

Thus, in a typical experiment, 2.00 g. of *i*-cholesteryl methyl ether, m. p. 79.0–79.5°, was subjected to a one-half hour reflux period in absolute ethanol to which was added ethanolic *p*-toluenesulfonic acid (total volume of final solution 37 ml.) 0.001 *M* in excess of the slight potassium acetate impurity present in the *i*-methyl ether as usually prepared.³ The acid was neutralized, the solvent was evaporated, and the organic material was taken up in hexane. Systematic separation of the products by chromatography with the aid of alumina gave rise to 1.09 g. of *i*-ethyl ether, m. p. 45.0–45.5° (reported⁴ 47°), mixed m. p. with authentic material, 45.5–46.0°, $[\alpha]^{25}_D$ (chloroform) +47.10° (1 dcm., $c = 2.65$) (reported⁴ $[\alpha]^{20}_D + 49.78^\circ$ ($c = 1.607$)), 0.18 g. of *i*-methyl ether, m. p. 78.5–79.5° and 0.48 g. of *n*-ethyl ether, m. p. 88.0–89.0°. Thus, under these conditions, the ethyl ether product was 68% *i*-ethyl. The latter ether is converted to *n*-ethyl at a very appreciable rate, but the results

(3) Stoll, *Z. physiol. Chem.*, **207**, 147 (1932).

(4) Beynon, Heilbron and Spring, *J. Chem. Soc.*, 907 (1936).

serve to indicate the initial conversion of *i*-methyl ether predominantly to *i*-ethyl.

The *i*-ethyl ether product was indistinguishable in melting point and optical rotation from authentic *i*-ethyl ether and has, therefore, the same configuration as that of the product of the first reaction of ion I with ethanol under the usual conditions of preparation of *i*-ethyl ether. As far as we are aware this represents the first demonstration of exchange at the 6-position of *i*-compounds and suggests that, with care, it can be general.

The present work strengthens the case for an intermediate ion I in certain forward and reverse *i*-sterol rearrangements. It supplies evidence neither for nor against some contribution of bimolecular type mechanisms, and these remain possibilities for some rearrangements.

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NEW BOOKS

Biochemistry. Part I. FIAT Review of German Science, 1939–1946. Senior Author, RICHARD KUHN, Kaiser-Wilhelm-Institut für Medizinische Forschung, Heidelberg; Co-authors, H. FISCHER, H.-J. BIELIG, H. VON DOBENECK, D. JERCHER, W. SIEDEL, M. STRELL, K. THOMAS, O. WARBURG AND G. WEITZEL, Published by Offices of Military Government for Germany, Field Information Agencies Technical, British, French, U. S. Printed under supervision of Dieterich'sche Verlagsbuchhandlung, Inhaber W. Klemm, Wiesbaden, Germany, 1947. 218 pp. Illustrated. 15 × 22.5 cm.

This volume, the first of a series of four devoted to biochemistry, consists of six review articles, respectively entitled: "Fat and Fat Metabolism," by K. Thomas and G. Weitzel (51 pp.); "Invert Soaps and Tetrazolium Salts," by D. Jerchel (7 pp.); "Natural Pigments I," by H. J. Bielig (42 pp.); "Natural Pigments II, Syntheses of Pyrroles and Bile Pigments," by H. Fischer and W. Siedel (19 pp.); "Natural Pigments III, Syntheses of Porphyrins, Pentdypent," by H. Fischer and H. v. Dobeneck (18 pp.); "Natural Pigments IV, Chlorophyll," by H. Fischer and M. Strell (11 pp.). In addition, the book contains three original articles on carboxyhemoglobin and on the photochemical assimilation of carbon dioxide, by O. Warburg.

Much of the research work carried out during the war years was inevitably of a highly technical and utilitarian character, and in most instances the individual reports demand detailed study only by specialists. These review articles accordingly constitute a useful readers' guide for biochemists to whom the journals published in Germany in 1939 to 1946 are only now becoming available.

There are, however, several discussions of subjects of general interest. The section on fats and fat metabolism contains a stimulating account of fundamental work by

Treibs (1942–1946) on the chemical reactions involved in the autoxidation of unsaturated fats, which must be carefully considered both by biochemists and by organic chemists. The same applies to the accounts of methods for the production of fatty acids from hydrocarbons and the studies of the metabolism and nutritional value of glycerides of these acids. The first section on natural pigments includes reviews, of more than ephemeral interest, of developments in the fields of carotenoids, flavines, pyrones and quinones. Of outstanding excellence are the reasoned discussions, by the late Hans Fischer and his associates, of the chemistry of porphyrins and other pigments related to pyrrole. The sections devoted to these topics resemble, in scope, articles in our own *Chemical Reviews*, and may well take a place in the permanent literature on the subject.

HANS T. CLARKE

Electrochemical Analysis with Graded Cathode Potential Control. By HARVEY DIEHL, Ph.D., Professor of Chemistry, Iowa State College, Ames, Iowa. Published by The G. Frederick Smith Chemical Co., 867 McKinley Ave., Columbus, Ohio, 1948. vii + 56 pp. 15 × 23 cm. Price, bound copies, \$1.00 each; paper back copies free on request.

Professor Diehl most appropriately has dedicated this booklet to the late Henry J. S. Sand, who, forty years ago, introduced the technique of controlling the cathode potential in electrolytic separations and electrogravimetric determination of metals. In spite of its obvious advantages the controlled potential method did not become generally popular because of the tedium associated with the manual control of the potential. Recently, however, potentiostats which automatically perform this