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THE TERRESTRIAL ARTHROPODA OF MACQUARIE ISLAND

by

K. C. WATSON

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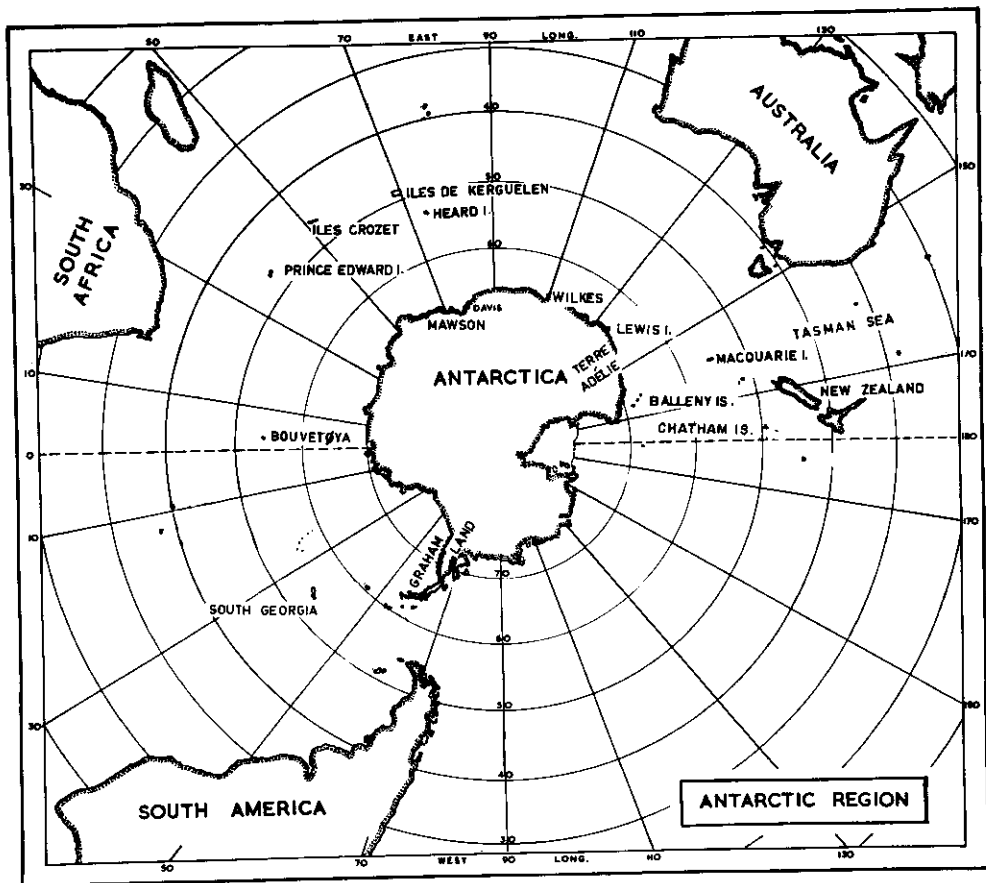
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MAP 1

Map showing location of the subantarctic Macquarie Island in the Antarctic region.

NOTE—Archipel de Kerguelen has recently become the accepted geographical name for a group consisting of one large island and other much smaller islands: in the scientific literature referred to in this report the various synonymous names used include Iles de Kerguelen, Iles Kerguelen, Ile Kerguelen, Kerguelen and Kerguelen.

THE TERRESTRIAL ARTHROPODA OF MACQUARIE ISLAND

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ABSTRACT

The terrestrial arthropoda of Macquarie Island were the subject of a field study by the author who spent a year on the island as a biologist with the Australian National Antarctic Research Expeditions. During this period over 2,000 specimens were collected, most of which have been deposited with the Australian National Insect Collection currently in the care of the Division of Entomology, CSIRO, Canberra.

The paper covers free-living species of insects, spiders, mites and tardigrades, and check lists of Siphonaptera, Mallophaga, Anoplura and Ixodidae are also included. In the class Insecta 34 genera are represented, and in the class Arachnida 57 genera, while there was also one genus and species for Tardigrada.

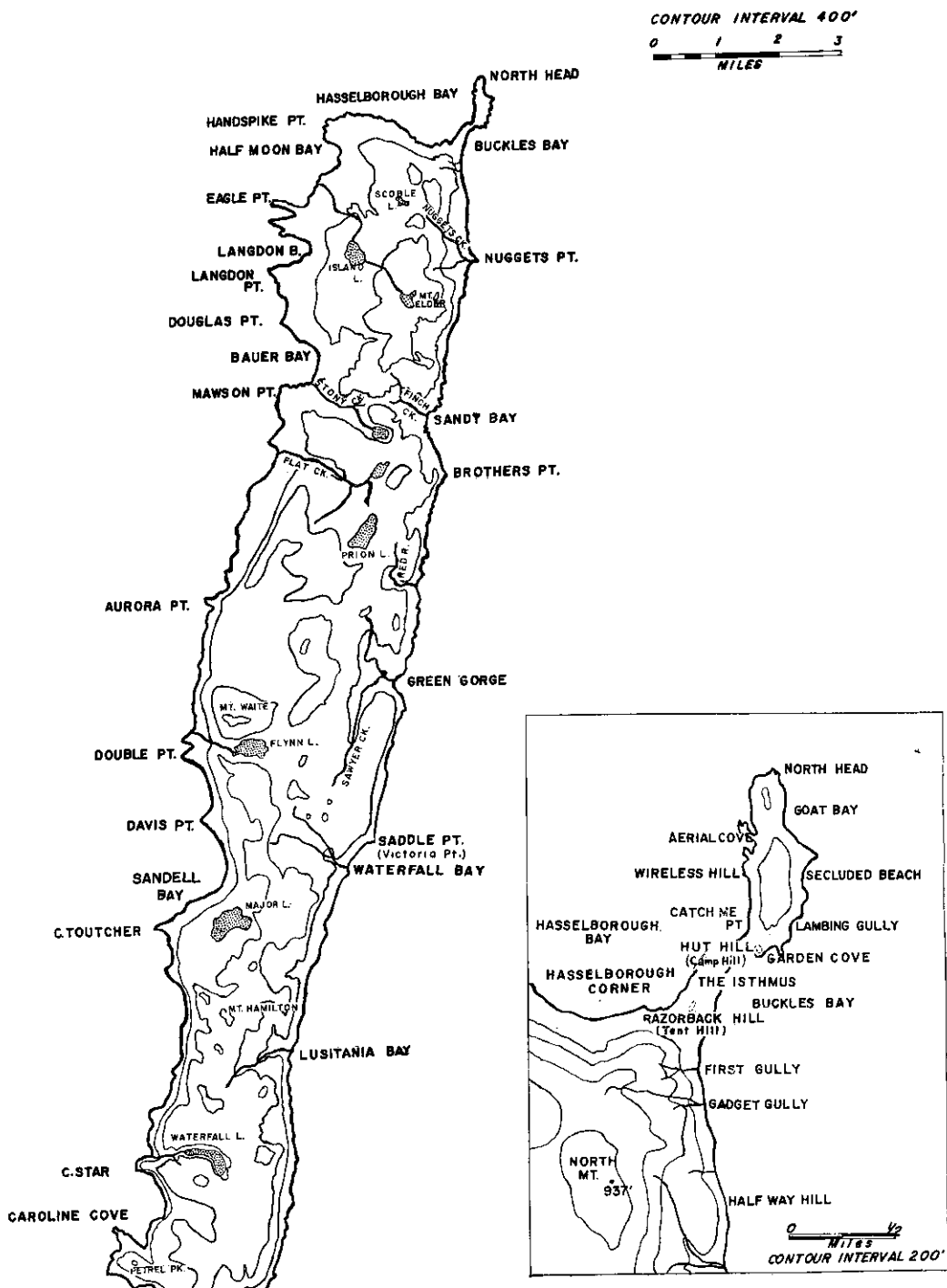
The collection included 65 new, or probably new, species.

The 119 species discussed involve 11 orders, 59 families and 89 genera. Of these, 31 per cent are possibly indigenous and 69 per cent are not well established; 28 per cent are associated with animal life, including nests, dung, carcasses and other debris, while 72 per cent are associated with plant life on the island. Most of the species associated with animal life are also to be found in association with plants.

Particulars are given to facilitate the recognition of each species in the field and to locate type specimens and other material for further taxonomic reference. There are also notes on the nature of the habitats of species, on the species' known geographical occurrence on Macquarie Island and in other parts of the world, and observations on their seasonal distribution.

There are twelve photographs showing typical Macquarie Island habitats with their botanical, soil and rock features. Two maps include one of Macquarie Island

THE TERRESTRIAL ARTHROPODA OF MACQUARIE ISLAND



I. INTRODUCTION

(a) *Historical*

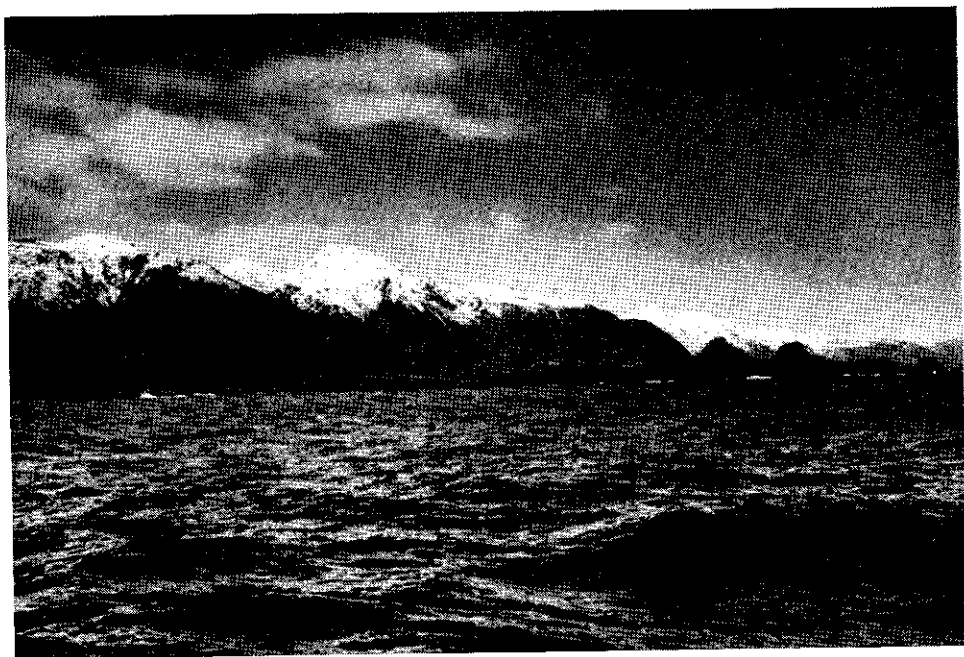
Macquarie Island was discovered in July 1810 by Captain Frederick Hasselburgh, a Sydney sealer. During the following years thousands of fur seals and, later, elephant seals and penguins were slaughtered by men working for firms in Sydney, Hobart and New Zealand. After 1919, no sealing licences were renewed by the Tasmanian Government, under whose jurisdiction the island is included. In May 1933 the island was proclaimed a sanctuary.

Insects were first recorded from the island in 1894 when a New Zealander, M. A. Hamilton, visited the island with Joseph Hatch who was then engaged in elephant sealing there. In his report to the New Zealand Institute, Hamilton mentioned some spiders and a few small flies that he found amongst what is known as Macquarie Cabbage (*Stilbocarpa polaris*). The spiders were deposited in the Otago Museum and later described by Hogg (1909) as representing a new species, *Myro hamiltoni*. The flies that Hamilton collected were eventually described by Lamb (1909) and Harrison (1959) as *Schoenophilus pedestris* (Dolichopodidae) and two species of kelp flies (Coelopidae). Hamilton also collected large numbers of collembola which were determined by Carpenter (1909).

Although both the British *Southern Cross* Expedition of 1898-1900 and Scott's British National Antarctic Expedition of 1901-4 visited Macquarie Island, equipped for comprehensive scientific programmes, there is no record of insect discoveries from either expedition.

The second collection of insects was made by H. Hamilton, son of the previous collector, who spent nineteen months on the island as biologist with Mawson's Australasian Antarctic Expedition of 1911-14. His collection was subsequently described by Tillyard, Brues and Lea (1920), and included seven more records: two collembola, one staphylinid beetle, one wingless hymenopteran, and, from rather incomplete material, the

The next collection was made during the 1928-29 German Expedition led by Kohl, which paid a brief call at the island. This comprised a few males of a fly which Enderlein described as a new species *Actoceles assymetrica* (1930), later listed by Harrison (1959) as *Paractora assymetrica* (Enderlein) of the family Dryomyzidae. Although Enderlein's lectotype (Elli Franz, 1962) in the Senckenberg Museum has not been re-examined, both Kohl's observation that the flies occurred *en masse* on the east coast and Enderlein's description, particularly of the hairy legs and abdomen, suggest that the specimens were of the common *Coelopa* species.



ANARE photo 13797

K. C. Watson

PLATE 1

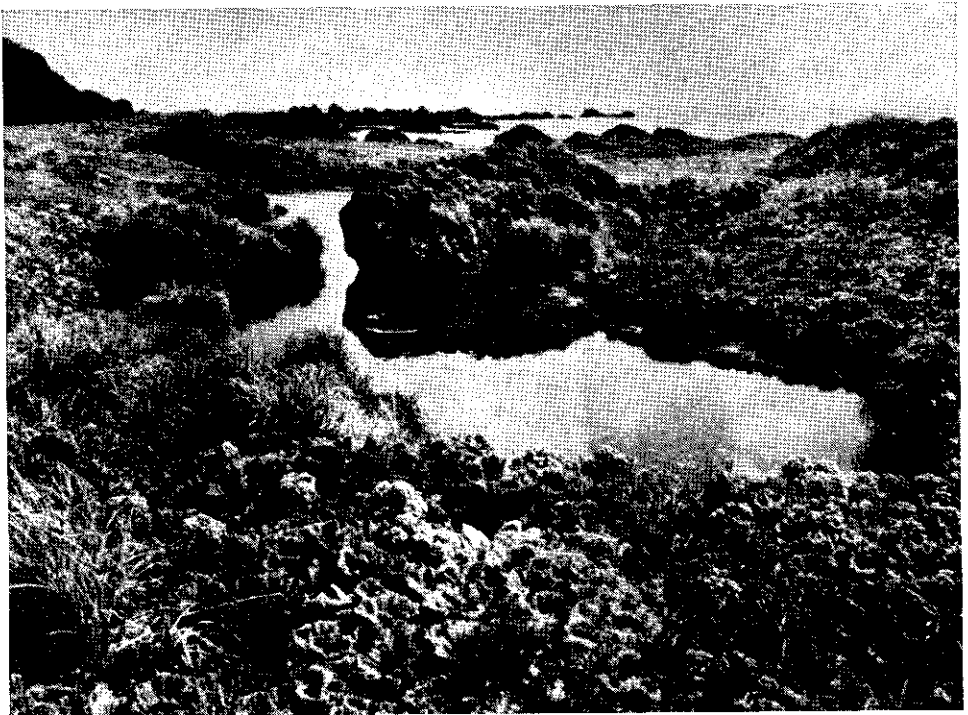
West coast of Macquarie Island showing coastal herbfield and tussock-covered slopes rising to plateau herbfield and feldmark, here seen with summer snow.

The largest insect collection prior to 1960 was made by T. H. Johnston during the 1929-31 British Australian New Zealand Antarctic Research Expedition. His collection comprised sixteen species of which thirteen were new records for the island. The groups represented were Collembola, Staphylinidae, Tipulidae, Sciaridae, Psychodidae, Coelopidae, Ephydriidae, Milichiidae and Lepidoptera (Womersley and Tindale, 1937). Johnston also collected mites from marine and littoral habitats.

Since 1948 when the Australian National Antarctic Research Expeditions

most cases the records have not been published. The present author has examined specimens collected in 1948 by R. Kenny; in 1949, 1950 and 1951 by J. Bunt, N. M. Haysom, E. Lindholm, T. Manefield and E. Shipp; in 1953 by K. G. Brown*; and in 1956 by D. A. Brown. Some fleas and ticks collected by ANARE members were recorded by de Meillon and Zumpt (1952); G. M. Dunnet (1961), who spent a week at the island in 1957, has also reported on the fleas.

The main body of this report is based on the results of collection and field observation from December 1960 to December 1961 when the author was stationed at the island as a biologist with the ANARE. Further collections were made by J. H. Calaby and J. L. Gressitt in early December 1960, and also by W. J. M. Vestjens during 1962.



ANARE photo 2802

J. Béchervaise

PLATE 2

Coastal herbfield terrace showing typical breeding habitats of the flies *Erioptera* (T.) *pilipes macquariensis* and *Ephydrella macquariensis*, and the moth *Eudoria mawsoni*. Hasselborough Bay.

This report covers the free-living terrestrial species of insects, spiders, mites and tardigrades known to occur on the island. Checklists of Siphonaptera, Mallophaga, Anoplura and Ixodidae are also included.

Most specimens from the 1960-61 collection have been deposited in the Australian National Insect Collection (ANIC), currently in the care of the Division of Entomology, CSIRO, Canberra.

*In 1951, B. G. ... and the insects of Heard Island and in 1953 collected at Macquarie

(b) *Geography*

Macquarie Island (lat. $54^{\circ}30'S$; long. $158^{\circ}57'E$) lies approximately 800 nautical miles south-east of Tasmania and about 600 nautical miles south-west of New Zealand. Nine hundred miles to the south is the Antarctic continent, while the Auckland and Campbell Islands, 400 miles to the north-east, are the island's nearest neighbours. The island is about 21 miles long with its main axis running $N15^{\circ}E$. Its maximum breadth is three miles and the total area 46 square miles. Its outlying islands, Judge and Clerk, nine miles NNE, and Bishop and Clerk, 20 miles south, are only barren rocks.



ANARE photo 7503

J. Warham

PLATE 3

Northern end of Macquarie Island: First Gully in foreground; The Isthmus with station buildings nestling to the left of Camp Hill; Aerial Cove at the bottom of the saddle between Wireless Hill and North Head.

The island is a long, narrow plateau, bounded on all sides by steep cliffs, from the foot of which a narrow coastal terrace extends to the sea (Plate 1). This terrace is most clearly defined along the northern half of the west coast, where it is up to a mile wide, and along the southern part of the east coast (Plate 2). The level of the plateau rises slightly from the northern end, where the general level is about 800 feet, with peaks up to 1200 feet, to the southern end, with a general level of 1000 feet and peaks up to 1400 feet. A narrow, sandy isthmus connects the small northern peninsula to the northern border of the main land mass

The ice ages have left the island with all the typical features of a well-glaciated topography. The slopes are dissected in a few places by large, low-level glacial valleys, while the surface of the plateau is marked by numerous ice-formed lakes, glacial valleys, great expanses of boulder clay, roches moutonnées and scattered



ANARE photo 8985

N. Laird

PLATE 4

Plateau herbfield comprising mosses, grasses and *Pleurophyllum hookeri*—typical habitat of the moth *Eudoria mawsoni* and fly *Schoenophilus pedestris*.

erratic boulders (Plate 4). Every hill and mountain shows the action of a dense ice sheet.

All the rocks of the island are basic and igneous. The geological history was summarized by Mawson (1943) as follows: "The first formed rocks were basaltic flows and sills which suffered from sub-aerial erosion, and then subsided to a considerable depth, receiving a deposit of globigerina ooze. Then followed a volcanic period which ended with a larger area of land in the region than at present. After some peneplanation, glaciation on a grand scale intervened. There is no geological evidence that suggests even indirectly that there was any land in the

(c) *Climate*

The meteorology of Macquarie Island is well summarized by Law and Burstall (1956).

Being a small land mass surrounded by extensive ocean, the island has a climate characteristically cloudy, wet and windy, with a relatively even temperature which is low, owing to the position of the island just north of the Antarctic Convergence.

Pressure sometimes varies greatly over a short period, but the mean pressure over a period of a month does not vary greatly throughout the year. The annual mean pressure has never been recorded to vary by more than two millibars from 998.9 mb.

Temperature remains fairly even throughout the year and from year to year. The mean annual temperature is 40.2°F and the annual range of the mean monthly temperatures is only 6.7 degrees. The warmest month is January and the coldest July. The highest temperature so far recorded is 52.7°F and the lowest 17°F, giving an absolute range of temperature of 35.7 degrees. The greatest month-to-month difference in mean monthly temperature is between November and December, namely 3.6 degrees.



ANARE photo

P. Tenni

PLATE 5

The beach at Nuggets Point. The sole locality of *Lepidocyrtus cyaneus cinereus*, *Pergamasus*

Humidity is high throughout the year, the mean relative humidity being 88%. Approximately half of the observations show a relative humidity of 90% or greater, while approximately one tenth show a relative humidity of less than 70%. Rain, drizzle, snow and hail are frequent but generally light, and give an annual average precipitation of 40 inches occurring on 330 days of the year. Snow lies on the ground for short periods only. Cloud-cover is persistent, and completely cloudless days are rare. The annual average of bright sunshine is 800 hours recorded on 264 days of the year; on 101 days no sunshine is received.

Macquarie Island is in the zone of westerlies, but travelling depressions give rise to winds from other directions. Two-thirds of all winds experienced are in the sector 255°-345°, i.e., ranging slightly wider than from west to north-north-west. Wind speed recorded at 33 feet above the ground on the isthmus varies from calm to over 50 knots, 68·5% being in the range 10-29 knots. Maximum wind gusts are in the region of 92 knots.

(d) Soils

Both peat and mineral soils occur on Macquarie Island. Taylor (1955) distinguished three main types of peat soils: highmoor peats, fen peats and bog peats. The first type is formed by the decomposition of organic matter under aerobic conditions, the latter two by anaerobic decomposition, that is, where the water table is high. Dissolved mineral salts are present in fen peats; in bog peats



ANARE photo 3419/A-4

R. Wilkinson

they are almost completely absent. The mineral soils on Macquarie are similar to the dry tundra soils of the Northern Hemisphere. In these soils the formation of peat is prevented by the slow growth rate of the plants due to high wind velocities.

Highmoor peat soils occur in grassland and herbfield communities on all slopes above 20° where wind velocities are not too high, and also on coastal flats where the subsoils are marine deposits of sand and gravel which drain rapidly. The peat profile may be up to six feet deep, averaging from 3 to 4 feet, and may be almost pure organic matter with a small amount of windblown sand or of gravel from soil slips.



ANARE photo 2801

J. Béchervaise

PLATE 7

The most common insect habitat on Macquarie Island is the "Macquarie Island Cabbage", *Stilbocarpa polaris*.

The occurrence of bog and fen peats corresponds with the associated bog and fen plant communities.

Dry tundra soils are the soils of the feldmark formation. They are generally gravelly loams with a high content of organic matter and are classed as well drained

(e) *Botany*

A comprehensive report on the flora and vegetation of Macquarie Island has been made by B. W. Taylor (1955). The recorded species include 31 flowering plants, three ferns, one clubmoss, several species of mosses and liverworts, and various fungi and lichens. There are no trees or shrubs and there is only one woody species, *Coprosma repens*, which has a prostrate, creeping growth form.

The main plant formations are distinguished by Taylor as follows:

1. GRASSLAND (Plates 5 and 6). This formation is dominated by tussocks of *Poa foliosa*. Its occurrence is limited by sea spray, wind exposure, high water tables and a shallow depth of peat. Associations occur on all steep coastal slopes up to 1,000 feet (except where soil slips cause addition or loss of material), in creek valleys, on inland slopes protected from high winds, and on coastal flats with a low water table. In climax communities only a few small species such as *Montia fontana*, *Cardamine corymbosa* and *Stellaria decipiens* are able to grow under the shade of the spreading tussocks. In places where seals wallow in the breeding and moulting seasons, pools are formed between tussocks, and other plants such as *Cotula plumosa* and *Poa annua* are able to establish themselves. In areas sur-



rounding permanent penguin rookeries, up to 50% of *Poa foliosa* tussocks may be replaced by the endemic *Poa hamiltoni*. In areas subject to soil slips and additions, the *Poa foliosa* is replaced by *Stilbocarpa polaris* (Plate 7), and species such as *Acaena anserifolia* are able to exist. In a few places on the east coast, the fern *Polystichum vestitum* occurs as a co-dominant with the *Poa foliosa*.

