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CONTENTS

Book Review – Price, P.W. 1975. <i>Insect Ecology</i>	279
Belicek – Coccinellidae of Western Canada and Alaska with Analyses of the Transmontane Zoogeographic Relationships Between the Fauna of British Columbia and Alberta (Insecta: Coleoptera: Coccinellidae) . . .	283
Editor's Acknowledgements.	411

BOOK REVIEW

PRICE, Peter W. 1975. *Insect Ecology*. John Wiley and Sons, New York. Hard covers, x + 514 pages. Taxonomic index, author index, general index. \$16.10 (Canada).

The importance of insect ecology in the applied fields of forestry, agriculture and medicine is reflected in the extensive studies of these animals that involve their relationships to each other, to other organisms and to the physical environment. Even by the end of the last century a considerable amount of literature had accumulated and new information was appearing at a very rapid rate. This situation, which has been continuing since then, has contributed no doubt to the paucity of books dealing comprehensively with insect ecology. Books or monographs on various aspects of insect ecology have, of course, been produced; examples are: Uvarov's "Insects and Climate", (1931); Folsom's "Entomology with Special Reference to its Ecological Aspects", (1922); Sweetman's "The Biological Control of Insects", (1936); Grahams "Principles of Forest Entomology", (1929) and, more recently, "The Ecology of Insect Populations in Theory and Practice" by Clark, Geier, Hughes and Morris (1967) and "Insect Population Ecology" by Varley, Gradwell and Hassell (1973). The first formal course in insect ecology was probably taught by R.N. Chapman in 1917 at the University of Minnesota and from his lecture notes he produced the first text on insect ecology: "Animal Ecology with Special Reference to Insects" (1931). In his preface, Chapman mentions the difficulty of keeping pace with the expanding literature, but nevertheless his book, quantitative in its approach, served as the standard text in insect ecology for many years even though it was hopelessly out of date ten to fifteen years after publication and was never revised. In 1954 Andrewartha and Birch surprised the academics with their iconoclastic yet authoritative "Distribution and Abundance of Animals". This work proved to be particularly useful to insect ecologists and was indeed acclaimed for provoking discussion and for providing a theoretical framework for others to build on, e.g. Glasgow's "The Distribution and Abundance of Tsetse" (1963).

Now, over 20 years later, new and exciting advances in ecology have made the need for a book in insect ecology greater than it ever was. Fortunately, Price has produced a book that fulfills this need admirably. Though faced by the same problems that confronted Chapman, he has undauntingly put together a relatively small book (433 pages of text and figures) yet one that gives a cohesiveness to the topic that has not been given before. I read this book from beginning to end with great pleasure.

The book consists of four parts; the first is entitled "Trophic Relationships". I found the chapter on trophic structure rather elementary and the chapter on energy flow somewhat cluttered with seemingly unrelated and barely touched-on topics as "evolution of insect

flight” and “energetics of insect locomotion”. But the chapters on coevolution of plants and herbivores and of prey and predator, and on predator-prey population dynamics are very thorough treatments of topics with which Price is obviously familiar. Part 2, “Populations”, contains material on population growth, life tables, ecological genetics and biological control. The chapter on population dynamics is particularly good especially the part on population regulation; Table 9.1 organizes the diverse theories on this topic in the most logical and succinct way. Part 3 is entitled “Coexistence and competition”. The chapters in this section deal with the latest theories on the niche concept and division of resources and partitioning of species in communities. Competition, both intraspecific and interspecific, is dealt with quite adequately in another chapter. The final chapter in this section – “Social Systems and Behaviour” – is concerned mainly with territoriality in insects and I do not think that this topic, which is concerned with one of many types of insect behaviour, needed the emphasis given to it this way. Part 4 is an especially interesting section that is entitled “Communities and Distributions”. Such topics as succession, community development, structure and organization and diversity and stability are thoroughly covered and I was very impressed by the synthesis of ideas on latitudinal trends of species diversity. A chapter devoted to pollination ecology indicates the importance that the author attributes to this subject but since Price throughout the book consistently draws on principles derived from contemporary studies in plant ecology and leans heavily on insect-plant coevolution as a fundamental principle of insect ecology his inclusion of this very readable and enlightening chapter is certainly justified. In fact, the approach taken by Price toward insect ecology is from the point of view of evolutionary biology and thus appropriately the final chapter in the book is entitled “Paleoecology and Biogeography”.

Unlike Andrewartha and Birch, Price does not take sides strongly on any of the current issues in ecology nor does he propose any new and potentially controversial theories, but instead has provided a succinct account of ecology today, using insects as examples as much as possible. Strangely, diapause is not discussed and I was very surprised to see no mention of any of the numerous studies of bark beetle pheromones that are implicated in aggregation of populations and in population regulation (see Vité and others. 1967-71. Boyce Thompson Inst. Contr. 24: 249-350). Photoperiodism and biological rhythms are also not discussed.

I found surprisingly few errors: eight typographical in the text and one error in Table 7.2 and one citation where a male author is referred to as “she”.

In general I think the author has succeeded in his purpose of producing a book intended for senior undergraduates and graduate courses in insect ecology and one that will be a useful addition to the library of anyone interested in ecology, either directly as in general ecology, or in the peripheral areas of systematics or applied biology.

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