

G. V. HUDSON'S MANUAL

DAVID MILLER.

In a letter written me by Hudson on 14th February, 1941, there are interesting data about the background to his "Manual of New Zealand Entomology" which he published in 1892. I think the information should be recorded.

Among other topics, Hudson wrote: "My Manual of New Zealand Entomology is a very crude work, and, as shown on the title page and preface, did not profess to be a systematic work, but merely a popular book on Natural History. Even had I been qualified to have written scientific descriptions at that time, which I was not, they would have been quite out of place. In a general way the life-histories and habits are mostly correct, but many of the names and identifications are wrong. In these days it was most difficult to get many of our commonest insects correctly identified. Probably few are now aware that I started on the Manual in 1881 immediately I arrived in New Zealand as a boy of 14. I practically completed the manual in 1886 (aged 19) when it was sent to Sir Robert Stout, who was then Premier, and he would have published it had he not been thrown out of office. Nothing transpired until 1890, when Sir Walter Buller and Mr. Charles Hulke (then President of the Philosophical Society) obtained an order for 1,000 copies at 5/- per copy from the Hon. T. W. Hislop, then Minister for education; this enabled publication to be made in 1892. The plate and account of the N.Z. Glow-worm were added in 1890 when I was 23. Plate iv is probably one of the best I did in my boyhood days. It is only fair to the manual for people to know that it was the work of a boy working almost entirely on his own resources."

Though superlatives can be too often and too thoughtlessly used, Hudson is a case where it can be correctly claimed that he became New Zealand's most eminent amateur entomologist. His nephew, Dr. Frank Hudson of Nelson, tells me that he died over his microscope in 1946, fifteen days after his 79th birthday.

THE D.S.I.R. ENTOMOLOGY DIVISION 1970 EXPEDITION TO THE THREE KINGS ISLANDS

G. W. RAMSAY.

Since its formation in 1964 the Systematics Section of the D.S.I.R. Entomology Division has organised six major collecting expeditions—Chatham Islands (9 Feb-5 Mar 1967), Big South Cape Island (2-22 Nov 1968, 1 Feb-6 May 1969), Stewart Island 2 Feb-4 Mar 1969), Paparoa Range (1-12 Dec 1969) and Manapouri (5-28 Jan 1970). The aim of these was to make comprehensive collections of all groups of Arthropods, to collect immature stages and,

whenever possible, to establish the host relationships of phytophagous insects. A vast amount of material and information has been accumulated. In addition, members of the Systematics Section have participated in expeditions to the Cook Islands (1965), Kermadecs (1966-67), Norfolk Island (1967), Auckland Islands (1967), Coppermine Island (1968), Codfish Island (1969), Campbell Island (1969), Antipodes Is (1969) and Chatham Islands (1970). Field trips to many other places within New Zealand have also been undertaken.

The success of these led to plans to send a seven-man team to the Three Kings Islands for four weeks during November, 1970. The party (see fig. 7) comprised Dr. G. Kuschel (leader, Entomology Division), Dr. F. Climo (Dominion Museum, Malacologist), Dr. D. Galloway (DSIR, Biochemistry Division, Lichenologist), Mr. D. H. Leigh (Nelson, Botanist), Mr. J. G. R. McBurney, Dr. G. W. Ramsay and Dr. J. C. Watt (Entomology Division). Transport and much other assistance besides was kindly provided by the Royal New Zealand Navy, and some equipment was loaned by both the New Zealand Army and Ministry of Works, to all of whom we are grateful.

Expedition stores and equipment were loaded on to the fisheries protection vessel HMNZS "Kiama" at the Devonport Naval Base and the party sailed on the morning of November 4th. The ship dropped anchor in North West Bay, Great Island at 0700 hours the following morning. A wooden whaler towed by a rubber Gemini craft with outboard were used to off-load us and our stores at the only reasonable landing place on the whole island—a tiny rock-strewn boulder beach. There were moments of anxiety as people and stores were taken ashore amid crashing waves, and no-one landed dry. By mid-day the party and most of the stores were ashore and we then had to face the heavy task of moving our supplies up the 250' bluffs to a suitable camp site in Castaway Valley. The route up was very steep and in places loose and difficult. It was necessary to attach a fixed rope up one particular stretch. The Captain of the "Kiama" kindly gave us the use of 20 "volunteers" for the afternoon and made our radio operational. With all this help we got some of the tents and food, the radio, the battery, and generator up to the camp site, and one tent erected by nightfall. It required another two days to get the camp properly established and all the necessary equipment and stores up from the landing beach. Our only communication with the outside world for the next month was through Mrs. Walker of Awanui radio. Reception was often difficult but messages always got through in the end.

Our camp consisted of a mess and stores tent, a laboratory tent and two dormitory tents. One of the latter became known as Centipede Lodge because of regular nightly visits by extremely large centipedes. These became so frequent that the occupants

devised an early warning system comprising a circle of metal foil bread wrappings spread around each sleeping bag. The scratching of mobile centipedes was more than sufficient to awaken sensitive sleepers. Water was always in short supply, Castaway Stream being the only source close to the camp. This supply, little more than a trickle at the best of times, steadily diminished during our stay and was only barely sufficient to satisfy our camp needs. The practice of carrying canned refreshments made it possible for us to work any part of the island on the hottest days without suffering from thirst. Our trip being early in the season, we were not plagued by blowflies as other people who have visited the island report. However, the number of flies did steadily increase during our visit.

