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THE INSECT FAUNA OF FUNAFUTI.

By W. J. RAINBOW,

Entomologist, Australian Museum.

[IV.]

THE INSECT FAUNA.

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Entomologist, Australian Museum.

AMONG the memoranda handed to me by Mr. Hedley in connection with the insects collected at Funafuti, the following remark occurs:—"The collection brought back does scanty justice to the Entomological fauna of Funafuti, whose claims were, I fear, unduly subordinated to the demands of the Marine Invertebrata, the spiders being the only group whose proportions are at all fairly represented."

Small as the collection is, however, it is not by any means devoid of interest, for while there are individuals amongst it that are well known to Entomologists, there are also some that are new. Indeed, it would be strange if it were not so, when we consider the rich fields awaiting the labours of systematic workers among the islands of the Pacific, that are, as yet, comparatively untouched. And it must also be borne in mind, that the fauna of the islands comprising the various groups—of which the Ellice Group is one—is of a more or less derived nature—that is to say, the fauna of any one island or group can scarcely be considered as appertaining solely to it, but must be studied from a much broader standpoint, not only as regards the distribution of the genera, but also of the species. Thus, for instance, amongst the beetles, *Sphenophorus sulcipes*, Karsch, originally recorded from the Marshall Islands* was obtained by Mr. Hedley at Funafuti; and amongst the butterflies *Junonia vellida*, Fabr., also obtained by Mr. Hedley, is not only common in the Ellice Group,† but also at the Gilbert Islands,‡ and coming nearer home—Australia. Then there are the mosquitoes—*Megarrhina inornata*, Walk., being found both in New Guinea and the Ellice Islands. Being possessed of this knowledge, therefore, it is only reasonable to

* Berlin. Ent. Zeit., xxv., 1880, p. 11, pl. i., fig. 16.

† Proc. Zool. Soc., 1878, p. 297; Ann. and Mag. Nat. Hist. (5), xv., p. 258.

‡ Geogr. Journ., vi., 4., 1895, p. 348.

assume that a systematic collection would bring to light other facts of an interesting nature, and demonstrate clearly that the insect fauna of one island or group is only more or less the reflex of another. In his valuable paper on "The Gilbert Islands,"* Mr. C. M. Woodford says, in endeavouring to account for the insect fauna he found there :—

"Of the insect fauna, the scorpions, spiders, most of the beetles, *Evania appendigaster*, the ants, the blatta, and the earwig, were most probably conveyed to the islands by ships.

"The remaining insect fauna, comprising the butterflies, eleven moths, three species of hymenoptera, one of the hemiptera, the locusta and the dragon-flies, were probably wind-borne, and I think that such of them as are not of almost cosmopolitan range most probably reached the group through the Marshalls.

"Of the two species of butterflies, *Junonia vellida* is generally distributed throughout the Pacific Islands, but *Hypolimnas rarick*, so far as I know, although found in the Marshalls, does not extend further to the south-east than the Gilbert Group."

The eleven species of moths taken by Woodford during his visit to the Gilbert Islands in 1884 were † :—(1) *Chærocampa erotoides*, (2) *Cephonodes hylas*, (3) *Deiopeia pulchella*, (4) *Prodenia retina*, (5) *Amyna octo*, (6) *Heliothis armigera*, (7) *Catephia linteola*, (8) *Archæa melicerte*, (9) *Remigia translata*, (10) *Marasmia creonalis*, and (11) *Chloanges suralis*. The latter insect was described by Mr. Butler as a new species, under the name of *Margeronia woodfordi*, but he has since identified it with *Chloanges suralis* of Zeller.

Of these Mr. Woodford remarks ‡ :—"Nos. 1, 3, 4, 5, 6, 7 and 10 may be said to be cosmopolitan, extending throughout the East generally, and to the more remote islands of the Pacific from Australia to Tahiti.

"No. 2, *Cephonodes hylas*, is also found in West Africa, South Africa, Natal, North India, Moulmein, Moreton Bay, and Japan. Being a very handsome and conspicuous insect, it would not be likely to escape observation; but I never observed it in the Solomons nor in Fiji, so that its range into this group was most probably through the Marshalls.

"No. 9, *Remigia translata*, is recorded from Ceylon, and from the Marshall Islands. I also met with this insect in the Ellice Group.

* *Loc. cit.*, p. 349.

† *Geogr. Journ.*, vi., 4, 1895, p. 348; also *Ann. Mag. Nat. Hist.* (5), xv., pp. 238-241.

