VOL. II. NO. 5 JULY, 1913.

PROCEEDINGS

OF THE

HAWAIIAN ENTOMOLOGICAL SOCIETY

FOR THE YEARS

1911-1912

(With two Plates and one Cut)

HONOLULU, HAWAII.
PRICE 50 CENTS.

OFFICERS

	1911	1912
PRESIDENT	E. M. EHRHORN	D. T. FULLAWAY
VICE-PRESIDENT	D. T. FULLAWAY	F. MUIR.
SECRETARY-TREASURER	D. B. KUHNS	O. H. SWEZEY.
EDITOR OF PROCEEDINGS	O. H. SWEZEY	O. H. SWEZEY.

MEMBERSHIP 1911-12.

Back, E. A.
*Blackburn, T.
Bryan, W. A.
Carter, G. R.
Cooke, J. P.
Davies, T. C.
Eckart, C. F.
Ehrhorn, E. M.
Fullaway, D. T.
Giffard, W. M.
Holmes, H.
Kershaw, J. C.
*Koebele, A.
Kuhns, D. B.
Muir, F.
Muuro Jas.
*Newell, Bro. Matthias
Paxton, E. E.
*Perkins, R. C. L.
Pfotenhauer, W.
Potter, W. R. R.
Severin, H. H.
*Sharp, D.
Swezey, O. H.
Tenney, E. D.
Terry, F. W.
Waldron, J. W.
Waterhouse, A.
Wilder, G. P.

*Honorary members.

All correspondence should be addressed to the Secretary, Hawaiian Entomological Society, Experiment Station, H. S. P. A., Honolulu, Hawaii, from whom copies of the Proceedings may be purchased.

Volume I of the Proceedings, for 1905-07 (in five numbers), contains 210 pages, 4 plates and 5 text figures. Price of the complete volume, $2.00. Volume II, No. 1, contains 35 pages, 1 cut and 1 portrait. Volume II, No. 2, contains 53 pages, 2 plates and 3 cuts. Vol. II, No. 3, contains 57 pages and 2 plates. Vol. II, No. 4, contains 45 pages and 1 plate. Price of any single number, 50 cents.

JANUARY 5TH, 1911.

The seventieth regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Notes on Cynipidae.*

BY D. T. FULLAWAY.

Mr. Fullaway had recently been working on an extensive, hitherto un-named collection of California gall-making Cypinids, at Leland Stanford University. In working it up, he found 72 species, of which 20 were new to science. He exhibited specimens of the insects and also galls; and gave interesting notes on the family as brought out in his work. Discussion followed, entered into by all members.

Effect of Exposing Aquatic Hemiptera to Atmosphere.**

BY H. H. SEVERIN.

In this paper, Mr. Severin gave results of some experiments on *Belostoma, Ranatra* and *Benacus griseus.*

Mr. Terry exhibited a wasp (*Odynerus* or closely related genus) caught on his window January 1, 1911. Undoubtedly a somewhat recent introduction, not having been taken by anyone previously.

FEBRUARY 2ND, 1911.

The seventy-first meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Mr. Fullaway gave an interesting account of his recent visit to California.

Mr. Swezey exhibited a collection of insects taken at the Grand Canyon, Arizona, while on a visit to that place.

*Published in Annals Ent. Soc. Am., IV., No. 4, pp. 331-380, pl. XXIII, 1911.—[Ed.]

**Published elsewhere.—[Ed.]

Mr. Ehrhorn exhibited a rubber leaf badly infested with *Coccus hesperidum*. Every insect showed the exit holes of a Hymenopterous parasite. He was unable to determine the parasite as all had issued previous to the time the leaf had been collected.

Mr. Kuhns exhibited specimens of the Orange aphis *Myzus citricidus* Kirk. which had been preserved by heating on a tin plate over a gas jet.

Note on Echthromorpha fuscator (Fab.)*

BY R. C. L. PERKINS.

In his paper "On the Ichnenmonidae of the Banksian Collection in the British Museum," Entomologist 1909, page 136, Morley refers to "*Ich. fuscator* Sw. MSS. Ex. Ins. Sandwich." This is doubtless that very common species of Hawaiian Pimplinae, generally known as *Echthromorpha maculipennis* Holmgr. There is no other Hawaiian insect of the Icheumonoid group with which the Fabrician description would agree, the character of red front legs and a black mark before the apices of the wings being quite sufficient to distinguish it.

Mechanism of the Hatching of the Walking Stick, *Diapheromera femorata* Say.**

BY H. H. SEVERIN.

MARCH 2ND, 1911.

The seventy-second regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Life History of the Walking Stick.**

BY H. H. SEVERIN.

