

### Suggestions for Manuscripts

Manuscripts intended for publication should be submitted in duplicate (original and one carbon), typewritten in double or triple space with ample margins on white bond paper (8 1/2 by 11 inches). Pages should be numbered consecutively. Fragmentary sheets and slips pinned or pasted on are not acceptable. Footnotes should be numbered consecutively and inserted in the manuscript immediately below the citation, separated from text by lines; they should be used only where necessary. Correct names and references are the responsibility of the author and should be checked for accuracy.

Illustrations should be drawn to allow for one-half or one-third reduction to page size (4 1/2 x 7 inches). Maps and sketches drawn to scale should have the scale plainly indicated. A complete list of figure legends and a duplicate print of each plate of figures are required to be submitted with the manuscript.

Tables and graphs should be used only where necessary, and omitted if essentially the same information is given in the paper. Graphs and figures should be drawn in India ink on white paper or tracing cloth or light blue cross-hatched paper.

Proof should be corrected as soon as received and returned to the editor with an abstract on forms provided. Additional costs to the Society for author's corrections in proof may be charged to the author. An order for reprints should be placed with the editor when proof is returned. Fifty copies of reprints will be supplied by the Society to each author under certain circumstances.

Examination of articles in this issue will help to confirm to the style of presentation desired.

## PROCEEDINGS

of the

## Hawaiian Entomological Society

VOL. XIX, No. 2

FOR THE YEAR 1965

SEPTEMBER, 1966

11, JANUARY 1965

The 709th meeting of the Hawaiian Entomological Society was called to order by President Mitchell at 2:00 P. M. in Agee Hall, Hawaiian Sugar Planters' Assn. (HSPA) Experiment Station, Honolulu.

Members present: Ashlock, Beardsley, Bess, Bianchi, Chock, Clagg, Davidson, Davis, Ganesalingam, Harrell, Holway, Joyce, Kajiwaru, Krauss, Look, Mitchell, Nakao, Nakata, Nishida, Pemberton, Perkins, Quate, Ross, Shiroma, Suchiro, Suman, Tenorio, Thistle, Tsuda, Voss, Wilson, Woolford, and Yoshimoto.

Visitors: Stanley F. Bailey, Blair R. Bartlett, Duane Gubler, Carleton Phillips, and Ellis Traughton.

Ronald Mau, Harry Kaya, and Mutsuo Miyatake were elected unanimously to membership in the Society.

Drs. Blair Bartlett and Stanley Bailey, visiting professors in Entomology at the University of Hawaii, spoke about their visit here. A movie, "The Sentinels of Agriculture", prepared by the Bureau of Entomology and Plant Quarantine, California State Department of Agriculture, was shown.

### NOTES AND EXHIBITIONS

**Rubus rogersi** Linton: N. L. H. Krauss reported on this wild blackberry, identified by the Royal Botanic Gardens, Kew, England, and native to England and Ireland. It has invaded the forest around Kokee, Kauai and has become a major pest. Specimens were collected at Kalalau Lookout, Kokee, 4,000 ft, 10, March 1963. The wild blackberry at Olinda, Maui previously was identified as *Rubus lucidus* Rydberg, a southeastern United States species (P. H. E. S., 18 (1) 8: 11-12, 1962). One or two additional species of introduced wild *Rubus* may occur on Hawaii.

**Hypothenemus pubescens** Hopkins: N. L. H. Krauss exhibited this immigrant scolytid, a new pest record for the island of Hawaii, which was recovered from Bermuda grass on the Kona Coast of Hawaii by Carl Gaddis, 16, December 1964. *H. pubescens* was reported for the first time in the state from Maui and Molokai during November, 1964 and from Oahu on 7, December 1964.

**Mosquito survey of some islands of the Central Pacific:**

## INSECTS AND OTHER TERRESTRIAL ARTHROPODS FROM THE LEEWARD HAWAIIAN ISLANDS<sup>1</sup>

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### INTRODUCTION

The Leeward Hawaiian Islands comprise a chain of small rocky islets, and coral atolls which extend west-northwest of Kauai. Nihoa, the nearest, is about 150 miles from Kauai, while Kure, the furthestmost, is some 1,150 miles away (see map, p. 158). All Leeward Islands except Midway and Kure are now a part of the Hawaiian Islands National Wildlife Refuge administered by the U.S. Fish and Wildlife Service.

This paper summarizes results of recent entomological field work in these islands, and attempts to update the existing lists of insects and other terrestrial arthropods known.