‡ *Geogr. Journ.*, vi., 4, 1895, pp. 349-350.

"No. 11, *Chloanges suralis*, occurs in Amboina, in the Marshalls, and Mr. Matthew took it in the Ellice Group. Its food plant occurs commonly in Fiji, but I never noticed the insect there, nor is it recorded among the extensive collection made there by Mr. Matthew. I did not notice it in the Solomons.

"It would appear probable, therefore, that the three last-named species have reached the Gilberts *via* the Marshall Group."

In the Gilbert Group, Dr. O. Finch collected the following moths:—*Sesia mylas*, *Sphinx urotus*, and *Utetheria pulchella*.*

While upon the subject of the Heterocera, it will be of interest to point out that *Deiopeia pulchella* was recorded by Butler, in "Proceedings of the Zoological Society of London," 1878, among a small collection of Lepidoptera obtained by the Rev. J. S. Whitmee at the Ellice Islands; also a worn example of a widely distributed moth, *Achæa melicerte*. Amongst those moths obtained by Mr. Woodford as having been obtained by him at the Gilberts in 1884, and recorded by Butler in "Annals and Magazine of Natural History," 5th Series, Vol. xv., pp. 239-242, the following were also taken at Nukufetau, in the Ellice Group:—*Deiopeia pulchella*, *Amyra octo*, *Remigia translata*, *Erlita modestalis*, *Rinecera mirabilis*, and *Harpagoneura complexa*.

COLEOPTERA.

Obs.—Seven species of Coleoptera, which, with the exception of two, were referable to known species, were obtained by Mr. Hedley, and are enumerated below. I am indebted to Mr. George Masters, Curator of the Macleay Museum, and to Mr. T. G. Sloane, for much valuable assistance and information. The following are the known species of Coleoptera obtained from Funafuti:—

FAMILY ELATERIDÆ.

Monocrepidius ferrugineus, Montrouz.....One specimen.
Monocrepidius umbraculatus, Cand.....One specimen.

FAMILY TENEBRIONIDÆ.

Uloma cavicollis, Fairm.....One specimen.
Uloma insularis, Guer.....One specimen.

FAMILY CALANDRIDÆ.

Sphenophorus sulcipes, Karsch.....Four specimens.

* Ann. K.K. Naturhist. Hofmus., viii., 1893, p. 22.

FAMILY CEDEMERIDÆ.

Genus NACERDES, Schmidt.*Nacerdes transmarina*, sp. nov.

(Plate i., fig. 6.)

Long. 14 mm., lat. 4 mm.

Eliptic, elongate, yellowish-brown, thorax narrowed in front and at base, scarcely as long as it is wide.

Head yellowish-brown, obscurely punctate, sparingly clothed with very short and fine yellowish pubescence. Eyes prominent, finely granulated, black. Thorax moderately convex, narrowed in front, truncated, abruptly and strongly bulging out laterally to about one-third its length, thence gradually tapering inwards to its posterior extremity where it is again truncated; disc clothed with very short yellowish pubescence. Elytra somewhat shorter than abdomen, yellowish-brown, moderately arched, obscurely punctate, clothed with short, fine, yellowish pubescence, broadest at the shoulders, gently tapering to abdominal extremity. Mentum small, somewhat concave. Underside concolorous, clothed with exceedingly fine pubescence; sterna obscurely punctate-striate. Legs moderately long, yellow-brown, thickly clothed with short yellowish pubescence, and armed with short black spines at joints. Antennæ, concolorous.

Three specimens.

FAMILY OTIORHYCIDES.

Genus ELYTRURUS, Schönherr.*Elytrurus squamatus*, sp. nov.

(Plate i., fig. 7.)

Long. 4 mm., lat. 2 mm.

Eliptic, robust, bluish-grey; thorax narrowed in front and at base, punctate; elytra, punctate-striate.

Rostrum black, with a broad central shallow depression. Thorax convex, scarcely as broad as long, closely covered with minute shining granules, slightly narrower in front than behind, gradually widening towards the middle, and then narrowing again. Elytra arched, striate-punctate, slightly wider at the shoulders than the thorax at its base, gradually widening towards the middle, thence narrowing again to the apex; the apices acute; the whole surface thickly covered with minute shining granules; there are also a few short hoary hairs towards the apex, and along the sides. The general colour is bluish-grey. Legs and antennæ concolorous, thickly covered with minute shining granules, and furnished with a few short hoary hairs. Antennæ long, slender.