Mr. Fullaway wished to record the capture of *Eucymatoge craterias* Meyr. probably the first from this island.

*Presented by Mr. Swezey.

**Published elsewhere.—[Ed.]

Mr. Terry stated that he had sent specimens of the Horn Fly to a specialist, Prof. M. Bezzi of Florence, Italy, and they had been identified as *Lyperosia irritans* L. a south European form.

Prof. Bryan gave an interesting account of his travels during the past year and of his efforts to get the next meeting of the American Association for the Advancement of Science at Honolulu.

Miscellaneous Notes.

BY O. H. SWEZEY.

(*a*) The Lantana Butterflies. (Lycaenidae).

These two species of butterflies were introduced from Mexico by Mr. Koebele at the same time as the other lantana insects, about 10 years ago. The larvae of these butterflies feed upon the flower clusters and also on the leaves to some extent. A few months ago these were identified by Dr. Dyar from specimens that I sent to the U. S. National Museum. *Thecla echion* L. is the larger prettier species with delicate tails to the hind wings. *Thecla agra* Hewitson is the smaller species without tails to the hind wings.

(b) Lithurgus albofimbriatus Sich. (Megachilidae).

This is the large black bee discussed by Dr. Perkins on page 112 of Vol. I of the Proceedings of the Hawaiian Entomological Society, and listed on page 605 of Vol. II, Part VI, of Fauna Hawaiiensis. Mr. T. D. A. Cockerell recently determined the species from specimens sent him by Dr. Perkins. The species occurs in Tahiti. Mr. Cockerell stated that the Hawaiian specimens were larger than those from Tahiti.

(*c*) *Alaptus* (?) sp. (Mymaridae).*

This is the tiny black insect that has occasionally been taken on windows of recent years; but no one has learned its habits. Feb. 5, I collected a nest of *Megachile palmarum* in an old *Sceliphron* nest at Koko Head. A few days later on examining it for *Melittobia,* I found that this parasite had bred out in every cell of the nest and nothing remained but dead male melittobias and

*Probably *Leimacis peregrina* Perkins. See Fauna Hawaiiensis II. Part VI, p. 661, 1910.—[Ed.]

pupal skins of the females; however, there were Psocids amongst the leaves and debris of the nest, and also several specimens of this tiny *Alaptus* were obtained. Dr. Perkins expressed it as his opinion that they had bred from eggs of the Psocid, as the latter were breeding in the nest. Perhaps further observations or study may prove this to be the case.

(*d*) Parthenogenesis in *Melittobia.*

Previous observations on the habits and breeding of this insect show that there are many more females produced than males. I recently performed an experiment to ascertain if possibly the insect might not reproduce parthenogenetically. Jan. 28, I placed four freshly emerged females with three larvae of *Sceliphron.* Very few eggs were laid. In about 10 days a few larvae were observed. The first adults were three males Feb. 21; up to March 1, 5 more males have matured; and all the pupae remaining are males. This experiment indicates that *Melittobia* can reproduce parthenogenetically; but when it does, only a very small number are produced and these are males. I intend to repeat the experiment for further proof.

(*c*) "Injurious Insects of Formosa, Vol. I."

I recently received a copy of this publication from the author, T. Shiraki, who made us a visit here a year or so ago while passing through from the United States. I find the following insects treated of or figured therein which also occur in the Hawaiian Islands: *Pyrameis cardui* C., *Agrotis ypsilon* Rott., *Heliothis armigera* Hb., *Hellula undalis* F., *Nymphula fluctuosalis* Zell., *Odezia hecate* var. *formosana* Shiraki (apparently is what we know as *Hymenia recurvalis* Fab.), *Omphisa anastamosalis* Guen., *Plutella maculipennis* Curt., *Bruchus chinensis* L., *Cylas formicarius* Tryon, *Adoretus umbrosus* Fab., *Lasioderma serricorne* Saun., *Oxya velox* Fab., *Gryllotolpa africana* Fab., *Icerya purchasi* Mask., *Aspidiotus ficus* Riley, *Parlatoria zizyphi* Lucas, *Coccus longulus* Dougl., *Lepidosaphes citricola* Pack., a total of 19 species.

APRIL 6TH, 1911.

The seventy-third regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Mr. Severin exhibited a box containing 17 specimens of the Japanese beetle (*Adoretus tenuimaculatus*) caught on the barbed awns of the heads of a grass (*Chaetochloa verticillata*) growing in Kapiolani Park, Waikiki. There were also a few other beetles and a roach (*Eleutheroda dytiscoides*) which had molted since becoming caught, but failed in making its escape.