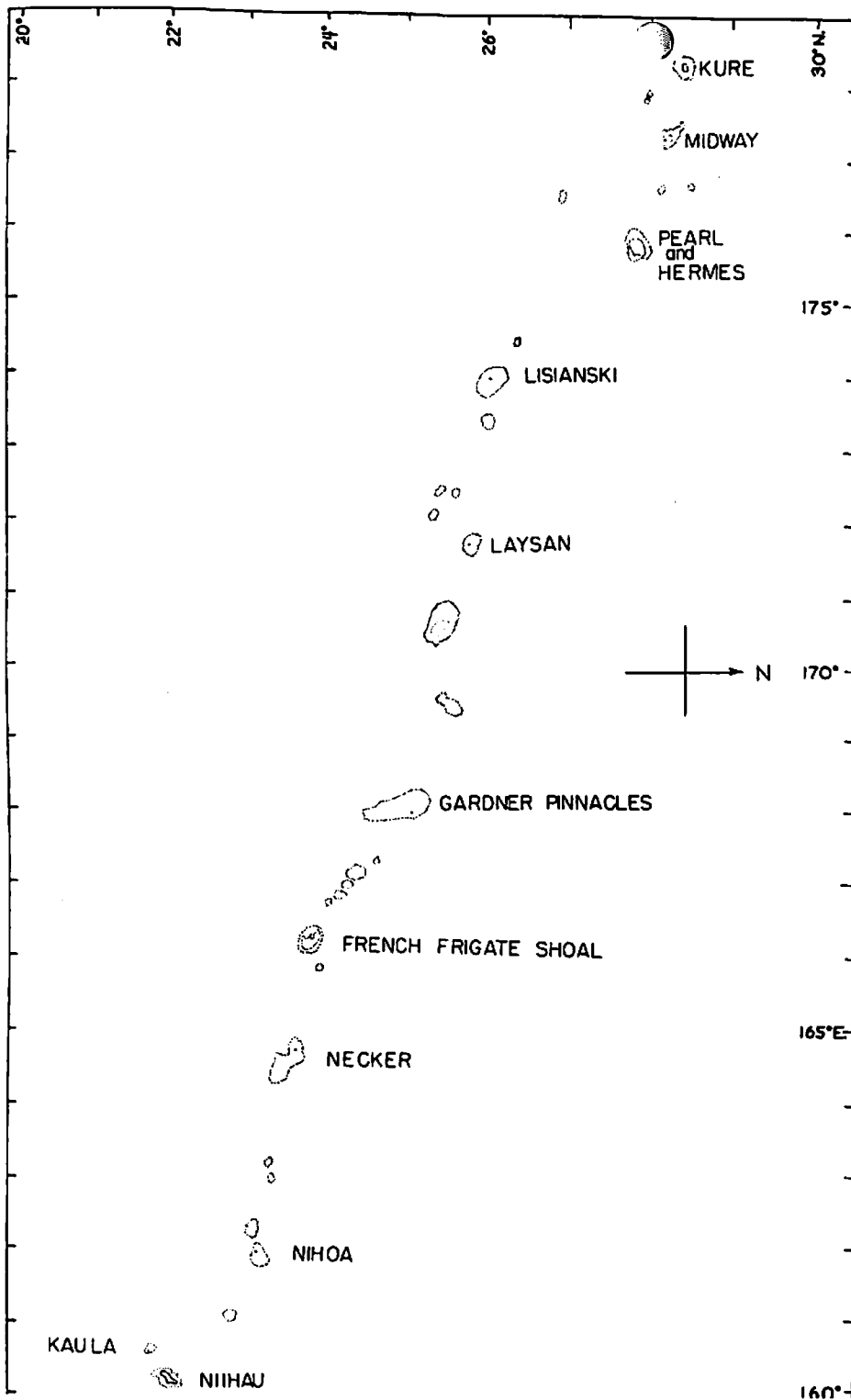
The terrestrial arthropod fauna of these islands is a mixture of endemic or indigenous elements and recently, adventive forms. The numbers of endemic species are greatest on the two relatively undisturbed southeastern volcanic islands of Nihoa and Necker, and apparently have disappeared largely from the more northwesterly atolls where, in most cases, the original vegetation has changed drastically in the past 100 years or so. Extinction of native plants and endemic insects has been documented fairly well for Laysan (Christophersen & Caum, 1931, Butler & Usinger, 1963a). Unfortunately, less is known about the original biota of the other atolls.

Most recent immigrant insects now known from the Leeward Islands occur also on the larger inhabited islands of Hawaii; however, two species could become serious crop pests should they spread into agricultural areas of the state. The Egyptian cotton moth, *Spodoptera litura* (Fabricius), is established on Pearl and Hermes Atolls and may be present also on Kure Atoll and Midway. In addition to cotton, this insect is also a pest of many garden and truck crops throughout the tropical and subtropical areas of the Old World and on many south and western Pacific islands. A species of scarab beetle, *Anomala sulcatula* Burmeister, known as a pest of sugar cane in the Philippine and Mariana Islands, is present on Midway Island.

New immigrant arthropods are continuing to invade and spread within the Leeward Islands. Such immigrants may have profound effects upon the delicate ecosystems of these small islands. Therefore, it seems worthwhile to record the recently discovered additions to the known terrestrial faunas for the benefit of ornithologists, ecologists, and others concerned with the biota of these islands.

<sup>1</sup>Published with the approval of the Director of the Hawaii Agricultural Experiment Station as Technical Paper No. 784.

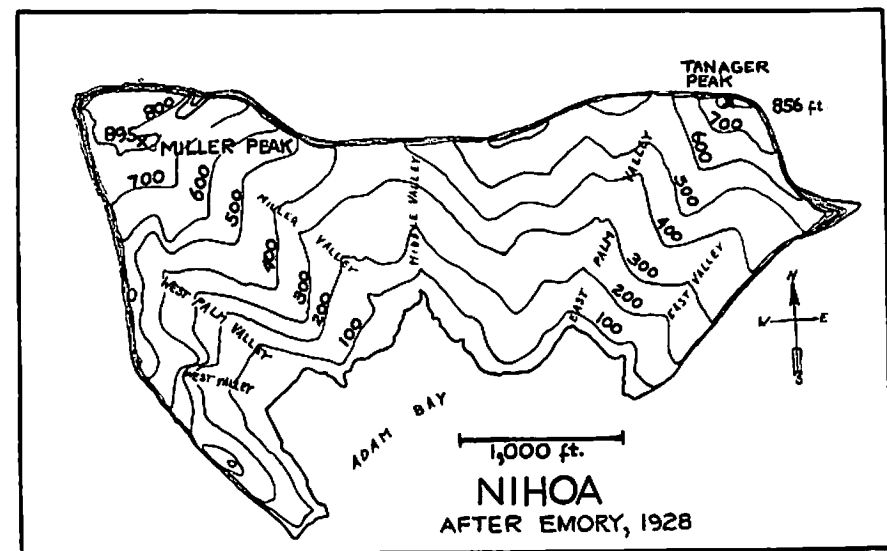
Beardsley, 1966



The principal work on terrestrial arthropods of the Leeward Islands (Bryan et al. 1926) deals with material collected by the 1923 Tanager Expedition and other earlier collectors. This paper contains a nearly complete listing of the species then known from each of the islands. Several recent papers list arthropods known to be from the following islands: Laysan (Butler 1961, Butler & Usinger 1963 a), Midway (Suchiro 1960), and Kure (Butler & Usinger 1963b). No attempt is made here to duplicate lists for these islands, although a few new records from my own recent collecting are given. A relatively complete list is provided for each remaining island I visited. I have indicated also the collection dates (year), pertinent host and other ecological data, abundance, etc.

One group of insects, the Mallophaga, is not included since they are being worked on by others. Published records of Mallophaga from the Leeward Islands are principally from Laysan Island (Thompson 1948; Zimmerman 1948, Vol. 2; Butler & Usinger 1963a), although the species concerned probably will be found wherever their avian hosts occur.

I am indebted to the following persons for assistance in identifying specimens: P. D. Ashlock, F. A. Bianchi, E. A. Chapin, Mrs. D. Fellows, D. E. Hardy, D. F. Hardwick, Louise M. Russell, C. W. Sabrosky, T. W. Suman, E. L. Todd, N. Wilson, W. W. Wirth, C. M. Yoshimoto, and E. C. Zimmerman. Other identifications are from Bryan (1926) or were made by this writer. Most Tanager Expedition material is at the Bernice P. Bishop Museum in Honolulu, and where misidentifications in Bryan's list are indicated, I have examined the specimens. Specimens collected by me in 1962 and 1964 will be placed in the Bishop Museum with duplicates in the collection of the Entomology Department,



University of Hawaii.