Obs.—This was the most representative species of the series collected, fifteen specimens having been obtained. In some of the members there is a slight difference in colouration, some being brownish-grey, but this is doubtless a sexual distinction. The chief interest attaching to this genus, however, is the fact that it is confined solely to the Pacific Islands. The following are the localities from which representatives have hitherto been obtained:—New Hebrides, New Guinea, Fiji, Tahiti, Vanikoro, and Nukuhiva.

Mr. Woodford, in his paper on "The Gilbert Islands,"* gives the following list of species as obtained by him in that group:—*Amarygmus*, sp., *Pantopceus guisens*, *Coccinella transversalis*, *C. arcuata*, *Necrobia rufipes*, *Tribolium ferrugineum*, *Dermestes*, sp., *Carpophilus*, sp., *Silvanus*, sp., *Carcinops* (?) sp., *Trogosita mauritanica*, *Alphitobius piceus*, *A. diapharinus*, *Sitophilus*, sp., *Adelocera modesta*, *Monocrepidius*, sp., *Nacerdes*, sp. (2), and a genus allied to *Tribolium* (?) sp.

HYMENOPTERA.

Only two species of Hymenoptera were obtained—one a bee, *Megachile*, sp., the other being a few *workers* of a species of ant—*Pheidole sewspinosa* (Mayr). According to Mr. Woodford, "A leaf-cutting-bee of the genus *Megachile* was very common on all the [Gilbert] islands, making its nest under the thatch of the houses, and using portions of the leaves of *Morinda citrifolia* for the construction of its cells."† My colleague, Mr. Hedley, informs me that *Morinda citrifolia* is common on the Island of Funafuti, but he did not notice that it was attacked by the leaf-cutting bees as reported by Mr. Woodford in the Gilberts. Nevertheless the leaves of *Pandanus odoratissimus*, a plant that is also common in the Gilberts, had the appearance of portions having been cut out of them apparently by some leaf-cutting insect.

FAMILY APIDÆ.

Genus MEGACHILE, Latr.

Megachile hedleyi, sp. nov.

(Plate i., fig. 5.)

Long. 11 mm., lat. 4 mm.

Expanse of anterior wings—Long. 7 mm., lat. 3 mm.

„ posterior wings „ 5 „ „ 2 „

* Geogr. Journ., vi., 4, 1895, p. 348.

† *Loc. cit.*, p. 348.

Head, forehead, and cheeks black, clothed with cinerous pubescence; head closely and finely punctured; occilli prominent; antennæ black; labrum black, closely and finely punctured; ligula and mouth parts ferruginous. Thorax black, finely and closely punctured, sparingly clothed with cinerous pubescence. Abdomen cordate, dorsal surface black, segments fringed with short black hairs; anterior extremity sparingly furnished with short cinerous pubescence, and posterior extremity with black; sides clothed with ferruginous pubescence; ventral surface black, clothed with long reddish hairs, except at posterior extremity where the hairs are shorter and black. Breast black, finely and closely punctured; a few short cinerous hairs are distributed over its surface. Legs black; coxæ and underside of each ambulatory limb clothed with short cinerous hairs; underside of tibiæ and tarsi ferruginous. Wings dark fuscous; veins and nervures black.

Two specimens.

I have very great pleasure in dedicating this species to my esteemed friend and colleague, Mr. Charles Hedley.

FAMILY FORMICIDÆ.

Pheidole sexspinosa, Mayr.....Twelve specimens, all workers.

Dr. Gustav. Mayr described the ♂ and worker of this species in a paper entitled "Neue Formiciden,"* and recorded it "Auf den Ellice-Inseln in grossen Ocean, vom Museum Godeffroy." To his description he appended a note which may be of interest to students, and of which the following is a translation:—

"The genus founded by Mr. Smith, and for which he proposed the name *Pheidolacanthinus*, would appear to suit the above species, but there is a difference in the structure of the antennæ. The one named by Mr. Smith has eleven joints, while the antennæ of *Pheidole sexspinosa* has twelve joints."

In Mr. Hedley's memoranda I read the following:—"Several ants occurred in the area of sandy soil near the cultivation grounds, one with a metallic colour could inflict an unpleasant bite upon bare feet." Mr. Woodford says of the Gilbert Islands:—"Three or four species of small ants were common on all the islands, and the firewood taken on board at several places swarmed with them."†

* Verh. K.K. Zool.-bot. Ges. Wien, xx., 1870, pp. 978-9.