2. HERBFIELD (Plates 2 and 4). This occurs on slopes and flats subject to moderate winds, and on all areas where *Poa foliosa* is precluded because of the high water table, and where wind velocity is not too severe. Thus, it is found in sheltered valleys, on slopes up to a maximum height of 1,200 feet and on the raised beach terraces. The dominant species is *Pleurophyllum hookeri* (Plate 8). Depending on conditions of wind exposure and addition by soil slips, associations are formed with *Cerastium triviale*, *Stilbocarpa polaris*, *Coprosma repens*, *Festuca erecta* and *Carex trifida*. Other plants occurring in sub-climax communities are



Callitriche antarctica, *Poa annua*, *Ranunculus biternatus*, *Montia fontana*, *Agrostis magellanica*, *Juncus scheuchzerioides* and *Colobanthus crassifolius*.

3. FEN. This occurs in the valley floors of the plateau and in small patches on the raised beach terrace. It appears only where the water table is at the surface of the ground or slightly above it, and where the water is neutral or alkaline due to contact with basic rocks and mineral soils. The dominant species is *Juncus scheuchzerioides*. The other species which may occur in association, depending on exposure to wind, depth of water and type of soil, are *Scirpus aucklandicus*, *Colobanthus crassifolius*, *Ranunculus biternatus*, *Callitriche antarctica*, *Agrostis magellanica*, *Deschampsia penicillata* and certain mosses.

4. BOG. This occurs only in parts of the west coast raised terrace where the water table is at the surface of the ground or only slightly above it, and where the



ANARE photo 2799A

N. Laird

PLATE 10

Coastal habitats: the cushion-like *Colobanthus muscoides* and frilly-leaved *Cotula plumosa* are

water is acid and low in soluble salts due to contact with peat soils. The dominant plants are species of mosses but other species occur such as *Montia fontana*, *Cardamine corymbosa*, *Callitriche antarctica*, *Ranunculus biternatus*, *Hydrocotyle* sp., *Epilobium nerterioides*, *E. linnaeoides*, *Juncus scheuchzerioides*, *Scirpus aucklandicus*, *Agrostis magellanica*, *Festuca erecta* and *Uncinia riparia*.

5. FELDMARK (Plate 9). This formation occurs in all areas subject to high wind velocities. It covers the greater part of the island above 600 feet. The dominant species are *Azorella selago* and mosses, and other species which grow in stunted form are *Pleurophyllum hookeri*, *Stilbocarpa polaris*, *Agrostis magellanica*, *Luzula campestris* and *Festuca erecta*. Mosses and lichens are common.



ANARE photo 13799

K. C. Watson

PLATE 11

Collecting the flies *Haliryus macquariensis* and *Apetaenus watsoni* from sea-sprayed rocks covered with the red-alga *Porphyra umbilicalis*. Aerial Cove.

6. MARITIME COMMUNITIES. (a) Coastal rocks (Plates 3, 10, 11): The intertidal zone is dominated by the growth of *Durvillea antarctica*. Above this is an extensive spray zone dominated by the red alga *Porphyra umbilicalis*. Other species occupying this zone and harbouring arthropod fauna are the red *Chaetangium fastigium* and the green *Prasiola crispa* (lettuce-like) and *Rhizoclonium* sp. (fine, filamentous). The first plants occurring above the marine algae are *Puccinellia macquariensis*, two species of mosses and several lichens; these plants may be drenched by waves during storms. Above the influence of waves, but still influenced by sea spray, are cushions of *Colobanthus muscoides*. Further from the sea, other

(b) Beaches: The boundary between the *Poa foliosa* association and the beaches is sharply defined (Plate 5). Only a few scattered plants of *Cotula plumosa* may grow on the beaches.

(f) Zoology

Seals and sea birds are the dominant species on the island; invertebrate groups are poorly represented. The Southern Elephant Seal (*Mirounga leonina*) occupies beaches all around the island for most of the year. The only other breeding seal, the New Zealand Fur Seal (*Arctocephalus forsteri*) is recolonizing a few areas, mainly at North Head. Rabbits are abundant in most localities throughout the island, and cats are firmly established though not so common. Rats and mice are widely distributed but not in large numbers; like the rabbit and cat, they were brought to the island during the nineteenth century, on sealing ships. At one stage horses were used by sealers for a few years, and since 1948 the ANARE station has at times kept sheep, goats, cattle, pigs, ducks and fowls. During 1962, the flock of 50 sheep which had been kept on Wireless Hill and Camp Hill was destroyed to check soil erosion due to over-grazing.

Four species of penguin breed around the island on coastal rocks and beaches: *Aptenodytes patagonica* (King Penguin), *Pygoscelis papua* (Gentoo Penguin), *Eudyptes chrysocome* (Rockhopper Penguin) and *Eudyptes chrysolophus schlegeli* (Royal Penguin). Of the four albatross species, *Diomedea melanophris melanophris* (Black-browed Albatross) and *Diomedea chrysostoma* (Grey-headed Albatross) breed in three colonies, one at North Head (*melanophris*) and two on the southern slopes of Petrel Peak; *Diomedea exulans* (Wandering Albatross) breeds in isolated sites on the western coastal terrace and the south-western highlands, and *Phoebetria palpebrata* (Light-mantled Sooty Albatross) nests on precipitous hill-sides throughout the island.

Macronectes giganteus (Giant Petrel) breeds in 70 rookeries and in isolated nests on the west and south-east coasts, and on the western highlands. Three species of burrowing petrels, *Pachyptila desolata* (Dove Prion), *Pterodroma lessoni* (White-headed Petrel) and *Puffinus griseus* (Sooty Shearwater) breed in colonies on the highlands. *Daption capensis capensis* (Cape Pigeon) has breeding colonies on isolated rocks off the northern peninsula. *Phalacrocorax albiventer purpurascens* (Macquarie Island Cormorant) and *Sterna vittata* (Antarctic Tern) breed in a few colonies on coastal rocks. *Catharacta skua lonnbergi* (Southern Skua) and, to a lesser extent, *Larus dominicanus* (Southern Black-backed Gull) are scavengers which breed inland and on coastal rocks respectively. The flightless rail or Weka, *Gallirallus australis scotti*, was introduced from New Zealand in the last century and is firmly established in parts of the coast. Two species introduced to New Zealand, *Carduelis flammea cabaret* (Redpoll) and *Sturnus vulgaris* (European Starling) have colonized the island since 1900. *Anas superciliosa* (Black Duck) breeds on ponds and bogholes near the coast.

The land Mollusca are represented by one minute snail, *Phrixgnathus hamiltoni*, an endemic species occurring on various plants, and by three species of slugs, two of them indigenous. A small copepod occurs in wet masses but other

Copepoda, Ostracoda, Cladocera and Isopoda, has been made.* The soil fauna includes large numbers of nematodes as well as rotifers and flagellate, ciliate and amoeboid protozoa. A detailed ecological survey of the littoral zone has been published (Haysom and Kenny, 1962).

(g) *Collecting procedure*

During the period from December 1960 to December 1961 the author collected over 2,000 specimens of land arthropods at Macquarie Island. Field observations were made at least once every week, most commonly in the area around the main station on the Isthmus between Gadget Gully and North Head. Other habitats were visited at least once every month, usually in the form of day excursions to Nuggets Point or Langdon Point, travelling by the plateau one way and by the coast the other way. Visits to the southern end of the island were made in February, August and late October.



ANARE photo 13795

K. C. Watson

PLATE 12

Collecting the midge *Bradysia watsoni* from *Stilbocarpa* and *Pleurophyllum* litter in the Giant Petrel rookery at Langdon Point.

During these field trips most of the island was traversed. Almost all of the plateau was seen from the various routes taken during the year; the plateau habitats are very similar from one end of the island to the other. The entire coast was seen, only three sections not actually having been covered by foot—the west coast below

Mount Waite, the west coast from Cape Toutcher to Star Head, and the south coast around Petrel Peak.

The best collecting equipment proved to be an aspirator, killing jar, small tubes of alcohol and plastic bags for gathering soil, litter, debris and plants for Berlese funnel extraction. As most of the insects are small and keep to the shelter of plants and stones, the aspirator was indispensable (Plate 12). A net was useful for sweeping tussock grass and for securing moths, tipulids and ephydriids.

Yellow trays filled with water with a few drops of detergent were placed amongst tussock grass and *Stilbocarpa*. Only a few sciarids, carnids, psychodids, springtails and one aphid were trapped in this way.

II. FREE-LIVING SPECIES BREEDING ON MACQUARIE ISLAND

Class **INSECTA**

Order **COLLEMBOLA**

Specimens collected during 1960-61 have been determined by Professor J. T. Salmon of Wellington. Apart from the species listed below, the collection also included several new species which Professor Salmon intends to describe later, one from each of the following genera:

Mesaphorura Börner, 1901

Subantarctica Salmon, 1949

Parafolsomia Salmon, 1949

Cryptopygus Willem, 1901

Isotoma Bourlet, 1839

All Collembola specimens are in the possession of Professor Salmon and will eventually be deposited in the Dominion Museum, Wellington, and the ANIC, Canberra.

Family **ONYCHIURIDAE**

Genus *Tullbergia* Lubbock, 1876

Tullbergia mixta Wahlgren, 1906

Tullbergia mixta Wahlgren, 1906. Wissensch. Erbn. Schweischen Südpolar Exped. 1901-3. 5 (9): 122.

DISTRIBUTION: Macquarie and South Shetland Islands.

HABITAT: Soil and litter of *Stilbocarpa polaris*; *Rhizoclonium* sp. on coastal rocks.

LOCALITY: Plateau above Gadget Gully; Garden Cove.

DATES: June, September.

Family **HYPOGASTRURIDAE**

Genus *Hypogastrura* Bourlet, 1839

Hypogastrura antarctica Salmon, 1962

Hypogastrura antarctica Salmon, 1962. Pac. Ins. 4 (4): 887.

DISTRIBUTION: Macquarie and South Shetland Islands.

HABITAT: *Poa hamiltoni*; *Stilbocarpa polaris* litter; rotting kelp; nest material of *Eudypetes chrysocome* and *Pygoscelis papua*; sheep dung; barn hay and manure; under beach rocks.

Family **ISOTOMIDAE**Genus *Sorensia* Salmon, 1949*Sorensia subflava* Salmon, 1949*Sorensia subflava* Salmon, 1949. Cape Exped. Ser. Bull. 4: 22.

DISTRIBUTION: Auckland, Campbell and Macquarie Islands.

HABITAT: *Poa foliosa* soil; *Stilbocarpa polaris* litter.

LOCALITIES: First Gully, Gadget Gully.

DATES: February, March.

Genus *Parisotoma* Bagnall, 1940*Parisotoma octooculata ovata* Salmon, 1949*Isotoma octo-oculata* Willem, 1902. In Exped. Ant. Belge: 1-19.*Parisotoma octo-oculata* Salmon, 1949. Cape Exped. Ser. Bull. 4: 36, 39.*Parisotoma octo-oculata ovata* Salmon, 1949. Cape Exped. Ser. Bull. 4: 39.

DISTRIBUTION: Auckland, Campbell and Macquarie Islands.

HABITAT: *Stilbocarpa polaris* litter; under beach rocks.

LOCALITIES: Gadget Gully; Hurd Point.

DATES: February, March.

Family **ENTOMOBRYIDAE**Genus *Lepidocyrtus* Bourlet, 1839*Lepidocyrtus cyaneus cinereus* Folsom, 1924*Lepidocyrtus cyaneus cinereus* Folsom, 1924. Amer. Mus. Novit. 108: 9.

DISTRIBUTION: Campbell Island, Macquarie Island, New Zealand, North America.

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATES: March, September, October, November.

Genus *Lepidobrya* Womersley, 1937*Lepidobrya mawsoni* (Tillyard), 1920*Entomobrya mawsoni* Tillyard, 1920. Australas. Ant. Exped. 1911-14 Sci. Rep. (C) 5 (8): 11.*Lepidobrya mawsoni* Salmon, 1949. Cape Exped. Ser. Bull. 4: 43.

DISTRIBUTION: Campbell and Macquarie Islands.

HABITAT: *Stilbocarpa polaris* litter and leaves; *Poa annua*.

LOCALITIES: Nuggets Point, First Gully, Wireless Hill, North Head, Camp Hill.

DATES: February, April, July, September, October.

Family **SMINTHURIDAE**Genus *Katianna* Börner, 1906*Katianna banzareii* Salmon, 1964*Katianna banzareii* Salmon, 1964. Pac. Ins. 6 (2): 314.

Specimens were first collected by the BANZAREE from Boulders Bay

DISTRIBUTION: Macquarie Island.

HABITAT: *Stilbocarpa polaris* plants and litter; sheep dung.

LOCALITIES: Nuggets Point, First Gully, Wireless Hill, Caroline Valley.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Genus *Metakatianna* Denis, 1933

Metakatianna gressitti Salmon, 1964

Metakatianna gressitti Salmon, 1964. Pac. Ins. 6 (2): 317.

Specimens were first collected by J. L. Gressitt from Isthmus station area, December, 1960.

DISTRIBUTION: Macquarie Island.

HABITAT: *Stilbocarpa polaris*, *Poa hamiltoni*, *Montia fontana*.

LOCALITIES: Lambing Gully, North Head, Aerial Cove.

DATES: March, June, August, September, December.

Order **CORRODENTIA**

Family **PHILOTARSIDAE**

Genus *Austropsocus* Smithers, 1962

Austropsocus insularis Smithers, 1962

Austropsocus insularis Smithers, 1962. Pac. Ins. 4 (4): 929-932.

Both genus and species were described by C. N. Smithers from specimens collected at Macquarie Island in 1960-61. The collection of 230 specimens included 100 females, 51 males and 79 nymphs.

RECOGNITION: Head, body and wings pale yellowish brown, many specimens with thoracic pleura and dorsa of abdomen tinged with pink (in life and in alcohol). Length of body about 2.3 mm (female), 1.5-1.6 mm (male). Eyes fairly large, ocelli absent. Fore wings reduced to small scale-like appendages; length 0.3 mm (female), 0.2 mm (male). Hind wings absent.

SPECIMENS: Holotype (female), allotype (male) and paratypes in the ANIC, Canberra; some paratypes in the Bishop Museum, Honolulu and the Australian Museum, Sydney.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: The most common habitats of adults and nymphs alike are the under-surface of *Stilbocarpa* leaves and the decaying litter beneath the *Stilbocarpa* plants. Specimens were also found in *Pleurophyllum* litter and on leaves and in litter of *Poa foliosa* and *P. hamiltoni*. One nymph was taken from a cushion of *Colobanthus muscoides*.

LOCALITIES: Widespread in grassland and herbfield from the coast to 600 feet.

ANNUAL DISTRIBUTION: Males, females and nymphs occur throughout the year.

Order **THYSANOPTERA**Family **THRIPIDAE**Genus *Physemothrips* Stannard, 1962*Physemothrips chrysodermus* Stannard, 1962*Physemothrips chrysodermus* Stannard, 1962. Pac. Ins. 4 (4): 933-936.

Both genus and species were described by L. J. Stannard from specimens collected at Macquarie Island in 1960-61. The collection of over 300 specimens included adults of both sexes, larvae and pupae.

RECOGNITION: Adult: Colour yellow except for the tip of mouth cone and antennal segments IV-VIII which are brown. Pterothorax greatly reduced, apterous. Length of distended female about 1.8 mm, of distended male about 1.3 mm. Larva I: Length distended about 0.8 mm. Colour pale yellow. Larva II: Length distended about 1.2 mm. Colour pale yellow. Prepupa: Length distended about 1.5 mm. Colour pale yellow. Antennae placed forward in a rigid U position, segments largely fused. Eye region small. Thorax without wing buds. Legs with tibiae and tarsae fused. Pupa: Length distended about 1.5 mm. Colour pale yellow. Antennal segments fused, curved over dorsum of head. Eye region large. Thorax without wing buds. Legs with tibiae and tarsae fused. All setae very long, curved, pointed.

SPECIMENS: Holotype (female), allotype (male), paratypes (females, males and immatures) in the ANIC, Canberra; some paratypes also in the Bishop Museum, Honolulu and the Illinois Natural History Survey, Urbana.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Common on flowers and leaves (in the region of the ligule) of *Poa foliosa* and *P. hamiltoni*. Also found on *Cotula plumosa* (particularly the flowers), *Poa annua*, *Puccinellia macquariensis*, *Montia fontana* and *Stellaria media*, and less commonly in soil and litter associated with *Poa foliosa* and *Stilbocarpa polaris*.

LOCALITIES: Widespread from coastal rocks above high-water mark to 700 feet.

ANNUAL DISTRIBUTION: Adults were collected throughout the year, larvae in January, February, March, April, October and November. Females containing eggs were collected in May, November and December.

Order **HEMIPTERA**Family **APHIDIDAE**Genus *Jacksonia* Theobald, 1923*Jacksonia papillata* Theobald, 1923*Jacksonia papillata* Theobald, 1923. Scot. Nat. 1923: 9-10.

This species was first recorded from Macquarie Island by Eastop (1962) from material collected during 1961-62. Over 660 specimens were collected of which one was an alate, 171 were apterate, and over 487 were nymphs.

RECOGNITION: Apterate form: Body brownish—or sometimes slightly greenish-ochreous. Head, antennae, legs and siphunculi dark brown. Length of body

SPECIMENS: Macquarie Island material determined by R. D. Hughes (Canberra) and V. F. Eastop (London), and deposited in the ANIC, Canberra and the British Museum (Natural History).

DISTRIBUTION: Britain (apparently more common in Scotland and Wales than in England), Iceland, Norway, New Zealand, Idaho (one small specimen) and Macquarie Island.

HABITAT: Apterate forms and nymphs most commonly occur on *Poa foliosa* where they are found at the base of the tussock aggregated around the culms and basal leaves. They are found in the same situation on the less widespread *Poa hamiltoni* and on *Poa annua*. Specimens were also collected by the author from the leaves of *Ranunculus biternatus*, *Montia fontana* and *Festuca erecta*, and by Tullgren extraction from *Stellaria media* and *Puccinellia macquariensis*. On two occasions, in March and September, *Stilbocarpa* litter, together with windswept penguin feathers, was collected at Nuggets Point, and a total of 17 aphids was extracted by the Tullgren apparatus. One apterate specimen was collected by J. L. Gressitt from *Pleurophyllum* litter. The single alate specimen was found on a leaf of *Acaena* sp. on Tent Hill.

LOCALITIES: Recorded from a wide area of the island, for example, from North Head, Nuggets Point, Langdon Point, Handspike Point and Hurd Point. The species, however, is not common, and often only one tussock, or one group of tussocks, will yield aphids, despite intensive searching of surrounding tussocks. Specimens have been collected up to 400 feet.

ANNUAL DISTRIBUTION: Apterate forms and nymphs were collected throughout the year; the alate form in April.

REMARKS: It is interesting that the other records of this species are all from cold, damp regions similar to that of Macquarie Island. Apart from cases where specimens were trapped, the habitat in these records is similar to that on Macquarie, the aphid living at the bases of tufts of grass, particularly species of *Poa* and *Festuca*. Stroyan (1950) considered the species to be exclusively a grass feeder but on Macquarie Island it appears to feed also on herbaceous dicotyledons.

Genus *Rhopalosiphum* Koch, 1854

Rhopalosiphum padi (Linnaeus), 1758

Rhopalosiphum padi Linnaeus, 1758. Edition X, Syst. Natura, *Aphis*: 451.

This species was first recorded from Macquarie Island by Eastop (1962) from the 1961 collection. One apterate, 3 alate and 10 nymphal forms were taken from a tussock of *Festuca erecta* in April 1961.

RECOGNITION: Colour of body brown. Length of body about 2 mm.

SPECIMENS: Macquarie Island material determined by R. D. Hughes (Canberra) and V. F. Eastop (London), and deposited in the British Museum (Natural History).

DISTRIBUTION: Cosmopolitan, except for tropical lowlands. The species is well

HABITAT: Specimens were collected from a single tussock of *Festuca erecta* where they were found low down on the leaves inside the tussock.

LOCALITY: Eastern slope of Wireless Hill.

DATE: April.

REMARKS: The species is probably a recent arrival at Macquarie Island and the proximity of the collecting site to the main ANARE station suggests that it may have been introduced by man.

Order LEPIDOPTERA

Family PYRALIDAE

Genus *Eudoria* Chapman, 1911

Eudoria mawsoni (Womersley and Tindale), 1937

Scoparia mawsoni Womersley and Tindale, 1937. Rep. B.A.N.Z.A.R.E. 1929-31, ser. B, 4 (3): 83-86.

Eudoria mawsoni (Womersley and Tindale). Common, 1962. Pac. Ins. 4 (4): 975-978.

This species is the only moth breeding on Macquarie Island. It was first described by Womersley and Tindale from a small series of poorly preserved adults and larvae collected by T. H. Johnston in 1930. Larvae, pupae, 196 males and 18 females from the 1960, 61 collections were examined by I. F. B. Common (Canberra) who was able to redescribe the species and establish it within the genus *Eudoria*.

RECOGNITION: Colour varies from ochreous grey to grey; some forms with dark markings, others without. Expanse of male 21·2-26·7 mm, of female 18·6-24·8 mm. Larva: colour of head dark brown, of body yellowish brown with reddish brown spots at the loci of setae. Length about 15 mm (fully grown). Pupa: colour tawny. Length about 9 mm.

SPECIMENS: Holotype and paratypes (1937) in the South Australian Museum, Adelaide; specimens from the 1960-61 collections in the ANIC, Canberra and the Bishop Museum, Honolulu.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Larvae live in mosses and *Colobanthus muscoides* (Plates 2 and 4). Although larvae of the genus *Eudoria* are moss-feeders, the fact that those of *mawsoni* occur not uncommonly in *C. muscoides*, in situations where mosses are not present, suggests that *mawsoni* feeds on this species as well as on mosses. The growth form of *C. muscoides* is similar to that of mosses.

LOCALITIES: Widespread all over the island from sea level to 800 feet, occurring in all of the five major plant formations. Particularly abundant in the herbfield terrace of the north coast.

ANNUAL DISTRIBUTION: Larvae are present throughout the year. From late October to February the larvae pupate, and adult moths start to emerge in early November and continue until March, being most abundant during December and

REMARKS: During the summer months they are commonly seen flying over the vegetation. They are most abundant in herbfield such as on the raised beach terraces and on the lower, sheltered parts of the plateau. A sweep net collection made on a fine sunny day in December indicated that nearly all moths on the wing were males.

Larvae are sometimes seen crawling over rocks, mosses and cushions of *Colobanthus*. On very cold days the larvae were found to be lying in tunnels excavated in mosses and *Colobanthus*. Some were found under stones, in dung, in the fibrous mud surface of stagnant pools, and in the soil around *Stilbocarpa* roots.

Order **DIPTERA**

Family **PSYCHODIDAE**

Genus *Psychoda* Latreille, 1796

Psychoda parthenogenetica (Tonnoir), 1940

Psychoda severini parthenogenetica Tonnoir, 1940. Trans. Soc. Brit. Ent. 7: 21-64.

Psychoda parthenogenetica (Tonnoir); Duckhouse, 1962. Trans. Roy. Ent. Soc. Lond. 114: 428.

This species was first recorded from Macquarie Island by Quate (1962) from a series comprising 81 adults, larvae and pupae collected during 1960-61. A specimen collected by K. G. Brown in April, 1953, has also been determined as *P. parthenogenetica*.

RECOGNITION: Colour of body brown, of wings brownish grey. Length of body 0.9-1.2 mm, of wings 1.6-2.0 mm. All adults female.

SPECIMENS: Macquarie Island material determined by L. W. Quate (Honolulu) and D. A. Duckhouse (Adelaide) and deposited in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Cosmopolitan.

HABITAT: Larvae breed in sheep dung, *Stilbocarpa* litter and in the mud banks of seal wallows. Adults are found most commonly in piles of sheep dung and amongst the decaying litter beneath *Stilbocarpa* plants.

LOCALITIES: Widespread around the coast and lower slopes of at least the northern half of the island. Specimens were collected at various sites north of Langdon Point and Green Gorge.