New island records in the species lists which follow are indicated by an asterisk.

Thanks are due the U.S. Fish and Wildlife Service (particularly to E. Kridler of the Honolulu office), the State of Hawaii Division of Fish and Game, personnel of the U. S. Navy and U. S. Coast Guard for making possible my field work in the Leeward Islands during 1962 and 1964 and to E. H. Bryan, Jr. of the B. P. Bishop Museum who kindly supplied maps and other information used to prepare the figures.

#### NIHOA ISLAND

Nihoa Island, the nearest and highest of the Leeward Islands, is a steep rocky remnant of a former extensive volcanic dome. The island's area is about 156 acres; the highest point about 895 feet (Emory, 1928). Although Nihoa was the site of a prehistoric Hawaiian settlement, it remains in a relatively undisturbed condition. The island is covered sparsely with a scrubby growth of native plants, predominantly *Chenopodium oahuense*, *Sida cordifolia*, *Solanum nelsoni*, *Sesbania tomentosa* and *Portulaca lutea*, with native bunch grass *Eragrostis variabilis* along some of the higher ridges, *Euphorbia celastroides* as a prostrate shrub above 800 feet on Miller Peak (the highest point on the island), and an endemic fan palm *Pritchardia remota* in scattered groves in two of the larger gulches. Other less prominent plants include *Amaranthus brownii*, *Panicum torridum*, *Rumex giganteus*, *Sicyos microcarpus*, and *Tribulus cistoides*. A few others are recorded which I did not see (Christophersen & Caum, 1931). All the plants are considered to be native, and, apparently, there are no recently established exotic weeds present.

I spent about 7 hours on Nihoa on 10, June 1962 and one night and most of two days in September, 1964. The vegetation was relatively green, indicating recent abundant rainfall in June, 1962, but was much drier in September, 1964. A total of 102 species of terrestrial arthropods was collected or observed during these two visits; 51 are new records. Of the 72 species listed by Bryan, 21 were not collected in 1962 or 1964. Of the 123 species listed below, at least 35 are restricted either to the island or are species endemic to the Hawaiian Archipelago.

In addition to the arthropods listed, a small gecko, *Lepidodactylus lugubris* Dumeril & Bibron (determined by Karl Frogner, University of Hawaii Department of Zoology) was taken in *Eragrostis* clumps in 1964, and appears to be a recently established immigrant.

#### CRUSTACEA (Det. by Mrs. D. Fellows)

##### ISOPODA

#### Armadillidae

\**Armadillidium* or *Spherillo* sp., 1964, in *Eragrostis* clumps.

#### Porcellionidae

\**Porcellio* (?) sp., immature specimen; 1964, in *Eragrostis* clumps.

#### ARACHNIDA

##### PSEUDOSCORPIONIDA

\*undetermined genus and species, 1964.

##### ARANEIDA (Det. by T. W. Suman)

#### Argiopidae

\*unidentified genus and species (mature ♀); 1964.

#### Clubionidae

\**Chiracanthium diversum* L. Koch; 1964.

#### Oonopidae

\**Gamasomorpha* sp. (1 ♀); 1964.

#### Salticidae

\*unidentified genus and species; 1964.

#### Thomisidae

\*unidentified genus and species (immature ♂); 1964.

#### INSECTA

##### THYSANURA

#### Lepismatidae

*Acrotelsella hawaiiensis* (Silvestri); 1923. Listed by Bryan as an undetermined species (see Zimmerman 1948, 2: 36).

##### COLLEMBOLA

\*undetermined genus and species; 1964.

##### ORTHOPTERA

#### Blattidae

*Cutilia soror* (Brunner); 1923; 1964.

*Periplaneta americana* (L.); 1923.

*Periplaneta australasiae* (Fabricius); 1923; 1964.

*Pycnoscelus surinamensis* (L.); 1923; 1964.

#### Tettigoniidae

*Banza nihoa* Hebard; 1923; 1964, in *Eragrostis* clumps.

##### DERMAPTERA

#### Labiduridae

*Euborellia annulipes* (Lucas); 1923; 1964.

##### PSOCOPTERA

undetermined genus and species; 1923; 1964.

##### THYSANOPTERA (Det. by F. A. Bianchi)

#### Thripidae

\**Frankliniella sulphurea* (Schmutz); 1962; 1964, in flowers of *Sesbania*, *Tribulus* & *Solanum*.



## COLEOPTERA

**Staphylinidae**

*Atheta coriaria* Kraatz; 1923.

**Coccinellidae**

*Coelophora inaequalis* (Fabricius); 1923, fragments (elytra) only.

\**Scymnus debilis* Leconte; 1964, on *Eragrostis*.

*Scymnus loewii* Mulsant; 1923; 1962, feeding on *Platyococcus* on *Pritchardia*; 1964, on *Chenopodium* and *Euphorbia*. Listed by Bryan as *Pullus kinbergi* (Boheman).

"*Scymnus* sp., near *bipunctatus*"; 1923, specimens not located.

**Nitidulidae**

\**Carpophilus dimidiatus* (Fabricius); 1964.

**Cucujidae**

*Cryptomorpha desjardinsi* Guenée; 1923.

**Lathridiidae**

\**Lathridius* (?) sp.; 1962, ex *Eragrostis*, one.

**Dermestidae**

*Dermestes ater* De Geer; 1923; 1964, under dead birds. Listed by Bryan as *D. cadaverinus* Fabricius.

*Dermestes frischii* Kugelam; 1923; 1964, under dead birds. Misidentified in Bryan's list as *D. vulpinus* Fabricius.

*Labrocera* sp.; 1923; 1964, on *Euphorbia celastroides*.

**Tenebrionidae**

*Sciophagus pandanicola* (Boisduval); 1923; 1964. Listed by Bryan as an undetermined species.

**Histeridae**

\**Saprinus lugens* Erichson; 1964, under dead birds.

**Anobiidae**

\**Xyletobius gossypii* Ford (?); 1964, at light.

**Cioidae**

*Cis vagans* Perkins; 1923; 1964, on *Euphorbia*.

**Cleridae**

*Necrobia rufipes* De Geer; 1923.

