Biochemical Pharmacology, 1960, Vol. 5, pp. 265–273. Pergamon Press Ltd., Printed in Great Britain.

BOOK REVIEWS

E. F. ANNISON and DYFED LEWIS: **Metabolism in the Rumen.** Methuen and Co. Ltd., London, 1959. pp. 177, 15s.

A GREAT deal of work on ruminant digestion has been done during the last 20 years and this monograph summarises the biochemical aspects of the subject. The title emphasises the fact that a study of the digestive functions of this organ is really a study of the metabolism of the bacteria and protozoa that live in it. To a large extent the metabolism of these organisms does fulfil the definition of digestion, namely that ingested food is prepared for assimilation by the animal. Since, however, the organisms themselves live on the food eaten by the animal, transformations of food constituents into microbial constituents also occur. The monograph consists of 6 chapters: the first is an introduction which sets out the important anatomical features of the stomach, being marred only by a misleading arrow in the diagram that shows the direction taken by the food through the stomach. This arrow suggests that when food is reswallowed during rumination it passes directly to the 3rd and 4th parts of the stomach, which is not supported by the text. The second chapter deals with the microbiology of the rumen; the third with fermentation of carbohydrates; the fourth with the metabolism of nitrogenous compounds; the fifth with absorption from the rumen; and the sixth with rumen function and dysfunction. Each chapter is annotated and the reference lists, although not exhaustive, give a good introduction to the literature. The text is supported by tables of published experimental results and diagrams.

This monograph is well written, easy to read, and gives a most comprehensive account of the work done in the various aspects of the subject. A clear indication of the ways in which this new knowledge has influenced research on the nutrition of domestic ruminants, on the evaluation of foodstuffs, and on the various disorders that occur in the rumen, or are associated with it, is given. Inevitably there are a few controversial conclusions, but this is only a sign that the subject is rapidly growing, and they are quite overwhelmed by the main body of the book on which substantial agreement has been reached. Consequently it can be recommended confidently as a book which all veterinary and agricultural students should read. It will be useful for those who teach animal nutrition and to those who wish to be well informed on this aspect of biology. The word biology is used because, although the subject matter is largely biochemical, it is treated in a biological manner.

One further matter should be mentioned. This book was written while both authors were on the staff of the Institute of Animal Physiology at Babraham, although the address given to the Preface suggests that this was not so.

A. T. PHILLIPSON

Steric Course of Microbiological Reactions. Edited by G. E. W. WOLSTENHOLME and C. M. O'CONNOR. J. and A. Churchill, Ltd., 1959. Ciba Foundation Study Group No. 2. pp. 115, 12s. 6d.

ONCE the cover of this exciting book is opened there are few faults to be found. The poor printing on the cover is matched by the inaccuracy of its title. Why should a book on microbiological reactions contain a table which compares enzymes from the flounder, sole, lamb, dogfish, grass frog and herring? Although some articles are largely microbiological, the substitution of the word "Biochemical" for "Microbiological" in the title would give a truer picture of the scope of this excellent book.

After NEUBERGER'S orientating opening remarks, WESTHEIMER gives an excellent summary of stereospecific reactions. These two articles summarize main themes of the following papers and discussion by treating the biochemical reactions specific for one of the two "a" groups attached to a carbon atom in compounds of the general type Ca_2bc. Citric acid (a = —CH_2.COOH), the nicotinamide residue (a = —H) and ethanol (a = —H) are the compounds most thoroughly considered.