Book Reviews

Vegetable Fats and Oils. E. W. Eckey. ACS Monograph Series. Reinhold, New York, 1954. ix + 836 pp. Illus. $16.50.

More than 10 years have passed since the publication of the second edition of *Vegetable Fats and Oils* by G. S. Jamieson, a most extensive and authoritative survey of the sources, preparation, composition, characteristics, and practical applications of the various fatty products obtained from plants. In the present volume, the title, aims, and scope of Jamieson's book, now out of print, have been retained, and the information has been considerably enriched and thoroughly brought up to date. However, Eckey's book cannot be regarded merely as a new and revised edition of the earlier volume. The introduction and the first seven chapters supply the basic information concerning fats in general, including their composition, physical and chemical characteristics, metabolism in animals, biological synthesis in plants, and methods of analysis. I was especially impressed with the excellent treatment of the physical properties of fats. Of course, in order to keep the size of the book within reasonable limits, much information had to be omitted or mentioned only in a cursory manner. This seems especially regrettable for the short chapter on "Methods" in which only the general principles of the various tests are outlined. In Jamieson's book this section occupied as much as one-fifth of the total number of pages; and for each determination or test, at least one standard procedure was described in such detail that the reader could have used the procedure directly without referring to specialized manuals.

As in the earlier volume, the largest portion of Eckey's book is devoted to the systematic description of nearly all the vegetable fats and oils for which analytic data are available. The older grouping into drying, semidrying, and nondrying oils has been abandoned, and the material has been arranged solely on the basis of the botanical classification of the plants from which the oils are obtained. Furthermore, for each plant, the information concerning the physical characteristics, the chemical composition, and the technologic applications of the oil is preceded by a concise description of the plant itself and of the nonfatty products that may be prepared from the various parts of the plant, including the fat-bearing part. Thus, not only in the general arrangement of the book, but also in the treatment of the individual topics, the emphasis has been shifted from the purely analytic and technologic data on the oil to the relationships between these data and the biological characteristics of the plant producing the oil. These relationships are further underlined in the numerous tables, in which the values for the various oils obtained from plants of the same genus or family are compared. In this respect one might well quote the statements made years ago by T. P. Hilditch that "the fatty (glyceride) components of seeds are specific and closely related to the families in which the parent plants have been grouped by botanists," and that, even in cases in which a peculiar fatty acid, such as erucic, petroselinic, or ricinoleic acid, is present as a major component of the seed oil, "the occurrence of these unusual features runs remarkably parallel with the groups in which morphologists have placed the plants."

Such an approach, together with the clear and fluent style, makes Eckey's book very pleasant and thought-provoking reading. Moreover, because of its complete and up-to-date information, this volume will continue to be what its predecessor has been for many years: a veritable encyclopedia on the subject and an invaluable reference book for all research and technical workers who are interested in the chemical, biological, and practical aspects of vegetable fats.

CAMILLO ARTOM

Department of Biochemistry,
Bowman Gray School of Medicine of Wake Forest College

Metabolism of Steroid Hormones. Ralph I. Dorfman and Frank Ungar. Burgess, Minneapolis, Minn., 1953. vi + 170 pp. Illus. $4.

During the last 15 years knowledge of the metabolism of the steroid hormones has increased rapidly, largely because of the development of relatively specific microtechniques for these compounds. This book is written by two major contributors to the field. It gives in outline and tabular form their accumulated information on the subject; textual material is limited to that necessary to give meaning to the charts and tables that are used for the major presentation. The book is prepared so that a person having only a limited familiarity with steroids can understand the structures and processes discussed. The term *steroid hormone,* however, is not defined, and therefore the distinction between biosynthesis of the hormones and their further metabolism is not always easy to discern.

The introduction outlines in simple terms some of the techniques that have been useful and gives the structural basis for steroid nomenclature. It is followed by a chapter on steroids isolated from natural sources, the conjugated forms in which they occur, and (a very important point) artifacts produced during the hydrolytic procedures often used in isolation. The next chapter deals with biosynthetic reactions in mammalian tissues as demonstrated by over-all studies using isotopes, by perfusion of specific tissues, or by incubation of tissue slices or homogenates. A separate chapter is devoted to microbiological reactions.