† Geogr. Journ., vi., 4, 1895, p. 348.

LEPIDOPTERA.

FAMILY NEPHALIDÆ.

Junonia vellida, Fabr.....One specimen, damaged.

Only one species—and of that a single specimen—of Lepidoptera was obtained, namely *Junonia vellida*. This species with four others, namely, *Euplœa eleutho*, *E. distincta*, *Diadema nerina*, and *D. otaheitea*, were obtained by the Rev. J. S. Whitmee at the Ellice Islands, and was duly recorded in a paper by A. G. Butler, in 1878.* Referring to *J. vellida*, the writer penned the following interesting note:—"Resembles Australian examples, being less suffused with orange-tawny than Samoan specimens." In another paper, entitled "Lepidoptera collected by Mr. C. M. Woodford in the Ellice and Gilbert Islands,"† Mr. Butler records *J. vellida* from Nukufetau (Ellice Group) and Tapetewea (Gilbert Group), and *Hypolimnas rarick* from Tapetewea. Mr. Woodford also refers to the two last-named species in his paper,‡ and states that the larva of *J. vellida* feeds upon *Scaevola kœnigii*, and the larva of *H. rarick* on an *Abutilon*. He says that "Of the two species of butterflies, *J. vellida* is generally distributed throughout the Pacific Islands, but *H. rarick*, so far as I know, although found in the Marshalls, does not extend further to the south-east than the Gilbert Group."§

Commenting on the Lepidoptera of the island, Mr. Hedley says:—"Large green caterpillars whose clawed tails proclaimed them of the Sphingidæ were occasionally brought by the natives, and were probably related to a large day-flying hawk-moth, like the European clearwing which was rarely seen, hovering and dashing from tree to tree above the sweep of a butterfly net. Small moths were to be obtained by beating the bushes, and swarmed to our lamp at night through the open sides of our native hut."

DIPTERA.

Amongst the Muscadæ procured four appear to be new to science, and are herewith described and figured. Other specimens obtained at Funafuti were so mangled by the natives who caught them as to be absolutely useless.

Speaking of the flies, Mr. Hedley says:—"They were a great nuisance; they swarmed on the ship's boats as they came ashore, and on their return invaded the vessel, to which they kept for

* Proc. Zool. Soc., 1878, pp. 296-7.

† Ann. & Mag. Nat. Hist. (5), xv., pp. 238-9.

‡ Geogr. Journ., vi., 4, 1895, p. 348.

§ *Loc. cit.*, p. 349.

several days after leaving the land. The mosquitoes of several kinds, larger and smaller, were an intolerable nuisance, not only to the whites but also to the natives. On the lee side of Funafuti neither black nor white could snatch an hour's sleep at night without the protection of curtains. Before civilisation mats were used for this purpose on Funafuti. Writing of Stewart's Islands in 1851, Mr. John Webster says* :—'A screen of fine matting was let down from the ceiling and surrounded my bed to keep out mosquitoes and other noxious insects.' To avoid the mosquitoes the natives often crossed the islet and slept on the windward side. The small islets on the leeward side of the atoll were much freer from these pests, and I have slept there all night in comfort in the open."

Although mosquitoes have been known to the natives of these islands, probably from time immemorial, there is no doubt that some species have been introduced by the agency of traders, for the few brought home by Mr. Hedley show that *Culex hispidosus*, Sk., and *Megarrhina inornata*, Walk.—the former common in Australia and the latter in New Guinea—have each taken up their abode in the Ellice Group. The Rev. Dr. W. Wyatt Gill, writing of the mosquitoes in the Hervey Islands, † says :—"There are some islands where this annoying insect was until lately unknown. The old men of Penrhyns, Rakaanga, and Manihiki assure me that no mosquito was ever seen on those atolls until some years after the introduction of Christianity. Although mosquitoes were (accidentally) conveyed to Penrhyns and Rakaanga in 1859, and to Manihiki so lately as 1862, in water-casks filled at Raratonga, they are plentiful in all three islands." Again, Mr. Woodford in his paper on "The Gilbert Islands," says :—"Mosquitoes occurred on some islands ; on others, as at Kuria, I did not notice them." ‡

Looking over Mr. Hedley's memoranda, I read the following interesting note, describing the ingenious method adopted by the natives at Funafuti for the purpose of capturing insects :—"Mosquitoes and other insects were caught thus by the natives : a forked stick was converted into a hoop by tying together the arms of the fork. This was passed over and over through the snares of the orb-weaving spiders till the hoop was filled by a membrane of glutinous spider-threads. By this any insect would be struck and meshed."