Mr. Severin also exhibited a number of insects caught in a Japanese Nursery on Young Street near Thomas Square, Honolulu, among them 4 species not hitherto recorded in these islands: 1 Zygaenid moth; 4 pupae of a leaf-roller on Japanese cherry; 1 Chrysomelid beetle; 1 Otiorhynchine beetle.

Mr. Ehrhorn exhibited a specimen of a slug-caterpillar moth (*Cnidocampa flavescens* Walker) and its cocoon, the latter fastened to a twig of a pear tree, found in the course of inspection in a shipment from Japan. He also exhibited an ant from Japan taken in inspection work (*Strumigenys lewisi*) remarkable for having very long falcate mandibles.

Mr. Sweezey exhibited the following insects taken on Mt. Olympus April 2nd:

One female *Brachymetopa unica* P., quite a rare insect, only an occasional specimen being taken.

One adult *Heterocrossa distincta* Walsm., with a parasite worm (*Gordius*) partially emerged from it. The moth was brought home alive and the worm emerged the following day.

Eight *Proterhinus maurus* P. A large species, possibly the largest one known. They were found at base of *Myrsine* leaves and in cavities in the twigs. He had taken a specimen or two of the same species on previous occasions, once on Palolo Ridge and another time along the trail towards Konahuanui; always on the same species of *Myrsine*.

Experiments in the Hatching of the Eggs of Chaetogaedia monticola.*

BY H. H. SEVERIN.

*Not available for publication.—[Ed.]

MAY 4TH, 1911.

The seventy-fourth regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Notes on the Large House Spider, Heteropoda regia.

BY E. M. EHRHORN.

On January 29th, 1911, I caught a female *Heteropoda regia* with a rather large abdomen, and placed her in a breeding jar. I fed her on flies and other insects, and on February 8th, during the night she made her egg cocoon and laid the eggs, at least on the morning of February 9, I found the egg-sac complete under her body and she carried it about without much inconvenience. On March 17th, I noticed that the edges of the egg-sac were opening and I could see a few small spiders, the egg-sac had turned much darker. On March 25th all the young spiders had left the egg-sac and I counted 197 of them, and in the egg-sac I found 10 eggs, probably unfertile ones, making a total of 207 individuals had all hatched.

Mr. Fullaway gave some breeding notes of life history, etc., of *Hyalopeplus pellucidus* and *Lycaena baetica.* They were to be published in full in the Annual Report of the Hawaii Experiment Station.

Mr. Ehrhorn exhibited specimens of an unidentified, probably recently introduced Ichneumonid,* collected by Mr. W. Weinrich on Sisal plant at Sisal, Oahu. Messrs. Swezey and Fullaway recognized it as the same that they had been catching lately in various places on Oahu.

Mr. Ehrhorn also reported that Mr. Weinrich had found the Mediterranean fruit fly breeding in oranges at Kalauao. Mr. Fullaway said that Mr. Austin had found the peaches infested with this fly at Mokuleia. These observations show that it is now probably distributed over the entire island.

Mr. Terry exhibited an illustration of beetles caught on heads of grass, *Cenchrus echinatus,* in Cuba. This was in a paper by E. A. Schwarz, and is a similar phenomenon to that exhibited by Mr. Severin at the previous meeting.

Cremastus hymeniae Crawf. See Proc. U. S. Nat. Mus., Vol. 40, p. 189, 1911 and U. S. Bureau Ent., Bul. 109, pt I, p. 7, 1911.—[Ed.]

JUNE 1ST, 1911.

The seventy-fifth regular meeting of the Society was held in the usual place.

Member elected .....Mr. J. C. Kershaw

ENTOMOLOGICAL PROGRAM.

Mr. Giffard gave notes on *Odynerus,* and exhibited his collection consisting of six cabinet drawers, containing 80 species of this and closely related genera of Hawaiian wasps. The President declared a recess to allow members opportunity to examine the collection. This is the largest collection of these wasps in the islands, at the present time.

Mr. Ehrhorn exhibited some galls on koa leaves which were sent him from Haleakala, Maui, by Mr. Hannestad. The larvae of a Tortricid moth were feeding in them, but it was considered that the galls were due to some other unknown cause.

Reaction of the Walking Stick to Gravity.*

BY H. H. SEVERIN.

JULY 6TH, 1911.

The seventy-sixth regular meeting was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Mr. Swezey reported having reared two species of Tortricid moths from the galls on Koa leaves from Maui, exhibited by Mr. Ehrhorn at the previous meeting: *Cryptophloebia illepida* and *Enarmonia Walsinghami.*

The former usually feeds in the pods of various legumes; and the latter in twigs of Koa, both living and dead. Their presence in the galls was considered a secondary matter and not the cause of the galls.