ANNUAL DISTRIBUTION: Adults were collected in all months of the year, larvae in March, April, September and November, and pupae in March, September and November. There is probably no seasonal variation in the life cycle.

REMARKS: *P. parthenogenetica* is not as common as *P. surcoufi*. In grassland and herbfield communities only a few *parthenogenetica* were found compared with *surcoufi*. On the other hand, a search amongst pellets of sheep dung reveals a predomination of *parthenogenetica* and, judging by the larval records, animal

Psychoda surcoufi Tonnoir, 1922

Psychoda surcoufi Tonnoir, 1922. Ann. Soc. Ent. Belg. **62**: 74.

This species was first recorded (as *Ps. subimmaculata*) from Macquarie Island by Womersley (1937d) from a single adult collected by T. H. Johnston during the B.A.N.Z.A.R. Expedition in 1930. K. G. Brown collected a few specimens in 1953 and a larger series was collected in 1960-61. L. W. Quate (1962) and D. A. Duckhouse (pers. comm.) have determined this collection. Quate determined these flies as *Ps. spatulata*; Duckhouse (1966) has since synonymised *spatulata* with *surcoufi*.

RECOGNITION: Colour of body yellowish, of wings white. Length of body 0.7-1.1 mm, of wings 1.5-2.2 mm.

SPECIMENS: Macquarie Island material has been deposited in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Australia, New Zealand, Campbell and Macquarie Islands.

HABITAT: Larvae live in litter and soil of herbfield plants, being particularly abundant in *Stilbocarpa* litter. Adults live in decaying plant and animal matter and are most common amongst *Stilbocarpa* plants.

LOCALITIES: Widespread, occurring in grassland and herbfield from the coast to 600 feet.

ANNUAL DISTRIBUTION: Larvae, pupae and adults of both sexes are present throughout the year.

REMARKS: On cold and windy days the flies keep to the ground under the leaves of *Stilbocarpa* and within tussocks of *Poa*. In sunny periods in positions of relative shelter from strong winds, dozens of flies take to the air above *Stilbocarpa* plants; on such occasions large numbers are also seen flying over seal-wallow areas around the coast.

Family TIPULIDAE

Genus *Erioptera* (*Trimicra*) (Fabricius), 1787*Erioptera* (*Trimicra*) *pilipes macquariensis* Alexander, 1962

Tipula pilipes Fabricius, 1787. Mantissa Ins. **2**: 324.

Trimicra pilipes Osten Sacken, 1869. Mon. Dipt. N. Amer. **4**: 167.

Erioptera (*Trimicra*) *pilipes* Edwards, 1938. Trans. Soc. Brit. Ent. **5**: 129.

Erioptera (*Trimicra*) *pilipes macquariensis* Alexander, 1962. Pac. Ins. **4** (4): 939-944.

This subspecies was first described by C. P. Alexander from a collection of over 80 adults and numerous larvae and pupae collected in 1960-61. Previously, the species (*Trimicra pilipes*) had been recorded from Macquarie by Womersley (1937d) from adults, larvae and pupae collected by T. H. Johnston during the B.A.N.Z.A.R.E. Tillyard (1920) gave a figure and brief description of a pupa collected at the island by H. Hamilton in 1913.

RECOGNITION: Length about 6.5-8.0 mm (female), 5-8 mm (male). General colouration dark brown, with grey in front of head and dorsally on the thorax.

SPECIMENS: Holotype (male), allotype (female) and paratypes in the Bishop Museum, Honolulu; larvae, pupae and paratypes in the ANIC, Canberra.

DISTRIBUTION: Macquarie Island. *Erioptera (Trimicra) pilipes* ranges over all the major regions of the earth and many varieties are recognized.

HABITAT: Patches of soft muddy peat, and fibrous mud on surfaces of fresh-water pools and seal-wallows along the coast; occasionally in mud patches in gullies (Plates 6 and 2).

LOCALITIES: Widespread.

ANNUAL DISTRIBUTION: Eggs are laid during the summer months and larvae hatch out and spend the winter months in mud patches. They begin to pupate in late October, and the first adults appear soon afterwards, in November. All adults have died by mid-April.

REMARKS: These crane flies, the largest insects on the island, are most abundant during November, December and January. They are seen flying over seal-wallow areas and resting on the surfaces of pools and on surrounding tussocks. They are less common in the gullies where they have been seen up to 500 feet. On the coldest days during winter the larvae lie stiffly extended in the mud, becoming active again for short periods when the mud is warmed by the sun.

Family **SCIARIDAE**

Genus *Bradysia* Winnertz, 1867

Bradysia watsoni Colless, 1962

Bradysia watsoni Colless, 1962. Pac. Ins. 4 (4): 955-957.

Womersley, reporting on the Diptera collected by T. H. Johnston during the B.A.N.Z.A.R. Expedition of 1930-31, gives a few details of a single specimen of *Sciara* sp. from Macquarie Island. This specimen was probably one of the species recently described as *Bradysia watsoni* by Dr. Colless. A large series of specimens comprising adults of both sexes, larvae and pupae was collected during 1960-61 and has been examined by Dr. Colless.

RECOGNITION: General colouration dark brown to black. Length of body about 2.2 mm, of wing 2.2-3.0 mm (female), 2.2-2.5 mm (male).

SPECIMENS: Holotype (male), allotype (female), paratypes and morphotype larvae and pupae in the ANIC, Canberra; some paratypes in the Bishop Museum, Honolulu, the United States National Museum and the British Museum (Natural History).

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Rotting plant material, mainly of *Stilbocarpa polaris* (Plate 12).

LOCALITIES: Widespread, occurring in herbfield and grassland up to 400 feet.

ANNUAL DISTRIBUTION: All stages are present throughout the year.

REMARKS: Except at temperatures around freezing point and lower, adults are

Family **CHIRONOMIDAE**Genus *Halirytus**Halirytus macquariensis* Brundin, 1962

Halirytus macquariensis Brundin, 1962. Pac. Ins. 4 (4): 945-954.

This species was first described by L. Brundin from a series of about 130 adults (all females), numerous larvae, one pupa and a few pupal skins collected at Macquarie Island during 1961.

RECOGNITION: General colouration blackish with a greenish tinge, most of body pruinose. Length of body 4.5-5.0 mm, of wing 0.7-1.4 mm. Wings strongly reduced, legs large. Larva: length up to 10 mm; dark brown and shiny. Pupa: length 9 mm; cephalothorax amber-coloured, abdomen blue-grey; abdomen with large, oblique terminal disc.

SPECIMENS: Holotype, paratypes, larvae and pupa in the ANIC, Canberra; some paratypes, larvae and pupal skins in the Swedish Museum of Natural History, Stockholm.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Red, brown and green algae (mainly *Porphyra umbilicalis* and *Rhizoclonium* sp.) on rocks in the upper *Porphyra* zone (Plate 11).

LOCALITIES: Coastal areas where suitable habitats exist. Aerial Cove, Garden Cove, Nuggets Point, Green Gorge, Hurd Point, Bauer Bay.

ANNUAL DISTRIBUTION: Larvae are present throughout the year, the adults in all except the coldest months from June to September. The single pupa was collected in November. Probably the adults emerge whenever the temperature rises sufficiently, even during the winter months.

REMARKS: Larvae are usually found lying quietly in the algal mass or attached to the rock beneath the alga by a thread-like secretion. Sometimes they occupy the cast pupal skins of *Apetaenus watsoni* (Coelopidae) which are already attached to the rock by a secretion. On one warm, sunny day in November larvae were seen crawling over the wet rocks in Garden Cove. The adults have only minute remnants of wings, and walk slowly and clumsily over the rocks, often losing their grip in the wind.

Genus *Smittia* Holmgren, 1869*Smittia* sp. Brundin, 1962

Smittia sp. Macquarie Island, Brundin, 1962. Pac. Ins. 4 (4): 945-954.

This midge was first recorded by Brundin from material collected in 1961 (119 females, numerous larvae and some pupae).

RECOGNITION: Colour of body blackish brown, of wings white. Length of body about 1.4 mm, of wings about 1.4 mm.

SPECIMENS: Specimens deposited in the ANIC, Canberra, and the Swedish Museum of Natural History, Stockholm.

HABITAT: Sheep dung in sheltered parts of tussock grassland.

LOCALITIES: Camp Hill and Wireless Hill (300 feet).

ANNUAL DISTRIBUTION: Adult females, larvae and pupae are present throughout the year. No males have been found on Macquarie.

REMARKS: During 1961 the flies were found to be quite common in small heaps of sheep dung on Camp Hill, a small hill within the main ANARE station area. Although sheep dung was just as plentiful on the higher parts of nearby Wireless Hill, comparatively few flies were found there. No flies were found in rabbit dung examined at various localities throughout the island. It may be that this fly has been introduced to the island along with the sheep which were first taken there in 1948. On one occasion, however, a pupa and two larvae were found while sorting through rotting leaves of *Stilbocarpa polaris* from a Giant Petrel rookery at Langdon Point.

The midges are found crawling amongst pellets of sheep dung; only rarely, when the wind is slight, are they seen to take flight.

Family COELOPIDAE

Genus *Apetaenus* Eaton, 1875

Apetaenus watsoni Hardy, 1962

Apetaenus watsoni Hardy, 1962. Pac. Ins. 4 (4): 963-967.

The genus *Apetaenus* was first described by Eaton (1875b) from flies collected at Ile de Kerguelén during the Transit of Venus Expedition of 1874. The species, *Apetaenus litoralis*, that he described is the type of the genus and a single remaining specimen in the British Museum has been designated the lectotype (Harrison, 1959). The B.A.N.Z.A.R. Expedition of 1929-31 collected further specimens from Ile de Kerguelén and from Macquarie Island, and Womersley (1937d) determined all these as *A. litoralis*. A further specimen collected by this expedition from Macquarie was determined by Womersley (1937d) as *Amalopteryx maritima* Eaton (Ephydridae), a species described from Ile de Kerguelén.

Hardy, describing the large series of specimens collected at Macquarie in 1960-61, has recognized a new species, *Apetaenus watsoni*, and has shown that the two adults described by Womersley as *A. litoralis* are also *A. watsoni*.

RECOGNITION: Colour dark brown to black, rather densely grey pollinose. Length of body 2.85-3.0 mm (female), 2.75-2.9 mm (male); of wing 0.3 mm. A densely haired species. The wings are about half the length of the thorax. Larva dark brownish grey above, light brown beneath; integument densely spiculated; from 4 to 7 mm in length.

SPECIMENS: Holotype (male), allotype (female), paratypes, larvae and pupae in the ANIC, Canberra; paratypes in the Bishop Museum, the United States National Museum, the British Museum (Natural History), and the University of Hawaii.

DISTRIBUTION: Macquarie Island.

HABITAT: Coastal rocks of the upper Beach, Langdon Point, Macquarie Island.

macquariensis on rocks close to the sea; under stones in penguin rookeries; fowl manure in pens at the Isthmus station (Plate 11).

LOCALITIES: Widespread around the coast and in penguin rookeries up to 600 feet (as at Caroline Cove).

ANNUAL DISTRIBUTION: Adults, larvae and pupae are present throughout the year.

REMARKS: These brachypterous flies are quite abundant throughout the year. They can be seen walking slowly over the algae or bare rock in the upper *Porphyra* zone; pairs in copulation are commonly seen throughout the year. Less frequently, flies can be found walking over pebbles on the beach, and in clusters on pieces of kelp and under stones and driftwood. In penguin rookeries they mass together under stones in the well manured mixture of mud and feathers. Here the immature stages lie in the wet mud; on the coastal rocks they are found entangled in the fine, filamentous green alga (*Rhizoclonium* sp.), amongst the fronds of *Porphyra umbilicalis* and in crevices of the rock. The pupae attach themselves to the rock or alga by a secretion.

Genus *Coelopa* Meigen, 1830

Coelopa (*Coelopella*) *curvipes* Hutton, 1902

Coelopa curvipes Hutton, 1902. New Zealand Inst., Trans. 34: 172.

Coelopella plebeia Malloch, 1933. Ann. Mag. Nat. Hist. 11 (10): 348.

Coelopa macquariensis Womersley, 1937. Rep. B.A.N.Z.A.R.E. 1929-31, ser. B, 4 (3): 72.

Coelopa (*Coelopella*) *curvipes* Hutton; Hardy, 1962. Pac. Ins. 4 (4): 963-971.

During a visit to Macquarie Island in 1894, A. Hamilton collected one male and two female kelp flies. Lamb (1909) determined all three specimens as *Coelopa nigrifrons*. Later, Harrison (1959) redetermined the two female specimens as *Coelopella plebeia* and then Hardy (1962), after comparing them with the large series of *C. (C.) curvipes* from the 1960-61 collection, regarded them as belonging to the latter species (*curvipes*). Harrison has established the synonymy of *Coelopa curvipes* and *Coelopa macquariensis*, a species described by Womersley from a series of 84 specimens collected by T. H. Johnston in 1930 during the B.A.N.Z.A.R. Expedition. However, Womersley's description of *macquariensis* larvae is believed by Hardy to have been based on specimens of *nigrifrons*. Over 1,450 adults and 900 immatures were included in the 1960-61 collection.

RECOGNITION: Colour grey-black with light reddish brown legs. Body length from 3.6 to 7.0 mm. Wing length 4.0-8.0 mm. Lower lateral margin of face with shining black spot; front of head dark reddish brown with a light dusting of grey; orbits and ocellar triangle heavily dusted with grey. Metasternum without hairs. Legs covered with fine long hairs that are longer in the male. In both sexes the anterior and posterior notopleural bristles are strong. Claspers in the male are single-lobed. Larvae white and shining, posterior spiracles scarcely raised and with a dense fringe around the margin. Pupae shining black.

SPECIMENS: The type locality of *curvipes* is Auckland Island, and the type specimen is in the Canterbury Museum. The type of *macquariensis* is in the British

ANIC, Canberra, the Bishop Museum, the United States National Museum, the British Museum and the University of Hawaii.

DISTRIBUTION: New Zealand, Auckland Islands, Chatham Islands, Macquarie Island.

HABITAT: Decaying kelp (*Durvillea antarctica*) and elephant seal carcasses on beaches above high tide mark.

LOCALITIES: Widespread around the coast where suitable habitats exist.

ANNUAL DISTRIBUTION: Larvae, pupae and adults occur throughout the year and appear to be more abundant than *nigrifrons* during November and less abundant than *nigrifrons* during the winter months.

REMARKS: During periods of high wind and of ground temperatures around freezing point, adult flies aggregate in thick masses within the piles of kelp and under pebbles. During severe storms, when seas mount high up on the beaches, flooding the piles of rotting kelp, the flies shelter behind rocks and tussocks. During one such storm in March 1961, dense clusters of kelp flies were seen in the lee of station buildings under eaves and inside entrance porches. On relatively warm, still days the adults are seen in large numbers flying up to ten feet above beaches

TABLE 1.
KELP HABITATS ON PEBBLE AND ROCK BEACHES
COLLECTIONS OF LARVAE OF *C. curvipes* AND *C. nigrifrons*.

Month	Total No. of Larvae	% <i>curvipes</i>	% <i>nigrifrons</i>
May	50	24	76
May	27	0	100
May	100	0	100
June	62	0	100
July	74	0	100
July	51	0	100
July	4	25	75
July	65	6.2	93.8
July	12	0	100
Aug.	33	9.9	90.1
Aug.	12	0	100
Aug.	17	0	100
Aug.	24	0	100
Aug.	30	0	100
Aug.	24	0	100
Oct.	3	0	100

TABLE 2.
CARCASS HABITATS ON SANDY BEACHES
COLLECTIONS OF LARVAE OF *C. curvipes* AND *C. nigrifrons*.

Month	Total No. of Larvae	% <i>curvipes</i>	% <i>nigrifrons</i>
May	116	93.4	6.6
May	169	91.8	8.2
July	26	100	0
		100	0

strewn with rotting kelp. Larvae are found on and within the decaying straps of *Durvillea* which are thick and slimy and, in greater numbers, within decaying seal carcasses and in the sand beneath them.

During 1961, larvae and adults of both *curvipes* and *nigrifrons* were collected from a variety of habitats in both summer and winter months. Although no particular type of habitat was occupied exclusively by either species, the larvae of *curvipes* were always found to outnumber greatly those of *nigrifrons* in seal carcasses and surrounding sand. On the other hand, *curvipes* larvae were always greatly outnumbered by *nigrifrons* larvae in collections from kelp on rock and pebble beaches. Tables 1 and 2 record the percentage of each species taken in random collections throughout piles of kelp on stony beaches and elephant seal carcasses, respectively. All seal carcasses lie on beaches well above high-water mark. It is possible that the immature stages of *nigrifrons* are better adapted to conditions of frequent wetting by sea-water, whereas those of *curvipes* are better adapted to less saline situations such as exist in carcasses and kelp higher up on sandy beaches.

Coelopa (Fucomyia) nigrifrons Lamb, 1909

Coelopa nigrifrons Lamb, 1909. The Subantarctic Islands of New Zealand, ed. C. Chilton. Wellington. 1: 140.

Coelopa (Fucomyia) nigrifrons Lamb; Hardy, 1962. Pac. Ins. 4 (4): 963-971.

This species was first described by Lamb from one male and two females collected by A. Hamilton at Macquarie Island in 1894. The two females have since been redetermined by Harrison (1959) as *Coelopella plebeia* Malloch which is now regarded as being conspecific with *Coelopa (Coelopella) curvipes* Hutton (Hardy 1962) which is the other species of *Coelopa* occurring on Macquarie Island. Three male kelp flies taken by Dr. L. Kohl from the east coast in 1928, and described by Enderlein (1930) as *Actoceles assymetrica*, were probably specimens of either *curvipes* or *nigrifrons*. The 1960-61 collections comprised over 1,600 adults and over 700 immatures.

RECOGNITION: Colour brownish black. Length of body 4.0 to 7.0 mm, of wings 3.5 to 7.0 mm. Lower lateral margin of face without shining black spot. Front of head dark-chocolate brown; ocellar triangle and orbits heavily dusted with grey. Metasternum with hairs. Legs covered with fine hairs that are longer in the male. In the male, the anterior notopleural bristles are less than half the length of the posterior notopleurals. Claspers in the male are distinctly bilobed. Larvae cream and dull with posterior spiracles distinctly elevated and widely separated. Pupae dark brown and dull.

SPECIMENS: Lectotype in the British Museum. Material from the 1960-61 collections in the ANIC, Canberra, the Bishop Museum, the United States National Museum, the British Museum and the University of Hawaii.

DISTRIBUTION: Macquarie Island.

HABITAT: Decaying kelp (*Durvillea antarctica*) and elephant seal carcasses on beaches above high-tide mark.

ANNUAL DISTRIBUTION: Larvae, pupae and adults occur throughout the year and appear to be more abundant than *curvipes* in the winter months and less abundant than *curvipes* in November.

REMARKS: Larvae are found on and within the decaying straps of *Durvillea*, which are thick and slimy. They live in conditions ranging from relatively fresh kelp, receiving frequent sea spray, to moist, putrid kelp well above high-water mark.

Family **EPHYDRIDAE**

Genus *Ephydrella* Tonnoir and Malloch, 1926

Ephydrella macquariensis (Womersley), 1937

Ephydra macquariensis Womersley, 1937. Rep. B.A.N.Z.A.R.E. 1929-31, ser. B, 4 (3): 59-79.
Ephydrella macquariensis (Womersley); Wirth, 1962. Pac. Ins. 4 (4): 971.

Dr. Wirth, after examining a large series of adults, larvae and pupae from the 1960-61 collection, has made the new combination of *Ephydrella macquariensis*. Womersley's description was made from 14 adults collected by T. H. Johnston in 1930.

RECOGNITION: Colour: thorax light brown with metallic green sheen; abdomen light greenish grey; front of head bright metallic green; wings light brown. Length of body about 5 mm, of wings 5.6 mm.

SPECIMENS: From the 1960-61 collection in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Macquarie Island.

HABITAT: Patches of soft, muddy peat, and fibrous mud on the surfaces of fresh-water pools. Larvae and pupae live just below the surface (Plates 2 and 6).

LOCALITIES: Coastal terraces of east, north and west coasts. On one occasion, about 20 adults were collected from the eastern shore of a small lake at 600 feet near Mt. Waite. Whether the flies breed at such heights and at such windy sites, or whether these flies were carried by the wind, is not known.

ANNUAL DISTRIBUTION: Eggs are laid during the summer months and larvae hatch out and spend the winter months quietly in mud. They begin to pupate in late October and the first adults appear soon after, in November. Most adults have died by April.

REMARKS: These flies are found on the surfaces of pools and mud patches where they congregate together. The larvae can be seen wriggling slowly along the surface of mud, except at the coldest times, when they are curled up stiffly in the mud.

In 1961, a fly was collected in July during a relatively warm period, but this was the only adult seen during the winter months.

Family **DOLICHOPODIDAE**

Genus *Schoenophilus* Mik, 1878

Schoenophilus pedestris Lamb, 1909

Schoenophilus pedestris Lamb. Kohn, 1962. Pac. Ins. 4 (4): 959-962.

This species was described by Lamb from two specimens collected at Macquarie Island by A. Hamilton in 1894. Marian A. Kohn has redescribed the species from the collection made in 1960-61, which comprised 234 specimens including larvae and adults.

RECOGNITION: General colouration black with coppery green metallic sheen, dusted with grey. Length 2.3 mm. Wings greatly reduced in width forming a slender appendage, length 0.8 mm.

SPECIMENS: "Type—Cambridge Museum" (Lamb). Material examined by Mrs. Kohn, including larvae, is deposited in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Macquarie Island.

HABITAT: Larvae live in soil, litter and sheep dung, and in cushions of *Colobanthus muscoides*; adults in herbfield, grassland and bog, occurring most commonly on *Colobanthus* cushions and amongst the leaves of *Pleurophyllum hookeri* (Plates 4 and 10).

LOCALITIES: Widespread. Occurring on coastal rocks, raised beach terraces and in the more sheltered grassland and herbfield of the slopes and plateau up to 700 feet.

ANNUAL DISTRIBUTION: Adults start to emerge at the end of October. They lay eggs during the late spring and summer, and by June all have died. The larva is the over-wintering stage. In spite of intensive searching, no pupae have been found.

REMARKS: In contrast to the other two brachypterous flies, these flies are quite active. They are often seen, both singly and in copulation, walking quickly over *Colobanthus* cushions and, when disturbed, they can jump a distance of two or three inches. When on leaves, such as those of *Pleurophyllum*, the slightest disturbance causes them to loosen their hold and drop down to the bottom of the plant where they rapidly seek cover.

Family CARNIDAE

Genus *Mynoglenes* Simon, 1905

Australimyza macquariensis (Womersley), 1937

Procenace macquariensis Womersley, 1937. Rep. B.A.N.Z.A.R.E. 1929-31, ser. B, 4 (3): 78-79.

Australimyza macquariensis (Womersley); Harrison, 1959. The Acalypterate Diptera of New Zealand. D.S.I.R., Wellington.

This species was described by Womersley from a collection of 50 adults made by T. H. Johnston at Macquarie Island in 1930.

RECOGNITION: Colour of body brown or dark brown with heavy dusting of grey, of legs yellowish brown. Length of body about 2.5 mm, of wing about 2.5 mm. Immatures: colour yellowish brown, length about 4 mm.

SPECIMENS: Type specimens (1937) in the South Australian Museum, Adelaide. Material from the 1960-61 collections in the ANIC, Canberra, and the Australian Museum, Sydney (with D. K. McAlpine, who determined them).

HABITAT: Decaying plant material in grassland and herbfield; sheep and rabbit dung. Larvae, pupae and adults are also commonly found on the under-surfaces of *Stilbocarpa* leaves.

LOCALITIES: Widespread, from *Colobanthus muscoides* and *Puccinellia macquariensis*, close to the sea, to plateau herbfield and grassland at 600 feet.

ANNUAL DISTRIBUTION: All stages are present throughout the year. Adults are most abundant in the summer months, and in smallest numbers in the coldest periods of June, July and August.

REMARKS: This is the most widely distributed fly on the island. It occurs in nearly all localities throughout the year. However, it is absent, like most other arthropods, from the feldmark above 600 feet.

The systematic position of the genus *Australimyza* is uncertain. The placing of it in the family Carnidae follows the advice of McAlpine in a personal communication. According to him, *Australimyza* cannot be regarded as belonging to the Milichiidae to which it has previously been referred.

