

THE DRAGONFLIES OF BRITISH COLUMBIA. By Robert A. CANNINGS & Kathleen M. STUART. 254 pp., 35 figs., 9 half-tone pls., 82 maps. British Columbia Provincial Museum Handbook No. 35 (British Columbia Provincial Museum, Victoria, British Columbia, Canada, V8V 1X4), 1977. – Price: Canadian \$2.00. Paperback.

The Canadian Province of British Columbia has a known dragonfly fauna of 80 species which belong to 23 genera and 9 families. Larvae of all but two species (*Coenagrion interrogatum* and *Sympetrum madidum*) are known in at least the final instar. The first checklist of the Odonata of British Columbia (F.C. WHITEHOUSE, 1941, *Am. Midl. Nat.* 26: 488-557) has recently been comprehensively updated (G.G.E. SCUDDER, R.A. CANNINGS & K.M. STUART, 1976, *Syesis* 9: 143-162); and the monograph of the Odonata of Canada and Alaska has been completed (E.M. WALKER & P.S. CORBET, 1975, *The Odonata of Canada and Alaska, Vol. 3*. Univ. Toronto Press, Toronto). So the way is clear for an uncomplicated handbook to be produced – a situation which Robert Cannings and Kathleen Stuart have exploited effectively. The book they have produced is the second to treat the Odonata of a Canadian Province: "*Les Libellules du Québec*", by Adrien ROBERT, was published in 1963 (*Bull. Serv. Faune, Québ.* 1).

"*The Dragonflies of British Columbia*" is attractive in appearance, outside and inside; and it is suitable for field use, being small (13 x 18.5 cm) and having flexible, but strong, cardboard covers. In a thoughtful and lively Foreword (by the Director of the British Columbia Provincial Museum) and in the Preface, the book's purpose is stated: to acquaint naturalists and other "enthusiastic

watchers" with the dragonflies of the Province. In the Introduction the authors identify the urgent need for conservation, drawing attention to the irreversible and destructive effect of man's activities on Odonata habitats, especially in the southern part of British Columbia, where most of its dragonfly species live. To this they add an articulate plea to the would-be collector ("collecting should be left to those seriously interested in studying dragonfly distribution patterns and classification") and a timely reminder of the advantage of watching dragonflies, as distinct from catching them ("living organisms supply information that dead ones can never yield"). This is indeed a book for the last quarter of the 20th Century!

The text is well written, being readable, informative and precise. The section introducing the Order Odonata is a beautifully simple, yet accurate, account for the non-specialist. By giving the actual or supposed English meaning of the Latin names used in classification, the authors will help many contemporary naturalists to remember and enjoy the names they use. The illustrations, comprising line-drawings and half-tones, are of a uniformly high standard and have been designed, and located in the text, so as to complement the keys, arrows being used to indicate features needed for diagnosis. The inclusion for each species of a distribution map, the use of the Life-Zone concept, and the authors' statement that the distribution of Odonata in British Columbia (especially in the northern part) is poorly known, are all features destined to encourage the users of the book to increase the extent and reliability of such information. The short, but adequate bibliography, and the carefully compiled glossary and index enhance the usefulness of the text. The larva of *Ischnura erratica* is described for the first time (although I understand that a more detailed description has been submitted for publication to *The Canadian Entomologist*); and the matter of the identity of the species of *Erythemis* in British Columbia, left unresolved by WALKER & CORBET (1975,

cf. above), is settled. The key for distinguishing *Enallagma* larvae constitutes a valuable step towards improving understanding of the ecology of members of this important genus.

If only because this book will generate additional information, I expect a revised edition to be needed before long. With this prospect in mind, I mention here certain respects in which this excellent publication could be made even better.

The only serious deficiency I noticed was the authors' failure to specify how the length of the body and the length of the hindwing are to be measured – an unexpected oversight because they explain clearly (p. 107) how certain dimensions of the larval labium are defined. As it happens, it is especially important to make clear how both these measurements are to be made because each can be subject to different interpretations.

The illustrations on the front and back covers, taken from Cannings' fine frontispiece, have each been turned through 45° and thus show an adult dragonfly resting at an unnatural (and impossible) angle. Such artistic licence cannot but offend the purist, especially since photographs of adult dragonflies are often, unintentionally, printed at the wrong angle. The book's covers could usefully have been made of material more resistant to water – and to muddy fingers!

The map of important localities (p. 12) would be more useful if overprinted with the coordinates used in the diagram of biotic zones (p. 22) which itself could with benefit be enlarged. The use of a super-numerary designation for Figure 9b (p. 42) is untidy.

The generalisation (p. 14) that Zygoptera, when at rest, hold the wings together above the body needs to be qualified to accommodate the exceptions which are correctly noted elsewhere: *Lestes* (p. 43) and *Ischnura cervula* (p. 90). The categorisation of larvae of Cordulegasteridae as sprawlers (p. 19) is inappropriate, and in any case conflicts with the statement (p.

149) that they bury themselves in silt.

Use of the word "immature" to indicate a stage of larval development (p. 90) compounds a looseness of terminology which is widespread in North America but no less unfortunate on that account. The terms "immature" and "mature" can be precise and informative for entomologists only if used solely to categorise degrees of reproductive readiness in the adult; when used otherwise their meaning is blurred.

Mention that the account of the larva of *Ischnura erratica* (p. 93) is the first to be published, and that a more detailed description is due to appear elsewhere would have been helpful to the systematist.

The account of seasonal development of *Anax junius* in Canada (pp. 131-132) is misleading and probably incorrect because it does not take account of the findings of R. TROTTIER (1971, *Can. Ent.* 103: 1671-1683) in southern Ontario. The statement (p. 164) that *Somatochlora sahlbergi* has "been found with *Aeshna septentrionalis* and *Enallagma boreale* at about 69°30'N, which is as far north as Odonata are known to exist" requires qualification: the most northerly known population of Odonata in Canada (on Herschel Island, Northwest Territories, at 69°36'N, 139°0'W) includes *A. septentrionalis* and *E. boreale* (WALKER & CORBET, 1975, cf. above) but not to my knowledge *S. sahlbergi*, for which the most northerly record in North America is Sagwon, Alaska at about 69°21'N (Gorham, 1972, cited by WALKER & CORBET, 1975). The location of "smaller migrations" of *Libellula quadrimaculata* referred to at the foot of page 210 should be "eastern Europe" and not "the eastern United States."

The specific name of *Epitheca canis* (p. 161) may well allude to the resemblance, in side view, of the superior anal appendage of the male adult to a dog's head. Those familiar with the description of a zygopteran larva by C. GESNER (1620, *Historia animalium*, IV. H. Laurentii, Frankfurt), and with recent published discussions on the etymology of the word *Libellula*, will realise

that to infer this word's derivation is not as straightforward as the authors imply (p. 200).

I found it a singular pleasure to review this book, which I regard as a model of its kind in almost all respects. One has only to read a few pages to become aware of the great amount of care, thought and skill that have been devoted to its production. All who use it will be in the authors' debt on this account. I hope that one way in which this publication will be used – and far beyond the boundaries of British Columbia – is as an example to be emulated when future handbooks are being prepared.

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