A Day's Collecting at Punaluu, Oahu.

BY OTTO H. SWEZEY.

The northwest portion of the Koolau Mountain Range is

*Not available for publication.—[Ed.]

very difficult of access and has not been visited by entomologists except when Dr. Perkins and Mr. Koebele made a trip into them about 15 years ago. They reached the main ridge from Wailua, following a large valley and taking three days to reach the higher part of the mountains, where they remained in camp for a few weeks collecting in the surrounding regions. It was found to be a rich collecting field. This part of the Range has now been made easily accessible by a trail which has been cut up the Punaluu Ridge on the windward side of the mountains. This trail was cut in an investigation of the water resources of the region, and there is a galvanized iron roofed camp used by the men engaged in that work, and which now furnishes a convenient shelter for tramping parties, this having become a favorite place for those desiring to camp a few days in the mountains.

On June 11th, 1911, I spent the day up this trail, not reaching the top, but getting into some good collecting ground where I spent the short time available before beginning the descent, as I had to return the same day. The best arrangement would be to plan on staying over night, or several nights at the camp, for the best results. In my short time for collecting, I was able to secure a great deal more than I have been accustomed to in a day in the mountains in the vicinity of Honolulu. As an indication of the possibilities of this region, I give the following list of my captures though I am not able at present to give the determinations of all the species. Several of the moths listed are not from specimens collected, but from caterpillars observed. Several species of dragonflies were also observed, but not captured.

Aculeate Hymenoptera.—*Odynerus oahuensis, Pompilus* sp., *Nesoprosopis unica, Nesoprosopis* sp.

Parasitic Hymenoptera.—*Echthromorpha fusator,* five species of Ophionids, several Bethylids and related species, one species of *Eupelmus,* two species of Mymarids.

Macrolepidotera.—*Vanessa tammeamea,* caterpillars of two or three species of *Scotorythra* were observed, *Genophantis iodora, Omiodes accepta, O. localis, O. asaphombra, O. monogramma, O. maia, Phlyctaenia eucrena, P. pyranthes, P. stellata, Pyrausta constricta, Scoparia ombrodes, S. lycopodiae.*

Microlepidopetera.—*Batrachedra sophroniella, Hyposmocoma atropurpurea, Heterocrossa divaricata, Bactra straminea, Archips* sp., *Epagoge infaustana, Opostega maculata, Philodoria micropetala.*

Diptera.—*Dicranomyia* sp. (larvae mining in leaves of *Cyrtandra), Pipunculus* sp., *Dyscritomyia* sp., several species of Drosophilidae and of other families.

Coleoptera.—*Coelophora inequalis, Scymnus vividus,* eight species of *Proterhinus,* one Annobiid, two Carabids, two Nitidulids, four Elaterids.

Orthopetera.—*Brachymetopa blackburni, Paratrigonidium* sp., *Loboptera extranea.*

Heteroptera.—*Reduviolus lusciosus, R. subrufus, Oechalia grisea, Nysius* sp., several species of Capsids.

Homoptera.—One species of Psyllidae (on native palm), *Iolania perkinsi, Oliarus montivagus, O. nubigenus, Oliarus* n. sp., eight or ten species of Delphacidae, four or five species of Jassidae.

OCTOBER 5TH., 1911.

The seventy-seventh regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

A Newly Introduced Wasp (Odynerus.)

BY W. M. GIFFARD.

(Specimens exhibited.)

A few weeks ago whilst in my garden at Makiki I observed what appeared to me to be a peculiar species of wasp flying rapidly over certain low-growing trees. The lateness of the day prevented more than a casual observation but on the following morning I watched for its reappearance. The weather being sunny and with little wind every opportunity was afforded for the occasion with the result that several individuals were observed and a few captured. These all proved to be males of a species of *Odynerus* which I had never before seen in the Territory and which certainly did not belong to our indigenous or endemic Aculeate fauna. For a few days I continued without success my search for female specimens meanwhile securing a sufficient number of males to form a series of that sex. With the object of capturing females I finally decided to closely ob-

serve the flights of the males, which appeared always to take a direction toward the dwelling near by. A close examination of the exterior of the building as well as of the shrubbery adjacent thereto resulted in noticing more than the usual number of males flying around and over Hibiscus bushes alongside a latticed porch. Having watched these for a short while it was observed that after flying around the flowers for a few minutes several of the wasps would direct their flight toward a window near by, the blinds of which had been securely closed and fastened for sometime past. A closer examination revealed the fact that numbers of the wasp were buzzing around the partly opened slats of the blinds. Noting several of the largest individuals which at first sight appeared to be females, I was again unsuccessful in securing that sex. Why so many male Odynerus were buzzing around the slats of these blinds without any apparent object was certainly puzzling. I finally came to the conclusion that a peculiar spot for their nests had been selected on the inside of the blinds and these males were waiting for the emergence of females. Eventually opening the blinds I discovered three large nests of our common mud-dauber (*Sceliphron caementarium*) adhering to the glass and window sash. After detaching these they were placed in separate breding jars in the laboratory. The results obtained have been altogether satisfactory as from these mud-dauber nests there have so far emerged 10 females and 18 males of this peculiar but apparently common wasp. With exception of a sufficient number for examination and determination all of the bred males were liberated.