So far as fleas are concerned, Mr. Hedley says that notwithstanding the fact that all conditions suitable for their propagation are present, they are unknown at Funafuti.

* Webster—Last Cruise of the "Wanderer," Sydney (n.d.), p. 59.

† Gill—Jottings from the Pacific, 1885, p. 162.

‡ Geogr. Journ., vi., 4, 1895, p. 348.

The following are the species obtained:—

FAMILY CULICIDÆ.

- Culex hispidosus*, Sk.....Two specimens.
Megarrhina inornata, Walk.....Six specimens.

FAMILY ANTHOMIZIDÆ.

Genus LISPE, Nob.

Lispe vittata, ♀, sp. nov.

(Plate i., fig. 1.)

Long. 5 mm., lat. 1 mm.

Expanse of wings—Long. 4 mm., lat. 2 mm.

Head—occiput black, hairy; forehead reddish-brown, grey laterally, clothed with black hairs; eyes, rich mahogany-brown; ocelli, three; antennæ, short. Thorax grey, three dark brown longitudinal lines running the entire length, upper surface clothed with short black hairs; sides furnished with few long coarse black bristles. Abdomen—dorsal surface dull yellowish with black median and lateral markings and patches, clothed sparingly with moderately long coarse black bristles; sides, pale yellowish with small black patches at junction of segments, and furnished with a few moderately long coarse black hairs. Breast, hairy and ashy-coloured. Legs yellowish, clothed with short black hairs and armed with few short strong spines. Wings covered with hair-like scales, semi-transparent, with brassy reflections.

A single specimen.

FAMILY TACHINARIDÆ.

Genus DEGEERIA, Meig.

Degeeria dawsoni, ♂ et ♀, sp. nov.

(Plate i., fig. 2.)

Long. 8 mm., lat. 3 mm.

Expanse of wings—Long. 4 mm., lat. 2 mm.

Head—occiput black, clothed with black hairs; forehead black with coarse black hairs or bristles; cheeks, grey; eyes, rich mahogany-brown; ocelli, three; antennæ, black. Thorax grey, clothed on superior surface with short coarse black hairs or bristles, seven dark grey longitudinal bars run the entire length of pro- and meso-thorax. Abdomen—dorsal surface grey with

black median patches, and black transverse bars at junctions of segments, clothed with few short black hairs; sides yellow-brown, darkest at posterior extremity, sparingly furnished with short black hairs; ventral surface dull white, with two small oblong yellow-brown patches, each patch fringed with short black hairs. Anus, black. Breast, dark brown. Legs black, clothed with black hairs and few short strong spines. Wings covered with hair-like scales, semi-transparent, with brassy reflections.

♂ Copulatory organ, a long telescopic, fleshy, pale yellowish process, consisting of seven segments, the extremity of each segment furnished with long, strong bristles.

One ♂ and three ♀ specimens.

At the request of Mr. Hedley this species is named after W. Pudsey Dawson, R.N., First Lieutenant of H.M.S. "Penguin," who did so much to facilitate the scientific objects for which the expedition was organised.

Genus EBENIA, Nob.

Ebenia nigricruris, ♀, sp. nov.

(Plate i., fig. 3.)

Long. $4\frac{1}{2}$ mm., lat. 1 mm.

Expanse of wings—Long. 4 mm., lat. 2 mm.

Head—occiput black, clothed with black hairs; forehead black with coarse black hairs or bristles; cheeks, grey; eyes, rich mahogany-brown; ocelli, three; antennæ, black. Thorax dark brown, shoulders grey; superior surface clothed with few short black hairs; sides furnished with long coarse bristles. Abdomen black at anterior extremity, second, third, and fourth segments grey, with broad black median transverse bar, the latter uneven in outline; junction of segments black; dorsal surface thinly clothed with moderately long, strong, black hairs; ventral surface dirty white with moderately long black hairs; anus, black. Breast black, with few short black hairs. Legs black, clothed with black hairs, and armed with short strong spines. Wings covered with hair-like scales, semi-transparent, with brassy reflections; veins, black.

A single specimen.

Ebenia fieldi, ♀, sp. nov.

(Plate i., fig. 4.)