Of the six known species of *Australimyza*, three are from New Zealand, one from Macquarie Island, one from Antipodes and Campbell Islands, and one, as yet undescribed, from southern Australia.

Order COLEOPTERA

Family STAPHYLINIDAE

Specimens from the 1960-61 collections have been determined by W. O. Steel.

Subfamily OMALIINAE

Genus *Omaliomimus* Jeannel, 1940

Omaliomimus albipenne (Kiesenwetter), 1877

Omalium albipenne Kiesenwetter, 1877. Dtsch. Ent. Zschr. **21**: 162.

Homalium variipenne Lea, 1920. Austral. Ant. Exp., 1911-14. Sci. Rep. (C) **5** (8): 30.

Omaliomimus flavipennis Cameron, 1947. Ann. Mag. Nat. Hist. ser. 11, **14**: 723.

Omaliomimus albipenne (Kiesenwetter). Steel, 1964. Pac. Ins. Mon. **7**: 347.

This species was first recorded from Macquarie Island from H. Hamilton's 1911-12 collection by Lea (1920) who regarded it as a new species of *Homalium*. Dr. Steel, after examining several specimens from the 1960-61 Macquarie Island collection, has established the synonymy of Lea's species with *Omaliomimus albipenne* of Kiesenwetter (personal communication).

SPECIMENS: The holotype, paratype and larva of Lea's *H. variipenne* are in the Australian Museum, Sydney. Specimens from the 1960-61 collection will be deposited in the ANIC, Canberra.

DISTRIBUTION: Auckland, Campbell and Macquarie Islands.

HABITAT: Driftwood, seal carcasses and rotting kelp on beaches; under stones in Royal Penguin rookeries; *Colobanthus muscoides*; animal and hay debris from

LOCALITIES: Widespread around the coast up to 700 feet.

ANNUAL DISTRIBUTION: Adults occurring throughout the year.

REMARKS: So far, it has not been possible to identify larvae and pupae of the staphylinid species of Macquarie Island. However, omaliine larvae in general have been collected from the same habitats as the adults throughout the year. Omaliine pupae have been collected in January, February and September.

Omaliomimus venator (Broun), 1909

Omaliomimus venator Broun, 1909. The Subantarctic Islands of New Zealand, Wellington, 1: 98.
Omaliomimus venator (Broun); Steel, 1964. Pac. Ins. Mon. 7: 345.

This species is here recorded from Macquarie Island for the first time.

SPECIMENS: Specimens will be deposited in the ANIC, Canberra.

DISTRIBUTION: Auckland, Campbell and Macquarie Islands.

HABITAT: Rotting kelp; nests and under stones in Royal Penguin rookeries; *Colobanthus muscoides*; *Poa foliosa* in seal-wallow areas.

LOCALITIES: Probably widespread around the coast; specimens collected at Hurd Point, Gadget Gully and the northern peninsula.

ANNUAL DISTRIBUTION: Occurring throughout the year.

REMARKS: As for the previous species.

Genus *Stenomaliomimus* Bernhauer, 1939

Stenomaliomimus helmsi (Cameron), 1945

Omaliomimus helmsi Cameron, 1945. Ann. Mag. Nat. Hist. (11) 12: 179.

Stenomaliomimus helmsi (Cameron); Steel, 1964. (Personal communication).

This species is here recorded for the first time from Macquarie Island.

SPECIMENS: Specimens will be deposited in the ANIC, Canberra.

DISTRIBUTION: New Zealand, Macquarie Island.

HABITAT: Under stones in Royal Penguin rookeries; Rockhopper Penguin nest material; domestic fowl debris; *Stilbocarpa polaris* litter.

LOCALITIES: Nuggets Point, Gadget Gully (sub-plateau), northern peninsula.

DATES: February, July, August, September, October, December.

REMARKS: As for *Omaliomimus albipenne*.

Stenomaliomimus sulcithorax (Broun), 1880

Omaliomimus sulcithorax Broun, 1880. Manual N.Z. Coleoptera: 116.

Omaliomimus perplexum Broun, 1894. Ann. Mag. Nat. Hist. (6) 14: 428.

Homaliomimus variipenne Womersley (nec. Lea), 1937. B.A.N.Z.A.R.E., 1929-31 (B) 4 (1): 23-36.

Stenomaliomimus sulcithorax (Broun). Steel, 1964. (Personal communication).

In his report of 1937, Womersley synonymized *Homaliomimus variipenne* L.

with a specimen of *A. crozetensis* collected by the B.A.N.Z.A.R. Expedition from the Crozet Islands. However, according to W. O. Steel (pers. comm.) and R. Jeannel (1940), the specimens which Womersley examined and determined as being *A. crozetensis* were neither Lea's *variipenne* nor Enderlein's *crozetensis* but were, in Steel's opinion, conspecific with *Omalium perplexum* Broun. This latter species is now synonymized, together with *Omalium cognatum* Broun, *O. flavipalpis* Broun and *O. planimarginatum* Broun with *Stenomalium sulcithorax* (Broun) by Steel (pers. comm.). At the same time Steel has made a new combination of the genus *Omalium* Gravenhorst with the genus *Stenomalium* Bernhauer. Thus the first record of this species from Macquarie Island was made by Womersley (1937c), in reporting a series of 37 adults and 2 larvae collected there by T. H. Johnston in 1930.

SPECIMENS: Specimens will be deposited in the ANIC, Canberra.

DISTRIBUTION: New Zealand, Macquarie Island.

HABITAT: Rockhopper Penguin nest material; sheep dung; *Stilbocarpa polaris* litter; *Poa foliosa* litter and soil.

LOCALITIES: Nuggets Point, Gadget Gully (to 700 feet), northern peninsula, Langdon Point.

ANNUAL DISTRIBUTION: Occurring throughout the year.

REMARKS: As for *Omaliomimus albipenne*.

Subfamily **ALEOCHARINAE**

Genus *Halmaeus* Kiesenwetter, 1877

Halmaeus antarctica Kiesenwetter, 1877

Halmaeus antarctica Kiesenwetter, 1877. Deut. Entom. Zeit. **21**: 154, 160-1.

Antarctophytosus macquariensis Womersley, 1937. B.A.N.Z.A.R.E., 1929-31 (B) **4** (1): 23-36.

Womersley (1937c) recorded 82 specimens of adult and larval staphylinids collected by T. Harvey Johnston at Macquarie Island in 1930 as comprising a new species *Antarctophytosus macquariensis*. W. O. Steel has established the synonymy of Womersley's species with Kiesenwetter's *Halmaeus antarctica* in a personal communication to the author.

SPECIMENS: Specimens will be deposited in the ANIC, Canberra.

HABITAT: Litter of herbfield and grassland plants; nest material of *Puffinus griseus*.

LOCALITIES: Widespread up to 1,200 feet.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Family **BYRRHIDAE**

Genus ? *Pedilophorus*

One adult (length 1 cm), two larvae and two pupae of what is probably a new species of the genus *Pedilophorus* have been examined by Dr. Britton of the CSIRO Division of Entomology in Canberra. The specimens were collected by

Order **HYMENOPTERA**Family **DIAPRIIDAE**Genus *Antarctopria* Brues, 1920*Antarctopria latigaster* Brues, 1920*Antarctopria latigaster* Brues, 1920. A.A.E., 1911-14, Sci. Rep. (C) 5 (8): 27-28.*Antarctopria latigaster* Brues. Yoshimoto, 1962. Pac. Ins. 4 (4): 973-4.

Brues' description was made from a few specimens collected by H. Hamilton in 1911. Yoshimoto's paper describes the male. The specimens examined by him comprised 44 females and 44 males collected during 1960-61.

RECOGNITION: Length 2.0-2.7 mm. Colour black, the thorax and legs ferruginous or fuscous; antennal scape and the pedicel, in part, rufous; palpi yellowish; head behind dull rufous. Mesonotum with a few punctures; groove at base of scutellum with a more or less distinct median raised line. Propleurae smooth; mesopleurae with short horizontal striae behind. Petiole of abdomen rugose, not very distinctly fluted; body of abdomen impunctate, sparsely clothed with pale erect hairs, as are also the remainder of the body and the legs; second segment about twice as long as wide.

SPECIMENS: Holotype (1920) in the Australian Museum, Sydney. Specimens from the 1960-61 collections in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Coastal habitats—marine algae of the upper *Porphyra* zone, *Colobanthus muscoides* cushions, penguin rookeries (Plate 10). Less commonly in herbfield and grassland plants.

LOCALITIES: Occurring widely around the coast and in some rookeries and gullies up to 300 feet.

ANNUAL DISTRIBUTION: Adults are present throughout the year. Larval and pupal stages are unknown.

REMARKS: This apterous wasp is not common on the island, although specimens can readily be found by searching the surface of *Colobanthus muscoides* cushions and the fine, filamentous green alga, *Rhizoclonium* sp., in certain parts of the coast. The immature stages are not known but probably feed on larvae or pupae of dipterous species.

Class **ARACHNIDA**Order **ARANEIDA**Family **AGELINIDAE**Genus *Myro* Cambridge, 1876*Myro kerguelenensis* Cambridge, 1876

This species was described by Cambridge from specimens collected at Iles Kerguelen. In 1894 A. Hamilton, during a short visit to Macquarie Island, collected two female specimens which Hogg (1909) described as a new species, *Myro hamiltoni*. A few further specimens of *hamiltoni* were recorded by Rainbow (1917) from the collections of H. Hamilton in 1912. Later, Hickman (1939) determined a small series of spiders collected by T. H. Johnston in 1930 as *Myro kerguelenensis* and, after examining Rainbow's specimens of *hamiltoni*, established the synonymy of the two species. Over 200 spiders were included in the 1960-61 collections and have been reported by R. R. Forster (1962).

RECOGNITION: Cephalothorax, mandibles, lip, maxillae, sternum, legs and palpi a uniform light yellow brown. Abdomen yellow-grey above; two dark brown spots about the middle; from the inner sides of these spots two thin lines reach to the posterior end, and two dark spots on the outside of these lines. Length of cephalothorax 2.5 mm; width 2 mm. Length of abdomen 4.0 mm; width 2.75 mm (Hogg's type specimens of *M. hamiltoni* from Macquarie Island).

SPECIMENS: Specimens from the 1960-61 collections in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Crozet, Heard, Kerguelen and Macquarie Islands.

HABITAT: In all plant formations in a wide variety of habitats: under stones and rocks; in plant litter, on plants—from mosses and cushion plants to tussocks and *Stilbocarpa*; in bird burrows and penguin rookeries.

LOCALITIES: Widespread from sea level to about 1,200 feet.

ANNUAL DISTRIBUTION: Adults and immatures are present throughout the year.

REMARKS: Eggs are laid in small plano-convex sacs which are attached to stones and leaves.

Family LINYPHIIDAE

Genus *Mynoglenes* Simon, 1905

Mynoglenes marrineri Hogg, 1909

Mynoglenes marrineri Hogg, 1909. The Subantarctic Islands of New Zealand, ed. C. Chilton. Wellington. 1: 155-181.

This species was described from material collected at Campbell Island in 1907. It was first recorded from Macquarie Island by Rainbow (1917) from one male specimen collected by H. Hamilton in 1913. A small series was collected by T. H. Johnston in 1930 and recorded by Hickman (1939). Numerous specimens were collected during 1960-61 and have been reported by R. R. Forster (1962).

RECOGNITION: Carapace, chelicerae, legs and palpi yellowish brown. The dorsal surface of the abdomen has a wide median yellowish band extending from the front almost to the spinnerets, the side being dark brown. Considerable variation in abdominal pattern. In young individuals the median yellow band is much reduced, and often consists of a yellowish patch in front, followed by 3 or 4 pairs of yellowish spots, all the rest of the dorsal surface being brown. Length of cephalothorax 3.31 mm. Width of carapace 2.26 mm. Length of abdomen 4.35 mm;

SPECIMENS: Specimens from the 1960-61 collections in the ANIC, Canberra, and the Bishop Museum, Honolulu.

DISTRIBUTION: Auckland, Campbell, Antipodes and Macquarie Islands.

HABITAT: A wide variety of habitats in coastal, grassland, herbfield and feldmark formations: under stones and rocks; in plant litter; on plants—from mosses and cushion plants to tussocks and *Stilbocarpa*; inside buildings; in penguin rookeries.

LOCALITIES: Widespread from sea level to at least 900 feet.

ANNUAL DISTRIBUTION: Adults and immatures are present throughout the year.

REMARKS: Eggs are laid in small sacs within larger sacs formed of a mass of threads into which insect carcasses are incorporated. Spiders collected from the biology hut and engine room at the Isthmus station, and from huts at Hurd Point and Green Gorge, were all of this species.

Mynoglenes insolens Simon, 1905

Mynoglenes insolens Simon, 1905. Zool. Jahrb., Syst. **21**: 418.

One male, two females and six immatures of this species were recorded by Hickman (1939) from a collection made by T. H. Johnston in the Isthmus area in 1930. However, although about 400 spiders were collected from a wide range of situations in 1960-61, this species was not present in that collection. It is unfortunate that Hickman's specimens of *insolens* could not be located and it is not known what features Hickman drew upon in distinguishing his *insolens* specimens from those of *marrineri*. It may be that his determination of *insolens* was based on certain varieties of *marrineri* occurring on Macquarie. Other explanations might be a mislabelled tube of specimens or that Johnston collected from an isolated population of *insolens* in Macquarie.

RECOGNITION: Length of cephalothorax 2.67 mm; width of carapace 1.97 mm. Length of abdomen 4.06 mm, width 2.38 mm (Simon's type specimens from the Chatham Islands).

DISTRIBUTION: Chatham, Auckland, Campbell and Macquarie Islands.

LOCALITY: Isthmus.

Order **ACARINA**

Suborder **GAMASINA**

Family **PARASITIDAE**

Specimens of the families Parasitidae, Neoparasitidae and Digamasellidae have been determined by Dr. W. Hirschmann of Fürth, in Bayern, Germany. However, at the time of printing, Dr. Hirschmann has not supplied complete determinations for the Parasitidae.

Genus *Eugamasus*

Eugamasus species 1

HABITAT: *Poa foliosa* flowers, *Stilbocarpa polaris* litter.

LOCALITIES: Wireless Hill, Nuggets Point.

Eugamasus species 2

HABITAT: Fowl debris, *Stilbocarpa polaris* litter.

LOCALITIES: Wireless Hill, Nuggets Point.

DATES: July, October.

Eugamasus species 3

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATES: October, November.

Eugamasus species 4

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATE: June.

Eugamasus species 5

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATES: March, June.

Genus *Pergamasus**Pergamasus* species 1

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATES: March, June, September, October, November.

Pergamasus species 2

HABITAT: *Stilbocarpa polaris* litter.

LOCALITY: Nuggets Point.

DATE: October.

Family **VEIGAIIDAE**Genus *Cyrthyrolaelaps* Berlese, 1904

A total of 159 specimens (81 females, 22 males, 54 nymphs and two larvae) were present in the 1960-61 collection sent to Dr. M. H. Farrier. Meanwhile Dr. W. Hirschmann has described a new species of *Cyrthyrolaelaps* from a few specimens present in the batch of Neoparasitidae sent to him.

Cyrthyrolaelaps watsoni Hirschmann, 1966

Cyrthyrolaelaps watsoni Hirschmann, 1966. *Acarologie* 9: 17-20.

HABITAT: *Stilbocarpa polaris* litter; moss.

LOCALITIES: Handspike Point, Gadget Gully, Wireless Hill.

Collection data for *Cyrtidrolaelaps* sp. nov. Farrier, 1964 (personal communication), which is possibly the same species as the previous one, are as follows:

HABITAT: Plant litter and soil in all plant formations except feldmark, bog and fen. Also in the cushion-like plants *Colobanthus muscoides*, *Cotula plumosa* and mosses, in small plants growing by seal wallows, and in nest material of *Diomedea exulans*.

LOCALITIES: Widespread on the coast and slopes and up to 800 feet.

ANNUAL DISTRIBUTION: Occurring in all months of the year.

Family DIGAMASELLIDAE

See note under Family Parasitidae.

Genus *Dendrolaelaps*

Dendrolaelaps kargi Hirschmann, 1966

Dendrolaelaps kargi Hirschmann, 1966. *Acarologie* 9: 25-44.

HABITAT: Sand under driftwood, *Puccinellia macquariensis*, nest material of *Eudyptes chrysocome*.

LOCALITIES: Isthmus, North Head, Garden Cove.

DATES: March, September.

Dendrolaelaps schusteri Hirschmann, 1966

Dendrolaelaps watsoni Hirschmann, 1966. *Acarologie* 9: 25-44.

HABITAT: Litter of *Poa foliosa*, *P. hamiltoni*, *Stilbocarpa polaris*; *Colobanthus muscoides*; algae on rookery rocks; sheep dung.

LOCALITIES: Nuggets Point, Gadget Gully, Aerial Cove, Camp Hill, North Head.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Dendrolaelaps watsoni Hirschmann, 1966

Dendrolaelaps watsoni Hirschmann, 1966. *Acarologie* 9: 25-44.

HABITAT: *Colobanthus muscoides*, mosses, *Pleurophyllum hookeri* litter, algae on rookery rocks.

LOCALITIES: Gadget Gully, Aerial Cove, Garden Cove, Wireless Hill, North Head.

DATES: March, August, November.

Genus *Gamasellus*

Gamasellus (Hydrogamasellus) antarcticus (Trägårdh), 1907

Hydrogamasus antarcticus Trägårdh, 1907. *Wiss. erg. Schwed. Südpolarexped.* 1901-1903, 1-34, Stockholm.

Gamasellus (Hydrogamasellus) antarcticus (Trägårdh) Hirschmann, 1966. *Acarologie* 9: 25-44.

HABITAT: Commonly in *Stilbocarpa polaris* litter. Also in *Poa hamiltoni* litter, *Puccinellia macquariensis*, mosses, cave lichens and nest material of *Diomedea exulans*.

LOCALITIES: Lower regions of slopes and gullies around the island. Cave at Brothers Point.

Gamasellus (Hydrogamasellus) macquariensis Hirschmann, 1966*Gamasellus (Hydrogamasellus) macquariensis* Hirschmann, 1966. *Acarologie* 9: 25-44.HABITAT: Litter of *Pleurophyllum hookeri*.

LOCALITY: Sub-plateau.

DATE: August.

Gamasellus (Hydrogamasellus) schusteri Hirschmann, 1966*Gamasellus (Hydrogamasellus) schusteri* Hirschmann, 1966. *Acarologie* 9: 25-44.HABITAT: Litter of *Poa foliosa*, *Stilbocarpa polaris*, *Pleurophyllum hookeri*; *Colobanthus muscoides*; *Cutola plumosa*; *Stellaria media*; *Festuca erecta*; *Poa annua*; mosses; sheep dung.

LOCALITIES: Widespread in gullies and slopes from Nuggets Point to North Head and up to 800 feet.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Gamasellus (Gamasellus) watsoni Hirschmann, 1966*Gamasellus (Gamasellus) watsoni*, Hirschmann, 1966. *Acarologie* 9: 25-44.HABITAT: Grassland soil, *Stilbocarpa polaris* litter.

LOCALITIES: Camp Hill, Lambing Gully.

DATES: August, September.

Family NEOPARASITIDAE

See note under Family Parasitidae.

Genus *Gamasiphis**Gamasiphis watsoni* Hirschmann, 1966*Gamasiphis watsoni* Hirschmann, 1966. *Acarologie* 9: 25-44.HABITAT: *Stilbocarpa polaris* litter; sheep dung.

LOCALITIES: Nuggets Point, Gadget Gully, First Gully, Garden Cove.

ANNUAL DISTRIBUTION: Occurring probably throughout the year; specimens were collected in January, February, June, September, October and November.

Genus *Hydrogamasus* Berlese, 1892*Hydrogamasus (Austrohydrogamasus) watsoni* Hirschmann, 1966*Hydrogamasus (Austrohydrogamasus) watsoni* Hirschmann, 1966. *Acarologie* 9: 25-44.HABITAT: Almost restricted to maritime habitats. Particularly common in *Porphyra umbilicalis* found growing on sea-sprayed rocks; also in *Rhizoclonium* sp., *Colobanthus muscoides*, *Puccinellia macquariensis*, *Poa annua*, mud and rocks in penguin rookeries, and sometimes under stones on sandy beaches. Also nests of *Pachyptila desolata*.LOCALITIES: Widespread around the coast. Mount Elder (*P. desolata* nests).

Family **LAELAPTIDAE**Genus *Ayersacarus* Hunter, 1964*Ayersacarus gelidus* Hunter, 1964*Ayersacarus gelidus* Hunter, 1964. Pac. Ins. Mon. 7: 631.

This species was described by Hunter from a series of over 100 females and over 40 males collected during 1961 at Macquarie Island and at Campbell Island (by Gressitt).

RECOGNITION: Colour of soft parts whitish, of sclerotised parts tawny. Body rounded anteriorly and posteriorly; length 1121μ (female), 1101μ (male). Dorsal plate covering dorsum except for a strip at lateral and posterior margins of body. Dorsal plate with fringed setae on posterior portion only. Peritremal plate separate from or at most weakly joined to parapodal plate.

SPECIMENS: Holotype (female), allotype (male) and paratypes in the ANIC, Canberra; five paratypes of both sexes in each of the U.S. National Museum, the British Museum (Natural History), the Institute of Acarology (Ohio), the Bishop Museum, and the University of Georgia.

DISTRIBUTION: Known only from Campbell and Macquarie Islands.

HABITAT: Nest material of *Pygoscelis papua* (Gentoo Penguin), *Diomedea exulans* (Wandering Albatross), *Phoebetria palpebrata* (Light-mantled Sooty Albatross), *Pachyptila desolata* (Dove Prion), *Puffinus griseus* (Sooty Shearwater), *Pterodroma lessoni* (White-headed Petrel) and *Phalacrocorax albiventer purpurascens* (Macquarie Island Cormorant); *Stilbocarpa* and *Pleurophyllum* litter; feldmark moss; sheep dung. (On Campbell Island specimens were taken from moss, *Azorella selago* and tussock soil.)

LOCALITIES: Handspike Point, Wireless Hill, Gadget Gully, Mount Elder, Nuggets Point, plateau above Douglas Point.

ANNUAL DISTRIBUTION: Specimens were collected throughout the year.

Ayersacarus plumapilus Hunter, 1964*Ayersacarus plumapilus* Hunter, 1964. Pac. Ins. Mon. 7: 630.

The female of this species was described by Hunter from a series of 18 specimens from Campbell Island collected by Gressitt in 1961, and the male from 4 Macquarie Island specimens from the 1961 collection. Twenty-two females were also present in the Macquarie collection but were not a part of the type series.

RECOGNITION: Colour of soft parts whitish, of legs and sclerotised parts tawny. Body squarish, length $1,128\mu$ (female), 962μ (male). Dorsal plate setae fringed. Dorsal plate covering most of dorsum. Peritremal plate strongly joined to parapodal plate.

SPECIMENS: Holotype (female), 7 female and 1 male paratypes in the Bishop Museum, Honolulu; allotype (male), 2 female and 2 male paratypes in the ANIC, Canberra; 2 female paratypes in each of the U.S. National Museum, the British Museum (Natural History) and the University of Georgia.

HABITAT: Nest material in burrows of *Pachyptila desolata* (Dove Prion). (On Campbell Island, specimens were taken from "mollyhawk" nest, penguin and skua nests, chicken yard debris and *Colobanthus* sp.)

LOCALITY: Mt. Elder.

DATES: Specimens have been taken in the months of February and December.

Ayersacarus strandtmanni Hunter, 1964

Ayersacarus strandtmanni Hunter, 1964. Pac. Ins. Mon. 7: 635.

This species was described by Hunter from a series of 6 females and one male collected at Macquarie Island in 1961.

RECOGNITION: Colour of soft parts whitish, of sclerotised parts tawny. Body rounded posteriorly and anteriorly; length $1,031\mu$ (female), 880μ (male). Dorsal plate covering most of dorsum. Dorsal setae long and simple. Peritremal plate not fused to parapodal plate.