**Cerambycidae**

*Plagithmysus nihoae* Perkins; 1923, ex *Euphorbia* stems.

**Chrysomelidae**

*Epitrix hirtipennis* (Melsheimer); 1923; 1962; 1964, feeding on *Solanum nelsoni*. Misidentified in Bryan's list as *E. parvula* (Fabricius).

**Anthribidae**

*Araecerus fasciculatus* (De Geer); 1923; 1962; 1964, adults at light, on *Chenopodium* and on *Euphorbia*.

**Curculionidae**

*Oodemus breviscapum* Perkins; 1923; 1962; 1964, ex *Eragrostis*.

*Oodemus erro* Perkins; 1923; 1964.

*Oodemus laysanensis* Fullaway; 1923; 1962; 1964, reared from larvae in

*Chenopodium* stems.

*Pentharthrum pritchardiae* Perkins; 1923, on *Pritchardia*.

*Rhyncogonus exsul* Perkins; 1923; 1962, adults abundant on *Chenopodium*; 1964, a few adults in *Eragrostis* clumps.

**Proterhinidae**

*Proterhinus abundans* Perkins; 1923; 1964, on *Euphorbia*.

*Proterhinus bryani* Perkins; 1923, on *Euphorbia*.

## DIPTERA

**Chironomidae** (Det. by D. E. Hardy)

\**Chironomus esakii* Tokunaga, 1962.

\**Telmatogeton pacificus* Tokunaga; 1964.

**Dolichopodidae**

*Paraphrosylus acrosticalis* (Parent); 1923. Listed by Bryan as *P.* sp. (see Hardy, 1964:249).

**Syrphidae**

\**Ischiodon grandicornis* Macquart (?); 1962, seen flying but not captured.

**Ephydriidae**

*Neoscatella sexnotata* (Cresson); 1923; 1962, 1964.

\**Atissia antennalis* Aldrich (Det. by W. W. Wirth); 1962, one specimen.

**Canaceidae**

*Canaceoides nudata* (Cresson); 1923. Reported by Bryan in 1932.

**Sphaeroceridae**

\**Leptocera hirtula* (Rondani) (?); 1962; 1964.

**Asteiidae**

*Bryania bipunctata* Aldrich; 1923; 1962; 1964. Listed by Bryan as an undetermined Asteinae.

\*New genus and species (Det. by C. W. Sabrosky); 1962.

**Drosophilidae** (Det. by D. E. Hardy)

\**Scaptomyza* (*Bunostoma*) sp.; possibly *hamata* Hardy; 1962 (one ♀)

\**Scaptomyza* (*Parascaptomyza*) *pallida* Zetterstedt; 1962, one specimen.

**Agromyzidae**

*Liriomyza* sp.; 1923. Listed by Bryan as *Agromyza pusilla* Meigen.

\**Pseudonapomyza spicata* (Malloch) (Det. by D. E. Hardy); 1962, one specimen.

**Milichiidae**

*Milichiella orientalis* Malloch; 1923. Listed by Bryan (1926) as an undetermined Milichiinae, and subsequently determined by Aldrich (Bryan, 1931).

\**Leptometopa* n. sp. (Det. by C. W. Sabrosky); 1962; 1964, plentiful.

**Chloropidae**

*Siphunculina signata* (Wollaston); 1925; 1962; 1964, abundant.

**Tachinidae**

*Achaetoneura archippivora* (Williston); 1923.

**Sarcophagidae**

*Goniphyto bryani* Souza-Lopez; 1923; 1962; 1964. Listed by Bryan as an undetermined species.

**Calliphoridae**

*Lucilia sericata* Meigen (?); 1923; 1962; 1964.

**Hippoboscidae**

*Olfersia spinifera* Leach; 1923; 1962; 1964, adults at light.

## HYMENOPTERA

**Braconidae**

\**Apanteles marginiventris* Cresson; 1962, reared from *Hilicoverpa* larva; 1964.

\**Chelonus blackburni* Cameron; 1962; 1964.

*Doryctes pallidiceps* (Perkins); 1923.

**Ichneumonidae**

*Horogenes blackburni* Cameron 1923; 1962; 1964.

**Mymaridae** (Det. by C. M. Yoshimoto)

\**Lymaenon mexicanus* Perkins; 1964.

**Eulophidae**

*Euderus metallicus* Ashmead; 1923.

*Hemiptarsenus semialbiclavus* (Girault); 1923; 1964. Listed by Bryan as *Pseudophelminus vagans* Timberlake, a synonym.

**Eupelmidae**

*Eupelmus nihoaensis* Timberlake; 1923.

*Lepideupelmus bryani* Timberlake; 1923.

*Lepideupelmus robustus* Timberlake; 1923; 1962; 1964.

**Pteromalidae**

\**Spalangia drosophilae* Ashmead (Det. by C. M. Yoshimoto); 1962; 1964.

**Diapriidae**

\*genus and species unidentified; 1964.

**Bethylidae**

*Sclerodermus nihoaensis* Timberlake; 1923.

**Formicidae**

*Monomorium floricola* (Jerdon); 1923; 1964.

*Phrenolepis longicornis* Fabricius; 1923; 1964.

*Tapinoma melanocephalum* (Fabricius); 1923; 1962; 1964.

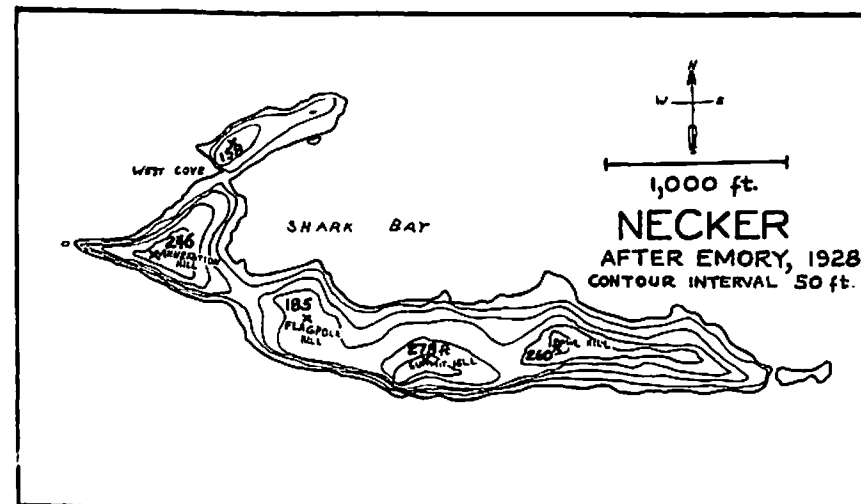
*Tetramorium guineense* (Fabricius); 1923; 1962; 1964.