Long. $4\frac{1}{2}$ mm., lat. 1 mm.

Expanse of wings—Long. 4 mm., lat. 2 mm.

Head—occiput black, clothed with black hairs; forehead black, with long, coarse black hairs or bristles; cheeks, white; eyes, rich mahogany-brown; occilli, three; antennæ, black. Thorax grey; two dark longitudinal bars extend from anterior extremity of pro- to near posterior extremity of meta-thorax; few rather long coarse black hairs; sides of a lighter grey colour, and furnished with a few long coarse black hairs. Abdomen, dark, with lateral patches of a light grey colour; posterior extremity black; dorsal surface furnished sparingly with short black hairs; ventral surface grey, and sparingly furnished with short black hairs; anus, black. Breast black, with few short black hairs. Legs black, clothed with black hairs, and armed with few short strong spines. Wings covered with hair-like scales, semi-transparent, with brassy reflections; veins, black.

A single specimen.

By request I have named this species after Captain Mostyn Field, R.N., Captain of H.M.S. "Penguin," as a permanent tribute to his courtesy, and a mark of the sense of indebtedness felt by the members of the Expedition for assistance in many ways.

HEMIPTERA.

A species of *Halobates* was taken by one of the party on a single occasion from a pool between tide-marks. On one occasion at dusk Mr. Hedley saw some *Halobates* in one of the saltwater pools which at high tide appear in the centre of the island, but failed to secure any. Lice were very common and afflicted the natives very much.

ORTHOPTERA.

Although the *Libellulidæ* are not represented in the collection from Funafuti, Mr. Hedley remarks that a large dragon-fly was a conspicuous object, flashing across the more open spaces in the woodland on sunny days. In the Gilbert Group the three following species are common:—*Anax guttata*, *Pantala flavescens*, *Trithemis bipunctata*.*

So far as the collection under discussion is concerned, this Order is represented by the following species:—

FAMILY LACERSTIDÆ.

Concephalus ensiger (?) Har.....One specimen.

* Geogr. Journ., vi., 4, 1895, p. 349.

FAMILY BLATTIDÆ.

- Panesthia ethops*, Stoll..... One ♂ et two ♀ specimens.
Loboptera decipiens, Germ..... One specimen.

FAMILY GUILLIDÆ.

- Arachnocephalus vestitus*, Costa..... One specimen.

PSEUDONEUROPTERA.

TERMITIDÆ.

Calotermes marginipennis, Latr.

Calotermes marginipennis, Latr., Hag. Monogr., p. 47.

Catalogue of Specimens of Neuropterous Insects in the Collection of the British Museum, by Dr. H. Hagen; Part I., Termitia, p. 7.

Not the least interesting feature of the Insecta from Funafuti is a small collection of White Ants—*Calotermes marginipennis*, Latr.. The localities recorded so far from whence examples have been obtained are California, Mexico, and Hawaii. The Rev. Thomas Blackburn collected it in the Hawaiian Islands, and it was recorded from there by McLachlan in a paper* dealing with Mr. Blackburn's collection.

This species of White Ant confines its attention at Funafuti to the coconut trees (*Cocos nucifera*). The insects generally attack the palms from three to six feet from the ground, tunnelling their way through, and as a result the trees are snapped off by the gales. At night, attracted by the lamps, these insects fly into dwellings. The Rev. Thomas Blackburn in a paper, "Notes on Hawaiian Neuroptera,"† writes:—"I have not met with any more than the two American species recorded in Mr. McLachlan's paper. They are both extremely common near Honolulu, flying in numbers to lamps at night, and doing much damage in the destruction of furniture and other woodwork, also frequently destroying trees. Without having given sufficient attention to the subject to generalize with absolute confidence, I may say that *Termitia* connected with household depredations, when identified by me, has always been *Calotermes castaneus*, Burm. (which, however, I have never observed outside Honolulu), while the tree

* Ann. & Mag. Nat. Hist., (5), xii., pp. 266-7.

† Loc. cit. (5), xiv., p. 413.

devastator when identified by me has always been *C. marginipennis*, Latr. This latter species I have observed on several of the islands.”

