

Chemical Society's specialist reports in this field and the authors have therefore included, where necessary, material published in the preceding year. With such a wide range of natural products, within which there are no sharply defined boundaries, it is difficult to decide on the best framework for a report. The procedure adopted takes cognizance of structural relationships, and of the biogenetic paths which provide the basic unifying theme. Part one (terpenoids) thus contains chapters on mono-, sesqui-, di-, tri-, and poly-terpenoids: the last chapter deals with the biosynthesis of both terpenoids and steroids. Part two (steroids) consists of two long "chapters" (the first on properties and reactions, the second on steroid synthesis) which are suitably divided into well chosen smaller sections. The intrinsic importance (biological and pharmacological) of steroids, and their suitability as substrates for mechanistic and spectrometric investigations, is recognized by the almost equal lengths of the two parts of this volume.

The eight authors are to be congratulated on the breadth and depth of their reading. Although exercising discretion in the material reported, they seem to have included all the important developments. Moreover, they have done much more than merely providing a comprehensive list of up to date references for further study: within a reasonably sized volume they have been able to summarize the chief points and to discuss briefly the significance of the publications to which they refer. Even the most active follower of the literature could not have hoped to have kept abreast of so many topics; organic chemists working on any aspect of terpenoids or steroids will find in this admirable volume a most welcome opportunity to see what advances have been made recently in all the related branches of research.

G. D. MEAKINS

## Foreign Substances

*Foreign Compound Metabolism in Mammals*. Vol. 1. Senior Reporter D. E. Hathway. Pp. xvii+455. (The Chemical Society: London, May 1971.) £11.

IN several countries of the world official bodies that formulate regulations concerning the safety in use of drugs, food additives, pesticides and the like now require information about what happens to these chemicals in the animal body, and in the past decade or so there has been a tremendous increase in the output of information on this subject. Much of the older work in this field was covered in the second edition of my book *Detoxication Mechanisms* which appeared in 1959; the volume under review covers the period 1960 to 1969.

This book is the first of a series planned to cover a variety of aspects of the metabolism of foreign compounds and future volumes are to include chapters on special techniques such as whole-body autoradiography and subjects such as drug tolerance and addiction. The six chapters are concerned with: (1), absorption, distribution and excretion; (2), the movement or transference of foreign compounds in the body; (3), the kinetics of drug metabolism; (4), biotransformations — an American term meaning the molecular reactions that compounds undergo in the body; (5), the mechanisms of biotransformations; and (6), species, strain and sex differences in metabolism.

The first three chapters aim to give an introduction to all aspects of the absorption, distribution and excretion of foreign compounds. Such subjects as the permeability of membranes, protein binding, the use of radioactive labels, the various physiological systems of the body and their involvement in drug metabolism, the kinetics of drug metabolism and drug interactions, to mention only a few, are discussed. These chapters are an up to date and readable account of these processes, and can be read with benefit by anybody in and intending to enter the field of biochemical pharmacology and toxicology because they form an important introductory background to the rest of the book. The fourth chapter is by far the largest in the book and covers more than 40 per cent of the pages. It gives a succinct account of the metabolic transformations of selected drugs, food additives, carcinogens, insecticides, herbicides, molluscicides and so forth. It is not claimed to be comprehensive because a coverage of the metabolism of all the compounds studied in the past ten years would require several volumes.

The fifth chapter is a systematic account of the mechanisms of the transformations of foreign compounds in body tissues covering the processes of oxidation, reduction, hydrolysis and conjugation and their enzymatic intricacies. The last chapter deals with three of the many factors which affect the metabolism of foreign compounds; namely, species, strain and sex. Species and strain are factors of considerable importance in the problem of extrapolating results from experimental animals to man. Sex differences in drug metabolism are not important except in rats which, nevertheless, are extensively used in testing.

This book is a useful addition to the literature on the fate of foreign compounds in animals, but unfortunately it does not possess a compound and subject index. The metabolic fates of many chemicals are competently described but to locate a particular compound is tedious.

R. T. WILLIAMS

## Intermediary Metabolism

*Regulation of Gluconeogenesis*. (Ninth Conference of the Gesellschaft für Biologische Chemie.) Edited by Hans-Dieter Söling and Willms Berend. Pp. xii+347. (Georg Thieme: Stuttgart; Academic: New York and London, July 1971.) \$12.50; £5.85.

THIS volume is the published result of a similarly entitled conference held in Göttingen in the spring of 1970. As such, it consists of twenty-five invited contributions together with full reports of the informal discussions which followed each principal paper. Even at a first glance it is clear that this book represents something of a turning point in the development of ideas concerning the loci of the rate-limiting steps of gluconeogenesis. To give a single example, it is instructive to note that both glucose 6-phosphatase and fructose 1,6-diphosphatase are conspicuous by their absence, both in the formal and the informal presentations. Even glyceraldehyde 3-phosphate dehydrogenase, a one-time favourite with some workers, has now been forsaken as a possible site of physiological regulation, and there is in evidence a general, although not unanimous, closing of the ranks behind the hypothesis that phosphoenolpyruvate carboxykinase, theoretically always the most likely candidate, is the site of gluconeogenic control. Indeed, much of the text is both directly and indirectly devoted to the consideration of the physiological role of this little understood enzyme and of its neighbour, pyruvate carboxylase.

In any new journal of inconclusive and negative results, the output from gluconeogenesis research groups would perhaps loom largest among the total number of contributions. One must therefore be particularly grateful to the editors and publishers of this volume for the provision of such full coverage of the informal discussion which contains much comment and material that would not normally be considered acceptable for publication by the established scientific journals. Among the problems dissected are: (1), compartmentation phenomena, both intercellular and intracellular; (2), the relationships between pyruvate carboxylase and phosphoenolpyruvate carboxykinase *in vivo* and *in vitro*; (3), gluconeogenesis, or, rather, the lack thereof, in homogenates; (4), the relationships between experimental and physiological situations, particularly with regard to hormone concentrations; (5), the interpretation of metabolite concentrations and crossover data; and (6), the role of the ubiquitous adenosine 3'5'-cyclic monophosphate.

On the debit side, one might perhaps have hoped for some information on, for example, ruminant gluconeogenesis and the role of energetically wasteful