication of subject matter is inherent when a group of experts engages in a compilation such as this. Most chapters tend to be too self-sufficient. For example, vitamins (fat soluble) are discussed in Chapter IV, Chemical Composition of Soybean Seed, in Chapter V, Chemical Composition of Soybean Oil, and again in Chapter X, Nutritive Factors in Soybean Products. Two of the references are repeated in all three chapters. Chapter VI, Chemical Characteristics of Soybean Oil, is largely devoted to a description of chemical analytical methods. Chapter X, Nutritive Factors in Soybean Products, is outstanding both in its clear presentation and in the coherent, excellent summary.

With the appearance of Volume I and the promise of Volume II soon, it is believed that these two volumes represent the most comprehensive treatise on any agricultural crop in the world in any language.

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BEESWAX, ITS PROPERTIES, TESTING, PRODUCTION, AND APPLICATIONS. Huber H. Root (Chemical Publishing Company Inc., 154 pp., 1951, $4.75). This small, almost pocket-size book attempts to cover the following subjects: the origin, discovery, production, extraction, testing, bleaching, and uses of beeswax; the honey comb and comb foundation; beeswax candles; formulas for beeswax products, especially polishes and cosmetics; and future trends.

There has been no attempt to provide complete coverage of the subjects, and apparently the material considered to have the greatest general interest was selected under each of the headings. The presentation is simple and provides easy reading. Quotations and references are used frequently and to good advantage.

Some of the information, especially that on testing and uses, appears to suffer from lack of critical evaluation by the author. The book is fairly elementary. While it will not serve as an exhaustive reference on beeswax, it will be of value as a survey of the literature. It presents an interesting treatment of the origin and nature of beeswax and should be of particular value to small scale producers of beeswax.

R. N. DUPUIS
S. C. Johnson and Son Inc.
Racine, Wis.

ORGANIC REAGENTS FOR ORGANIC ANALYSIS, by the staff of Hopkins and Williams Research Laboratory (Chemical Publishing Company Inc., Brooklyn, N. Y., 1950; 5½ in. x 8½ in., 263 pp., $5). This considerably enlarged second edition retains the plan of the first edition, being divided into three main sections. The first section consists of critical discussions of the derivitization agents which have been proposed for 17 major classes of organic compounds. The authors recommend several reagents for each class and give literature references for the Other Reagents which have been used. The selection or rejection of each reagent is explained, and the choice in most cases is based on the laboratory experiences of the authors.

The second section gives detailed instructions for the use of the 48 Selected Reagents, including quantitative applications where they are sufficiently general to warrant consideration. The third section, comprising about 40% of the book, consists of alphabetical tables of melting points.

The book is very well printed on good low-gloss paper, and the binding up to the standard for British printings of the postwar period. The authors have fulfilled their stated intention in that they have produced a valuable up-to-date supplement to the standard texts on qualitative organic analysis. The concise and practical treatment of the subject and the alphabetical arrangement of the tables suggest that the book will be most useful to the organic research chemist. It is not intended for classroom use and cannot be so recommended.

In view of existing differences in preference and usage with respect to nomenclature, it is the opinion of the reviewer that the tables might be more readily useful if arranged according to the physical constants of the parent compounds. However the alphabetical arrangement is no serious handicap, and the book offers an economy of library and laboratory time which makes it well worth its purchase price.

R. H. TENNYSON
Corn Products Refining Company, Argo, Ill.

PHYSICO-CHEMICAL CONSTANTS OF PURE ORGANIC COMPOUNDS. J. Timmermans (Elsevier Publishing Company Inc., New York, 1950, 693 pp., price $12.50). This is a compilation of "those physico-chemical constants of organic compounds which have been measured with sufficient care to warrant their acceptance as data established with a precision worthy of contemporary science." As director of the International Bureau of Physico-Chemical Standards in Brussels, Professor Timmermans has had extended experience in purifying and measuring the basic physical properties of organic compounds and in appraising the reliability of published data. He is therefore especially well qualified to select from the literature those data which have been measured with a high degree of accuracy on highly pure specimens.

