AQUATIC ORDERS AND NEUROPTERA

L. J. DUMBLETON
Entomology Division, D.S.I.R., Lincoln.

ODONATA

The New Zealand fauna includes 4 families, 10 genera and 11 species—the world fauna is about 4,500-5,000 species, the Australian about 201 species. It is less diversified than the Australian fauna since the superfamily Agrioidea and the family Gomphidae are absent. The following families are represented (genera/spp.):

Zygoptera (Damsel flies):

Coenagriidae 2/2; Sympecmatidae 1/1.

Anisoptera (Dragon flies):

Petaluridae 1/1; Aeschnidae 2/2; Cordulidae 3/4; Libelluldae 1/1.

The species were described by the following overseas workers: Burmeister, 1839; Rambur, 1842; White, 1843, 1846; Brauer, 1865; Selys, 1871; McLachlan, 1873. The types are overseas.

The only recent taxonomic work is contained in papers by Fraser (Australasian fauna, 1960) and **Penniket** (keys to nymphs and adults, 1966). (The names of indigenous workers are in **bold type**). At least five of the species occur in Australia also. The insects are large and conspicuous and there are probably few additions to be made to the fauna except an occasional immigrant. There are nearly as many genera as species and the taxa are relatively distinct. The immature stages are known and there is little likelihood of major changes in the taxonomy of the order.

PLECOPTERA

The New Zealand fauna includes 4 families, 12 genera and 32 species—the world fauna is about 1,300-1,500 species, the Australian about 25 species. The following families are represented:—

Eustheniidae 1/1; Austroperlidae 1/1; Gripopterygidae 6/22; Family (Notonemourinae) 4/8.

The species were described by Newman, 1845; Enderlein, 1909; Hare, 1910; **Hudson**, 1913; **Tillyard**, 1923; Kimmins, 1938; **Wisely**, 1953; Illies, 1963; **McLellan**, 1963; **McLellan & Winterbourn**, 1968. The species are all endemic. The types which are deposited in New Zealand are mostly in the Dominion Museum, Canterbury Museum, and Entomology Division, Nelson. Both the sexes and the immature stages are now fairly well known. I. McLellan, the most active worker on the order, considers that some 6 or 8 undescribed species exist and that there is a possibility of more from alpine and southern areas but there are not likely to be more than one or two new genera. There is need for clarification of the position of some of the genera in the world classification. There is work in the order to keep an active worker profitably occupied.

EPHEMEROPTERA

The New Zealand fauna includes 4 families, 9 genera and 26 species—the world fauna is about 1,000-1,500 species and the Australian about 20 species. The fauna is similar in size and diversity to the Australian one though the Baetidae are not present. The following families are represented:—

Siphloneuridae 5/9; Siphlaenigmatidae 1/1; Leptophlebiidae 2/14; Ephemeridae 1/2.

The species are all endemic. They were described by the following workers: Walker, 1853; Eaton, 1871, 1883, 1899; McLachlan, 1873, 1894; **Hudson,** 1904; **Tillyard,** 1923; **Phillips,** 1923, 1930; Lestage, 1935; **Penniket,** 1962, 1966. The types of many of the first described species are overseas, those described by N.Z. workers are mostly in the Dominion Museum and Canterbury Museum. Active New Zealand workers are Penniket, McLean, Norrie, Moore. Penniket considers that there are several unnamed genera and many unnamed species.

NEUROPTERA

The small New Zealand fauna includes 6 families, 9 genera and 12 species—the world fauna is about 5,000 and the Australian about 250 species. It is much less diversified than the Australian fauna, the families Ithonidae, Chrysopidae, Mantispidae, Psychopsidae and Nemopteridae being absent, and some of those which are present are very poorly represented. Three of the species were originally described from Australia, the remainder are endemic. The following families are represented:—

Megaloptera:

Corydalidae 1/1.

Planipennia:

Berothidae 1/1; Hemerobiidae 3/4; Osmylidae 2/4; Coniopterygidae 1/1; Myrmeleontidae 1/1.

Only the single Corydalid is aquatic, the remainder being terrestrial insects.

The species were described by the following workers: Newman, 1838; Walker, 1853, 1860; McLachlan, 1863, 1873, 1894, 1899; Enderlein, 1906; **Tillyard,** 1923. The types are mostly not in New Zealand. The most recent papers are those by Kimmins (Osmylidae, 1940) and **Wise** (annotated faunal list, 1963).

There are nearly as many species as genera and the taxa are relatively distinct. There is little likelihood of significant increases in the number of genera and species. Except for minor alterations in classification and the description of immature stages the taxonomy of the order is likely to remain relatively static.

TRICHOPTERA

The New Zealand fauna includes 13 families, 42 genera, and about 130 species—the world fauna consists of 4,000-5,000 species and the Australian 58 species. It is the largest aquatic order and

is unusual in being larger than the Australian one and little less diversified. The following families are represented:

Plectrotarsidae 1/1; Sericostomatidae 12/33; Philanisidae 2/2; Beraeidae 2/2; Helicophidae 1/1; Philoreithridae 1/2; Leptoceridae 4/9; Hydropsychidae 2/11; Polycentropidae 2/6; Psychomyidae 2/2; Philopotamidae 2/3; Ryacophilidae 9/54; Hydroptilidae 2/4.

All the species are endemic. They were described by the following workers: Walker, 1852; McLachlan, 1862, 1866, 1868, 1871, 1894; **Hudson, 1904**; Hare, 1909; Mosely, 1953; **Tillyard**, 1921, 1924, 1925; **McFarlane**, 1939, 1951, 1956, 1960, 1964, 19666; **Wise**, 1958, 1962. The species are listed by Wise, 1965. The types of the species described by earlier workers are mostly overseas, those described by New Zealand workers are mostly in the Auckland Museum, Canterbury Museum, and the Entomology Division, Nelson. Good progress has been made with the taxonomy and most of the immature stages and the distributions of the species are now known. A number of undescribed species are known and probably significant additions have still to be made to the fauna. The family placement of some difficult genera, especially in the Hydrobiosinae and Sericostomatidae pose problems which require further work.