SPECIMENS: Holotype (female), allotype (male), 2 female paratypes in the ANIC, Canberra; 1 female paratype in each of the U.S. National Museum, the British Museum (Natural History) and the University of Georgia.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Nest material in burrows of *Pachyptila desolata* (Dove Prion).

LOCALITY: Mount Elder.

DATE: February.

Genus *Hypoaspis* Canestrini, 1885

Hypoaspis evansi Hunter, 1964

Hypoaspis evansi Hunter, 1964. Pac. Ins. Mon. 7: 638.

Hunter described this species from a single female specimen collected at Macquarie Island by J. H. Calaby in December, 1960.

RECOGNITION: Colour of soft parts whitish, of sclerotised parts tawny. Length of female $1,070\mu$. Dorsal plate narrowing posteriorly, not extending to lateral margins of body. Dorsal setae simple.

SPECIMEN: Holotype (female) in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Under board, upper beach.

LOCALITY: Green Gorge.

DATE: December.

Genus *Androlaelaps* Berlese, 1910

Androlaelaps pachyptilae (Zumpt and Till), 1956

Haemolaelaps pachyptilae Zumpt and Till, 1956. Z. f. Parasitenkunde, Bd. 17: 285.

Androlaelaps pachyptilae (Zumpt and Till) Hunter, 1964. Pac. Ins. Mon. 7: 639.

Hunter (1964) has recorded this species from a series of seven female specimens collected during 1961 from Macquarie and Campbell Islands. They appear to be identical to *H. pachyptilae* Zumpt and Till. Dr. Till, who has compared the Macquarie Island specimens with *pachyptilae*, has found only minor differences

RECOGNITION: Females: Dorsal plate oval, average length 647μ , with 39 pairs of setae of which the marginal ones are more than twice as long as the median ones. Characteristic feature is the shape of the dentilus (seta arising from each of the fixed digits of the chelicerae): the dentilus is lanceolate for half its length, for the rest it is a slender, geniculate section, tapering apically.

SPECIMENS: Specimens from Macquarie Island in the ANIC, Canberra. Holotype and paratypes from Heard Island in the South African Institute for Medical Research, Johannesburg.

DISTRIBUTION: Known only from Auckland, Campbell, Heard and Macquarie Islands.

HABITAT: Nest material in burrows of *Puffinus griseus* (Sooty Shearwater). (On Campbell Island specimens were taken from nest material of *Pterodroma lessoni* (White-headed Petrel) and *Diomedea chrysostoma* (Grey-headed Albatross)).

LOCALITY: Gadget Gully.

DATE: March.

Family HAEMOGAMASIDAE

Genus *Haemogamasus* Berlese, 1889

Haemogamasus pontiger Berlese, 1903-4

Haemogamasus pontiger Berlese, 1903, 4. Redia 1: 260.

Eulaelaps mawsoni Womersley, 1937. Austral. Ant. Exped. 1911-14 Sci. Rep. (C) 10 (6): 1-24.

This mite was first recorded from Macquarie Island by Womersley who described it as a new species of *Eulaelaps*. The description was made from a single female collected in 1913 by T. H. Johnston from "between tide marks, west coast". The 1961 collection included one male and one female of this species (determined respectively by R. Domrow and P. E. Hunter).

RECOGNITION: Average body length of female 856μ , of male 681μ . Dorsal shield widest at level of coxae II, narrowing posteriorly so as not to cover entirely the dorsal surface. Sternal shield distinctive in that its posterior margin is invaginated for about $\frac{2}{3}$ of the shield's length. Genitoventral shield relatively large and widely expanded posterior to coxae IV. Metapodal shield small—long irregular rods or ovals. Peritreme distinctive in possession of an invagination on median surface of posterior end in most specimens. (This description is based on specimens in the U.S. National Museum.)

SPECIMENS: Womersley's type specimens of *Eulaelaps mawsoni* are in the South Australian Museum. The two specimens from 1961 are in the ANIC, Canberra.

DISTRIBUTION: Cosmopolitan.

HABITAT: Bran and fowl house debris.

LOCALITY: Isthmus station.

DATE: July, 1961.

REMARKS: This species is apparently a facultative parasite; it has been collected from diverse habitats including wild nests, rabbit burrows, and bird droppings.

Family **BLATTISOCIDAE**Genus *Iphidozercon* Berlese, 1903*Iphidozercon* sp. Lindquist, 1962 (pers. comm.)

Dr. E. E. Lindquist has examined three females of the Blattisocidae from the 1961 Macquarie Island collection. Two of these are deposited in the ANIC, Canberra.

HABITAT: Nest material of *Eudyptes chrysocome*; *Stilbocarpa polaris* litter next to nest of *Pygoscelis papua*.

LOCALITIES: Garden Cove, Nuggets Beach.

DATES: 30th September, 13th October.

Family **AMEROSEIIDAE**Genus *Ameroseius* Berlese, 1903*Ameroseius* sp. Chant and Lindquist, 1963 (pers. comm.)

Drs. D. A. Chant and E. E. Lindquist have examined five specimens which were present in the 1960-61 collection. The specimens are of an undescribed species of *Ameroseius* and are conspecific with specimens collected by Gressitt from Macquarie Island in 1960, and by Rennell from Campbell Island in 1962.

SPECIMENS: At the time of writing, the specimens are in the possession of Dr. Chant (Ontario, Canada): some of them will be deposited in the ANIC, Canberra.

DISTRIBUTION: Known only from Campbell and Macquarie Islands.

HABITAT: Litter and soil of *Poa foliosa* and *Stilbocarpa polaris*; *Colobanthus muscoides*; algae and lichens lining wall of cave.

LOCALITIES: First Gully, Catch-me Point, Garden Cove, Wireless Hill, North Head.

DATES: February, March, April, October.

Family **UROPODIDAE**

Specimens of mites of the families Uropodidae and Polyaspididae have been sent to B. D. Ainscough who has, pending the completion of his paper on them, supplied definite but incomplete determinations as below. All are new species.

Genus *Uropoda* Latreille, 1806*Uropoda species 1* sp. nov.

DISTRIBUTION: Macquarie Island.

HABITAT: Flowers, litter and root soil of grassland, herbfield, feldmark and coastal plants; under stones; nest material of birds; sheep dung; cave-wall lichens.

LOCALITIES: Widespread from sea level to 1,400 feet (Mount Hamilton).

ANNUAL DISTRIBUTION: Occurring throughout the year.

Uropoda species 2 sp. nov.

DISTRIBUTION: Macquarie Island.

HABITAT: Nest material of *Pachyptila desolata*, *Puffinus griseus*, *Pterodroma lessoni*; plant litter associated with penguins and sheep.

LOCALITIES: Widespread from coast to plateau (Mount Elder) over at least the northern part of the island (e.g., Green Gorge, Nuggets Point, plateau above Langdon Point, North Head).

ANNUAL DISTRIBUTION: Occurring throughout the year.

Uropoda species 3 sp. nov.

DISTRIBUTION: Macquarie Island.

HABITAT: Litter and root soil of *Poa foliosa*, *Stilbocarpa polaris*, *Pleurophyllum hookeri*, *Azorella selago* and mosses; nest material of *Diomedea exulans* and *Pterodroma lessoni*; sheep dung.

LOCALITIES: Widespread from coast to plateau (800 feet) over at least the northern part of the island (e.g., Green Gorge, Langdon Point and plateau above it, North Head).

ANNUAL DISTRIBUTION: Occurring throughout the year.

Family **POLYASPIDIDAE**

Genus nov.

1. Species nov.

DISTRIBUTION: Macquarie Island.

HABITAT: Root soil of *Poa foliosa*.

LOCALITY: Catch-me Point.

DATE: 27 November, 1961.

Genus nov.

1. Species nov.

DISTRIBUTION: Macquarie Island.

HABITAT: *Stilbocarpa polaris* fruiting heads; *Puccinellia macquariensis* and green alga of sea-sprayed coastal rocks.

LOCALITIES: Nuggets beach, Aerial Cove, Garden Cove.

DATES: March, May, June, December.

Family **CERCOMEGISTIDAE**

Two species present in the 1960-61 collection have been examined by Dr. Camin of the University of Kansas who, pending a full description, has written as follows: "Both (species) are trigynaspid mites of the family Cercomegistidae. Species 1 is undescribed. It appears to belong in or near the genus *Celaenogamasus* whose described species are South American. Species 2 is a new genus and perhaps

claws on the first pair of legs and it has many other gamasine monogynaspid characters. Its closest relative appears to be another undescribed species from the island of Trinidad!"

Species 1 (gen. nov., undescribed)

DISTRIBUTION: Macquarie Island.

HABITAT: Litter of *Stilbocarpa polaris*, *Polystichum vestitum*, *Poa foliosa*, *P. hamiltoni* and *Puccinellia macquariensis*.

LOCALITIES: Green Gorge, Nuggets Creek, Gadget and First Gullies, Handspike Point, Isthmus, northern peninsula.

ANNUAL DISTRIBUTION: Apparently does not occur during the winter months. Specimens were collected in January, February, March, April, October and December.

Species 2 (genus *Celaenogamasus*?)

DISTRIBUTION: Macquarie Island.

HABITAT: Plant and animal material in coastal areas—apparently related to the presence of birds: *Stilbocarpa polaris* litter near nesting birds; *Poa hamiltoni* tussocks; *Colobanthus muscoides* and *Stellaria media* in association with penguins; windswept penguin feathers; green alga on coastal and rookery rocks; wall lichens of caves inhabited by *Eudyptes chrysolome* (Brothers Point and North Head); cave rookery debris.

LOCALITIES: Brothers Point, Nuggets Point, Langdon Point, Handspike Point, Isthmus, northern peninsula. Probably widespread around the coast.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Family **EVIPHIDIDAE**

Genus *Alliphis* Halbert, 1923

Alliphis siculus (Oudemans) sensu Karg, 1962

Alliphis siculus (Oudemans) Karg, 1962. Räuberische Milben im Boden, Wittenberg.

One specimen of this species was collected during 1960-61 and has been determined by E. E. Lindquist, who writes: "Your mite fits Karg's redescription and illustrations of *siculus* in every way. However, Karg notes that his specimens differ in several points from the original description of Oudemans, although he feels that Oudemans may not have been entirely accurate in his observations. Hence my tagging "sensu Karg" onto the determination."

DISTRIBUTION: Widespread in Europe and Africa; probably cosmopolitan.

HABITAT: Sheep dung.

LOCALITY: Camp Hill.

Suborder **TROMBIDIFORMES**Family **TARSONEMIDAE**

A few specimens of this family were present in the 1960-61 collection. However, they are still awaiting determination and are in the temporary possession of Dr. R. E. Beer, of the University of Kansas.

Family **PYEMOTIDAE**

Genus *Neopygmephorus* Cross, 1964

Neopygmephorus arvorum (Jacot), 1936

Pygmephorus arvorum Jacot, 1936. Canadian Ent. **68**: 82.

Neopygmephorus arvorum (Jacot) Cross, 1964. Pac. Ins. Mon. **7**: 646.

This species is recorded from Macquarie Island for the first time. Two specimens collected in 1961 have been determined by Dr. E. A. Cross.

RECOGNITION: Hind margin of posterior ventral plate entire. Internal caudal setae of segment V less than twice as long and three times as wide basally as the two remaining pairs; claw I simple, without basal enlargement or thumb. With two pairs of caudal setae; trochanter IV long and thin, about three times as long as wide; external ventrals II elongate, spiniform.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known from eastern United States, Western Europe and Macquarie Island.

HABITAT: Soil and plant litter in plateau herbfield and feldmark.

LOCALITIES: Scoble Lake, Mount Hamilton.

DATES: Specimens taken in June and October.

REMARKS: As in the case on Macquarie Island, the species in United States and Europe is usually found in soil.

Neopygmephorus pannonicus (Willmann), 1951

Pygmephorus pannonicus Willmann, 1951. SB. Österreich Akad. Wissenschaften, Mathem.-Naturw. Kl., Abt. I, Bd. **160**: 132.

Neopygmephorus pannonicus (Willmann) Cross, 1964. Pac. Ins. Mon. **7**: 646.

Two specimens, tentatively determined by Cross as *N. pannonicus*, were present in the 1961 collection.

RECOGNITION: Hind margin of posterior ventral plate entire. Internal caudal setae of segment V greatly enlarged, at least twice the length and thrice the basal width of either of the other two caudal pairs; claw I stout, with basal enlargement; small thumb opposite claw I.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Austria and Macquarie Island.

HABITAT: Soils.

LOCALITIES: Mount Hamilton and Isthmus.

Neopygmephorus sellnicki (Krczal), 1958

Pygmephorus sellnicki Krczal, 1958. Statens Västskyddenstätt-Meddelanden 11: 69.
Neopygmephorus sellnicki (Krczal) Cross, 1964. Pac. Ins. Mon. 7: 645.

One specimen of this mite was collected at Macquarie Island in 1961 and has been determined by Dr. Cross.

RECOGNITION: Hind margin of posterior ventral plate tripartite, the three lobes large and distinct. Apodemes III curving posteriorly at the sides to meet margin of coxal foramina III; tarsi II and III each with a stout spine.

SPECIMEN: Specimen in the ANIC, Canberra.

DISTRIBUTION: Known from Europe, Japan, United States and Macquarie Island.

HABITAT: *Stellaria media* with soil.

LOCALITY: First Gully.

DATE: April.

REMARKS: Of this species, Cross says: "One of the most cosmopolitan of all pyemotids. . . . The single Macquarie specimen falls well within the range of variability mentioned by Krczal (1959) and is more typical of his description and drawings than many N. American specimens presumed to be conspecific."

Neopygmephorus togatus (Willmann), 1942

Pygmephorus togatus Willmann, 1942. Abh. Nat. Ver. Bremen 32: 175.
Neopygmephorus togatus (Willmann) Cross, 1964. Pac. Ins. Mon. 7: 646.

One specimen of this mite was collected at Macquarie Island in 1961 and has been determined by Dr. Cross.

RECOGNITION: Hind margin of ventral plate entire. Internal caudal setae of segment V less than twice as long and three times as wide, basally, as the two remaining pairs; claw I simple, without basal enlargement or thumb. With three pairs of caudal setae; trochanter IV only slightly more than twice as long as wide; external ventrals II short, setiform.

SPECIMEN: Specimen in the ANIC, Canberra.

DISTRIBUTION: Known from Western Europe and Macquarie Island.

HABITAT: *Azorella selago*, mosses and soil.

LOCALITY: Mount Hamilton.

DATE: October.

REMARKS: The single female specimen was collected at the highest point on the island (1,421 feet). Specimens from western Europe have been taken from wet moss and from mole tunnels.

Neopygmephorus tripartitus Cross, 1964

Neopygmephorus tripartitus Cross, 1964. Pac. Ins. Mon. 7: 643.

This species was described by E. A. Cross from a series of 57 specimens collected at Macquarie Island in 1961. All specimens were females.

large and distinct. Apodemes III straight, not distinctly developed at the sides, not meeting margins of coxal foramina III.

SPECIMENS: Holotype (female) and 4 paratypes in the ANIC, Canberra. One paratype in each of the Bishop Museum, the U.S. National Museum, the British Museum (Natural History) and the Zoological Institute, University of Erlangen, Germany.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Plateau and coastal *Stilbocarpa polaris* litter (especially abundant in litter containing penguin feathers), *Puccinellia macquariensis*, *Cotula plumosa* and *Colobanthus muscoides*.

LOCALITIES: Nuggets Point, Scoble Lake, Wireless Hill (eastern beach).

DATES: June and September.

Family NANORCHESTIDAE

Genus *Nanorchestes* Topsent and Trouessart, 1890

Nanorchestes antarcticus Strandtmann, 1963

Nanorchestes antarcticus Strandtmann, 1963. Pac. Ins. 5 (2): 470.

Over 100 specimens were present in the 1961 collection from Macquarie Island. Determinations were made by Dr. N. Wilson of Honolulu.

RECOGNITION: Very small, globular, with a sharp demarcation between propodosoma and hysterostoma.

SPECIMENS: Specimens in the Bishop Museum, Honolulu, and the ANIC, Canberra.

DISTRIBUTION: Known from Antarctica and Macquarie Island.

HABITAT: Grassland, herbfield and feldmark soils and plant litter; *Colobanthus muscoides*, *Puccinellia macquariensis*, lichens and green algae on sea-sprayed rocks.

LOCALITY: Widespread from coastal plant communities to the highest point of Mount Hamilton.

ANNUAL DISTRIBUTION: The mites were collected throughout the year.

Family EUPODIDAE

Genus *Eupodes* Koch, 1836

Eupodes sp. nov. N. Wilson, 1964 (pers. comm.)

A total of 321 specimens of this species was collected at Macquarie Island during the 1960-61 survey, and in 1962 by W. J. M. Vestjens. Specimens have been determined by Drs. E. E. Lindquist and N. Wilson.

SPECIMENS: Specimens are in the possession of N. Wilson of the Bishop Museum, Honolulu, and will eventually be deposited in the ANIC, Canberra.

HABITAT: Leaves, litter and soil of grassland and herbfield plants; *Colobanthus muscoides*; *Puccinellia macquariensis*; sheep dung; Rockhopper Penguin nest material; green algae on coastal and rookery rocks; under wooden board on sandy beach.

LOCALITIES: Widespread from sea level to 700 feet.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Genus *Protereunetes*

Protereunetes sp. nov. N. Wilson, 1964 (pers. comm.)

A series of 76 specimens of this species was collected at Macquarie Island during 1960-61. Specimens have been determined by Drs. E. E. Lindquist and N. Wilson.

SPECIMENS: Specimens are in the possession of N. Wilson and will be deposited in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Litter and soil of grassland and herbfield plants; *Colobanthus muscoides*; *Puccinellia macquariensis*; lichens of caves and coastal rocks; sheep dung; Rockhopper Penguin debris (in North Head cave); under wooden board on sandy beach.

LOCALITIES: Northern peninsula, Isthmus, First Gully, Gadget Gully, Nuggets Point, Eagle Cave.

ANNUAL DISTRIBUTION: Occurring throughout the year.

REMARKS: This species is not as common in the collections as is the previous one. It is recorded from the west coast from only one specimen from Eagle Cave. Although there are no records from the island south of Nuggets Point and Eagle Point, it probably does occur in southern localities; investigations south of these Points were not as thorough as in the northern parts.

Genus *Halotydeus*

Halotydeus sp. N. Wilson, 1964 (pers. comm.)

Two specimens of this species were collected at Macquarie Island in 1961. It is probably a new species but both specimens are in bad condition and one of them is immature.

SPECIMENS: Specimens are in the possession of N. Wilson of the Bishop Museum, and will be deposited in the ANIC, Canberra.

HABITAT: *Cotula plumosa* and *Colobanthus muscoides* growing on sea-sprayed rocks.

LOCALITY: Nuggets Point.

Family **RHAGIDIIDAE**Genus *Rhagidia* Thorell, 1871*Rhagidia macquariensis* Womersley and Strandtmann, 1963*Rhagidia macquariensis* Womersley and Strandtmann, 1963. Pac. Ins. 5 (2): 451-472.

Womersley and Strandtmann described this species from a series of 12 specimens collected by J. L. Gressitt at Macquarie Island in December, 1960. A further series of over 170 specimens collected in 1960-61 has been determined by Dr. N. Wilson of Honolulu as *R. macquariensis*.

RECOGNITION: Colour whitish. Body elongate, non-sclerotized; propodosoma prominently delineated from hysterosoma; length about 1000 μ . Chelicerae large with large strong chelae, fixed digit with a prominent tooth subapically; legs long with moderately abundant setae.

SPECIMENS: Holotype, some paratypes and numerous specimens in the ANIC, Canberra; some paratypes in the Bishop Museum, Honolulu.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Under stones, in soils, mosses, *Azorella selago*, *Colobanthus* spp., and in litter of herbfield and grassland plants.

LOCALITIES: Widespread from sea level to the highest point on the island (Mount Hamilton, 1,421 feet).

ANNUAL DISTRIBUTION: All months of the year.

Family **TYDEIDAE**Genus *Tydeus* Koch, 1836*Tydeus* sp. nov. E. W. Baker, 1963 (pers. comm.)

One specimen of this mite was collected at Macquarie Island in December 1960 by J. H. Calaby. Dr. Baker intends to describe the species in a forthcoming paper.

SPECIMEN: The single specimen (M/60/Ar/9a) is in the ANIC, Canberra.

DISTRIBUTION: Known only from Australia and Macquarie Island.

HABITAT: Grassland.

LOCALITY: Gadget Gully.

DATE: 5 December, 1960.

Family **EREYNETIDAE**Genus *Ereynetes* Berlese, 1883*Ereynetes macquariensis* Fain, 1962*Ereynetes macquariensis* Fain, 1962. Pac. Ins. 4 (4): 921-928.

This species was described by Fain from 186 specimens (93 females, 89 males and 4 tritonymphs) collected at Macquarie Island during 1961.

orange-yellowish. Body: length of female 270-345 μ , of male 250-330 μ . The dorsal shield is single and in most specimens weakly sclerotized.

SPECIMENS: Holotype (male), allotype (female), paratypes and other specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Soils of both highmoor peat and dry tundra types (occurring to at least five feet below the surface in the former); litter of herbfield and grassland plants; mosses; lichens; *Colobanthus muscoides* cushions; the green alga *Rhizoclonium* sp. of upper Porphyra zone; and penguin debris, lichens and algae within caves.

LOCALITIES: Widespread in coastal, grassland, herbfield and feldmark communities, from sea level to the highest point of the island (Mount Hamilton, 1,421 feet).

ANNUAL DISTRIBUTION: Adults occurring throughout the year.

REMARKS: These mites are particularly abundant in *Rhizoclonium* growing on rocks in the upper Porphyra zone of the coast.

Genus *Ereynetoides* Fain and Nadchatram, 1962

Ereynetoides watsoni Fain, 1962

Ereynetoides watsoni Fain, 1962. Pac. Ins. 4 (4): 921-928.

This species was described by Fain from three specimens (one female, two male) collected at Macquarie Island during 1961.

RECOGNITION: Colour of soft parts of body whitish or slightly yellowish; dorsal shield, legs and mouth parts orange-yellowish. Body length of male about 300 μ . Dorsal sclerotization consisting of two separate areas, the anterior large and the posterior small.

SPECIMENS: Holotype (male) and female paratype in the ANIC, Canberra; paratype (male) in collection of Dr. A. Fain, Antwerp.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Stilbocarpa polaris* litter.

LOCALITIES: Handspike Point and Langdon Point.

DATES: The specimens were collected in the months of June and November.

Family **BDELLIDAE**

Genus *Bdellodes* Oudemans, 1937

Bdellodes (Hoploscirus) macquariensis Atyeo, 1963

Bdellodes (Hoploscirus) macquariensis Atyeo, 1963. Pac. Ins. 5 (2): 445-450.

This species was described by Atyeo from a series of ten females and eight males collected at Macquarie Island in 1960-61.

RECOGNITION: Colour in alcohol: body cream, legs and gnathosoma light brown. Length, including gnathosoma 1550 μ (female), male slightly smaller. Dorsal hysterosomal setae long.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Plants and decaying plant matter of grassland, herbfield and feldmark.

LOCALITIES: Widespread over the island from the coastal *Colobanthus muscoides* community to the plateau *Azorella selago* alliance.

ANNUAL DISTRIBUTION: Adults present throughout the year.

REMARKS: Bdelids are predators of small arthropods and their eggs. The sites from which this and the following species were collected suggest that this species is distributed at all heights and does not occur in the rocky shore communities. *Bdellodes watsoni*, on the other hand, may not occur above 300 feet and is common amongst green algae of the Porphyra zone. This is possibly a case where two species have evolved from a single immigrant species by adaptation to different ways of life, perhaps in respect to food.

Bdellodes (Hoploscirus) watsoni Atyeo, 1963

Bdellodes (Hoploscirus) watsoni Atyeo, 1963. Pac. Ins. 5 (2): 445-450.

This species was described by Atyeo from 12 females and 6 males collected at Macquarie Island in 1961.

RECOGNITION: Colour in alcohol: body cream, legs and gnathosoma light brown. Length, including gnathosoma, 1,115 μ (female), male slightly smaller. Dorsal hysterosomal setae short.

SPECIMENS: Holotype (female), allotype (male), paratypes and one other specimen in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Plants and decaying plant material of grassland and maritime communities.

