

liquid 2-formyldecalone-1. Without distillation this was treated with isopropyl iodide and potassium carbonate in acetone according to Claisen's method for O-alkylation.⁵ Almost colorless, crystalline enol ether, m. p. 67–72°, was thus obtained in 94% over-all yield from decalone-1. The recrystallized 2-isopropoxymethylenedecalone-1 melted at 77–78° (cor.), and gave a slowly developing violet color with ferric chloride. *Anal.* Calcd. for C₁₄H₂₂O₂: C, 75.63; H, 9.98. Found: C, 75.31; H, 9.77. Angular methylation was effected by treatment with potassium amide in ether followed by methyl iodide. The alkylated enol ether was hydrolyzed with dilute hydrochloric acid to give 2-formyl-9-methyldecalone-1 which was separated by alkaline extraction, and cleaved to the ketone by distillation of the alkaline solution. The steam-volatile material consisted of a mixture of *cis*- and *trans*-9-methyldecalone-1 obtained in about 30% over-all yield from decalone-1. Further work, as yet incomplete, indicates that this yield can be increased. The ketones were easily separated by taking advantage of the

(5) Cf. v. Auwers, *Ber.*, **71B**, 2082 (1938).

differential rates of formation of the semicarbazones.¹ Almost pure *trans* derivative separated rapidly, m. p. after recrystallization 218–218.5° (cor.), undepressed by an authentic specimen.¹ The *cis* semicarbazone, which formed slowly, melted at 224–225.5° (cor.) after recrystallization. A mixture with authentic material¹ showed no depression of the melting point.

2-Methylcyclohexanone has been converted through the sequence of reactions described above into pure 2,2-dimethylcyclohexanone, b. p. 166–169°; over-all yield 31%; m. p. of oxime 93–93.5° (cor.); m. p. of semicarbazone 199–201° (cor.). Mixtures of these derivatives with samples obtained by an alternate synthesis¹ showed no depression of the m. p. The methylation step was promoted successfully with potassium *t*-butoxide in *t*-butyl alcohol.^{1,2} When this procedure was used in the decalone series, however, the methylation was incomplete.

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NEW BOOKS

Varnish Constituents. By H. W. CHATFIELD. Science Publishers, Inc., 215 Fourth Avenue, New York 3, N. Y., 1944. 496 pages. 14 × 22 cm. Price, \$7.00.

This book contains a detailed description of the many diverse materials which are available for use in the manufacture of oleoresinous varnishes. There is some discussion of the methods of manufacture of some of these raw materials, especially where variations in the manufacture results in different grades or varieties which the varnish maker needs to distinguish. The main emphasis is on the properties of the materials which influence or control their suitability for varnish making. The author evidently attempts to give definite numerical values of measurable properties wherever feasible. A substantial fraction of the book is devoted to tables in which the numerical values of significant properties are systematically tabulated for easy reference and comparison. There are such tables for Varnish Oils; Acids; Monoglycerides; Synthetic Resins (47 pages); Solvents and Diluents (22 pages); Plasticizers (16 pages); Driers, Salts and Soaps; Asphaltums and Pitches, Waxes; besides numerous small tables of varied sorts. Numerous references to the technical and patent literature are given. The text contains much descriptive matter and comments on performance and usefulness of the materials with a discussion of the possibility of substitution of one material by another and the influence of such replacements on the properties of the finished varnish. Since these comments are written by an experienced English expert they should be of value to American formulators in these days when shortages of materials and priorities may make substitutions necessary.

Statistical data as to production and international commerce in these materials are omitted and what little comment there are on such questions is apt to be weak. Thus under the heading Soya Bean Oil he says, "The oil is obtained from the beans of *Glycine* or *Soya hispida*,

indigenous to China, Japan and Manchuria. Some oil is produced in the United States of America, Russia and Europe, and a little from experimental sources in Great Britain." The author apparently is not aware that the production of soya bean oil has been gaining rapidly in the United States. In 1943 the production in the United States was 1226 million pounds, which was almost as much as the cottonseed produced (1312 million pounds) and substantially ahead of the linseed oil (917 million pounds).

GRINNELL JONES

Annual Review of Biochemistry. Vol. XII. JAMES MURRAY LUCK, Editor, Stanford University, JAMES H. C. SMITH, Associate Editor, Carnegie Institution of Washington, Stanford University, California. Annual Reviews, Inc., Stanford University P. O., California, 1943. ix + 704 pp. Illustrated. 15.5 × 23 cm. Price, \$5.00.

Annual Review of Biochemistry. JAMES MURRAY LUCK, Editor, Stanford University, JAMES H. C. SMITH, Associate Editor, Carnegie Institution of Washington, Stanford University, California. Vol. XIII. Annual Reviews, Inc., Stanford University P. O., California, 1944. ix + 795 pp. Illustrated. 15.5 × 23 cm. Price, \$5.00.

Since its inception in 1932, the "Annual Review of Biochemistry" has proven to be perhaps the most valuable publication of its kind in the field of Biochemistry. The high standards set in previous years are maintained in volumes XII and XIII, in spite of the many handicaps inherent in war conditions. It is to be regretted that the cosmopolitan character of pre-war issues is now lacking in these volumes. With the exception of a few English re-

viewers, all are American. Inasmuch as comparatively little work of a fundamental nature in biochemistry is being carried out at present on the European continent, one is led to believe that few of the major contributions or advances are omitted in these reviews.

