

rate of diffusion of the extractable material from one phase to the other. This and the concept of the mass transfer coefficient are discussed in Chapter 5.

Perhaps the most interesting and useful sections of this book to a practicing chemist or chemical engineer are chapters 6, 7, and 8, giving the methods of calculation for stagewise contact and continuous countercurrent contact with single, mixed, and double solvents. The several systems are discussed mainly in terms of graphical constructions on triangular coordinates, the Janecke diagram, and the distribution diagram consisting of the stepwise construction between the equilibrium curve and the operating curve in a manner similar to the McCabe Thiele diagram. The effect of either raffinate or extract reflex or both stands out clearly through the use of the above graphical calculations.

Two chapters are devoted to the description and discussion of equipment for stagewise and continuous countercurrent contact in extraction systems. The field is thoroughly covered in a general way with a large bibliography available to supply details.

The last chapter discusses a number of extraction processes that have attained commercial success. The petroleum industry contributes a large share with its lub oil refining, kerosene purification, desulfurization, gasoline sweetening, etc. The fat and oil industry is represented by its propane refining, furfural refining, and segregation of glyceride oils and fatty acids. The concentration of the active principle of penicillin from the fermentation broth by continuous countercurrent extraction with amyl acetate is one of the more important applications of liquid extraction to the pharmaceutical industry that is described.

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METHODS OF VITAMIN ASSAY, Second Revised Edition. Association of Vitamin Chemists (Interscience Publishers Inc., 301 pages, 1951, \$5.50). This volume, which is larger and better than the first edition put out in 1947, presents chemical assay methods for vitamin A, carotene, ascorbic acid, and thi-

amin, along with microbiological assays for riboflavin, niacin, pantothenic acid, vitamin B₆, folic acid, and vitamin B₁₂. The strength of this book is tied in closely with the limitation of its scope. It covers in careful detail only those methods which have been worked on in several laboratories in the Chicago area on certain important commercial food, feed, and drug products. Because the authors have not had practical experience in enough separate laboratories, the important vitamins D, E, and K, as well as p-aminobenzoic acid, inositol, and choline are treated in a single chapter consisting mostly of bibliography.

Each method contains the minor details, usually missing from most procedures, which are necessary to get good reproducibility of values in laboratories of producers, sellers, and independent analysts. The presentation shows that the authors are usually interested in using these methods, not to find the vitamin contents for "scientific" purposes but to make sure that they can back up the label of a feed or of a drug or to settle fairly a commercial bulk transaction. The emphasis on accuracy and reliability is indicated by the fact that the first chapter is concerned with the principles of sampling, not of chemistry or of biochemistry.

Nevertheless the treatment given the vitamins covered in their main chapters is quite thorough. The background of biology, physics, and chemistry needed for the procedures is presented along with the pertinent references. In addition to the joint writing and testing of the methods by committees of the Association of Vitamin Chemists, each procedure at several stages in its drafting has been referred to well-known authorities on the various vitamins in university, government, and industrial laboratories.