The headquarters of *Calotermes*, as indeed the Termitidæ as a whole, is Tropical America, more species having been recorded from Brazil than any other part of the globe, and from whence many have distributed. Arguing from the same premises, Tropical America would appear to be the home of the *Cocos* tribe, the majority of its species being found within that zone. In discussing this question, Mr. W. Botting Hemsley says* :—“De Candolle states† he formerly believed it to have spread from Western America, but with fuller data and more experience in such questions, he inclines to the opinion that its original home is the Indian Archipelago ; but as the thirty other species belonging to the genus are restricted to Tropical America, the first opinion seems the sounder.” It is quite probable that *Cocos nucifera*, being an introduced plant into the Islands of the Pacific, the insect that proves so destructive to it, may also have been introduced, if not actually with, at any rate at no late date after its introduction. The distribution and association of this species of Termitid, with its host plant, therefore affords an interesting study when considered in the light of faunistic distribution, coming as it did, originally from Mexico and California. From the early days of settlement in California, the Hawaiian Islands have been a centre of commercial enterprise with the Californians, and it is possible therefore that *Calotermes marginipennis* may have been introduced in Hawaii by human agency, and that when swarming numbers of these destructive insects may have been wafted from island to island. The coconut palm was first introduced into the Ellice Group during the reign of King Touassa, somewhere about two centuries ago. During the period intervening, and up to more recent times, the islands were frequently visited and raided by neighbouring islanders (see pp. 44 and 45 of Part I. of this Memoir) ; besides this the Ellice Group was the field of a great whaling fishery in the early forties, and this industry was pursued chiefly by Americans, who not only visited the group, but also other islands of the Pacific from Hawaii onwards, so that, taking all these facts into consideration, it is quite reasonable to suppose that this, and other species of insects, may have been introduced by the agency of man. It is unfortunate, considering its many important bearings, that the fauna of the Pacific Islands has not been more thoroughly worked ; when it is, however, the distribution of species—both fauna and flora—will doubtless form one of the most interesting and instructive lessons of modern biological investigation.

* Challenger Reports—Botany, i, 2, 1885, p. 203.

† De Candolle—Origin des Plantes Cultivées, p. 350.

MYRIAPODA.

FAMILY CHILOPODA.

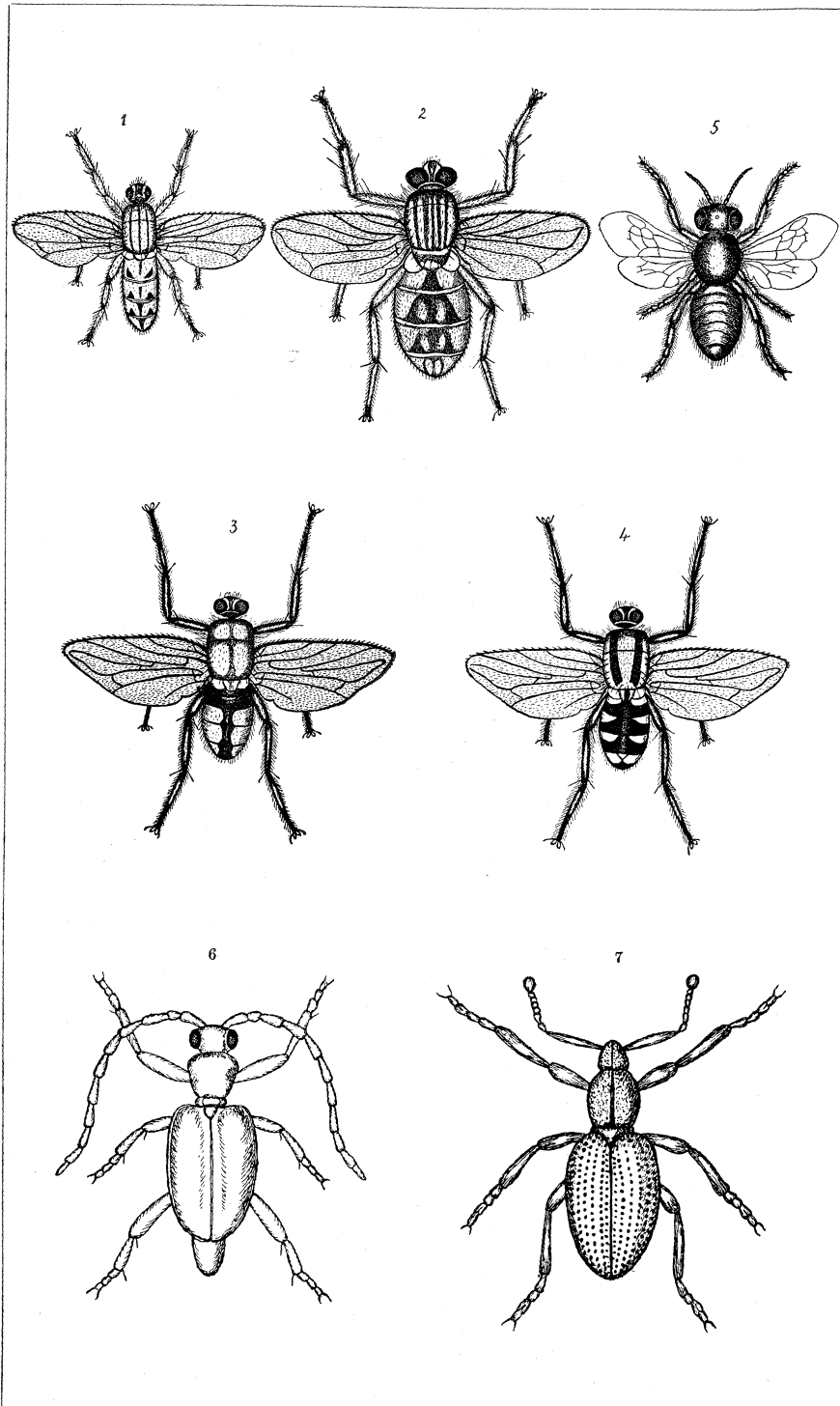
Scolopendra platypus, Brandt.....Two specimens.