The fifth chapter, according to its title, deals with the "Reactions of steroid hormones in mammals." The title should more appropriately be that used on the tables in the chapter: "Reactions involving steroid

hormones and related substances," since not all of the substrates listed have been demonstrated to be steroid hormones or substances that would be formed from them. The chapter is divided into four sections. Two deal with the reactions of the neutral and phenolic steroids observed *in vivo* and two with the *in vitro* reactions. The former are reactions that would be necessary to explain the formation of a compound isolated from the urine after the administration of a given steroid substrate. The *in vitro* reactions are those that would be necessary to account for the formation of an identified product or structure after incubations with tissues. There is considerable repetition of information given in previous chapters, since all reactions of the neutral or phenolic steroids having 21 carbons or less are tabulated, but the emphasis here is on type of chemical transformation rather than on its role in the organism. The next chapter, "Enzymes influencing steroids," again involves repetition of much material covered under biosynthesis and *in vitro* reactions. In this chapter, however, the types of tissue preparation and the cofactors used are listed.

The next two chapters are given over to an ingenious organization of the previously covered material on the basis of chemical structure. The seventh chapter, "A complete system of steroid metabolism," is largely made up of a series of charts in which certain compounds are taken as key structures, and the various reactions that have been postulated in the previous chapters are organized around them. In the eighth chapter the authors attempt to deduce the effect of structure on the subsequent metabolic reactions and to outline the metabolism of certain steroids on the basis of the reactions and urinary products already discussed. Here an oversimplification enters, for it is implied that all the urinary steroids are formed by enzymes in the tissues of the mammal (usually human) from which the urine has been obtained. This ignores the possible role of the intestinal environment during biliary-enteric recirculation of steroid metabolites, apparently a rather general phenomenon. The last chapter deals with rather general considerations, such as the importance of method, the probability of conversion of C_{19} steroids to C_{21} compounds, and a discussion of the apparent differences between the results of *in vivo* and *in vitro* studies.

For the experienced worker, this book can be very useful as a quick reference for information that would otherwise require hours of library work. Also, in some of the tables space has been provided for the addition of further data as they appear. Thus the usefulness of the outline as a reference can be maintained. The organization of the material according to certain concepts also offers a challenge to test the hypotheses as well as a basis for associative memory. There is danger, however, that the scientist who uses this book to bring himself abreast of an unfamiliar field will be led to false conclusions. For, in the later chapters, chemical organization is achieved at the expense of lack of distinction between biosynthetic processes in the endocrine tissues and the further metabolism of the hormones. Further, as already noted, at no place in the book is the possible role of intestinal environment during hepatoenteric recirculation mentioned. Thus an unwarranted impression of certainty may be obtained regarding certain processes that are, at present, hypothetical. If these factors are kept in mind, however, the book can be a very valuable reference work and a guide to investigations that will determine the significance of the reactions indicated.

LEO T. SAMUELS
Department of Biological Chemistry,
University of Utah College of Medicine

Representative Chordates. A manual of comparative anatomy. Charles K. Weichert. McGraw-Hill, New York–London, 1954. vii + 204 pp. Illus. $3.50.

This laboratory guide for the dissection of four representative vertebrates (the marine lamprey, *Petromyzon marinus*; the spiny dogfish, *Squalus acanthias*; the mud puppy, *Necturus maculosus*; and the cat, *Felis domestica*) is designed as a companion volume to the author's *Elements of Chordate Anatomy*. It contains 103 illustrations.

WILLIAM L. STRAUS, JR.
Laboratory of Physical Anthropology,
Johns Hopkins University

Qualitative Analysis and Chemical Equilibrium. T. R. Hogness and Warren C. Johnson. Holt, New York, ed. 4, 1954. xiii + 621 pp. Illus. $5.

In this revision the authors have reached effectively their announced objectives of presenting a considerable body of related theory and a workable short laboratory course in qualitative analysis that is adaptable both to semimicro and macro work. The procedures are, however, given in terms of semimicro operation using the centrifuge.

The theoretical section occupies slightly more than one-half of the volume. A considerable amount of pertinent descriptive chemistry and facts about equilibria precedes each laboratory procedure for a group of elements. The inclusion of a chapter on quantized atoms and molecules and another chapter on nuclear chemistry may represent unnecessary material in many institutions. The other 12 chapters of the theoretical material are standard material for many courses that cover general chemistry and qualitative analysis. The discussion of complex-ion formation has been expanded and includes informative text and charts on the relationship of electronic orbitals and complex formation.

The other chapters of the theoretical section cover atoms, molecules, and solubility; electrolytes; atomic and molecular structure; oxidation-reduction equations; oxidation-reduction equilibria; equilibrium and reaction velocity; equilibria of weak acids and bases; the Brønsted concept of acidity; solubility product; colloidal properties; polybasic acids; hydrolysis, acid-