The criteria used in this selection are extremely restrictive. They are concisely explained in a 15-page introduction, which should be studied carefully in order to understand the scope of the tables. The evaluation of the suitability of the data depends essentially upon such considerations as the origin of the samples and their method of purification, the method of measurement and its calibration, and the concordance of the values with those obtained by other authors on samples of diverse origin and with different apparatus, and it often involves plotting the data on suitable coordinates. When the available data are inadequate to prove their accuracy in this manner, they are usually rejected. Rigorous adherence to these rules and the inadvertent possibility that the author's coverage is not complete has undoubtedly resulted in the omission of much highly acceptable material. This seems to be especially apparent in connection with the compounds pertinent to fats and oils. For example, data are given for tricaprin, trilaurin, and tripalmitin, but not for trimyristin and tristearin. Similarly, Bertram's value for the freezing point of oleic acid, 16°C., is given, and J. C. Smith's value, 16.25°C., and the freezing point of the unstable form are not mentioned. Therefore, though it constitutes a mark of merit for an investigator to have his data included in this social register of pure compounds, their omission can by no means be considered derogatory. In any case there is a high degree of probability that the data appearing in these tables are quite accurate.

All of the data for each compound are grouped together. The compounds are arranged in 14 classes with suitable subclasses and can be readily located by means of complete formula and subject indexes. The constants reported, when available, include boiling point, melting or freezing point, viscosity, surface tension, refractive index, optical rotation, critical constants, specific heats, and latent heats at various temperatures, pressures, and wavelengths as the case may be. With few exceptions all values are clearly labeled with the name of the author and the year of publication so that the exact literature reference may be found in the author index. About 1,550 com-

pounds are included. For about 400 of these the data are unfortunately not given, but the author and reference and a list of the available constants are cited. In many cases the preferred method of purification is outlined.

This volume is not meant to be a substitute for the International Critical Tables or similar tabulations. It will have special uses of its own because of the highly critical manner in which the data have been selected. It will provide standards for the estimation of the purity of specimens of organic compounds, and it will obviously constitute an excellent source of literature references to proven methods of purification and to accurate methods and techniques of physical measurement.

Professor Timmermans is to be commended for seeing the need for these tables and for undertaking the gigantic task involved. They will be of incalculable value to all scientists who are interested in working with pure organic compounds.

EVALD L. SKAU
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A full range of chemical products representing nearly all the leading British chemical houses will be shown at the 1951 British Industries Fair, in London and Birmingham, England, from April 30 to May 11. Engineering exhibits will also be shown concurrently.

D. D. WALKER, formerly with the Owensboro (Ky.) Grain Company, has been named superintendent of the soybean solvent extraction plant now under construction by the Funk Bros. Seed Company of Bloomington, Ill. This plant will be one of the first large units to use trichlorethylene as solvent.

Edward G. Egan has been appointed head of the Chemical Department of the AMERICAN MINERAL SPIRITS COMPANY, New York.

E. F. Scherubel Dies

Erwin F. Scherubel, one of the 20 charter members of the Society of Cottonseed Products Analysts which later changed its name to the American Oil Chemists' Society, was killed in an automobile collision on January 25, 1951. He had retired from Swift and Company, Chicago, in 1944.

Mr. Scherubel, who was born at Beaver Dam, Wis., February 5, 1879, was graduated from the University of Chicago in 1903. He then entered the employ of Swift and Company and a few years later was made assistant chief chemist. About 1915 he entered the plant operating division, where he continued until his retirement. His professional work was in soaps, fats and oils. He served as abstractor and editor in these fields for Chemical Abstracts, publication of the American Chemical Society. He was a college classmate of J. J. Vollertsen.

The first industry-wide meeting of the scientific instrument and laboratory apparatus makers and distributors since the military emergency began will be held April 15-18 at the Greenbrier hotel, White Sulphur Springs, W. Va. It will be the 33rd annual meeting of the Scientific Apparatus Makers Association, with an anticipated attendance of 350 representatives from 190 companies.

Three silicone alkyd coating resins are announced by the Plaskon Division, LIBBEY-OWENS-FORD GLASS COMPANY, Toledo, O., as the first chemically combined silicone alkyds resins, commercially available.