This newly introduced *Odynerus* uses the vacant cells of *Sceliphron* for its nests in the same manner as our indigenous *O. nigripennis* is now known to do. In some of these cells were found fairly large supplies of caterpillars with which the larvae of Odynerus are fed. Specimens of the caterpillars have been kindly determined for me by Mr. O. H. Swezey as *Cryptoblabes aliena* Sw. It is of economic interest to note that this particular species of Lepidopterous larva has thus far not been found in the nests of any of our local species of *Odynerus*. The mud-dauber nests also appeared to be well stocked with the larvae and pupae of *Sceliphron* as well as those of the *Odynerus* although up to the present I have only bred out the latter. The larvae of both these Aculeates I found attacked by *Melittobia hawaiiensis* Perk., swarms of these small Chalcidoid parasites being found in both larval and pupal stages. Thousands have since bred out in the jars as well as in individual tubes where both larvae and

pupae of the Aculeates were placed for experimental purposes. At this time I should judge that the larvae of *Sceliphron* are more susceptible to attack from these parasites than that of the *Odynerus*. *M. hawaiiensis* has previously been bred from the larvae of *Sceliphron caementarium, Odynerus nigripennis, Pison hospes* and *Megachile palmarum*. It is quite probable that this Chalcid and others are, to a more or less extent, accountable for the occasional rarity of many species of our endemic wasps.

A careful study of available literature on the Eumenids (unfortunately confined here to three works) leads me for the present to determine this newly introduced wasp as *Odynerus nasidens Latr.* If it is not that species then it is either *O. simplicornis* Sauss., or a variety of one or the other.

Saussure in his Synopsis of Am. Wasps, Pt. I, pp 228-229, 1875, places the *O. nasidens* of Latreille in his Division *Pachodynerus* (also see Sauss. Mon. des Guepes Sol. p. 169, 1852, and Supl. pp. 229, 252, 1856, Division Epsilon), this division of the Odynerus having the antennae of the males simple, that is, not terminated by a hook. He has described three species in the Section of his Division *Pachodynerus* to which *O. nasidens* belongs, viz.:—*O. brevithorax,* Sauss, *O. nasidens,* Latr., and *O. simplicornis,* Sauss. All of these three species evidently have a close resemblance to each other and Saussure himself states that without comparing numerous specimens of each of the species one easily confounds all under the same description, taking them for *O. nasidens* of Latreille. He further states that even after the examination of his numerous specimens he still remained in doubt although he *thought* that he could distinguish *O. brevithorax* quite clearly and in consequence determined it as a new species. On the other hand in referring to his *O. simplicornis* he admits that "one should perhaps consider this species as a variety of *O. nasidens.*" Unfortunately there are no named specimens of foreign Eumenids available locally for reference purposes so that a comparison of such with either tables of genera or species is altogether impossible. The available literature on the subject is also incomplete and because of these facts I have sent a small series of both sexes of this introduced wasp to the U. S. National Museum at Washington. In due course we will no doubt secure a conclusive determination of the species.

According to Saussure, *O. nasidens* and its close allies are species peculiar to tropical America, 1st—from the hot parts of Mexico, 2nd—from Colombia and Venezuela, 3rd—from Bahia

and Brazil. It is possible that the wasp under discussion was introduced here from Mexico amongst freight received from Salina Cruz by the American-Hawaiian line of steamers.

For examination I have captured 16 males flying over garden plants and shrubs, and 18 males and 10 females have been bred from the nests of *Sceliphron caementarium* as previously noted. A much larger series could, if necessary, be captured as I still notice many of these wasps flying around.

Note—Since writing the above I have received a small lot of endemic *Odynerus* from Kauai collected for me by Mr. G. P. Wilder, and among these I noticed two males and one female of this newly introduced wasp. This indicates that it is already established elsewhere than on Oahu, and also that the species must have been here for some time past. It is somewhat strange that a series has not been captured long ere this. I now think it possible that the single individual wasp which Mr. F. W. Terry captured a few months ago in the window of a room on Punchbowl and which he exhibited at a meeting of the Entomological Society a few months ago may be the same species. As he is away at this time this fact cannot be ascertained and his specimen is therefore not available for comparison.

