

tion of calcium during ovulation, egg-shell formation, pregnancy and embryonic growth, as the case may be, in different classes of tetrapods. It terminates with a stimulating chapter of conclusions and speculations. As the author has admitted, this book is theoretical rather than applied and caters primarily for zoologists and comparative physiologists. Nevertheless, it is very informative owing to the inclusion of large numbers of tables and figures, so that for the applied physiologist and veterinary and medical scientists who are interested in calcium metabolism it serves as a useful handbook. On the whole, the literature covered is quite complete. It illustrates the amazing paucity of information on the regulation of calcium in vertebrates other than the tetrapods. With the recent discovery of (thyr)-calcitonin and its identity as the hormone secreted by the ultimobranchial bodies, the subject of hormonal regulation of calcium balance is bound to attract more and more attention. This book is a timely review of the past literature and stands out as a milestone to mark the beginning of perhaps a new era.

B. LOFTS

PHENOLS OXIDIZED

Oxidative Coupling of Phenols

(Organic Substances of Natural Origin: a Series of Monographs, Vol. 1.) By W. I. Taylor and A. R. Battersby. Pp. xiv + 387. (London: Edward Arnold (Publishers), Ltd.; New York: Marcel Dekker, Inc., 1967.) 260s. net.

PHENOLS and phenol ethers represent a large proportion of the benzenoid-aromatic compounds which are of such widespread occurrence in nature. Many of the more complex compounds, for example, alkaloids, tannins, lignins, and many quinonoid pigments are clearly the result of the oxidative coupling of two or more phenolic nuclei, and so much work on this subject has been done in the past few years that the time is ripe for the publication of a monograph on the subject.

It may be said straight away that the present monograph is extremely good. It consists of a number of reviews on the most important aspects of the oxidative coupling of phenols written and edited by internationally recognized experts. Each chapter is self-contained and there is surprisingly little overlap or duplication between one chapter and another. The text is profusely illustrated with beautifully printed structural formulae.

The first chapter (ninety-four pages, 424 references) is by H. Musso and deals concisely with the general problem of phenol coupling in terms of mechanism, formation of C-C and C-O aromatic bonds, and so on. A particularly valuable feature is the comprehensive table of products formed by phenols (mostly "unnatural" ones) when oxidized by various reagents. There is also a table of phenoxy radicals investigated by electron spin resonance methods. The second chapter (twenty-three pages, sixty-six references) by A. I. Scott describes "Some Natural Products Derived by Phenol Oxidation" and gives a glimpse of the variety of naturally occurring phenolic products. It whets the appetite for the specialized chapters which follow. In the third chapter (fifty-seven pages, 134 references), A. R. Battersby discusses "Phenol Oxidations in the Alkaloid Field". Since the original suggestions on the possible biogenesis of morphine and other alkaloids by Robinson in 1931, it has been shown that over 200 of the more than 2,000 known alkaloids can be accommodated within the framework of the oxidative coupling of phenols. For many alkaloids the detailed pathways of biosynthesis have been unravelled by feeding labelled intermediates to plants as well as by carrying out *in vitro* experiments. In the fourth chapter (thirty-five pages, 105 references), entitled "Biochemical Aspects of Oxidative Coupling of Phenols", B. R. Brown summarizes our present, all too scanty knowledge of the enzymes

which catalyse phenol-coupling. The fifth chapter (thirty-eight pages, fifty-seven references), by D. W. Cameron and Lord Todd, gives a fascinating account of the aphid pigments. The sixth chapter (seventy-nine pages, 277 references), by J. M. Harkin, and the seventh chapter (thirty-six pages, sixty-three references), by K. Weinges and R. Spänig, deal respectively with the industrially important, highly irregular polymer known as lignin and with "Lignans and Cyclo-lignans", which are essentially dimeric derivatives of propenylphenols.

All chemists and biochemists interested in phenols and in phenolic natural products should read this monograph. It is therefore most unfortunate that the price puts it beyond the range of all but a few individuals and the wealthier libraries.

J. F. W. McOMIE

VIRUSES IN THE LABORATORY

Virological Procedures

By J. Mitchell Hoskins. Pp. xiv + 358. (London: Butterworth and Co. (Publishers), Ltd., 1967.) 70s.

THIS book has been written for those concerned with the laboratory diagnosis of virus infections of man, with particular reference to the problems existing in the British Isles. The author considers that a virus diagnostic laboratory should have certain essential services available, and that these services should be used in different ways to meet the particular requirements involved in diagnosing infections with different viruses. Following this logical approach, the book is divided into five sections. The first and largest deals with basic laboratory facilities, ranging from considerations of the design of suitable accommodation, through technical points concerning equipment, washing and sterilization procedures, to more detailed accounts of the uses of experimental animals, embryonated eggs and tissue cultures in virology. The preparation of monkey kidney cell cultures is described as an instance of primary cell cultures, and the handling of HeLa cells is used to illustrate the uses of cell lines. The treatment of diploid cell cultures and of organ culture methods is less detailed, although useful in the context of the book. The information on the uses of laboratory animals and of embryonated eggs is presented clearly with appropriate illustrations.

The second section is concerned with the isolation of viruses, starting with the collection of clinical material and describing the various ways in which virus isolations may be attempted. Virus strains successfully isolated must then be identified, and the third section deals with this problem, indicating some of the clues which may assist the virologist in his task, and concluding with methods for the identification of specific viruses.

Some virus infections are diagnosed on the basis of serological evidence, and the fourth section is concerned with serological procedures. Recommended methods for preparing and standardizing diagnostic antigens and reference antisera are given, with details of the ways in which complement fixation, haemagglutination-inhibition, neutralization and other serological tests are carried out. The fifth section suggests the methods of choice for investigating different groups of viruses. This material is presented in the form of tables summarizing criteria which are considered useful in diagnosing infections due to particular groups of viruses, for example the picornaviruses and the myxoviruses. This whole section is short, and while tabulation has many advantages the presence of forty-nine footnotes to the table on myxoviruses is not an attractive feature. The book concludes with appendixes giving formulae of commonly used media, buffers and stains, and tables of logarithms and antilogarithms.

This fairly compact volume contains much that will be of great practical value in a virological laboratory. The author has been selective, and not everyone will agree