**Hylaeidae**

*Nesoprosopis perkinsiana* Timberlake; 1923; 1964.

## NECKER ISLAND

Necker Island, 300 miles northwest of Kauai, is both smaller and lower than Nihoa and consists of a long, roughly hook-shaped ridge with steep sides and a fairly broad, easily traversable summit at 150-200 ft elevation. The highest elevation is 278 feet, and the land area is about 41 acres



(Emory, 1928). The surface is rocky and is partly clothed with sparse, scrubby vegetation. During June, 1962, I spent approximately three hours on the island, and during September, 1964, one night and most of two days.

The flora of Necker includes only five species of vascular plants: *Chenopodium oahuense*, *Panicum torridum*, *Portulaca lutea*, *Sesbania tomentosa*, and *Sesuvium portulacastrum* (Christophersen and Caum, 1931). Despite the simplicity of the flora, the terrestrial fauna includes a fair number of apparently endemic arthropods. Of the approximately 69 species here recorded, about 20 are known only from Necker, or from Necker and Nihoa. Twenty-eight of the species reported below are new records. Of the 41 species previously recorded, 10 were not re-collected in 1962 or 1964.

## CRUSTACEA

ISOPODA (Det. by Mrs. D. Fellows)

**Porcellionidae**

\**Porcellio* sp., Prob. *laevis*\* Latrielle; 1964, on rocks, 30 feet above sea level.

## ARACHNIDA

ARANEIDA (Det. by T. W. Suman)

**Lycosidae**

\**Lycosa* sp.; 1962; 1964.

**Salticidae**

\*genus and species not identified; 1964.

**Scytodidae**

\**Scytodes striatipes* (L. Koch); 1964.



**Dermestidae**

*Dermestes maculatus* De Geer; 1923. Listed by Bryan as *D. vulpinus* Fabricius; specimen not located.

*Dermestes ater* De Geer; 1923; 1964. Listed by Bryan as *D. cadaverinus* Fabricius.

*Labrocerus* sp.; 1923.

**Histeridae**

\**Acrilus* sp.; 1962, ex ground litter.

**Tenebrionidae**

*Sciophagus pandanicola* (Boisduval); 1923; 1964. Listed by Bryan as an unidentified tenebrionid.

**Elateridae**

*Itodactylus novicornis* Van Zwaluwenburg; 1923; 1964, under rocks under *Chenopodium*.

\**Itodactylus* sp.; 1964, under rocks under *Chenopodium*.

**Anthribidae**

*Araecerus fasciculatus* (De Geer); 1923; 1964.

**Curculionidae**

*Rhyncogonus biformis* Perkins; 1923; 1964, plentiful under *Chenopodium* bushes.

*Oodemus laysanensis* Fullaway; 1923; 1964, ex *Chenopodium* twigs.

*Oodemus neckerensis* Perkins; 1923; 1964.

## DIPTERA

**Chironomidae** (Det. by D. E. Hardy)

\**Telmatogeton pacificus* Tokunaga; 1964, adults at light.

**Ceratopogonidae**

\*genus and species not yet identified; 1964.

**Dolichopodidae**

*Paraphrosylus acrosticalis* (Parent); 1923. Listed by Bryan as *P.* sp.

**Phoridae**

\**Diploneura peregrina* (Wiedemann); 1964.

**Ephydriidae**

*Neoscatella sexnotata* (Cresson); 1923; 1962; 1964.

*Atissia antennalis* Aldrich; 1923. Not listed by Bryan (1926), but description based on specimens from Necker collected by Tanager Expedition (Aldrich, 1931).

**Sphaeroceridae**

\**Leptocera hirtula* (Rondani) (?); 1964.

**Asteiidae**

\*New genus and species (Det. by D. E. Hardy); 1964 (same as Nihoa species).

**Chloropidae**

*Siphunculina signata* Wollaston; 1923; 1962; 1964.

**Milichiidae**

*Milichiella orientalis* Malloch; 1923. Not listed by Bryan (1926), but a specimen from Necker was subsequently determined by Aldrich (Bryan, 1931).

\**Leptomelopa* n. sp. (Det. by C. W. Sabrosky); 1964.

**Sarcophagidae**

*Goniophyto bryani* Souza Lopez; 1923; 1962; 1964.

**Hippoboscidae**

*Olfersia spinifera* Leach; 1923; 1964, adults at light.

## HYMENOPTERA

**Encyrtidae**

\**Anagyrus* n. sp.; 1964, reared from *Pseudococcus* n. sp. on *Chenopodium*.

**Eupelmidae**

*Lepideupelmus robustus* Timberlake; 1923; 1964.

**Signiphoridae**

\**Thysanus aspidioti* Ashmead; 1964, reared from *Hemiberlesia lataniae* on *Chenopodium*.

**Pteromalidae** (Det. by C. M. Yoshimoto)

\**Spalangia drosophilae* Ashmead; 1964.

**Formicidae**

*Cardiocondyla nuda minutior* Forel; 1923; 1964.

*Monomorium minutum* Mayr; 1923; 1964.

*Ponera kalakauae* Forel; 1923.

*Tetramorium guineense* (Fabricius); 1923; 1962; 1964.

## FRENCH FRIGATE SHOAL

French Frigate Shoal, situated about 80 miles west of Necker, is a group of about a dozen small coralline islets with a total land area of some 50 acres enclosed within a large reef. The largest islet, Tern Island, is the site of a U.S. Coast Guard Station and is occupied now almost entirely by the airstrip, buildings, and other facilities associated with the station. Vegetation of a limited sort occurs on 6 or 7 of the islets. La Parouse Rock, a small remnant of the original volcanic dome, lies outside the fringing reef and, apparently, is void of higher plant life.

During the Tanager Expedition visit in 1923 only 6 species of vascular plants were found: *Boerhavia diffusa*, *Chenopodium oahuense*, *Ipomoea pes-caprae*, *Portulaca lutea* and *Tribulus cistoides*, (Christophersen & Caum, 1931). In addition to these, there are now several introduced weeds and a few ornamentals on Tern Island.

In June, 1962, I spent a few hours collecting on Tern Island, and in September, 1964, I made brief visits to Trig, Whale-Skate, and East Islets. Fifty-two species of terrestrial arthropods from the atoll are listed below, of which 25 are new records. Of the 27 species listed by Bryan (1926), 11 were not collected in 1962 or 1964.