Mr. Severin related some observations he had made a few weeks previously on the occurrence of Nematodes in sugar beet fields in California.

Mr. Ehrhorn, who had recently returned from a vacation trip to California, spoke of the unusual dryness of the regions surrounding San Francisco and Central California, and the consequent scarcity of insects, making it exceedingly unfavorable for doing any collecting.

NOVEMBER 2ND, 1911.

The seventy-eighth regular meeting of the Society was held in the usual place.

Mr. Swezey exhibited a collection of about 50 species of moths collected by Mr. Giffard at his new bungalow near the Volcano House, Kilauea, Hawaii. The moths were collected as they came to lights at night, during the summer of 1911, when Mr. Giffard was making a short stay there at several different

times. Some of the species exhibited were very common, some rather rare, and a few apparently new to science.

Mr. Giffard added that he collected *Banchogastra nigra* and other Ophionids also at lights.

Mr. Giffard further reported having found *Pachodynerus nasidens* very numerous at Makaweli, Kauai. This is the new wasp exhibited by Mr. Giffard at the previous meeting. Mr. Severin reported collecting it at the College of Hawaii. Mr. Swezey reported rearing two specimens from a *Sceliphron* nest at the Experiment Station, H. S. P. A.; and Mr. Muir reported collecting a specimen on the window at the same place.

DECEMBER 21ST, 1911.

The seventy-ninth regular and sixth annual meting of the Society was held in the usual place.

ANNUAL ADDRESS.

Suggestions for the Future Growth of the Hawaiian Entomological Society.

BY E. M. EHRHORN.

The Hawaiian Entomological Society is now seven years old, for on December 15, 1904, the first meeting to consider the advisability of forming the society took place and the first regular meeting was held January 26, 1905. As the seventh president of the Society, I desire to say that in looking over the Proceedings I find that the society today is not doing as much nor possibly as important a work as it did in the first three or four years of its existence. It is true that many of our members have been absent and we have lost several by death and resignation. Article II of our Constitution says: "The objects of the Society shall be to promote the study of Entomology in all possible bearings, and to encourage friendly relations between those in any way interested in the science." In 1905 we had a membership of twenty of which two were honorary members; today we have a membership of twenty-five with four honorary members. Our Constitution in Article III says: "The society shall consist of active, corresponding and honorary members. No

corresponding members shall be elected from residents on the Island of Oahu." Many of our members are supporting members, that is; many of our rich influential men have become members so as to financially aid us, and some have in the past contributed money to help publish our Proceedings. Only a small number of our members take an active part in the meetings and at times it is hard to even get a quorum.

It seems to me that it would be advantageous to our Society to follow other societies in regard to membership. We find that on account of the small number of strictly professional members, some societies have divided their membership into two groups; namely, active members and associate members. Other societies add foreign and corresponding members. I believe that some steps should be taken to encourage the study of Entomology in these Islands and to that end we should provide a section into which would fall members who are interested in Entomologoy such as teachers and students. I believe that that class of membership will help the Society and we shall be able to promote our favorite study in all possible bearings and encourage those who now feel diffident and yet might, by a little encouragement, show their hidden talents. I personally know of several individuals, who never got the fever until they were shown interesting phases of Entomology and they are today not only enthusiasts, but very good Entomologists, some even specialists in certain groups. Our various departments today are in need of willing workers as assistants in Entomology, some of our young men or women who have a fairly good education would be able to become proficient in many phases of Entomology, mounting specimens, rearing injurious as well as beneficial insects, etc., if we could encourage them in these studies. I believe that it is possible to interest and encourage many students of our various colleges in the many interesting branches of our study and some no doubt would become good working members in the end.

Now that the Territorial Government is undertaking inspection work in various ways, we who come in direct contact with the situation fully realize the scarcity of available men, especially those who have the smallest knowledge of Entomology. Our colleges and schools are not taking up the study of Entomology in a way which would encourage the student to make this his future work. This is possibly due to the lack of funds or to the lack of time, which is usually consumed by other studies.

Associate members or junior members could be taken in on a smaller fee but certain privileges of active members could be withheld from them. The educational features would be their greatest benefit, and if encouraged by this, they would have a chance to soon become active members, in other words, by such arrangements the Society would run a good chance of acquiring a good working membership in the near future.

Many of our professional men, our medical fraternity, our health authorities, even men working in vegetable pathology would be interested in our work. The medical men have always various cases where insects seem to have a direct bearing, the health authorities especially at the present moment have many problems which come in direct touch with Entomology and the vegetable pathologist has interesting work in the fungi which attack insects and in those insects which feed on fungi. We have enormous fields for investigation, but our force is now in very limited numbers.