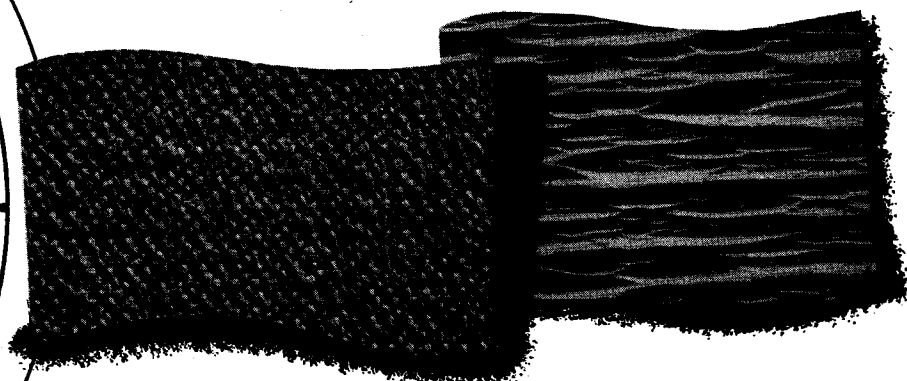
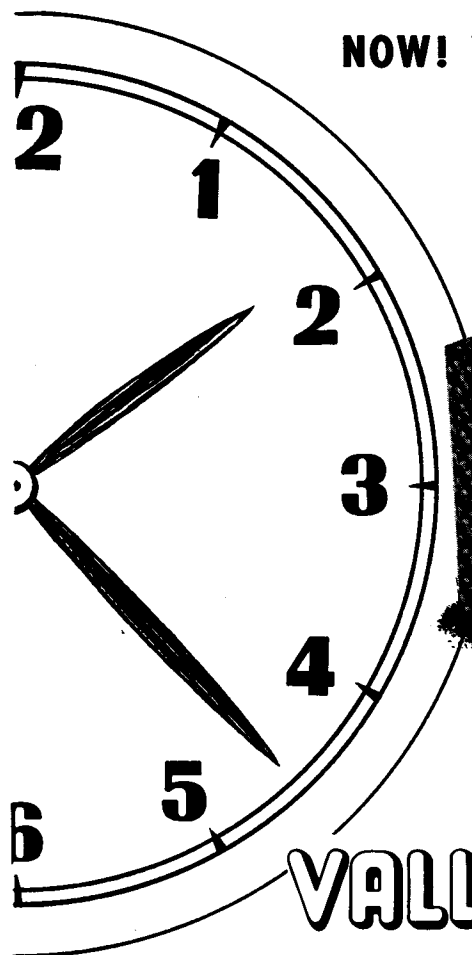
The volume should be a useful reference to research workers in the fields of vitamins and nutrition. It will be very valuable for analysts of foods and vitamin products and to technical workers concerned with the practical aspects of animal and human nutrition, whether in experiment stations or in industrial laboratories.

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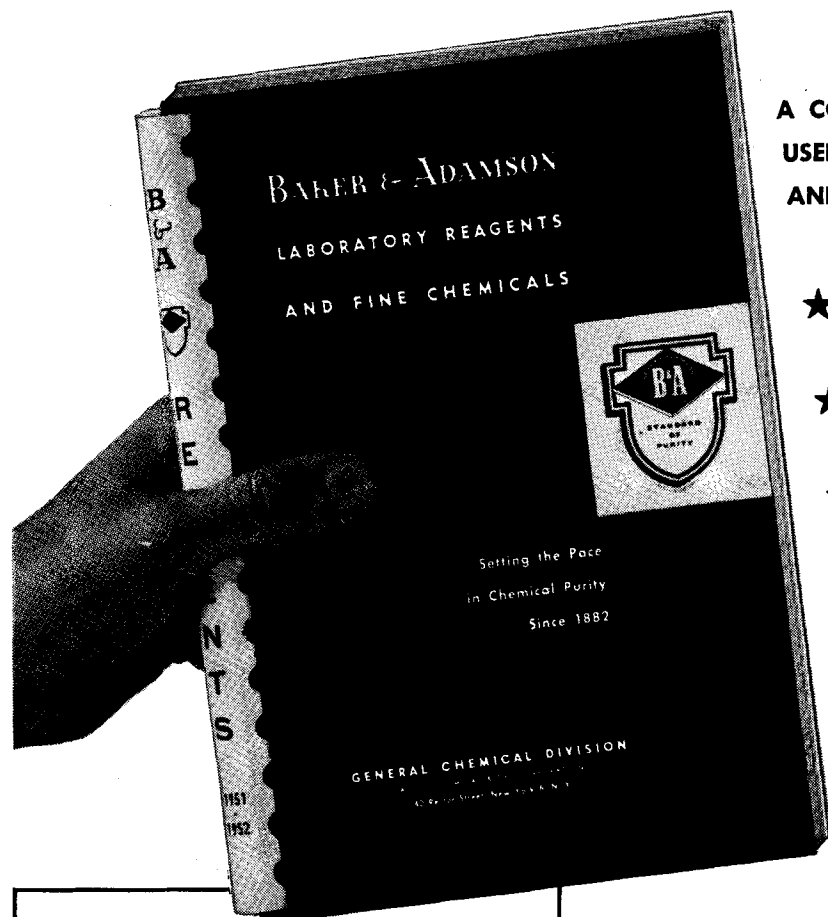
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