*Deltocephalus sonorus* Ball; 1962, Tern I.; 1964, Trig I., on grass.

### Aphididae

*Aphis craccivora* Koch; 1923; 1964, Whale-Skate I., East I., on *Chenopodium*, *Tribulus* and *Portulaca*. Listed by Bryan as *A. medicinis* Koch.

### Pseudococcidae

\**Ferrisia virgata* (Cockerell); 1964, Trig I., on *Portulaca* and *Boerhavia*.

### Coccidae

\**Saissetia oleae* (Bernard); 1962, Tern I., on *Coccoloba uvifera* twigs.

### Diaspididae

\**Hemiberlesia lataniae* (Signoret); 1964, Whale-Skate I., on twigs and branches of *Chenopodium oahuense*.

\**Odonaspis ruthae* Kotinsky; 1962, Tern I., 1964 Trig I., on *Lepturus* stems.

## LEPIDOPTERA

### Noctuidae

*Agrotis kerri* Swezey; 1923.

\**Chrysodeixis chalcites* (Esper); 1962, Tern I., one reared from larva on *Messerschmidia argentea* foliage.

*Spodoptera exempta* (Walker); 1923. Misidentified in Bryan's list as *S. mauritia* (Boisduval).

### Pterophoridae

*Megalorhipida defectalis* (Walker); 1923; 1964, Trig I., Whale-Skate I., East I., on *Boerhavia*. Listed by Bryan as *Trichoptilus oxydactylus* (Walker).

### Pyralidae

*Hymenia recurvalis* (Fabricius); 1923.

### Tineidae

*Erunetis kerri* Swezey; 1923; 1964, Trig I.

*Tineola uterella* Walsingham; 1923.

### Tortricidae

*Crociosema plebiana* Zeller (?); 1923.

## COLEOPTERA

### Coccinellidae

*Scymnus lowei* Mulsant 1923; 1964, Trig I., Whale-Skate I. Listed by Bryan as *S. kinbergi* (Boheman).

### Dermestidae

*Dermestes ater* De Geer; 1923; 1964, Trig I. Listed by Bryan as *D. cadaverinus* Fabricius.

### Tenebrionidae

\**Alphilobius laevigatus* Fabricius; 1964, Whale-Skate I., under boards.

### Curculionidae

*Dryotribus mimeticus* Horn; 1923; 1964, Trig I., under driftwood.  
*Dryotribus wilderi* Perkins; 1923.

## DIPTERA

### Syrphidae

\**Ischiodon grandicornis* (Macquart); 1962, Tern I.; 1964, Trig I., Whale-Skate I., East I., adults flying, larvae preying on aphids.

### Dolichopodidae

*Paraphrosylus acrosticalis* (Parent); 1923. Listed by Bryan as *P. sp.*

### Ephydriidae

\**Hecamede persimilis* Hendel; 1962, Tern I.; 1964, Trig I., Whale-Skate I.

### Agromyzidae

\**Liriomyza* sp., *hawaiiensis* group; 1964, Tern I., reared from mines in *Tribulus* leaves, Trig I., Whale-Skate I.

### Chloropidae

*Siphunculina signata* Wollaston; 1923; 1962, Tern I.; 1964, Trig I., Whale-Skate I., East I.

### Sphaeroceridae

\**Leptocera hirtula* (Rondani)?; 1962, Tern I.; 1964, Trig I.

### Sarcophagidae

*Goniophyto bryani* Souza-Lopez; 1923; 1962, Tern I.; 1964, Trig I., Whale-Skate I., East I. Listed by Bryan as an undetermined species.

### Hippoboscidae

*Olfersia spinifera* Leach; 1923.

## HYMENOPTERA

### Eulophidae

\**Hemiptarsenus semialbiclavus* Girault; 1962, Tern I.; 1964, Tern I., reared from *Liriomyza* larvae in *Tribulus* leaves.

### Formicidae

*Cardiocondyla nuda* Mayr; 1923; 1964, Trig I.

\**Phrenolepis longicornis* (Latreille); 1962, Tern I.

*Ponera kalakauae* Forel; 1923.

\**Monomorium floricola* (Jerdon); 1962, Tern I.; 1964, Trig I.

*Monomorium pharaonis* (L.); 1923; 1964, Whale-Skate I.

\**Tetramorium guineense* (Fabricius); 1962, Tern I.

\**Tetramorium tonganum* Mayr; 1962, Tern I.

## LISIANSKI ISLAND

Lisianski Island, about 360 miles WNW of French Frigate Shoal and 100 miles WNW of Laysan, is a single, roughly rectangular low coraline



islet approximately one-half square mile in area. The greatest elevation is about 40 feet.

Lisianski is now covered with low vegetation, although it was almost completely denuded by rabbits prior to the arrival of the Tanager Expedition in 1923. The vascular plants present include *Scaevola frutescens* (mostly along the beach margins), *Eragrostis variabilis*, *Portulaca lutea* (?), *Nama sandwicensis* and *Tribulus cistoides*. A few ironwood trees (*Casuarina* sp.) are present, also.

Approximately 7 hours were spent collecting insects on Lisianski on 18. IX. 64. Thirty-five species of terrestrial arthropods are known now from the island, 21 being new records. Bryan (1926) listed only 13 species, 7 of which were not re-collected in 1964. In addition, Hardwick (1964) recently has described an apparently endemic species of *Helicoverpa* from Lisianski, based on specimens apparently taken prior to 1923 by an unknown collector.

## ARACHNIDA

ARANEIDA (Det. by T. W. Suman)

### Argiopidae

- \**Neoscona* sp.; 1964.
- \**Tetragnatha* sp.; 1964.

### Clubionidae

- \**Chiracanthium diversum* L. Koch; 1964, plentiful.

## INSECTA

### ORTHOPTERA

### Blattidae

- \**Blattella germanica* (L.); 1964.
- \**Periplaneta americana* (L.); 1964.

### DERMAPTERA

### Labiduridae

- Anisolabis eleronoma* Borelli; 1923.

### THYSANOPTERA (Det. by F. A. Bianchi)

### Phlaeothripidae

- \**Karpyothrips melaleuca* (Bagnall); 1964, on *Eragrostis*.

### HEMIPTERA

### Lygaeidae (Det. by P. D. Ashlock)

- Nysius fullawayi* Usinger; 1923; 1964, on *Portulaca*. Listed by Bryan as *Nysius* spp.