The demand for our Proceedings has increased and are very valuable to other societies. It is true that we have not published as frequently lately as in the past and unless some new life be introduced into the Society, I am afraid that we shall weaken considerably in the future. I am not making these remarks to throw cold water on our work, but merely to try and bring before the Society the absolute necessity of considering some ways and means to promote it.

I would recommend that a committee be appointed by the incoming president to take up this matter and formulate some plan by which we can increase the membership of the Society and possibly broaden the field of Entomological work.

Further Notes on "A Newly Introduced Wasp (Odynerus)."

BY W. M. GIFFARD.

In the course of my remarks on the above subject read before the September meeting of the Hawaiian Entomological Society I referred to the species as possibly *O. nasidens* Latr. (*Pachyodynerus* Sauss.) or else Saussure's *P. simplicornis*. Having sent specimens to Mr. S. A. Rohwer of the U. S. National Museum, Washington, D. C., I am in receipt from him of the following note, viz.:

Pachodynerus simplicornis Sauss.

"Brethes calls attention to the fact that *Pachodynerus* has only 12-jointed antennae (the 12th joint being small and knob-like) and considers it to be a genus. Brethes also figures the genitalia of the male of *nasidens* and *brevithorax*. Your insect differs from these but agrees with what we have as *simplicornis*. As the types have never been examined it is possible that error may have crept in, but for the time being it may be well to consider your insect *simplicornis*. It is my impression that there are more species in this group.

"If it were possible to examine the types of the species in question, especially in reference to the genitalia, I thing it possible that your insect would be classed as a new species. As this is entirely out of the question it is best to leave it as I have determined it."

NOTES AND EXHIBITIONS.

Mr. Swezey reported that *Caryoborus gonagra,* the tamarind weevil, had been found on Kauai; quite a number of specimens having been sent to the Experiment Station H. S. P. A., that had been collected in Mr. Hans Isenberg's gardens at Lihue, where they were thought to be some new bug destructive to all kinds of garden vegetables. Mr. Swezey thought that they were probably only hiding in the dead or crumpled leaves, as he had found them quite numerous in the dried up dead leaves on papaia trees at his place in Kaimuki.

Mr. Ehrhorn read a letter from Q. Q. Bradford, Formosa, in which he reported having seen but one specimen of the Japanese rose beetle there; also that he considered the melon fly scarce there, having seen a few cucumbers with the spots where the eggs had been laid.

Mr. Ehrhorn also reported having discovered the presence of the mite which causes the "Kiawe itch," it being the same species *(Pediculoides ventricosus* Newport) that attacks the joint worm in straw, in the States, where severe cases of itch have been traced to it from that source. He expects to continue observation and experiments with this mite. It breeds on the larvae of weevils feeding in the Kiawe beans.

Mr. Ehrhorn further called attention to the abundance of the pigeon fly (a species of pupiparous fly), at a place on the

corner of Young and Keeaumoku streets, Honolulu. In discussion, it was brought out that this fly is now very common in Honolulu. It is but little more than a year since its presence here first came to the attention of the entomologists. It has not yet been determined specifically, nor from what locality it came.

Mr. Fullaway exhibited specimens of parasites bred from the cotton moth *(Gelechia gossypiella),* the following now being known: *Chelonus blackburni, Pristomerus* sp., *Parasierola* sp., *Hockeria* sp.

ELECTION OF OFFICERS FOR 1912.

President ..... D. T. Fullaway
Vice-President ..... F. Muir
Secretary-Treasurer ..... O. H. Swezey

JANUARY 4TH., 1912.

The eightieth meeting of the Society was held in the usual place.

ENTOMOLOGICAL NOTES.

Mr. Swezey exhibited a collection of 30 or more species of moths, collected by Messrs. Giffard and Ehrhorn at Mr. Giffard's house near the Volcano House, Kilauea, Hawaii, during the early part of the evening of three nights in December, 1911. Among them there was one new species: an *Aristotelia* larger than any species previously described for the Hawaiian Islands. There were also a few other species not previously seen by Mr. Swezey.

