

Reviews of Recent Books

B-Vitamins for Blood Formation by Thomas H. Jukes, Charles C Thomas, Springfield, Illinois, 1952, pp. 113, \$4.00.

This is a brief summary of the role of B-vitamins in blood formation. The monograph is particularly valuable for the excellent summarization of the experimental studies involved in the discovery of folic acid and the vitamin B₁₂ group of compounds and gives details concerning what is known of the chemical properties and metabolic aspects of these vitamins. The monograph also deals with the *citrovorum* factor, the "intrinsic factor," and, very briefly, with vitamin B₆.
M.M.W.

Refining of Oils and Fats for Edible Purposes by A. J. C. Andersen, Academic Press, Inc., New York, 1953, pp. 204, \$7.00.

This book, by a British chemical engineer, describes the methods of removal of fat-soluble and fat-insoluble impurities in the refining of oils and fats. The principles and practices of various treatments of degumming, deacidification, bleaching, deodorization, etc. are described. There are numerous illustrations and flow-diagrams showing machines that are in common use.

This is a book aimed for the chemical engineer or the industrial organization that actually processes these fats and oils for the preparation of edible material. It will be of interest to those concerned with the technical aspects of the procedures. A.E.S.

General Biochemistry by Joseph S. Fruton, Ph.D., and Sofia Simmonds, Ph.D., John Wiley & Sons, Inc., New York, 1953, pp. 940, \$10.00.

This volume should interest any reader whose field impinges to any extent on that of biochemistry. The authors' approach to biochemistry is semihistorical, in that the reader first learns what was learned first about a given topic. The subject is then gradually expanded, the order of complexity paralleling the chronological order of biochemical progress. History and procedure, discovery and theory are carefully interwoven, until finally the reader is led to a consideration of the latest techniques and a summation of current knowledge.

Proteins are considered in the opening section; their classification, isolation, chemistry, behavior as electrolytes, linkages and interrelations with other substances are described. Comprehensive sections follow on enzymes, biological oxidation, and the intermediate metabolism of carbohydrates, lipids, and

nitrogen compounds. A final section is devoted to general aspects of metabolism, including the role of vitamins, hormones, and inorganic ions. This material, so vital to the understanding of nutrition, is presented in a clear fashion. Recent work on the newer growth factors is covered, and the references are as up to date as the process of printing allows.

Since this is not a practical manual for laboratory use, the sections dealing with procedures are not precisely detailed; they are, however, clear and complete enough to guide the reader to a better understanding of their applications, results, and implications. References to more detailed descriptions of the methods discussed are conveniently available in the footnotes.

Mathematical techniques and the principles of physics are discussed wherever these are necessary to the understanding of dynamic organic processes. Kinetics and thermodynamics illumine the discussion of enzyme-catalyzed reactions, and the possibilities—and limitations—of isotope-tracer methods are considered.

The English language is handled unusually well—not always the case in technical works. Economy of style is achieved without sacrifice of necessary detail, and consideration of detail never interferes with the orderly and logical progression of the exposition.

Since almost every further discovery in biochemistry casts additional light on basic metabolic processes and supplies the physician and nutritionist with new experimental and clinical tools, a *summa* such as this should serve as a helpful refresher course and stimulating guide to workers in all related fields.
C.-J.H.

Refrigeration in America. A History of a New Technology and Its Impact by Oscar Edward Anderson, Jr. Published for the University of Cincinnati by Princeton University Press, 1953, pp. 344, \$6.00.

The author of this book, a university professor, has presented a very informative and exceptionally well-documented survey of the evolution of refrigeration, tracing it from earliest times through the year 1950 but with major emphasis on the diverse applications of refrigeration within the United States. It was the practical applications of refrigeration rather than the development of the scientific principles upon which these rest that are so uniquely American developments. In no other country have the applications of refrigeration been so highly developed nor produced such a profound impact on socio-economic aspects of national life.

There are included within this historical survey of refrigeration the outstanding developments in the specialized categories of the home food refrigerator, the cold storage warehouse, the refrigerated freight car, refrigeration facilities of merchant sea-going vessels, the frozen food industry, the community frozen food locker, and air-conditioning directed toward improving human comfort—along with sketches of the technical improvements which made progress in each of these fields possible.