Centipedes were fairly common on the island, and were apt to creep into and hide amongst the folds of any unworn titi dresses. If such clothes had been laid aside, it was necessary before using to have them carefully fumigated. This was done by placing a handful of "Gnashu" (*Scaevola*) leaves on some embers around which the titi dresses were arranged, and a couple of mats were packed round to keep the smoke in. Karsel and Finch* recorded *S. platypus*, Brandt, *Orphnæus lividus*, Mein., and *Otostignus orientalis*, Por., from the Marshall Group in 1880.

* Berlin. Ent. Zeit., xxv. p. 15.

EXPLANATION OF PLATE I.

- Fig. 1. *Lispe vittata*, Rainb.
,, 2. *Degeeria dawsoni*, Rainb.
,, 3. *Ebenia nigricurvis*, Rainb.
,, 4. ,, *feldi*, Rainb.
,, 5. *Megachile hedleyi*, Rainb.
,, 6. *Nacerdes transmarina*, Rainb.
,, 7. *Elytrurus squamatus*, Rainb.



W. J. RAINBOW, del.

CORRECTIONS.

- Page iii., paragraph 2, line 2—*for* “Mervyn” *read* “Mostyn.”
- „ 9, „ 4, line 1—*for* “Mervyn” *read* “Mostyn.”
- „ 20, foot-note § —*for* “1844” *read* “1884, p. —.”
- „ 71, paragraph 3, line 4—*for* “supplied” *read* “applied.”
- „ 97, line 6 —*for* “Nob” *read* “Latr.”
- „ 98, line 17 —*for* “Nob” *read* “Macq.”
- „ 155, heading, above Echinodermata, *read* “[VII.]”
- „ 220, line 34 —*for* “VIRIDE” *read* “VIRIDIS.”
- „ 231, line 2 —*for* “genealogies” *read* “genealogies.”
- „ 250, foot-note § —*for* “ix.” *read* “xi.”
- „ 276, foot-note † —*for* “1897” *read* “1887.”
- „ 301, foot-note * —*for* “1876” *read* “1878.”
- „ 389, paragraph 3, line 1—*add after* fig. 2, “and Plate xxvii., fig. 1.”
- „ 389, „ 4, line 3—*for* “fig. 6” *read* “fig. 2.”
- „ 389, „ 4, line 7—*for* “fig. 7” *read* “fig. 1.”
- „ 390, „ 3, line 2—*for* “fig. 8” *read* “Plate xxvii., fig. 2.”
- „ 390, „ 3, line 10—*delete* “fig. 8.”
- „ 392, „ 2, line 4—*for* “perceptable” *read* “perceptible.”
- „ 398, „ 2, line 4—*for* “indicate” *read* “indicates.”
- „ 398, „ 4, line 4—*for* “have” *read* “has.”
- „ 399, „ 4, line 8—*for* “reject” *read* “rejects.”
- „ 528, line 16 —*for* “davidi” *read* “davidis.”
- „ 530, line 38 —*for* “Chiridota” *read* “Chirodota.”