LOCALITIES: The only specimens so far collected have been from the Royal Penguin rookery at North Head and from Garden Cove, First Gully and Finch Creek.

ANNUAL DISTRIBUTION: Adults present throughout the year.

Family **HALACARIDAE**

Genus *Isobactrus* Newell, 1947

Isobactrus sp., near *Isobactrus magnus* (Lohmann), 1907 (pers. comm.)

One specimen of this species was collected at Macquarie Island during 1961. Dr. I. M. Newell, who examined the specimen, has found only relatively minor points of difference in comparing it with Lohmann's description of *Isobactrus magnus* from Iles Kerguelén. However, Dr. Newell believes the Macquarie Island form represents a distinct species from the Kerguelén species and he will describe the former in a forthcoming paper.

SPECIMEN: The single specimen (M/61/Z/76) is in the possession of I. M. Newell and will be deposited in the ANIC, Canberra.

LOCALITY: Aerial Cove.

DATE: 8 May 1961.

REMARKS: Womersley (1937a) records eight species of *Halacaridae* from the collections of the Australasian Antarctic Expedition from Macquarie Island. As their collection data refer to intertidal habitats not covered by the present survey, these species are not included in this report.

Family CHEYLETIDAE

Genus *Cheyletus* Latreille, 1796

Cheyletus eruditus (Schrank), 1781

Acarus eruditus Schrank, 1781. Enumeratio insectorum Austriae indigenorum, p. 513.

Cheyletus eruditus (Schrank) Oudemans, 1906. Mem. Soc. Zool. France, 19: 84-88.

This is the first record of this species from Macquarie Island. The determination was made by Dr. E. W. Baker from a single specimen collected in 1961.

RECOGNITION: Body length including rostrum 714μ . Rostrum simple, narrow, broadening slightly to rear. Peritreme with 9 or 10 segments. Propodosomatic shield rounded anteriorly, widening posteriorly, covering most of the propodosoma. Hysterosomal shield small and rounded. (Male and female are similar. This description is based on material from Holland.)

SPECIMEN: The single specimen is in the ANIC, Canberra.

DISTRIBUTION: Cosmopolitan.

HABITAT: Rat debris in food store.

LOCALITY: ANARE station, Isthmus.

DATE: September 1961.

REMARKS: The Cheyletidae are free-living predators often found in food stores where they prey on grain-eating mites.

Suborder SARCOPTIFORMES

Family ACARIDAE

Genus *Acarus* Linnaeus, 1758

Acarus siro Linnaeus, 1758

Acarus siro Linnaeus, 1758. Syst. Nat., Ed. 10.

Acarus siro Linn. A. M. Hughes, 1961. "The Mites of Stored Food". H.M.S.O.

This species is recorded for the first time from Macquarie Island. A series of eleven specimens collected in 1961 has been determined by Dr. A. M. Hughes.

RECOGNITION: Body length $350-650\mu$ (female), $320-420\mu$ (male). Body without colour, legs pale yellow to reddish-brown. Body setae fine and sparsely pectinate. The chelicerae are distinctly toothed; at the base of the fixed limb is a spine and, posterior to this, a conical spur. Two pairs of anal suckers.

DISTRIBUTION: Cosmopolitan.

HABITAT: Nests of *Rattus rattus*, *Diomedea exulans*, *Eudyptes chrysocome*; *Stilbocarpa* litter with penguin feathers; *Puccinellia macquariensis* in association with Rockhopper Penguins; fowl house debris; wheat and bran.

LOCALITIES: Handspike Point and Halfmoon Bay (*D. exulans* nests), Nuggets Point (*Stilbocarpa* litter), North Head (*Puccinellia macquariensis*), Garden Cove (*E. chrysocome* nest) and ANARE station, Isthmus.

DATES: Specimens taken in July and September.

REMARKS: *Acarus siro* is found throughout the world in grain stores and also in bird nests where they live as scavengers.

Genus *Caloglyphus* Berlese, 1923

Caloglyphus sp. A. M. Hughes (pers. comm.)

One specimen of this mite was collected at Macquarie Island in 1961 and has been examined by Dr. A. M. Hughes.

SPECIMEN: Specimen in the ANIC, Canberra.

HABITAT: Fowl house debris.

LOCALITY: ANARE station, Isthmus.

DATE: July 1961.

REMARKS: Species of *Caloglyphus* occur on damp, decaying debris such as grain, potatoes and organic soil matter.

Genus *Calvolia* Oudemans, 1911

Calvolia sp. nov. A. M. Hughes, 1962 (pers. comm.)

At least eight specimens of this mite were collected at Macquarie Island in 1961. They have been examined by Dr. A. M. Hughes who is in the course of describing the new species.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Poa foliosa* soil (to at least 3 feet deep); *Prasiola crispa* (green alga) on penguin rookery rocks; nests of *Diomedea exulans* and *Eudyptes chrysocome*; lichens, wall scrapings and penguin debris from caves.

LOCALITIES: Handspike Point (*D. exulans* nest); Eagle Point, North Head and Brothers Point (caves); North Head; Garden Cove; Hasselborough Bay.

DATES: March, September, November.

REMARKS: Species of *Calvolia* are found on plants, in the galleries of bark-boring beetles, on stored wheat and on rotting potatoes.

Genus *Schwiebea* Oudemans, 1916

Schwiebea talpa Oudemans, 1916

This is the first record of this species from Macquarie Island. Dr. A. M. Hughes determined a series of three specimens collected at the island in 1961.

RECOGNITION: Average length of idiosoma 320μ (female), 266μ (male). Colour white to yellowish brown. Body oval and elongated with transverse constriction marking the division between propodosoma and hysterosoma. Body setae short, smooth and sparse. Dorsal propodosomal shield an ill-defined plate.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Cosmopolitan.

HABITAT: Nests of *Diomedea exulans*.

LOCALITIES: Handspike Point, Halfmoon Bay, Douglas Bay.

DATES: June and July.

REMARKS: *Schwiebea talpa* is found in soil.

Genus *Tyrophagus* Oudemans, 1924

Tyrophagus longior (Gervais), 1844

Tyroglyphus longior Gervais, 1844. In "Histoire Naturelle des Insectes". Apteres (Ed. Walckenaer) 3: 262.

Tyrophagus longior Robertson, 1959. Aust. J. Zool. 7 (2): 165-167. (Designation and description of neotype.)

This is the first record of this species from Macquarie Island. Dr. A. M. Hughes has determined a series of three specimens collected at the island in 1961.

RECOGNITION: Length of male (neotype, Holland) 610μ . Hairs forming train at end of body from 85 to 95 per cent. of body length. Penis attenuated, shaft curved like spout of coffee pot.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known from western Europe, Canada, Australia, New Zealand and Macquarie Island.

HABITAT: Fowl house debris, rat debris, lichens and algae lining walls of cave.

LOCALITIES: ANARE station, Isthmus; Catch-me Cave.

DATES: July, August, September.

REMARKS: *Tyrophagus longior* has been recorded from stored grain, hay, straw, corn stubble, cucumber plants, mushrooms and cheeses.

Family HYADESIDAE

Genus *Hyadesia* sp. nov. A. M. Hughes, 1962 (pers. comm.)

One specimen of this mite was collected at Macquarie Island in 1961 and has been examined by Dr. A. M. Hughes who is in the course of describing the new species.

SPECIMEN: Specimen in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Rhizoclonium* sp. (green alga on coastal rocks).

DATE: December 1961.

REMARKS: Species of *Hyadesia* are aquatic or semi-aquatic. They frequent algae and crawl over stones in shallow water or in intertidal regions.

Family CARPOGLYPHIDAE

Genus *Carpoglyphus* Robin, 1869

Carpoglyphus sp. nov. A. M. Hughes, 1962 (pers. comm.)

Numerous specimens of this mite were collected at Macquarie Island in 1961 and a paper describing the new species is being prepared by Dr. Hughes.

SPECIMENS: Specimens will eventually be deposited in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Litter of herbfield and grassland plants; lichens and algae lining cave walls; *Puccinellia macquariensis*; *Colobanthus muscoides*; flowers of *Cotula plumosa*; Royal Penguin debris; cormorant nest material; hay and dung from stable; sheep dung.

LOCALITIES: Catch-me Point, Eagle Point and North Head (caves); ANARE station, Isthmus; Nuggets Point; Hasselborough Bay; Plateau.

ANNUAL DISTRIBUTION: Occurring throughout the year.

REMARKS: According to Dr. Hughes this species closely resembles *C. lactis* which occurs almost exclusively on dried fruit.

Family GLYCYPHAGIDAE

Genus *Glycyphagus* Hering, 1838

Glycyphagus domesticus (De Geer), 1778

Acarus domesticus De Geer, 1778. Mem. Hist. Ins. 7.

Glycyphagus domesticus (De Geer) A. M. Hughes, 1961. "The Mites of Stored Food", H.M.S.O.

Numerous specimens were collected at Macquarie Island in 1961 and have been determined by Dr. A. M. Hughes.

RECOGNITION: Length of idiosoma 400-750 μ (female), 320-400 μ (male). Setae arising from legs and idiosoma are long, pectinate and radiate stiffly from the surface of the body. Legs long, with tapering segments.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Cosmopolitan.

HABITAT: Nest material of *Pachyptila desolata* (Dove Prion) and *Diomedea exulans* (Wandering Albatross); fowl house debris; bran and wheat; mosses; *Azorella selago*; *Colobanthus muscoides*; *Cotula plumosa*; *Poa hamiltoni* litter; *Stilbocarpa* litter and soil; grassland soil.

LOCALITIES: Hasselborough Bay, northern peninsula, Douglas Bay, Nuggets Point,

DATES: Specimens were collected in February, May, June, July, August, September, November.

REMARKS: *Glycyphagus domesticus* feeds on moulds. It is commonly found in bee hives and bird nests, in granaries and in dried plant materials.

Glycyphagus sp. A. M. Hughes, 1962 (pers. comm.)

One specimen of this mite was present in the 1961 collection and has been examined by Dr. Hughes.

SPECIMEN: Specimen in the ANIC, Canberra.

HABITAT: Rockhopper Penguin (*Eudyptes chrysocome*) debris in cave rookery.

LOCALITY: North Head.

DATE: 23 November.

Family ANOETIDAE

Genus *Histiostoma* Kramer, 1876

Histiostoma sp. R. D. Hughes, 1964 (pers. comm.)

Dr. R. D. Hughes has examined eleven anoetid specimens collected at Macquarie Island during 1961 but has found it impossible to make a definite identification of any of the specimens because only one deutonymph is present. This deutonymph does, however, belong to the genus *Histiostoma*, and it is almost certain that seven other specimens (6 females, 1 male) and possibly one protonymph are the same species. The species appears to be undescribed. The two remaining anoetid specimens are reported below.

SPECIMENS: Specimens will be deposited in the ANIC, Canberra.

COLLECTION DATA:

M/61/Z/9	female	26 Jan.	Plateau	<i>Pleurophyllum hookeri</i> litter
M/61/Z/20	female	24 Feb.	First Gully	<i>Stilbocarpa polaris</i> litter
M/61/Z/28	female	2 Mar.	Nuggets Ck.	<i>Stilbocarpa polaris</i> litter
	male			
M/61/Z/129	female	19 Jul.	Halfmoon Bay	<i>Diomedea exulans</i> nest material
M/61/Z/170	protonymph	7 Sep.	Camp Hill	Sheep dung with soil
M/61/Z/186	deutonymph	28 Sep.	Hasselborough Bay	Mud and decaying kelp
M/61/Z/191	female	3 Oct.	Langdon Pt.	<i>Stilbocarpa polaris</i> litter
M/61/Z/197	female	12 Oct.	Camp Hill	<i>Colobanthus muscoides</i>

REMARKS: The Anoetidae are usually found in damp situations such as damp decaying plant material; the deutonymphs are found on insects. In all the above collections the mites were extracted by Berlese funnels from material gathered in plastic bags. Large numbers of collembola and staphylinids were present in the

OTHER SPECIES

Dr. R. D. Hughes has commented on the other two anoetid specimens present in the collection which he examined: "The other Z/129 is similar to *Wichmannia*. Likewise, Z/153 probably is *Bonomia* or *Spinanoetus*. These observations are unsupported by deutonymphs and are unreliable."

SPECIMENS: Specimens in the ANIC, Canberra.

COLLECTION DATA:

M/61/Z/129	? <i>Wichmannia</i> sp.	19 Jul.	Halfmoon Bay	<i>Diomedea exulans</i> nest material
M/61/Z/153	? <i>Bonomia</i> or ? <i>Spinanoetus</i> sp.	17 Aug.	Lambing Gully	<i>Stilbocarpa polaris</i> litter

Included in the collection of Macquarie Island Acaridae examined by Dr. A. M. Hughes were two anoetid specimens, one female and one nymph, which Dr. Hughes believes may belong to an undescribed species of *Algophagus*. Without further specimens, this identification must be regarded as tentative only.

SPECIMENS: Specimens in the ANIC, Canberra.

COLLECTION DATA:

M/61/Z/164	female nymph	26 Aug.	North Head	Penguin rookery mud
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Supercohort **ORIBATEI**Family **PALAEACARIDAE**

Genus *Andacarus* Grandjean, 1958

Andacarus watsoni Travé, 1964

Andacarus watsoni Travé, 1964. Pac. Ins. Mon. 7: 647.

Travé has described this species from a series of 38 female, 8 male and one larval specimens collected at Macquarie Island in 1961.

RECOGNITION: Length in dilute lactic acid 415-425 μ (male), 415-450 μ (female). The sensillus, terminating in a club in the form of an orange pip, is characteristic of the species. Secondary veins form a checkerwork within the square formed by the primary lamellar veins. The rutellum terminates in pronounced teeth which are heavily pigmented. Colour whitish, legs and prodorsum pale red-brown, dorsal setae black and bristle-like.

SPECIMENS: Holotype (female), allotype (male) and paratypes in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Moss on wind-exposed rock face, 300 feet above beach.

LOCALITY: Aerial Cove (scree ascent to Wireless Hill).

REMARKS: The moss from which these mites were extracted was relatively dry and was growing in isolated cushions on a vertical rockface. Mosses from similar situations in other parts of the island have not been examined, so it is not possible to speculate on the distribution of the species throughout the island.

Family **HOLONOTHRIDAE**

Genus *Holonothrus* Wallwork, 1963

Holonothrus foliatus Wallwork, 1963

Holonothrus foliatus Wallwork, 1963. Pac. Ins. 5 (4): 722-727.

This genus and species were described by Wallwork from a series of 9 adults, 4 tritonymphs, 2 deutonymphs, 1 protonymph and 1 larva collected at Macquarie Island in 1961. The new family Holonothridae has been established by Wallwork on the basis of characters in his description of *Holonothrus foliatus*.

RECOGNITION: Average body length of adult 757.5 μ . Body colour brown. Debris frequently attached to cerotegument. Immature stages with pleated integument. Sensillus completely contained within pseudostigma in all stages. Posterior margin of hysterosoma with a pair of prominent tubercles in larva and nymphs; these tubercles lacking in the adult. Lateral abdominal gland present. Leg setae inserted on prominent apophyses.

SPECIMENS: Syntypes (adults, deutonymphs, tritonymphs, protonymphs and larva) in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Mosses of feldmark and plateau herbfield; *Stilbocarpa* litter.

LOCALITIES: Plateau above Gadget Gully, Mount Hamilton; Nuggets Point.

DATES: August, October, November.

Family **METRIOPPIIDAE**

Genus *Macquarioppia* Wallwork, 1963

Macquarioppia striata Wallwork, 1963

Macquariella striata Wallwork, 1963. Pac. Ins. 5 (4): 727-731.

Macquarioppia nom. nov. Wallwork, 1964. Pac. Ins. Mon. 7: 605.

This genus and species were described by Wallwork from a series of 13 adults collected at Macquarie Island in 1961.

RECOGNITION: Average body length 645 μ . Integument smooth, brown in colour with a number of small, dark areas, irregular in shape, present on peripheral regions of notogaster and in interlamellar region. Lamellae are strongly developed ridges, each ridge produced dorsally into a vertically-aligned blade which is ornamented with a series of longitudinal striae. Sensillus with a short, slender stalk and a swollen, rounded head covered with small granules. Legs rather slender. Sexual dimorphism lacking.

SPECIMENS: Holotype, paratypes and other specimens in the ANIC, Canberra.

HABITAT: Litter of herbfield and grassland plants, algae and lichens lining interior of cave, *Prasiola crispa* (green alga) on rocks in Royal Penguin rookery.

LOCALITIES: Plateau above Gadget Gully and at Caroline Valley (about 700 feet), Gadget Gully, North Head rookery, Brothers Point Cave.

DATES: March, August, September, December.

REMARKS: *Macquarioppia striata* is not common although it occurs over a wide range of habitats. It is, however, absent from the littoral zone. Collecting data indicates a wide range throughout the island, and it probably occurs throughout the year, since specimens were collected in summer and in winter.

Family OPPIIDAE

Genus *Oppia* Koch, 1836

Oppia crozetensis (Richters), 1908

Notaspis crozetensis Richters, 1908. Deutsche Südpolar Exped. 1901-03, 9, Zool. 1: 259-302.
Oppia crozetensis anareensis Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 397-398.
"Oppia" *crozetensis* (Richters) Wallwork, 1963. Pac. Ins. 5 (4): 731-733.

This species was first recorded from Macquarie Island by Dalenius and Wilson (1958) from a few specimens collected during the Australian National Antarctic Research Expeditions of 1949-51. Fifteen adult specimens collected during 1961 have been determined by Dr. Wallwork who places the species in the genus *Oppia*, pending a revision of the genus. Dr. Wallwork regards Dalenius' subspecific distinction as unwarranted. It is interesting that Wallwork remarks on the similarity of *O. crozetensis* to *O. magellanicus* Hammer, 1962 from southern Chile: "I can find no distinct differences between the two species."

RECOGNITION: Colour light brown. Average body length 312·1 μ . Lamellae are distinct ridges extending forwards from median wall of each pseudostigma for about $\frac{1}{2}$ length of propodosoma; each ridge of uniform thickness throughout its length, the two lamellae being continuous anteriorly through a curved trans-lamella. A lateral ridge (tutorium) present on each side of prodorsum curving medially. Between tutorium and lamella on each side is a series of three pale areas of weak chitinization. Pseudostigmata prominent.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Possession Island (Crozet) and Macquarie Island.

HABITAT: Litter of herbfield and grassland plants; *Colobanthus muscoides*; *Puccinellia macquariensis*; in caves: Rockhopper Penguin debris, and lichens and algae lining walls; nest material of *Diomedea exulans*, *Pachyptila desolata* and *Pterodroma lessoni*.

LOCALITIES: Widespread from sea level to 1,200 feet. (Mount Elder, Wireless Hill, Handspike Point, Douglas Point, Langdon Point, Aerial Cove, Scoble Lake, Brothers Point Cave, North Head Cave.)

Family **PODACARIDAE**Genus *Halozetes* Berlese, 1916*Halozetes marinus* (Lohmann), 1908

Notaspis marina Lohmann, 1908. Deutsche Südpolar Exped. 1901-03, **9**, Zool. 1: 361-413.
Anarea macquariensis Dalenius, 1958. Arkiv. f. Zool. ser. 2, **11** (23): 406-408.
Anarea marina (Lohmann) Dalenius, 1958. Arkiv. f. Zool. ser. 2, **11** (23): 408.
Halozetes marinus (Lohmann) Wallwork, 1963. Pac. Ins. **5** (4): 734-738.

This species was first recorded from Macquarie Island by Womersley (1937a) from a collection made by H. Hamilton in 1913. Further specimens were collected by ANARE in 1949-51 and reported by Dalenius and Wilson (1958) under the name *Anarea marina*. Thirty adults (17 males, 13 females) and one tritonymph were collected in 1961 and have been determined by Dr. Wallwork. Some of the specimens in the ANARE collections of 1949-51 were described by Dalenius as a new species, *Anarea macquariensis*, but Wallwork believes the distinction of this species from *Halozetes marinus* is unwarranted.

RECOGNITION: Colour dark brown. Average body length 791·8 μ (males), 840·1 μ (females). Females are larger in body size and have a relatively larger body aperture than males. Rostral setae smooth or roughened, shorter than their mutual distance. Interlamellar setae very long, thickened, dark in colour, broadly curved and divergent, smooth or roughened but not barbed. Sensillus has a thin stem and a flattened, expanded head, constricted apically.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Iles Kerguelén, Macquarie and St. Paul Islands.

HABITAT: Algae on rocks of the upper Porphyra zone.

LOCALITIES: Widespread.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Halozetes intermedius Wallwork, 1963

Halozetes intermedius Wallwork, 1963. Pac. Ins. **5** (4): 738-741.

This species was described by Wallwork from a series of over 100 adults (comprising approximately equal numbers of each sex) collected at Macquarie Island in 1961.

RECOGNITION: Colour dark brown. Average body length 724·5 μ (females), 671·1 μ (males); females generally larger than males and with a relatively larger genital aperture. Morphology is similar to that of *H. marinus*. The following characters distinguish adults from those of *marinus*: Pseudostigmata well developed, sensilli strongly clavate; interlamellar setae only twice as long as mutual distance at maximum length, barbed; females with weakly developed curved chitinised ridge traversing sternal region immediately anterior to genital aperture.

SPECIMENS: Holotype (male), allotype (female), syntype (tritonymph), paratypes and other specimens in the ANIC, Canberra.

HABITAT: Crevices of rock in the Porphyra zone. Also in algae, *Colobanthus muscoides* and *Puccinellia macquariensis* influenced by sea spray, *Prasiola crispa* on rocks in Royal Penguin rookery, and Rockhopper Penguin debris.

LOCALITIES: Widespread around the coast.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Halozetes crozetensis (Richters), 1908

Scutovertex crozetensis Richters, 1908. Deutsche Südpolar Exped. 1901-03, 9, Zool. 1: 259-302.
Pertorgunia crozetensis (Richters) Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 403.
Pertorgunia colobanthi Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 400.
Halozetes crozetensis (Richters) Wallwork, 1963. Pac. Ins. 5 (4): 742-746.

This species was first recorded from Macquarie Island by Dalenius and Wilson (1958) from specimens collected by the ANARE in 1949-51. Over one hundred specimens (comprising approximately equal numbers of each sex) collected during 1961 have been determined by Dr. Wallwork. Wallwork (1963) has redescribed the species, as previous descriptions have been incomplete. The large samples of the 1961 collection have revealed a range of morphological variability which indicates the synonymy of Dalenius' *Pertorgunia colobanthi* with *H. crozetensis*.

RECOGNITION: Colour dark brown. Average body length 647·6 μ (females), 612 μ (males); females are usually larger than males and have a relatively larger genital aperture than the males. Characteristic features are: short, medially curved, strongly tufted lamellar setae; interlamellar setae thickened, not tapering apically, strongly barbed, usually longer than their mutual distance; separation of prodorsum and notogaster complete; notogaster strongly ovoid in shape, posterior margin indented; pre-genital ridges developed in both sexes.

SPECIMENS: Paratypes (Wallwork) and other specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Heard, Iles Kerguelen, Macquarie and Possession (Crozet) Islands.

HABITAT: Marine algae of the Porphyra zone, *Colobanthus muscoides*, *Puccinellia macquariensis*, *Cotula plumosa*, litter of grassland and herbfield plants, mosses, lichens, on rocks and under stones and feathers in penguin rookeries, under sheep dung, algae and lichens lining cave walls, nest material of *Eudyptes chrysocome*, *Diomedea exulans* and *Phalacrocorax a. purpurascens*.

LOCALITIES: Widespread from sea level to 700 feet.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Halozetes macquariensis (Dalenius), 1958

Pertorgunia macquariensis Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 398-400.
Halozetes macquariensis (Dalenius) Wallwork, 1963. Pac. Ins. 5 (4): 746-749.

This species was described by Dalenius from a series of specimens collected by ANARE in 1949-51. Thirty adults (15 females, 15 males) collected in 1961 have been examined by Dr. Wallwork who has found it necessary to redescribe the species (1963).

832·3 μ (males); females generally larger than males with a relatively larger genital aperture. Characteristic features are: lamellar setae short, straight, smooth or finely barbed; interlamellar setae finely barbed, tapering slightly; separation of prodorsum and notogaster complete, but weakly developed in some specimens; anterior margin of notogaster strongly peaked; pre-genital ridges in females only.