The excellent policy followed by the editors of rotating a subject among many schools of thought, if only on a national scale, is being continued. As the progress of a particular phase of biochemistry is traced through the volumes of a number of consecutive years, the reader meets with a diversity of points of view of the various authors, which is stimulating and refreshing, yet he is not left with a feeling of marred continuity of the subject. These diverse points of view are of particular value in helping to maintain a balanced perspective among research workers.

These volumes subdivide the field of biochemistry in approximately two dozen chapters, as follows: Two or three chapters each on Proteins and Amino Acids; Hormones and Vitamins; Carbohydrates; Metabolism and Nutrition; single chapters on Enzymes; Viruses; Steroids; Lipids; Pigments; Alkaloids; Synthetic Drugs; Compounds of Sulfur and Phosphorus; Photochemistry and Analytical Procedures. In view of the number and variety of subjects covered, it would be futile to attempt to examine each of these reviews individually. It might, however, be said that practically every phase of biochemistry of current interest is critically and expertly reviewed. Since there is no clear demarcation between animal and plant biochemistry, a considerable number of the reviews are of equal concern to workers in either of the fields. It might also be pointed out that many of the articles are of interest not only to the biochemist but also the investigator or teacher in pure chemistry. The present reviewer knows of no publication in which the yearly progress of such branches of organic chemistry as the chemistry of carbohydrates or of the amino acids and proteins is better summarized.

Subjects dealt with for the first time in these volumes are: synthetic drugs, the electron microscope in biology, and histochemistry.

The editors and contributors deserve much credit for their judicious handling of these topics and for maintaining this publication at a high level of distinction.

W. Z. HASSID

Organic Syntheses. Volume 24. NATHAN L. DRAKE, Editor-in-Chief, Roger Adams, A. H. Blatt, H. T. Clarke, J. B. Conant, L. F. Fieser, Reynold C. Fuson, Henry Gilman, W. W. Hartman, John R. Johnson, C. S. Marvel, C. R. Noller, F. C. Whitmore, and E. C. Horning, Secretary to the Board. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1944. 119 pp. 15 × 24 cm. Price, \$2.00.

This book is the Twenty-Fourth Volume of the well-known series of Organic Syntheses, an annual publication of satisfactory methods for the preparation of selected organic chemicals meeting with wide application in synthetic processes. The Editor-in-Chief of this volume is Nathan L. Drake, who has been assisted by the regular Editorial Board and also by forty-seven contributors other than members of the publishing Board. In this volume thirty-seven organic preparations have been described embracing a wide variety of organic compounds. Of this number compounds of the aromatic and heterocyclic types predominate. Every preparation that has been submitted has been checked by two investigators before acceptance and essential notes are given in each instance. The procedures can therefore be adopted with confidence. This

volume can be recommended as a worthy addition to this commendable series of practical preparations.

TREAT B. JOHNSON

Surface Chemistry. Publication of the American Association for the Advancement of Science, No. 21. Edited by FOREST RAY MOULTON. American Association for the Advancement of Science, Smithsonian Institution Building, Washington, D. C., 1943. 160 pp. 19 × 26.5 cm. Price to members, \$2.75; to others, \$3.25.

The American Association for the Advancement of Science has made a definite contribution by publishing this volume. It is based on a symposium in commemoration of the twenty-fifth anniversary of Dr. W. D. Harkins' first publication in this field. The subject is of profound theoretical interest and it is also of prime practical importance both for many technological problems and for the understanding of fundamental physiological processes. It is of more general interest than might be suggested merely by looking at the table of contents.

Fifteen of the leading authorities in this country participated in the contributions here made available. One deals with interactions of biologically significant substances such as carcinogenic hydrocarbons with surface films, illustrating this important approach to biology. Then Langmuir and Schaefer discuss the effect of surface films on evaporation. The pièce de résistance is Harkins' résumé of his life work in this field together with the references to 111 papers by Harkins and his collaborators. The reviewer takes the opportunity of referring to another comprehensive discussion by Harkins in Jerome Alexander's "Colloid Chemistry," Vol. V, Reinhold Publishing Corporation, New York, 1944, pp. 12 to 102.

G. E. Boyd discusses the results of the Chicago school dealing with the difficult subject of the surfaces solids.

Other contributions deal with orientation, polarity, rate processes, and intermolecular attractions in and between surfaces. These are also related to problems of friction and lubrication as well as to the nature of cohesion, adhesion, and catalysis.

Two other papers are concerned with the elasticity of rubber-like materials and with diffusion and viscosity in protein solutions.

Nowhere else is all this important material so conveniently brought together.

J. W. MCBAIN

BOOKS RECEIVED

January 10, 1945–February 10, 1945

NOEL L. ALLPORT. "The Chemistry and Pharmacy of Vegetable Drugs." Chemical Publishing Company Inc., 234 King Street, Brooklyn, N. Y. 252 pp. \$4.75.

W. W. UMBREIT, R. H. BURRIS and J. F. STAUFFER. "Manometric Techniques and Related Methods for the Study of Tissue Metabolism." Burgess Publishing Company, 426 South Sixth Street, Minneapolis 15, Minn. 198 pp. \$3.50.

W. H. ZACHARIASEN. "Theory of X-Ray Diffraction in Crystals." John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 255 pp. \$4.00.

"Abridged Scientific Publications from the Kodak Research Laboratories." Vol. XXV, 1943. Eastman Kodak Company, Rochester, N. Y. 443 pp.