We were very fortunate with the weather. The wind-swept vegetation and exposed cliffs of some places indicated that the Three Kings get a good share of wind and storm. However, during our stay, apart from one southerly gale during which 22 mm of rain fell, we experienced fair weather with light breezes. The minimum shade temperature recorded was 12°C, with a daily average of 13.5°C and the maximum 23°C with a daily average of 21.1°C.



Fig. 1: DSIR Entomology Division 1970 Three Kings Expedition members. Back, left to right: Dr. G. Kuschel (leader), Dr. J. C. Watt, Mr. D. H. Leigh, Dr. F. Climo; Front, left to right: Mr. J. G. R. McBurney, Dr. G. W. Ramsay, Dr. D. Galloway.

Scientifically the expedition was most successful, with many specimens, especially insects and arachnids, being collected. In general the insect fauna, which is diverse and comprises many species, exhibits a higher degree of endemism than would be expected, especially with flightless species. In the Coleoptera there is a Cucujid and Chrysomelid which have no known relatives on the mainland. Of the 61 species of weevil collected, over half are undescribed and unknown elsewhere. Representatives of 76 species of Lepidoptera were collected. Here the extent of endemism is low (6-8%) and, unlike other islands which have been modified by man, the number of tramp species is low, numbering only two. Most of these species belong to only five families which are also the major ones of the New Zealand mainland. Our visit was rather early in the season for Hemiptera and Orthoptera. Cicada nymphs were collected but adults were rarely heard singing. Adults of the endemic Phasmid and rhabdophorid wetas were found but only nymphs of Acridids and Tettigoniids occurred, the latter as first instar nymphs only. Eight species of ants were collected, including two new records. Of spiders, we found 26 species, 11 being new, and of these, two represent a genus new to the New Zealand fauna, but present in Australia. One new species of Opilione was found as well as two others previously described from the Three Kings. Acari were abundant and, in general, seem similar to mainland forms. Thirty-four species or sub-species of Mollusca were collected including all taxa previously recorded from Great Island, as well as three new records and 10 new species. Two of these are athoracophorid slugs (a family new to the islands) and two paryphantid snails.

Vertebrates were not neglected and, as time permitted, a few reptiles were collected, under special permit. Five species of skink and one gecko were taken of which three species of skink were new records for the islands. Birds were also observed and a brief account of these will appear in "Notornis". The Indian Mynah was reported for the first time. Fortunately there are no rats present.

Apart from the lichens, a small collection of plants was also made and included ten new records. It was very heartening to find a majority of the endemic species of **Brachyglottis**, **Myrsine**, **Pittosporum**, **Paratrophis**, **Cordyline** and **Meryta** thriving and increasing although with the endemic **Alectryon** there is cause for concern as few plants still remain and we saw no seedlings. The same applies to the unique specimens of **Tecomanthe** and **Pennantia** (= **Plectomirtha**) which both appear to be in good condition. The regeneration of the vegetation since the extermination of the goats in 1946 continues and access to most parts of the island is now difficult because of dense undergrowth. Tall kanuka trees remain the general canopy tree but numerous young **Cordyline** and **Meryta**

plants are now present beneath. Apart from one **Meryta** growing on an inaccessible cliff ledge, this species was exterminated by the goats of Great I. Because its fruit is palatable to birds, **Meryta** is being redistributed over the island. Certain species of insect known to be present on the Three Kings could not be located on Great I. This was thought to be due to the earliness of our visit until we realised that the host plant involved, **Meryta**, had been reintroduced to Great Island without its associated insect fauna. All species concerned were found during a brief visit to South West Island at the end of our stay.

These preliminary results indicate that the expedition was successful and worthwhile. It was thoroughly enjoyed by all participants who have unforgettable memories not only of large centipedes and restless nights but also of the magnificent evening and dawn chorus of numerous bellbirds.

The expedition members wish to thank Lt. Cdr. F. D. Arnott and the officers and ships company of HMNZS "Kiama" for their help and co-operation, without which the expedition would not have been possible. Thanks are also extended to Dr. Climo, Mr. Don, Mr. Dugdale, Dr. Forster, Dr. Kuschel, Dr. Moore, Dr. Watt and Mr. Whitaker who have supplied information pertinent to the groups of their special interest used in this account.

INSECTS IN THE FOOD SUPPLY OF STARLINGS IN MID-CANTERBURY

W. R. LOBB and J. WOOD,
Winchmore Irrigation Research Station, Ashburton.

1. INTRODUCTION AND METHODS

SUMMARY

A method to determine the insects on which birds are feeding is described. Forty-seven Arthropoda have been identified as occurring in the diet of Starlings.

INTRODUCTION

While studying the influence of starling (***Sturnus vulgaris***) predation on the larval population of grass grub (***Costelytra zealandica***) on an irrigated farm in Mid-Canterbury it was observed that they were feeding on the emerging grass grub adults during irrigation. A preliminary check of the faeces revealed that chitinous parts of insects invariably passed through the birds and were recognisable. This paper deals with the methods used in this study.

COLLECTION AND SITES

Two sites were chosen, one on the Winchmore Irrigation Research Station and one on a Winchmore irrigated farm which was known to have a very high population of both grass grubs and