SPECIMENS: Allotype male (Wallwork) and other specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Rock crevices and ground mud in penguin rookeries; mud banks of fresh water pools and seal wallows; *Poa hamiltoni* tussocks; coastal *Colobanthus muscoides* (Plate 6).

LOCALITIES: North Head, Aerial Cove, Caroline Valley (700 feet).

DATES: March, May, June, September, October.

Halozetes belgicae (Michael), 1903

Halozetes belgicae brevipilis Wallwork, 1963

Notaspis belgicae Michael, 1903. Résultats du voyage du S.Y. Belgica 1897-99. Rapports scientifiques (Zoologie). Acariens libres. R. 17: 1-7.

Pertorgunia belgicae (Michael) Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 402-403.

Halozetes belgicae brevipilis Wallwork, 1963. Pac. Ins. 5 (4): 749-754.

This mite was first recorded from Macquarie Island by Dalenius and Wilson (1958) from specimens collected by ANARE in 1949-51. Wallwork, having examined a series of 45 adults (28 males, 17 females) collected during 1961, has described a new subspecies from the Macquarie forms.

RECOGNITION: Colour dark brown. Average body length 555·4 μ (females), 523·6 μ (males); females usually larger than males and with relatively larger genital aperture. Subspecies *brevipilis* is distinguished from the nominate form by the shorter lamellar and interlamellar setae. *H. b. brevipilis* is distinguished from other species of *Halozetes* occurring on Macquarie Island by its smaller size and from *H. crozetensis* (the next largest species) by the following characters: male with at least 6 aggenital setae (as compared to male *crozetensis* which has at most 5 aggenital setae); females smaller, paler in colour and more strongly rounded in appearance, with notogastral setae less conspicuously barbed than in *crozetensis*.

SPECIMENS: Holotype (male), allotype (female), paratypes and other specimens in the ANIC, Canberra.

DISTRIBUTION: Macquarie Island.

HABITAT: *Poa hamiltoni* litter; coastal *Colobanthus muscoides*, *Cotula plumosa* and *Puccinellia macquariensis*; rock crevices and ground mud of penguin rookeries; under sheep dung; nest material of *Eudyptes chrysocome*; mosses; cave scrapings (Brothers Point); marine algae of upper *Porphyra* zone.

LOCALITIES: Widespread in coastal habitats; Caroline Valley Royal Penguin rookery (700 feet); Mount Hamilton (mosses).

Genus *Alaskozetes* Hammer, 1955

Alaskozetes antarcticus (Michael), 1903

Alaskozetes antarcticus grandjeani (Dalenius), 1958

Notaspis antarctica Michael, 1903. Résultats du voyage du S.Y. Belgica 1897-99. Rapports scientifiques (Zoologie). Acariens libres. R. 17: 1-7.

Halozetes antarctica Grandjeani Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 406.

Halozetes antarctica grandjeani Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 406.

Alaskozetes antarcticus grandjeani (Dalenius) Wallwork, 1963. Pac. Ins. 5 (4): 754-757.

This subspecies was described by Dalenius from specimens collected at Heard and Macquarie Islands by the ANARE during 1949-51. Dalenius also recorded *Halozetes antarcticus* from the same two islands, but this form was not present in the 1960-61 collections (see remarks below). Forty-eight adults (28 females, 20 males) collected in 1960-61 have been examined by Wallwork who has redescribed the subspecies (1963).

RECOGNITION: Colour brown, whitish underneath. Average body length 1028·7 μ (females), 994·9 μ (males). Interlamellar setae strongly thickened and barbed, in most cases shorter than their mutual distance, occasionally as long as or slightly longer than this. Rostral setae barbed and usually tapering to a fine point distally; apex occasionally blunt. Lamellar setae are very short spines.

SPECIMENS: In the ANIC, Canberra.

DISTRIBUTION: Heard Island, Macquarie Island.

HABITAT: *Poa hamiltoni* litter; *Cotula plumosa*; *Colobanthus muscoides*; *Puccinellia macquariensis*; *Rhizoclonium* sp.; *Prasiola crispa*; under rocks and in their crevices in penguin rookeries and the upper spray zone of the coast; Rockhopper Penguin debris in cave; nest material of *Diomedea exulans* and *Phalacrocorax a. purpurascens*.

LOCALITIES: Widespread around the coast, and at Caroline Valley Royal Penguin rookery.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Genus *Podacarus* Grandjean, 1955

Podacarus auberti Grandjean, 1955

Podacarus auberti Grandjean, 1955. Mem. Mus. Nat. Hist. Nat. Paris ser. A, Zool. 8 (3): 109-150.

This species was first recorded from Macquarie Island by Dalenius and Wilson (1958) from specimens collected during the ANARE of 1950-51. Over thirty specimens collected during 1960-61 have been determined by Dr. Wallwork.

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Heard, Kerguelen and Macquarie Islands.

HABITAT: Leaves and litter of *Poa foliosa* (particularly abundant in seal-wallow areas) and *Poa hamiltoni*; *Cotula plumosa*; *Colobanthus muscoides*, *Rhizoclonium* sp.; under stones in penguin and cormorant rookeries; nest material of *Pterodroma lessoni* and *Phalacrocorax a. purpurascens*.

LOCALITIES: Widespread from sea level to at least 700 feet.

Family **MYCOBATIDAE**Genus *Cryptobothria* Wallwork, 1963*Cryptobothria monodactyla* Wallwork, 1963*Cryptobothria monodactyla* Wallwork, 1963. Pac. Ins. 5 (4): 757-760.

This genus and the species were described by Wallwork from a series of ten adults collected at Macquarie Island in 1961.

RECOGNITION: Colour brown. Average body length 371.7μ ; sexual dimorphism lacking. Rostrum indented, with median rounded lobe flanked by a pair of lateral teeth. Rostral setae inserted on latero-dorsal margins of rostrum at anterior extremities of a pair of chitinized ridges which appear to be extensions of tatoria. Rostral setae gently curved, barbed, thickened basally, terminating in fine tips, about as long as their mutual distance, extending in front of rostrum for a distance equal to half their lengths. Anteriorly, the lamella projects above prodorsum in a relatively short free cusp bearing the insertion of lamellar seta. Lamellar setae thinner and shorter than rostrals and finely barbed, not extending as far anteriorly as tips of rostrals. Tutorium well developed on each side, terminating anteriorly in a free pointed cusp. An extension of anterior margin of notogaster, a tectum, covers posterior part of prodorsum. Beneath it are large, broadly triangular pseudo-stigmata bearing sensilli each of which consists of a short stem and a relatively large, hollow, globular head.

SPECIMENS: Holotype and paratypes in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Colobanthus muscoides*; *Pleurophyllum* and *Stilbocarpa* litter; herbfield plants.

LOCALITIES: Douglas Point; Garden Cove; Plateau, northern end (700 feet).

DATES: Specimens were collected in March and December.

Genus *Neomycobates* Wallwork, 1963*Neomycobates tridentatus* Wallwork, 1963*Neomycobates tridentatus* Wallwork, 1963. Pac. Ins. 5 (4): 760-763.

This genus and the species were described by Wallwork from a series of 42 adults collected at Macquarie Island in 1961.

RECOGNITION: Colour pale brown. Average body length: 443.4μ ; sexual dimorphism lacking. Rostrum markedly tridentate. Rostral setae inserted on dorso-lateral margins of rostrum, thickened, barbed, broadly curved medially, projecting beyond rostrum for a distance equal to half their length. Lamellae projecting anteriorly into cusps which are twice as long as breadth of translamella, each terminating in a truncate apex in which is inserted the lamellar seta. Lamellar setae not much longer than rostrals; thickened, barbed, directed straight forwards. Interlamellar setae generally longer than lamellar setae, thickened, barbed, almost straight, directed vertically. Tutorium strongly developed on each side and scoop-shaped: projects freely over lateral margins of prodorsum as a pointed cusp for almost half its

Sensillus large, with a short stem and expanded head which is rather more elongate than corresponding structure in *Cryptobothria monodactyla*. Notogaster strongly convex with well developed and ventrally curved pteromorphs.

SPECIMENS: Holotype, paratypes and other specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: Leaves of *Poa foliosa* in seal wallow areas; *Stilbocarpa* litter close by nest of *Phoebetria palpebrata*; *Rhizoclonium* sp. in Porphyra zone.

LOCALITIES: Hasselborough Bay, Isthmus, Gadget Gully, Garden Cove.

DATES: Specimens collected in March, August and September.

Family **PARAKALUMMIDAE**

Genus *Sandenia* Oudemans, 1917

Sandenia rotunda Wallwork, 1963

Sandenia rotunda Wallwork, 1963. Pac. Ins. 5 (4): 763-767.

This species was described by Wallwork from a series of 14 adults collected at Macquarie Island during 1961.

RECOGNITION: Colour dark brown except for anterior mid-dorsal region of notogaster which is much paler in colour.

SPECIMENS: Holotype, paratypes and other specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Puccinellia macquariensis*; *Colobanthus muscoides*; *Poa hamiltoni*; *Stilbocarpa* litter; rock crevices, nest material and windswept feathers in penguin rookeries; *Rhizoclonium* sp. in Porphyra zone.

LOCALITIES: Caroline Valley, Nuggets Point, northern peninsula.

ANNUAL DISTRIBUTION: Occurring throughout the year.

Family **HAPLOZETIDAE**

Genus *Totobates* Hammer, 1961

Totobates anareensis (Dalenius), 1958

Liebstadia anareensis Dalenius, 1958. Arkiv. f. Zool. ser. 2, 11 (23): 409.

Totobates anareensis (Dalenius) Wallwork, 1963. Pac. Ins. 5 (4): 767-768.

This species was described by Dalenius from specimens collected at Macquarie Island by the ANARE during 1949-51. A series of 22 adults collected in 1961 has been reported by Wallwork (1963).

RECOGNITION: Colour pale brown. Approximate body length 360 μ .

SPECIMENS: Specimens in the ANIC, Canberra.

DISTRIBUTION: Known only from Macquarie Island.

HABITAT: *Stilbocarpa* litter; *Puccinellia macquariensis*; *Poa hamiltoni* and *P. foliosa* litter; *Colobanthus muscoides*; mosses; sheep dung; rock crevices in penguin

LOCALITIES: Widespread, from coastal habitats to plateau herbfield (700 feet).

ANNUAL DISTRIBUTION: Occurring throughout the year.

Totobates elegans (Hammer), 1958

Totobates sp. Hammer, 1958. Biol. Skv. Dan. Vid. Selsk. **10** (1).

Totobates elegans (Hammer) Wallwork, 1963. Pac. Ins. **5** (4): 767-768.

This species was first recorded from Macquarie Island by Wallwork from a series of 7 adults collected in 1961.

RECOGNITION: Colour pale brown.

SPECIMENS: In the ANIC, Canberra.

DISTRIBUTION: Known only from the Andes Mountains, Campbell Island and Macquarie Island.

HABITAT: *Pleurophyllum hookeri* litter, nest material of *Diomedea exulans*.

LOCALITIES: Plateau, northern end (700 feet); Handspike Point.

DATES: Specimens collected in June, September and December.

Class **TARDIGRADA**

Family **MACROBIOTIDAE**

Genus *Hypsibius* (Ehrenberg), 1848

Hypsibius (Isohypsibius) augusti (John Murray), 1907

Macrobotus augusti Murray, 1907. Trans. Roy. Soc. Edinb. **45**: 646, 647, 660.

Hypsibius (Isohypsibius) augusti (Murray) Thulin, 1928. Hereditas **11** (2/3): 207-266.

This is the first record of this species from Macquarie Island. More than thirty specimens were collected during 1961 and have been determined by Dr. C. B. Curtin.

SPECIMENS: In the ANIC, Canberra.

HABITAT: Wet mosses; soil bordering fresh-water ponds.

LOCALITIES: Wireless Hill; plateau above First Gully (400 feet).

DATES: Specimens collected in August and September.

REMARKS: Although, strictly speaking, *Hypsibius augusti* is an aquatic form, it is included in this survey because of its occurrence in wet mosses. The species is abundant in the bottom mud of freshwater ponds.

III. PARASITES OF MAMMALS AND BIRDS

Class **INSECTA**

Order **PHTHIRAPTERA**

[The following species have been determined by Dr. T. Clay, of London.]

Suborder **MALLOPHAGA**

Genus *Ancistrona* Westwood, 1874

Ancistrona sp.

HOST: *Pachyptila desolata desolata* (Gmelin), 1789. Dove Prion. Collected by

Genus *Austrogoniodes* Harrison, 1915

Austrogoniodes cristati Kéler, 1952

HOSTS: *Eudyptes chrysocome* Forster, 1871, Rockhopper Penguin. Collected by K. Keith, 1956; W. J. M. Vestjens, 1962.

Eudyptes chrysolophus schlegeli Finsch, 1876, Royal Penguin. Collected by K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Austrogoniodes hamiltoni Harrison, 1937

HOSTS: *Eudyptes chrysocome* Forster, 1871, Rockhopper Penguin. Collected by H. Hamilton, 1912; ANARE, 1949; W. J. M. Vestjens, 1962.

Eudyptes chrysolophus schlegeli Finsch, 1876, Royal Penguin. Collected by W. J. M. Vestjens, 1962.

Eudyptes pachyrhynchus atratus Finsch, 1875, Snares Crested Penguin. Collected by M. P. Hines, 1957.

Austrogoniodes macquariensis Harrison, 1937

HOSTS: *Eudyptes chrysocome* Forster, 1871, Rockhopper Penguin. Collected by H. Hamilton, 1912; W. J. M. Vestjens, 1962.

Eudyptes chrysolophus schlegeli Finsch, 1876, Royal Penguin. Collected by H. Hamilton, 1912; W. J. M. Vestjens, 1962.

Eudyptes pachyrhynchus atratus Finsch, 1875, Snares Crested Penguin. Collected by M. P. Hines, 1957.

Austrogoniodes struthus Harrison, 1915

HOSTS: *Eudyptes chrysolophus schlegeli* Finsch, 1876, Royal Penguin. Collected by H. Hamilton, 1912.

Eudyptes pachyrhynchus sclateri Buller, 1888, Erect-crested Penguin. Collected by H. Hamilton, 1912.

Austrogoniodes waterstoni (Cummings), 1914

HOST: *Eudyptes pachyrhynchus sclateri* Buller, 1888, Erect-crested Penguin. Collected by H. Hamilton, 1912.

Genus *Damalinia* Mjoberg, 1910

Damalinia ovis (Schrank), 1781

HOST: *Ovies aries* Linnaeus, Sheep. Collected by K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Genus *Docophoroides* Giglioli, 1864

Docophoroides brevis (Dufour), 1835

HOST: *Diomedea exulans* Linnaeus, 1758, Wandering Albatross. Collected by K. Keith, 1956; J. Warham, 1961; W. J. M. Vestjens, 1962.

Docophoroides murphyi (Kellogg), 1914

HOST: *M. murphyi* (Gmelin), 1789, Giant Petrel. Collected by H.

THE TERRESTRIAL ARTHROPODA OF MACQUARIE ISLAND

Genus *Halipeurus* Thompson, 1936*Halipeurus diversus* (Kellogg), 1896HOST: *Puffinus griseus* (Gmelin), 1789, Sooty Shearwater. Collected by ANARE, 1949.*Halipeurus procellariae* (J. C. Fabricius), 1775HOST: *Pterodroma lessoni* (Garnet), 1826, White-headed Petrel. Collected by ANARE, 1949; K. C. Watson, 1961.*Halipeurus turtur* Edwards, 1961HOST: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by ANARE, 1949.*Halipeurus* sp.HOST: *Procellaria cinerea* Gmelin, 1789, Grey Petrel. Collected by H. Hamilton, 1912.Genus *Harrisoniella* Bedford, 1929*Harrisoniella grandis* (Piaget), 1880HOST: *Catharacta skua lonnbergi* (Mathews), 1912, Southern Skua. Collected by E. Shipp, 1950; K. C. Watson, 1961; W. J. M. Vestjens, 1962.*Harrisoniella* sp.HOST: *Diomedea exulans* Linnaeus, 1758, Wandering Albatross. Collected by W. J. M. Vestjens, 1962.Genus *Longimenopon* Thompson, 1948*Longimenopon galeatum* Timmermann, 1957HOST: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by K. C. Watson, 1960.Genus *Naubates* Bedford, 1930*Naubates heteroproctus* Harrison, 1937HOST: *Pterodroma lessoni* (Garnet), 1826, White-headed Petrel. Collected by H. Hamilton, 1913; ANARE, 1949.*Naubates prioni* (Enderlein), 1908HOST: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by ANARE, 1949; E. Shipp, 1950.*Naubates* sp.HOST: *Pygoscelis papua*. Collected by K. Keith, 1956. A single female, probably a straggler from one of the Petrels.Genus *Nesiotinus* Kellogg, 1903*Nesiotinus demersus* Kellogg, 1903HOST: *Antenodytes patagonicus* Miller, 1778; King Penguin. Collected by ANARE

Genus *Pectinopygus* Mjoberg, 1910

Pectinopygus turbinatus (Piaget), 1890

HOST: *Phalacrocorax albiventer purpurascens* (Brandt), 1837, Macquarie Island Cormorant. Collected by H. Hamilton, 1912.

Genus *Pelmatocerandra* Enderlein, 1908

Pelmatocerandra setosa (Giebel), 1876

HOST: *Pelecanoides urinatrix* Gmelin, 1789, Common Diving Petrel. Collected by J. Warham, 1960.

Genus *Perineus* Harrison, 1936

Perineus sp. nov. (T. Clay, 1962, pers. comm.)

HOST: *Macronectes giganteus* (Gmelin), 1789, Giant Petrel. Collected by K. C. Watson, 1961.

Perineus circumfasciatus Kéler, 1957

HOST: *Diomedea melanophris melanophris* Temminck, 1828, Black-browed Albatross. Collected by K. C. Watson, 1961.

Perineus diomedeeae (J. C. Fabricius), 1775

HOSTS: *Diomedea melanophris melanophris* Temminck, 1828, Black-browed Albatross. Collected by K. Keith, 1956; K. C. Watson, 1961.

Phoebetria palpebrata (Forster), 1785, Light-mantled Sooty Albatross. Collected by W. J. M. Vestjens, 1962.

Perineus hyalinus

HOST: *Diomedea exulans* Linnaeus, 1758, Wandering Albatross. Collected by M. P. Hines, 1957.

Perineus obscurus (Rudow), 1869

HOST: *Macronectes giganteus* (Gmelin) 1789, Giant Petrel. Collected by ANARE, 1949; E. Shipp, 1950; K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Perineus sp. (Nymph)

HOST: *Macronectes giganteus* (Gmelin), 1789, Giant Petrel. Collected by W. J. M. Vestjens, 1962.

Perineus sp.

HOST: *Phoebetria palpebrata* (Forster), 1785, Light-mantled Sooty Albatross. Collected by H. Hamilton, 1912.

Genus *Pseudonirmus* Mjoberg, 1910

Pseudonirmus gurlti (Taschenberg), 1882

HOST: *Daption canensis canensis* (Linnaeus), 1758, Cape Pigeon. Collected by

Genus *Saemundssonina* Timmermann, 1935*Saemundssonina lari* (O. Fabricius), 1780, *sens. lat.*HOST: *Larus dominicanus* Lichtenstein, 1823, Southern Black-backed Gull. Collected by H. Hamilton, 1912; E. Shipp, 1950.*Saemundssonina stresemanni* Timmermann, 1949HOST: *Catharacta skua lonnbergi* (Mathews), 1912, Southern Skua. Collected by W. J. M. Vestjens, 1962.*Saemundssonina* sp.HOST: *Larus dominicanus* Lichtenstein, 1823, Southern Black-backed Gull. Collected by W. J. M. Vestjens, 1962.*Saemundssonina* sp.HOST: *Calidris canutus rogersi* (Mathews), 1913, Knot. Collected by H. Hamilton, 1913.*Saemundssonina* sp.HOST: *Catharacta skua lonnbergi* (Mathews), 1912, Southern Skua. Collected by W. J. M. Vestjens, 1962.*Saemundssonina* sp.HOST: *Pterodroma lessoni* (Garnet), 1826; White-headed Petrel. Collected by ANARE, 1949.*Saemundssonina* sp.HOST: *Sterna vittata bethunei* Buller, 1826, Antarctic Tern. Collected by H. Hamilton, 1912.Genus *Trabeculus* Rudow, 1866*Trabeculus* sp.HOST: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by H. Hamilton, 1912.Suborder **ANOPLURA**Genus *Antarctophthirus* Enderlein, 1904*Antarctophthirus ogmorhini* Enderlein, 1906HOST: *Hydrurga leoptonyx* de Blainville, 1820, Leopard Seal. Collected by H. Hamilton, 1912.Genus *Lepidophthirus* Enderlein, 1904*Lepidophthirus macrorhini* Enderlein, 1904HOST: *Mirounga leonina* (Linnaeus), 1748, Elephant Seal. Collected by H. Hamilton, 1912; M. D. Murray, 1957; K. C. Watson, 1961; ANARE, 1962.Genus *Polyplax**Polyplax spinulosa* (Burmeister), 1839

Order **SIPHONAPTERA**Family **CERATOPHYLLIDAE**Genus *Nosopsyllus* (Bosc)*Nosopsyllus fasciatus* (Bosc), 1800

HOST: *Rattus rattus* Linné, 1758, Rat. Collected by G. M. Dunnet, 1957; K. C. Watson, 1961.

Family **PYGIOPSYLLIDAE**Genus *Notiopsylla**Notiopsylla enciari* Smit, 1957

HOST: *Pterodroma lessoni* (Garnet), 1826, White-headed Petrel. Collected by G. M. Dunnet, 1957; K. C. Watson, 1961.

Notiopsylla kerguelensis (Taschenberg), 1880

HOSTS: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by G. M. Dunnet, 1957; K. C. Watson, 1961.

Puffinus griseus (Gmelin), 1789, Sooty Shearwater. Collected by G. M. Dunnet, 1957; K. C. Watson, 1961.

Larus dominicanus Lichtenstein, 1823, Southern Black-backed Gull. Collected by G. M. Dunnet, 1957.

Family **RHOPALOPSYLLIDAE**Genus *Parapsyllus* Enderlein*Parapsyllus cardinis* Dunnet, 1961

HOST: *Pachyptila desolata desolata* (Gmelin), 1789, Dove Prion. Collected by G. M. Dunnet, 1957; K. C. Watson, 1961.

Pterodroma lessoni (Garnet), 1826, White-headed Petrel. Collected by G. M. Dunnet, 1957.

Macronectes giganteus (Gmelin), 1789, Giant Petrel. Collected by G. M. Dunnet, 1957.

Parapsyllus magellanicus heardi de Meillon, 1952

HOSTS: *Eudyptes chrysolome* Forster, 1871, Rockhopper Penguin. Collected by ANARE, 1949; G. M. Dunnet, 1957; K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Pterodroma lessoni (Garnet), 1826, White-headed Petrel. Collected by G. M.

Class **ARACHNIDA**Order **ACARINA**Suborder **IXODIDES**Family **IXODIDAE**

[The following species have been determined by Dr. F. H. S. Roberts, Queensland.]

Genus *Ixodes* Latreille, 1795

Ixodes pterodromae Arthur, 1960

HOSTS: *Aptenodytes patagonica* Miller, 1778, King Penguin. Collected by H. Hamilton, 1912.

Catharacta skua lonnbergi (Mathews), 1912, Southern Skua. Collected by H. Hamilton, 1912.

The identity of the ticks of the above two records is doubtful. Nuttall (1916) identified the species as *Ixodes auritules*, but the species is probably *I. pterodromae*.

Pachyptila desolata desolata (Gmelin), 1789; Dove Prion. Collected by K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Ixodes uriae White, 1852

HOSTS: *Aptenodytes patagonica* Miller, 1778, King Penguin. Collected by H. Hamilton, 1912; ANARE, 1950.

Diomedea exulans Linnaeus, 1758, Wandering Albatross. Collected by K. Keith, 1956.

Diomedea melanophris melanophris Temminck, 1828, Black-browed Albatross. Collected by ANARE, 1950.

