

Book Reviews

The Chemistry of Pesticides: Their Metabolism, Mode of Action and Uses in Crop Protection. By Kenneth A. Hassall. Macmillan, London, 1982. xvi + 372 pp. Price: £30 hard cover; £15 paper cover.

This important book has chapters on: *General considerations; Physico-chemical aspects of pesticide formulation and application; Principles of pesticide metabolism; Organophosphorus insecticides; Carbamate insecticides, molluscicides and nematocides; Organochlorine insecticides; Other insecticides and related compounds; Fungicides: general principles; Inorganic and heavy metal fungicides; Non-systemic organic fungicides; Systemic fungicides; Herbicides applied to foliage; Herbicides that act through the soil.*

Throughout, the author has tackled the subject in a truly chemical and biochemical manner. Each chapter concludes with an excellent yet succinct bibliography, there is a section on back-up reading and a very useful index.

The author aims the book as an introductory text suitable for undergraduates for whom the subject forms part of a wider course. He also points out that specialists in such fields as chemistry, biochemistry, agriculture, biology, toxicology and soil science may turn to it to superimpose a knowledge of pesticides upon their pre-existing expertise. It is a pity that he does not include students of food science and technology in the list for this reviewer will certainly recommend the text to all within the field of food chemistry.

The author is clearly concerned about the commercial secrecy that has surrounded the marked worldwide growth in pesticide manufacture. Growth of production underlines the economic importance of these chemicals, with herbicides leading fungicides and insecticides in both total output and rate of increase. Their poisonous characteristics are of public concern though there is a good toxicity ratio between mammals and pests. As far as the former are concerned, LD 50s for male rats vary between 2 and 7000 mg kg⁻¹ for some of the common types of chemical.

The structure and metabolic effects of all the main types of chemical are presented in explanatory detail. Neurotoxicity appears to be a fundamental effect after the primary metabolic step of interaction with enzyme systems. Despite the excellent structural approach, however, the author does not seem to stress the success rate as far as structure/activity relationships are concerned. For example, some 100 000 organophosphorus compounds have been screened for possible insecticidal action and over 100 have been marketed for this purpose. Although the organophosphorus compounds inhibit the acetyl choline esterase system, the organochlorine compounds destabilise neuronal activity in a way that remains obscure. In the USA in 1977 the total tonnage of organophosphorus compounds manufactured was somewhat greater than that of organochlorine compounds.

However, one of the most interesting groups of chemicals is that of the pyrethroids. These substances, obtained from chrysanthemums, contain as principal ingredients, pyrethrins and cinerins, characterised by a high toxicity for insects yet low for mammals. Chemically they all contain the dimethyl cyclopropane ring joined to a cyclopentenolone moiety. Pyrethroids are still too expensive to compete with the more numerous types of pesticide chemical.

Dr Hassall's book is one of those texts that improves with every reading. It is characterised by an academic thoroughness that fits its intended purpose and it is highly recommended for food scientists and technologists interested in this important field.

Gordon G. Birch

Amphoteric Surfactants. Surfactant Science Series, Volume 12. Edited by Bernard R. Bluestein and Clifford L. Hilton. Marcel Dekker, New York and Basle, 1982. 352 pp. Price: Sfr. 156.