### Nabidae

- Nabis capsiformis* Germar; 1923.

## HOMOPTERA

### Aphididae

- Aphis craccivora* Koch; 1923; 1964, on *Tribulus*. Listed by Bryan as *A. medicaginis* Koch.

- \**Hysteroneura* sp. (Det. by Louise M. Russell); 1964, on *Eragrostis*.

### Pseudococcidae

- \**Trionymus insularis* Ehrhorn; 1964, on *Eragrostis* stems, plentiful.

### Coccidae

- \**Saissetia nigra* (Nietner); 1964, very heavy infestations on *Scaevola*, less abundant on *Eragrostis*.

### Diaspididae

- \**Hemiberlesia lataniae* (Signoret); 1964, heavy infestation on twigs of *Scaevola*, also on *Portulaca*.

## LEPIDOPTERA

### Noctuidae

- Helicoverpa minuta* Hardwick; date unknown, presumably prior to 1923.
- Pseudaletia unipuncta* (Haworth); 1923.

### Pterophoridae

- \**Megalorhipida defectalis* (Walker); 1964, plentiful on *Boerhavia*.

### Tineidae (Det. by E. C. Zimmerman)

- \**Ereunetis kerri* Swezey; 1964, reared from larvae on *Eragrostis*.

### Cygnodiidae (Det. by E. C. Zimmerman)

- \**Petrochroa dimorpha* Busck; 1964.

## COLEOPTERA

### Coccinellidae

- \**Scymnus loewii* Mulsant; 1964, preying on *Trionymus insularis*. Listed by Bryan as *S. kinbergi* (Boheman).

### Dermestidae

- Dermestes ater* De Geer; 1923; 1964. Listed by Bryan as *D. cadaverinus* Fabricius.

## DIPTERA

### Dolichopodidae

- Paraphrosylus acrosticalis* (Parent); 1923; 1964, along rocky beach, preying on small flies. Listed by Bryan as *P.* sp.

### Phoridae

- Diplonevia peregrina* (Wiedemann); 1923; 1964. Misidentified in Bryan's list as *Apiochaeta scalaris* (Loew).

### Ephydriidae

- \**Hecamede persimilis* Hendel; 1964, along beach.

### Canaceidae

- Canaceoides nudata* (Cresson); 1923; 1964, along beach.

**Sphaeroceridae**

*Leptocera* sp.; 1923.

**Milichiidae**

\**Milichiella lactipennis* (Loew); 1964.

\**Leptomeltopa* n. sp. (Det. by C. W. Sabrosky); 1964.

**Chloropidae**

*Cadrema pallida* Loew; 1923. Listed by Bryan as *Hippelatus nigricornis* var. *flavus* Thomson.

*Siphunculina signata* Wollaston; 1923; 1964.

**Tethinidae** (Det. by D. E. Hardy)

\**Tethina albula* (Loew); 1964.

\**Tethina insularis* Aldrich; 1964.

**Calliphoridae**

\**Lucilia graphita* Shannon; 1964.

**Muscidae**

\**Musca domestica* L.; 1964, very abundant and annoying.

**Hippoboscidae**

*Olfersia spinifera* Leach; 1923.

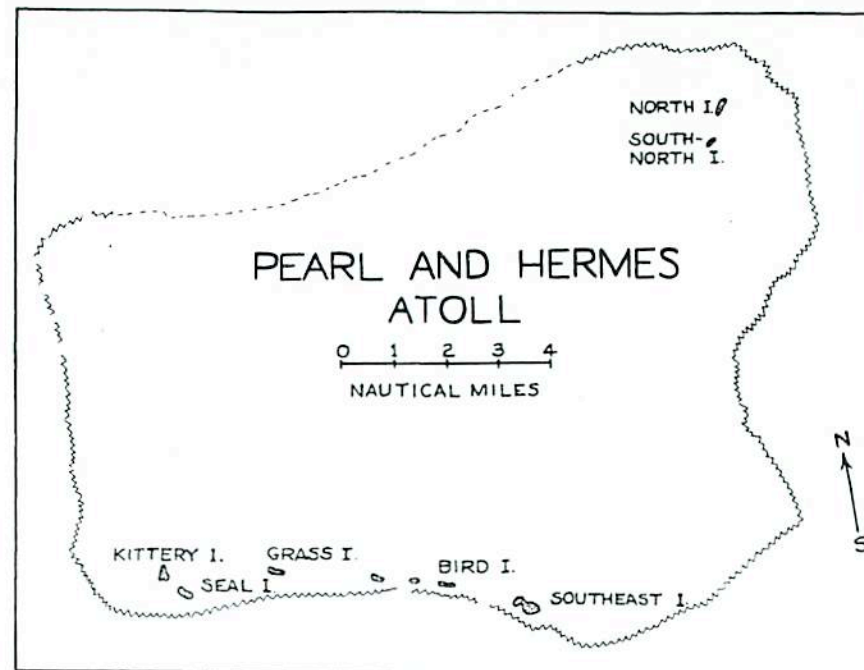
## PEARL AND HERMES ATOLL

Pearl and Hermes Atoll is a large, shallow, reef-enclosed lagoon with about seven small islets along its south side and two near the northeast corner. The total land area probably amounts to one-half square mile. Several of the islets are large enough to support permanent vegetation.

Three of the Pearl and Hermes islets were visited in September, 1964. One night and several daylight hours were spent on Southeast Islet (the largest of the group), and about two hours on North Islet at the northeastern corner of the atoll including a few minutes on the nearby small "South-North" Islet. Records from two northeastern islets are cited together under North Islet in the list below.

The vascular plants observed were *Portulaca* sp., (Southeast I. only) *Sesuvium portulacastrum*, *Boerhavia diffusa*, *Tribulus cistoides*, *Eragrostis variabilis*, *Lepturus repens*, *Setaria* sp. (Southeast I. only), *Sicyos* sp., *Lepidium owaihuense* (North Islet), *Achyranthes splendens* (North Islet), *Solanum nelsoni*, and the dead stalks of an introduced mustard (on Southeast Islet). A few shrubs of *Scaevola frutescens* and *Messerschmidia argentea* were also seen along the beaches. In general, North Islet seemed to have suffered less disturbance from the activities of man than had Southeast Islet.

Fifty-one species of terrestrial arthropods from Pearl and Hermes Reef are recorded below; of these, 30 are new records. Of the 21 species listed by Bryan, 7 were not re-collected in 1964.