Eudyptes chrysocome Forster, 1871, Rockhopper Penguin. Collected by H. Hamilton, 1912; ANARE, 1950; K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Eudyptes chrysolophus schlegeli Finsch, 1876, Royal Penguin. Collected by H. Hamilton, 1912; K. C. Watson, 1961; W. J. M. Vestjens, 1962.

Macronectes giganteus (Gmelin), 1789, Giant Petrel. Collected by K. C. Watson, 1962.

Phalacrocorax albiventer purpurascens (Brandt), 1837, Macquarie Island Cormorant. Collected by H. Hamilton, 1912.

Phoebastria palpebrata (Forster), 1785, Light-mantled Sooty Albatross. Collected by H. Hamilton, 1912; K. Keith, 1956.

Pterodroma lessoni (Garnet), 1826, White-headed Petrel. Collected by K. C. Watson.

Pachyptila desolata (Gmelin), 1789. Collected by W. J. M. Vestjens, 1962.

IV. TRANSIENT SPECIES

Listed here are species either self-introduced, like the moth *Agrotis ipsilon aneituma*, or introduced by man, which are probably not established residents of

Class **INSECTA**Order **DERMAPTERA**Family **FORFICULIDAE**Genus *Forficula* Linn.*Forficula auricularia* Linn.

A female of this species was taken alive by J. Warham inside a building at the Isthmus station on 10 November 1960. This was eight months since the last visit by a ship. It seems likely that this specimen of the common European earwig was brought from Europe by one of the Danish vessels which called at Macquarie in December 1959 and March 1960. However, the species is now established in Australia.

Order **LEPIDOPTERA**Family **NOCTUIDAE**Genus *Agrotis* Ochsenheimer, 1816*Agrotis ipsilon aneituma* (Walker), 1865

This is the Australian and south-west Pacific race of *A. ipsilon* Hufnagel. Two specimens of this species were collected at Macquarie Island by K. G. Brown during a visit in March 1953. In the same month of the year 1962, W. J. M. Vestjens collected 51 specimens (4 females, 47 males) from lights where the moths appeared on three successive days (8th, 9th and 10th). On 17 April 1965, D. K. Pocock captured one living specimen on the Isthmus.

Family **PYRALIDAE**Genus *Anagasta* Heinrich, 1956*Anagasta kuehniella* (Zeller), 1879

An adult of this species was found dead, together with larval and pupal skins, in a tin of cashew nuts at the Isthmus station in May 1961. *A. kuehniella* is widely distributed throughout the world.

Order **DIPTERA**Family **PSYCHODIDAE**Genus *Psychoda* Latreille, 1796*Psychoda alternata* Say, 1824

A single male was collected at Macquarie Island by J. L. Gressitt in December 1960. The specimen was reported by L. W. Quate (1962) and is deposited in the

Family **CHLOROPIDAE**Genus *Thyridula**Thyridula (Thyridula)* sp. near *T. (T.) centralis* Malloch

One adult specimen was taken by the author in January 1961 and has been deposited in the ANIC, Canberra. Both C. W. Sabrosky (1962) and D. K. McAlpine have examined the specimen, but are unable to give a definite determination because of lack of material for comparison and because the original description of *centralis* is too brief.

The fly was collected, together with sciarids from beneath *Stilbocarpa* plants, in a Giant Petrel rookery at Langdon Point. Subsequently a special lookout was kept for further specimens and, on several occasions, a careful search was made in the original Langdon Point locality. It may be that the fly had been transported to the island as an egg or immature stage by a Giant Petrel.

Genus *Tricimba**Tricimba* sp.

A fly collected by J. L. Gressitt at Macquarie Island in December 1960 has been identified as *Tricimba* sp. by D. K. McAlpine of the Australian Museum, Sydney.

Class **ARACHNIDA**Order **ARANEIDA**Family **OECOBIDAE**Genus *Oecobius* Lucas, 1845*Oecobius navus* Blackwell, 1859

An immature specimen of this small spider was taken from "a pipette during sorting" by T. H. Johnston at the Isthmus station in December 1930. This species has a wide distribution, being known from Japan, New Caledonia, Venezuela, U.S.A. and other localities, and from Victoria and Tasmania. The Macquarie specimen was probably taken on board ship in packing cases at Melbourne or Hobart, and carried to the island by the 1930 expedition. An allied species of *Oecobius* has been taken at a height of 1,000 feet by aeroplane, so it is possible also that Johnston's specimen reached Macquarie by wind transport over a wide distance. However, as no other specimens of *O. navus* have been found on the island, it is unlikely that Johnston's reached Macquarie in this way.

V. SUMMARY

In summary, some features are indicated that may deserve closer study in the future:

- A. Representation of taxonomic groups on Macquarie Island.
- B. Association with animals.
- C. Association with plants.
- D. Species showing seasonal distribution.
- E. Species probably introduced by man.
- F. Species apparently not well established on the island.
- G. Species possibly indigenous to Macquarie Island and antarctic-subantarctic region.

- A. Representation of taxonomic groups on Macquarie Island, excluding transient species and parasites of vertebrates.

	Order	No. of Families	No. of Genera	Species/Genus Ratio *
1. INSECTA:	COLLEMBOLA	6	12	1(x12)
	CORRODENTIA	1	1	1(x1)
	THYSANOPTERA	1	1	1(x1)
	HEMIPTERA	1	2	1(x2)
	LEPIDOPTERA	1	1	1(x1)
	DIPTERA	8	10	1(x8), 2(x2)
	COLEOPTERA	2	4	1(x2), 2(x2)
	HYMENOPTERA	1	1	1(x1)
2. ARACHNIDA:	ARANEIDA	2	2	1(x1), 2(x1)
	ACARINA	12	19	1(x13), 2(x1), 3(x3), 4(x1), 5(x1)
	GAMASINA			
	TROMBIDIFORMES	10	13	1(x11), 2(x1), 5(x1)
	SARCOPTIFORMES	5	11	1(x10), 2(x1)
ORIBATEI	8	11	1(x9), 2(x1), 5(x1)	
3. TARDIGRADA:		1	1	1(x1)

* Figures in the last column refer to the number of species in a genus. For example, 5(x1) means that in the case of one genus there are five species representing it on Macquarie Island.

B. Association with animals.

Species	Birds and their nests	Sheep dung	Seal carcasses	Domestic animal debris	Habitats prone to animal excreta	Plant material also
<i>Hypogastrura antarctica</i>	x	x		x		x
<i>Katianna banzareii</i>		x				x
<i>Psychoda parthenogenetica</i>		x			x	x
<i>Smitia</i> sp.		x				x
<i>Apetaenus watsoni</i>				x		
<i>Coelopa curvipes</i>			x			x
<i>Coelopa nigrifrons</i>			x			x
<i>Schoenophilus pedestris</i>						x
<i>Australinyza macquariensis</i>		x				x
<i>Omaliomimus albipenne</i>		x				x
<i>Omaliomimus venator</i>				x		
<i>Stenomaliium helmsi</i>	x					
<i>Stenomaliium sulcithorax</i>	x					
<i>Halmacusa antarctica</i>	x					
<i>Eugamasus species 2</i>						x
<i>Cyrtodrolaelaps watsoni</i>				x		x
<i>Gamasiphis watsoni</i>						x
<i>Hydrogamasus (A.) watsoni</i>		x				x
<i>Ayersacarus gelidus</i>						x
<i>Ayersacarus plumapilus</i>						x
<i>Ayersacarus strandimanni</i>						x
<i>Haemolaelaps pachyptilae</i>						x
<i>Haemogamasus pontiger</i>						x
<i>Dendrolaelaps schusteri</i>						x
<i>Dendrolaelaps kargi</i>		x				
<i>Gamasellus (H.) antarcticus</i>	x					
<i>Gamasellus (H.) schusteri</i>	x					
<i>Iphidozercon</i> sp.						
<i>Uropoda</i> species 1	x	x				
<i>Uropoda</i> species 2	x					
<i>Uropoda</i> species 3	x	x				

B. Association with animals (continued).

Species	Birds and their nests	Sheep dung	Seal carcasses	Domestic animal debris	Habitats prone to animal excreta	Plant material also
<i>Alliphis sictulus</i>	x	x				x
<i>Eupodes</i> sp. nov.	x	x				x
<i>Protereunetes</i> sp. nov.	x	x				
<i>Cheyletius eruditus</i>	x			x		
<i>Carpoglyphus</i> sp. nov.	x	x				x
<i>Glycyphagus domesticus</i>	x			x		x
<i>Glycyphagus</i> sp.	x					
? <i>Wichmannia</i> sp.	x					
<i>Oppia crozetensis</i>	x					x
<i>Halozetes crozetensis</i>	x	x				x
<i>Halozetes macquariensis</i>	x				x	x
<i>Halozetes belgicae brevipilis</i>	x	x				x
<i>Alaskozetes ant. grandjeani</i>	x				x	
<i>Podacarus auberii</i>	x				x	
<i>Neomycobates tridentatus</i>						x
<i>Sandania rotunda</i>						x
<i>Totobates anarensis</i>	x	x				x
<i>Totobates elegans</i>	x					x

association with plants.

Species	<i>Stilbocarpa</i>	<i>Pleurophyllum</i>	<i>Poa</i> spp.	Bog & Fen	Feldmark	<i>Colobanthus</i>	Others
<i>ta mixta</i>	x						x
<i>trura antarctica</i>	x		x				x
<i>subflava</i>	x		x				
<i>ma octooculata ovata</i>	x						
<i>trius cyaneus cinereus</i>	x		x				
<i>rya mawsoni</i>	x	x					
<i>i banzareii</i>	x		x				
<i>tanna gressittii</i>	x	x	x			x	
<i>socus insularis</i>	x		x				
<i>othrips chrysoodermis</i>	x		xx				
<i>a papillata</i>	x	x	xx			x	
<i>siphum padi</i>	x						
<i>mawsoni</i>							
<i>a parthenogenetica</i>	xx						
<i>a surcouffi</i>	xx	x					x
<i>a pilipes macquariensis</i>			x				
<i>i watsoni</i>	xx	x	x				
<i>s macquariensis</i>						x	
<i>us watsoni</i>							x
<i>curvipes</i>							x
<i>nigrifrons</i>							x
<i>illa macquariensis</i>							x
<i>aphilus pedestris</i>						x	
<i>myza macquariensis</i>	x	x	x				
<i>mimus albipennis</i>						x	
<i>mimus venator</i>						x	
<i>mimus helmsi</i>	x		x				
<i>alium sulcithorax</i>	x		x				
<i>usa antarctica</i>	x		x				
<i>aphorus species</i>		x				xx	
<i>opria latigaster</i>	x	x				x	
<i>erguelenensis</i>	x			x			
<i>enes marrineri</i>	x	x					
<i>sisus species 1</i>	x						
<i>sisus species 2</i>	x						
<i>sisus species 3</i>	x						

Association with plants (continued).

Species	Stilbocarpa	Pleurophyllum	Poa spp.	Bog & Fen	Feldmark	Colobanthus	Others
<i>...sus</i> species 4	x						
<i>...sus</i> species 5	x						
<i>...sus</i> species 1	x						
<i>...sus</i> species 2	x		x			x	x
<i>rotalaps watsoni</i>	x	x	x			x	x
<i>...phis watsoni</i>	x	x					
<i>...amasus (A.) watsoni</i>	x	x			x		
<i>...arus gelidus</i>	x		x			x	x
<i>...aelaps schusteri</i>	x	x				x	x
<i>...aelaps watsoni</i>		x					
<i>...aelaps kargi</i>			x				x
<i>...illus (H.) antarcticus</i>	x	x					
<i>...illus (H.) macquariensis</i>	x	x	x				x
<i>...illus (H.) schusteri</i>	x	x	x			x	x
<i>...illus (G.) watsoni</i>	x	x					
<i>...arcon</i> species	x		x				
<i>...eius</i> species	x		x				
SPIDA Genus 1	x						
SPIDA Genus 2	x						
...a species 1	x	x	x			x	x
...a species 2	x		x				
...a species 3	x	x	x				
MEGISTIDAE							
...s 1	x		x			x	x
...s 2	x					x	
<i>mephorus arvorum</i>		x			x		
<i>mephorus pannonicus</i>					x		
<i>mephorus selnicki</i>					x		
<i>mephorus togatus</i>					x		
<i>mephorus tripartitus</i>	x	x			x	x	x
<i>...estes antarcticus</i>	x	x	x			x	x
...s sp. nov.	x	x	x			x	x
<i>...inetes</i> sp. nov.	x	x				x	

THE TERRESTRIAL ARTHROPODA OF MACQUARIE ISLAND

Association with plants (continued).

Species	<i>Stilbocarpa</i>	<i>Pleurophyllum</i>	<i>Poa</i> spp.	Bog & Fen	Feldmark	<i>Colobanthus</i>	Others
<i>Aedeus</i> species					x	x	x
<i>Idia macquariensis</i>			x			x	
<i>s</i> species	x	x	x		x		
<i>Etetes macquariensis</i>	x		x		x		
<i>etoides watsoni</i>	x	x	x		x		
<i>des macquariensis</i>			x		x		
<i>des watsoni</i>						x	
<i>trus</i> species	x				x		
<i>s siro</i>			x				
<i>lia</i> sp. nov.							x
<i>hagus longior</i>							x
<i>sia</i> sp. nov.	x	x	x				x
<i>bihagus domesticus</i>	x		x		x	x	x
<i>stoma</i> species	x	x				x	x
<i>omni</i> or ? <i>Spinanoetus</i>	x						x
<i>arus watsoni</i>	x						x
<i>olhrus foliatus</i>	x		x		x		x
<i>arioppia striata</i>	x	x	x				x
<i>crozetensis</i>	x	x				x	x
<i>etes marinus</i>							x
<i>etes intermedius</i>		x	x				x
<i>etes crozetensis</i>	x		x			x	x
<i>etes macquariensis</i>			x			x	x
<i>etes belgicae</i>			x				x
<i>zetes antarcticus</i>							x
<i>djeani</i>			x				
<i>arus auberti</i>	x		x			x	x
<i>bothria monodactyla</i>	x	x				x	
<i>colobates tridentatus</i>	x		xx				x
<i>ia rotunda</i>	x		x			x	x
<i>ites anareensis</i>	x		x			x	x
<i>ites elegans</i>							
<i>ius augusti</i>		x					x

denotes a habitat where the great majority of a species was found to occur.

D. Species showing seasonal distribution.

Species	Larvae	Pupa	Adults
<i>Scoparia mawsoni</i>	all year	Oct.-Feb.	Nov.-Mar.
<i>Erioptera pilipes macquariensis</i>	Dec.-Oct.	Oct., Nov.	Nov.-Apr.
<i>Halirytus macquariensis</i>	all year	all year?	Oct.-May
<i>Ephydrella macquariensis</i>	Dec.-Oct.	Oct., Nov.	Nov.-Apr.
<i>Schoenophilus pedestris</i>	all year	?	Oct.-June
Genus 1 (CERCOMEGISTIDAE)	?	?	Oct.-Apr.?

E. Species probably introduced by man.

Species	Comments
<i>Rhopalosiphum padi</i>	Cosmopolitan species; collected only once on Wireless Hill (i.e., near station)
<i>Smittia</i> species	Associated with sheep dung; found only near station
<i>Alliphis siculus</i>	Associated with sheep dung; found only near station
<i>Cheyletus eruditus</i>	Common mite of food stores
<i>Acarus siro</i>	Common mite of grain stores
<i>Tyrophagus longior</i>	Usually occurring in food stores
<i>Glycyphagus domesticus</i>	Common mite of bird nests and food stores; possibly introduced by birds

F. Species apparently not well established on the island.

Species	Collection Sites
<i>Rhopalosiphum padi</i>	Wireless Hill
<i>Smittia</i> species	Camp Hill, Wireless Hill
<i>Lepidocyrtus cyaneus cinereus</i>	Nuggets Point
<i>Eugamasus</i> species 1	Nuggets Point, Wireless Hill
<i>Eugamasus</i> species 2	Nuggets Point, Isthmus
<i>Eugamasus</i> species 3	Nuggets Point
<i>Eugamasus</i> species 4	Nuggets Point
<i>Eugamasus</i> species 5	Nuggets Point
<i>Pergamasus</i> species 1	Nuggets Point
<i>Pergamasus</i> species 2	Nuggets Point
<i>Ayersacarus plumapilus</i>	Mount Elder
<i>Geolaelaps evansi</i>	Green Gorge
<i>Haemolaelaps pachyptilae</i>	Gadget Gully
<i>Haemogamasus pontiger</i>	Isthmus
<i>Iphidozercon</i> species	Garden Cove, Nuggets Beach
POLYASPIDAE Genus 1	Catch-me Point
<i>Alliphis siculus</i>	Camp Hill
<i>Neopygmephorus sellnicki</i>	First Gully
<i>Neopygmephorus togatus</i>	Mount Hamilton
<i>Halotydeus</i> species	Nuggets Point

<i>Isobacterus</i> species	Aerial Cove
<i>Cheyletus eruditus</i>	Isthmus station
<i>Caloglyphus</i> species	Isthmus station
<i>Tyrophagus longior</i>	Isthmus (including Catch-me Cave)
<i>Hyadesia</i> species	Buckles Bay
<i>Glycyphagus</i> species	North Head
? <i>Wichmannia</i> species	Halfmoon Bay
? <i>Bonomia</i> or ? <i>Spinanoetus</i>	Lambing Gully
? <i>Algophagus</i> species	North Head
<i>Andacarus watsoni</i>	Aerial Cove
<i>Totobates elegans</i>	Northern plateau, Handspike Point

In addition, the following species have been collected only from habitats around the Isthmus, the northern peninsula, and slopes and gullies between Nuggets Point and the Isthmus.

<i>Psychoda parthenogenetica</i>	Various sites north of Langdon Point and Green Gorge
<i>Dendrolaelaps schusteri</i>	Nuggets Point, Gadget Gully, Aerial Cove, North Head, Camp Hill
<i>Dendrolaelaps watsoni</i>	Gadget Gully, Aerial Cove, Wireless Hill, North Head
<i>Dendrolaelaps kargi</i>	Isthmus, Garden Cove, North Head
<i>Ameroseius</i> species	First Gully, Garden Cove, Wireless Hill, North Head
POLYASPIDAE Genus 2	Nuggets Beach, Aerial Cove, Garden Cove
<i>Neomycobates tridentatus</i>	Hasselborough Bay, Isthmus, Gadget Gully, Garden Cove

G. Species possibly indigenous to Macquarie Island and antarctic-subantarctic region.

Species	Known only from Macquarie I.	Known only from antarctic and subantarctic region	First report from Macq. I.
<i>Hypogastrura antarctica</i>		S. Shetland Islands	1962
<i>Sorensia subflava</i>		Auckland, Campbell islands	1949
<i>Parisotoma octooculata ovata</i>		Auckland, Campbell islands	1949
<i>Lepidobrya mawsoni</i>		Campbell I.	1920
<i>Mesaphorura</i> sp. nov.	x		1966
<i>Subantarctica</i> sp. nov.	x		1966
<i>Parafolsomia</i> sp. nov.	x		1966
<i>Cryptopygus</i> sp. nov.	x		1966
<i>Isotoma</i> sp. nov.	x		1966
<i>Katianna banzareii</i>	x		1964
<i>Metakatianna gressitti</i>	x		1964
<i>Austropsocus insularis</i>	x		1962
<i>Physemothrips chrysodermus</i>	x		1962
<i>Eudoria mawsoni</i>	x		(1937) 1962
<i>Erioptera pilipes macquariensis</i>	x		(1937) 1962
<i>Bradysia watsoni</i>	x		1962
<i>Halirytus macquariensis</i>	x		1962
<i>Smittia</i> species	x		1962
<i>Apetaenus watsoni</i>	x		(1937) 1962
<i>Coelopa curvipes</i>		N.Z., Auckland, Chatham islands	(1894) 1962
<i>Coelopa nigrifrons</i>	x		1894
<i>Ephydrella macquariensis</i>	x		(1937) 1962
<i>Schoenophilus pedestris</i>	x		1909
<i>Australimyza macquariensis</i>	x		1937
<i>Omaliomimus albipenne</i>		Auckland, Campbell islands	(1920) 1966
<i>Omaliomimus venator</i>		Auckland, Campbell islands	1966
<i>Stenomaliium helmsi</i>		N.Z.	1966
<i>Stenomaliium sulcithorax</i>		N.Z.	(1937) 1966
<i>Halmaeus antarctica</i>		Antarctica	(1937) 1966

<i>Myro kerguelensis</i>		Heard, Crozet, Kerguelen islands	1909
<i>Mynoglenes marrineri</i>		Auckland, Campbell islands	1917
		Antarctica	
<i>Mynoglenes insolens</i>		Auckland, Campbell, Chatham islands	1939
<i>Eugamasus</i> species 1	x?		1966
<i>Eugamasus</i> species 2	x?		1966
<i>Eugamasus</i> species 3	x?		1966
<i>Eugamasus</i> species 4	x?		1966
<i>Eugamasus</i> species 5	x?		1966
<i>Pergamasus</i> species 1	x?		1966
<i>Pergamasus</i> species 2	x?		1966
<i>Cyrrhodrolaelaps watsoni</i>	x		1966
<i>Dendrolaelaps kargi</i>	x		1966
<i>Dendrolaelaps schusteri</i>	x		1966
<i>Dendrolaelaps watsoni</i>	x		1966
<i>Gamasellus</i> (H.) antarcticus		Antarctica	1966
<i>Gamasellus</i> (H.) macquariensis	x		1966
<i>Gamasellus</i> (H.) schusteri	x		1966
<i>Gamasellus</i> (G.) watsoni	x		1966
<i>Gamasiphis watsoni</i>	x		1966
<i>Hydrogamasus</i> (A.) watsoni	x		1966
<i>Ayersacarus gelidus</i>		Campbell I.	1964
<i>Ayersacarus plumapilus</i>		Campbell I.	1964
<i>Ayersacarus strandtmanni</i>	x		1964
<i>Hypoaspis evansi</i>	x		1964
<i>Androlaelaps pachyptilae</i>		Auckland, Campbell, Heard islands	1964
<i>Iphidozercon</i> species	x?		1966
<i>Ameroseius</i> species		Campbell Is.	1966
<i>Uropoda</i> species 1 sp. nov.	x		1966
<i>Uropoda</i> species 2 sp. nov.	x		1966
<i>Uropoda</i> species 3 sp. nov.	x		1966
POLYASPIDAE			
species 1 sp. nov.	x		1966
POLYASPIDAE			
species 2 sp. nov.	x		1966
CERCOMEGISTIDAE			
species 1 sp. nov.	x		1966
CERCOMEGISTIDAE			
species 2 sp. nov.	x		1966
<i>Neopygmephorus tripartitus</i>	x		1964
<i>Nanorchestes antarcticus</i>		Antarctica	1966
<i>Eupodes</i> sp. nov.	x		1966
<i>Protereunetes</i> sp. nov.	x?		1966
<i>Halotydeus</i> species	x		1966
<i>Rhagidia macquariensis</i>	x		1963
<i>Tydeus</i> sp. nov.	x		1966
<i>Ereynetes macquariensis</i>	x		1966
<i>Ereynetoides watsoni</i>	x		1962
<i>Bdellodes macquariensis</i>	x		1962
<i>Bdellodes watsoni</i>	x		1963
<i>Isobactrus</i> species	x	(near largest of Kerguelen islands)	1966
<i>Calvolia</i> sp. nov.	x		1966
<i>Hyadesia</i> sp. nov.	x		1966
<i>Carpoglyphus</i> sp. nov.	x		1966
<i>Andacarus watsoni</i>	x		1964
<i>Holonothrus foliatus</i>	x	Crozet I.	(1958) 1963
<i>Oppia crozetensis</i>		Kerguelen, St. Paul islands	1937
<i>Halozetes marinus</i>			(1958) 1963
<i>Halozetes intermedius</i>	x	Crozet, Heard, Kerguelen islands	(1958) 1963
<i>Halozetes crozetensis</i>	x		1963
<i>Halozetes macquariensis</i>	x		(1958) 1963
<i>Halozetes belgicae brevipilis</i>	x		1958
<i>Alaskozetes antarcticus</i>		Heard I.	1958
grandjeani	x	Heard, Kerguelen islands	
	x		1958
	x		1958

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