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Agricultural Chemicals. Book I--Insecticides. W.T. Thomson. Thomson Publications (P.O. Box 989, Davis, California 95616), 1967. 366 p. $10.00.

Norman C. Leeling
Michigan State University

tion of members of the various genera. Each chapter is constructed, more or less, on the following outline: range of species, location and author of studies made, habitat and season of activity, general features of adult behavior, reproductive behavior, digging the nest, nest structure, hunting and provisioning, immature stages and development, natural enemies. Many chapters end with a summary. Chapter one is a brief introduction to the nyssonine wasps. Chapter 13 concerns itself with fossil history, distribution and comparative morphology; Chapter 14, with comparative ethology; Chapter 15, with the evolution of behavior of sand wasps.

The book is overwhelmingly detailed and complete and exhibits scholarship at its best. No stone has been left unturned in observing the wasps and unearthing every printed word about them. The exhaustive survey of the literature has been conducted with a critical eye. Nothing is too minute or unimportant to note and no recorded statement passes unchallenged if there is reason to doubt its validity. It is noted on page 105, for example, that "A Kodachrome transparency supplied by Ward's Natural Science Establishment is inaccurate and also presumably posed from dead specimens." Similarly a section of page 148 deals with the question of whether ***Bembex texanus*** gives one or several digging strokes of the leg when the head goes down and challenges an early statement on the matter. Occasional small lapses as, for example, the incorrect spelling of "desiccated" on page 447, are few and far between.

This book is a mountain of rich ore. On reading the middle chapters this reviewer sometimes felt as though he were in the middle of an encyclopedia but one so fascinating that he was beguiled into reading beyond whatever particular point he had had occasion to check. This detailed treatment tends to make the book most suitable for the specialist or for use as a reference work. For the non-specialist but professional biologist the last three chapters provide the most rewarding reading. Here the vast amount of preceding material is gathered together and the "comparisons" actually made. It is a little disappointing (at least to this reviewer) that the conclusions derived from the study have not been more obviously and closely tied in with some of the generalizations, hypotheses, and conclusions of Ethology. In one sense the ethological approach has been employed to further one's understanding of the sand wasps rather than the study of the sand wasps exploited to enrich one's understanding of behavior. On the other hand the book *is* about sand wasps. It is recommended with enthusiasm to all who are interested in or wish to become interested in these insects.

Vincent G. Dethier
Professor of Biology
Princeton University
Princeton, New Jersey 08540

AGRICULTURAL CHEMICALS. Book I--Insecticides. W. T. Thomson. Thomson Publications (P.O. Box 989, Davis, California 95616), 1967. 366 p. $10.00.

This book contains a wealth of information which would be extremely useful to people dealing with various aspects of insecticide usage ranging from laboratory investigations to field applications.

The chemicals are arranged in groups of related compounds, the divisions

being: Cyclo Compounds, Carbamates, Dinitro Compounds, Animal-Plant Derivatives, Diphenyl Compounds, Other Non-Phosphate Compounds, Organic Phosphates (Phosphoric, Thiophosphoric, and Dithiophosphate prototypes, and Inorganic Compounds.

Among the items of information listed for each chemical are: Names (common and trade, with most popular listed first), Structural Formula (if known), Chemical Name, Year patented or put on market, Name of company which developed it or licensed to market it in the U.S., Toxicity data (for acute oral LD50 of technical material to white rats, usually), Formulations under which the chemical is marketed, Uses on plants and animals for which the compound is registered, Rates of usage (extremes on a per acre and per 100 gallons of water basis), General application methods, Precautions, Listing of related mixtures, Closely related compounds, and Important pests controlled.

In addition to the chemical section, the book has an Introduction and a Glossary and Index. The Introduction details the purpose of the book and who should benefit from its use. The Glossary and Index contains much information that is valuable on the practical level, such as calibration information; formulae for calculating amounts of ingredients, tank capacity, nozzle flow rates, and so forth; conversion tables; conversion factors; a table of common elements, standard abbreviations used in the manual; and a glossary of terms. Additional information in this section includes a literature cited section, a listing of companies from which technical bulletins can be obtained, a list of selected farm magazines, a trade name index, and a chemical formula index.

The book is organized in a logical manner and the compounds can be easily found either by use of the index or by scanning the particular section including the group of compounds to which the individual chemical belongs. Listing all the names, both common and trade, for each compound in the index greatly facilitates the utility of this book. The information given for each chemical includes all the categories necessary for the safe and effective use of these chemicals, except that no antidote information is given. Inclusion of many experimental compounds not now registered for use should extend the usefulness of this book many years.

The book does contain some typographical and grammatical errors and even minor errors in structural formulae. One other minor drawback is that certain chemical structures are depicted somewhat differently than the usual manner, creating some difficulty in recognizing them. These minor points do not, however, significantly detract from the book, which is one of the better ones of its type currently available. This book is recommended for people dealing directly with insecticides, such as farmers, pesticide salesmen, pest control operators, and research workers. It is also a necessary addition to the library of all concerned indirectly with insecticides and their properties.

Norman C. Leeling
Department of Entomology
Michigan State University
East Lansing, Michigan 48823