Natural ice, harvested in the winter seasons from rivers, lakes, and ponds, was the first refrigerant of commercial importance. From primitive beginnings the natural ice industry grew steadily in volume and efficiency in this country until about 1860, continued in a strong position for some years, but fell into a decided decline by the first decade of the 20th Century. Meanwhile, a method of manufacturing ice had been discovered (about 1775) and came into greatest prominence in the southern part of the United States, reaching peak production in 1931.

Cold storage warehouses for food began to be in evidence during the mid-1850's and were definitely a commercial success by around 1875. Practical refrigerator cars used for the transport of dressed beef came into being around 1870 and were in fairly wide use by the meat-packing industry by 1890. The rapid advance of the industrial age, together with the growth of large urban centers, gave a tremendous stimulus to both cold storage and refrigerated transport of fresh foods. By 1950 cold storage warehouses were scattered across the entire country, with concentrations in regions of food production, in large urban centers, and at various intermediate positions. By 1950 there were at least 110,000 general service refrigerator cars in operation in the United States, with about 35,000 of these suitable for transport of fresh fruits and vegetables.

The spectacular advent of frozen foods for retail distribution began in the 1920's as more or less an outgrowth or progression of methods first developed in the fish industry. The rapid success in this area of food refrigeration was, in no small degree, attributable to the leadership of scientists associated with the United States Department of Agriculture. By 1950 the commercial frozen-fruit pack had reached the annual rate of 481,000,000 pounds, and frozen vegetables 587,000,000 pounds.

Air-conditioning, which had been successfully used in various manufacturing enterprises in the latter part of the 19th century, made its real beginning as a means of improving the comfort of people in the 1920's. The first large-scale users of air-conditioning for enhancing human comfort did so in hopes of increasing trade and profits . . . these included the motion-picture houses, followed by department stores, hotels, railroad passenger cars, ocean liners, motor buses, and offices. The chief obstacle to the wider

use of air-conditioning in private homes continues to be the relatively high cost of installation.

It is clearly obvious that the manifold applications of the principles of refrigeration in the United States have exerted a tremendous impact upon socio-economic conditions. Our national dietary, as a result of modern food refrigeration, has become more varied, more nutritious, and more suited to the less active types of occupation accompanying the industrialization of the country. Modern refrigeration of foods has increased the possibilities of regional specialization in food production and of land-usage. The food resources of the entire country are now made available to all consumers within reach of good retail marketing facilities. The commercial "quick-freezing" of foods has resulted in changes in the varieties of fruits and vegetables grown in this country, with emphasis on varieties which provide the most acceptable frozen products. In large measure, food refrigeration has tended to stabilize food prices, eliminate glutting of the markets at respective peak seasons of harvesting, and provide further incentives to growers. Various refrigeration techniques have made possible the centralization of many food industries near centers of food production which has been attended with highly significant economies and less waste of by-products. Refrigeration has provided nursery-men and florists with means of retarding germination of seeds and bulbs at will, of delaying blossoming periods, and of holding cut flowers. The history of refrigeration in the United States has a dynamic background and shows no signs of slackening either in progressive development or impact.

For readers with specialized interest in some one phase of the evolution of refrigeration in the United States it may be something of a disappointment not to find that material already assembled as an uninterrupted story but rather scattered through the various chapters of this survey. However, such readers will undoubtedly be grateful for the inclusion of what would appear to be a very complete and usable index.

L.E.B.

Books received for review by the *Journal of Clinical Nutrition* are acknowledged in this column. As far as practicable those of special interest are selected, as space permits, for a more extensive review.

Biochemistry and Physiology of Nutrition. Vol. I, edited by G. H. Bourne and G. W. Kidder, Academic Press, Inc., New York, 1953, pp. 569, \$13.00.
Hepatitis. Transactions of the International Society of Geographical Pathology, E. Karger A.G., Basel and New York, 1953, pp. 652, Swiss fr. 46.80.
Gourmet Cooking for Cardiac Diets by Florence Field, The World Publishing Co., Cleveland, 1953, pp. 350, \$3.50.