## ARACHNIDA

ARANEIDA (Det. by T. W. Suman)

**Argiopidae**

\**Neoscona* sp.; 1964, North I., Southeast I.

\**Tetragnatha* sp.; 1964, North I., Southeast I.

**Salticidae**

\**Hasarius adansoni* (Audouin); 1964, Southeast I.

## CHILOPODA

**Geophilidae**

*Honuaphilus alohanus* Chamberlin; 1923.

## INSECTA

## ORTHOPTERA

**Blattidae**

\**Periplaneta americana* (L.); 1964, Southeast I.

*Pycnoscelus surinamensis* (L.); 1923, 1964, Southeast I.

## DERMAPTERA

**Labiduridae**

*Anisolabis eteronoma* Borelli; 1923; 1964, North I., Southeast I. Listed



**Milichiidae**

- \**Leptomelopa* n. sp. (Det. by C. W. Sabrosky); 1964, North I., Southeast I. Bryan lists an "undertermined Milichiinae" collected in 1923, but specimens were not located.

**Chloropidae**

- \**Siphunculina signata* (Wollaston); 1964, North I.

**Tethinidae**

- Tethina insularis* Aldrich; 1923. Not listed by Bryan (1926) but two specimens in type series were from Pearl and Hermes material collected by Tanager Expedition.

**Sarcophagidae**

- Goniophyto bryani* Souza Lopez; 1923; 1964, North I., Southeast I. Listed by Bryan as an undetermined species.

**Calliphoridae**

- Lucilia graphita* Shannon; 1923; 1964, North I.

**Muscidae**

- Musca domestica* L.; 1923.

## HYMENOPTERA

**Braconidae**

- Chelonus blackburni* Cameron; 1923; 1964, North I., Southeast I.  
 \**Apanteles* sp., probably *marginiventris* Cresson; 1964, Southeast I., numerous empty cocoons on *Sesuvium* infested with *Hymenia* larvae.

**Encyrtidae**

- \**Dusmetia sangwani* Rao?; 1964, Southeast I., larvae and pupae of what is probably this species found within parasitized specimens of *Antonina graminis*.

**Formicidae**

- \**Cardicondyla nuda* Mayr; 1964, North I., Southeast I.  
 \**Pheidole megacephala* Fabricius; 1964, North I., Southeast I., tending *Aphis* or *Tribulus*.  
*Tetramorium guineense* (Fabricius); 1923; 1964, North I., Southeast I.

## KURE ATOLL

A brief stopover was made at Kure Atoll, en route to Midway, on 14, September 1964. About three hours were spent collecting insects in the area surrounding the U. S. Coast Guard Station on Green Island. Butler and Usinger (1963b) have listed the insects taken by them during a three-day stay in September, 1961. The new records listed below probably are mostly recent immigrants which became established during the three-year interval between the Butler-Usinger collections and my own.

## HOMOPTERA

**Cicadellidae**

- \**Circulifer tenellus* Baker; 1964, on *Boerhavia*.

- \**Deltocephalus sonorus* Ball; 1964, on grass.

- \**Empoasca solana* Delong; 1964, on *Solanum nigrum*.

**Pseudococcidae**

- \**Antonina graminis* (Maskell); 1964, on *Eragrostis* stem.

**Diaspididae**

- \**Hemiberlesia lataniae* (Signoret); 1964, on *Lepidium*.

- \**Odonaspis ruthae* Kotinsky; 1964, *Eragrostis* stems.

## LEPIDOPTERA

**Noctuidae**

- \**Spodoptera mauritia* (Boisduval); 1964, adults on mess-hall screen.

**Gelichiidae**

- \**Stoberhinus testaceus* Butler; 1964.

## COLEOPTERA

**Coccinellidae**

- \**Scymnus notescens* (Blackburn); 1964.

## DIPTERA

**Ceratopogonidae**

- \*undetermined genus and species; 1964.

**Agromyzidae**

- \**Pseudonapomyza spicata* (Malloch); 1964.

**Chloropidae**

- \**Siphunculina signata* (Wollaston); 1964.

**Sphaeroceridae**

- \**Leptocera hirtula* (Rondani)?; 1964.

## HYMENOPTERA

**Mymaridae**

- Polynema reduvioli* Perkins; 1923; 1964.

**Eulophidae**

- \**Euderus metalicus* Ashmead (?); 1964.

**Encyrtidae**

- \**Anagyrus swezeyi* Timberlake; 1964.

- \**Blepyrus insularis* (Cameron); 1964. This species is a parasite of *Ferrisia virgata*. The latter was stated to be heavily infesting *Boerhavia*, and apparently was abundant on other hosts as well, in 1961. In 1964 this mealy bug was scarce.

## LAYSAN ISLAND

New records in my June, 1962 collections from Laysan have been cited by Butler and Usinger (1963a). Half a day was spent collecting on Laysan in September, 1964. An apparently recently established immigrant spider was found, but no new insects.



Also taken in 1964 and not previously reported from Laysan was a small lizard of the family Scincidae, *Cryptoblepharus boutoni poecilopleurus* (Wiegmann) (Det. by W. O. Wirtz II), several of which were seen.

## ARANEIDA

**Clubionidae** (Det. by T. W. Suman)

\**Chiracanthium diversum* L. Koch; 1964, plentiful.

The following insects collected in 1964 seem worthy of note.

## COLEOPTERA

**Coccinellidae**

*Scymnus loewi* Mulsant (Det. by E. A. Chapin); 1912; 1964, feeding on *Trionymus insularis* on *Eragrostis*.

This is probably the species collected by Butler in 1959 on *Eragrostis*, the specimens of which were lost. (Butler & Usinger 1963a: 15) Listed by Bryan as *S. kinbergi* (Boheman).

**Cleridae**

*Necrobia rufipes* De Geer; 1912; 1964.

**Curculionidae**

*Dryotribus mimeticus* Horn; 1912, 1964, numerous specimens on underside of driftwood on beach.

## DIPTERA

**Milichiidae**

\**Leptomelopa* n. sp. (Det. by C. W. Sabrosky); 1962; 1964. Same species from Nihoa, Necker, Lisianski and Pearl and Hermes Atoll, not previously recorded.

## HYMENOPTERA

**Pteromalidae** (Det. by C. M. Yoshimoto)

*Spalangia drosophilae* Ashmead; 1962; 1964. Recorded as *Spalangia* sp. by Butler & Usinger (1963a).

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