lism is not in agreement with McHenry's conception of the function of choline, nor has it factual support. Biologists now go farther than Witzemann; they are aware of the interrelation not only of fat and carbohydrate metabolism but of all foodstuffs. They have been speaking for some time of pyruvic acid as the hub towards which the breakdown of foodstuff (carbohydrate, fat, protein) converges, from which synthesis starts.

H. Dam, the discoverer of vitamin K, has given us an excellent review of the chemical and physiological properties of this vitamin, and has shown that there still remain many obscure problems, such as the nature of the action of vitamin K on prothrombin formation.

Pfiffner's article on the "Adrenal Cortical Hormones" concludes the book. After reviewing the chemical properties of the different steroids extracted from the adrenals, the methods of assay, Pfiffner devotes one page (out of 27) to the effect of corticosterones on carbohydrate metabolism, unfortunate neglect when the article is written for "Advances in Enzymology."

The publishers are to be congratulated for the excellent care with which the book has been presented. The errors found in Van Slyke's article (pp. 34 and 39) were promptly corrected. It is unnecessary to say that this series must be in the library of every laboratory where there is interest in the mechanism of biochemical activities.

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BIOLOGICAL SYMPOSIA

Comparative Biochemistry, Intermediate Metabolism of Fats, Carbohydrate Metabolism and the Biochemistry of Choline. Edited by HOWARD B. LEWIS. ix + 247 pp. Illustrated. Jaques Cattell Press. 1942.

THE fifth volume of "Biological Symposia" deals with comparative biochemistry, intermediate metabolism of fats, carbohydrate metabolism and the biochemistry of choline. This volume is edited by Professor Howard B. Lewis, who provides a short introduction for it.

It may be stated immediately that there is a wealth of information in this collection of scientific articles. Those in which comparative biochemistry is discussed will be found of great value, not only to students who are interested in this subject specifically, but to workers in all branches of the biological sciences. The article on the end products of nitrogen metabolism in plants will be stimulating to those who are interested in nitrogen metabolism of animals. This latter subject is also discussed and it may in turn suggest new approaches to the problems of the plant biochemists and physiologists.

The article on the merging of growth factors and vitamins proves again the point that investigators of bacterial metabolism must keep pace with the rapid growth of our knowledge of the vitamins, while the vitamin experts will profit greatly by studying the results of investigations of the metabolism of bacteria.

Four articles on the intermediate metabolism of fat help us to keep abreast of this rapidly growing field and the changing views which must be adopted in light of the accumulating evidence. The symposium on carbohydrate metabolism deals primarily with the more purely biochemical aspects of the study and consists of four stimulating articles on "Oxidation Catalysts," "Phosphorylation of Glycogen and Glucose," "Oxidoreduction in Carbohydrate Breakdown" and "Pyruvate Oxidation and the Citric Acid Cycle." There is little doubt that many of the fundamental changes in sugars within the body are now being revealed. These short reviews should help materially to bring the subject up to date. Here again the interrelationship of the various fields discussed in this volume is obvious. The accessory food factors are assuming an ever-increasing role in all considerations of protein, fat and carbohydrate metabolism.

The four articles on choline provide a most useful picture of this relatively new but rapidly extending field. Choline, as a dietary factor, is now known to be intimately related to fat, protein, and more indirectly to carbohydrate metabolism as well as to many of the components of the vitamin B complex.

In this review it will be impossible, of course, to make any detailed summary of the information found in any of the four divisions into which the symposia fall. The general impression given by the whole volume is that a great deal of essential information has been gathered together and presented in a most pleasing and stimulating way. One is left with the feeling that a much more extended review of each of the fields would be most acceptable. This, however, would not be possible under the conditions of presentation of these symposia. It is to be hoped that editors will be found and the necessary arrangements made for the publication of the symposia which have more recently been presented before the Federation of American Societies for Experimental Biology.

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HURRICANES

Hurricanes. By I. R. TANNEHILL. 2nd edition, 8vo, x + 256 pages. 119 figures. Princeton University Press. 1942.