Mr. Ehrhorn exhibited a few species of ants, recently determined by Mr. W. M. Wheeler. Two of them were: *Monomorium minutum* var. *liliuokalani,* collected at Kaimuki; and *Tetramorium guinense,* collected at Hilo. Two species had not previously been recorded from the Islands. *Plagiolepis exigua* Forel, taken at Kalihi; and *P. mactavishi,* taken in Honolulu. Dr. Perkins recognized *exigua* as a species that he had been seeing a good deal of lately, his first notice of it having been specimens that were sent in from Hutchinson Sugar Plantation, Naalehu, Hawaii, two or three years ago. Mr. Swezey had the

past year found their nests in rotten sugar canes at the Experiment Station in Honolulu and at Aiea, Oahu. This was followed by a general discussion of several of our species of ants. Mr. Ehrhorn related an interesting experiment in which he sprinkled pulverized Cyanide of Potassium on the surface of the ground around the entrance of a nest of *Solenopsis geminata,* and then by stamping on the ground, the ants were disturbed, and many came forth and were very quickly overcome as they crawled over the Cyanide.

Mr. Giffard called attention to the spread of the introduced fern weevil (*Syagrius fulvitarsis* Pasc.), on the mountain ridges near Honolulu. It was first known on Pacific Heights Ridge as early as 1903. By 1906, it was common on the Pauoa side of Tantalus; and has now spread to the Manoa side of Tantalus. It is attacking and killing off nearly all the ferns of the species *Sadleria cyatheoides,* and is causing some concern lest it later on attack some other species of tree ferns of the region, none of which so far have been observed to be attacked by it. During all this time, several of the florists in Honolulu were having their maidenhair ferns attacked by this weevil. In the latter fern, it is the underground rhizome that is attacked, while in the *Sadleria,* the weevils attack the stem of the frond, the larvae burrowing all through it.

Moths from Olinda, Maui.

BY OTTO H. SWEZEY.

The following is a list of moths collected by Mr. J. F. Rock as they came to lights at night, at Olinda, Maui. Among them are a few that I have never collected, and are somewhat rare, one of them being *Hymenia exodias,* which was only collected once before and that by Dr. Perkins on Molokai.

FAMILY CARADRINIDAE.

2—*Cirphis unipuncta* (Haw.)
3—*Lycophotia saucia* (Hub.)
1—*Agrotis cinctipennis* (Butl.)

FAMILY PLUSIADAE.

2—*Nesamiptis obsoleta* (Butl.)
6—*Cosmophila noctivolans* (Butl.)
27—*Cosmophila sabulifera* (Guen.)

FAMILY SELIDOSEMIDAE.

4—*Scotorythra rara* (Butl.)
2—*Scotorythra paludicola* (Butl.)

FAMILY PYRAUSTIDAE.

10—*Omiodes continuatalis* (Wall.)
16—*Omiodes accepta* (Butl.)
3—*Omiodes localis* (Butl.)
4—*Omiodes monogona* Meyr.
3—*Hymenia exodias* Meyr.
1—*Phlyctaenia micacea* (Butl.)
1—*Scoparia siderina* Meyr.
6—*Scoparia frigida* Butl.

FAMILY CARPOSINIDAE.

1—*Heterocrossa trigononotata* Walsm.

FAMILY TORTRICIDAE.

2—*Crocidosema plebiana* Z.

FEBRUARY 1ST., 1912.

The eighty-first regular meeting of the Society was held in the usual place.

The secretary read Resolutions of Sympathy on the death of Mr. F. W. Terry and an Obituary Notice*, prepared by the President and secretary as instructed by the Society at the previous meeting. Both adopted.

ENTOMOLOGICAL PROGRAM.

Mr. Swezey reported breeding *Pentarthron flavum* P. from eggs of *Vanessa tammeamea* collected on Mt. Olympus, Oahu, January 21, 1912. He had observed a parasite sitting on an egg in situ; and of 11 eggs collected, 5 had already yielded parasites. He exhibited 24 that had emerged from one egg of the butterfly. This is believed to be the first record of this butterfly's eggs being parasited.

*Published in Proc. Haw. Ent. Soc. II., 4, p. 189, 1912 [Ed.].

Mr. Fullaway reported finding 20 per cent of the eggs of *Caryoborus* and *Bruchus prosopis* on algeroba pods parasitized by a Trichogrammid (*Uscana semifumipennis* Girault).* This parasite is thought to have been introduced at the time he was receiving weevil parasites from Texas a few years ago.

A New Endemic Fern Weevil of the Genus Heteramphus.

BY OTTO H. SWEZEY.

On January 14th, 1912, while following up the ridge on the west side of Palolo Crater on the trail leading to the summit of Mt. Olympus, fronds of ferns of the genus *Elaphoglossum* were observed to be mined by some insect. Examination of several mines resulted in the finding of one adult beetle, a pupa, and several larvae. The fronds of the ferns of this genus being broad and entire are quite suitable for the work of leaf-miners. Three species of *Elaphoglossum* were found to have the fronds mined. Larvae of the miner were first found in *E. micradenium,* but later in *E. gorgoneum,* and *reticulatum* also. The adult beetle found was in its own mine, where it had transformed to the adult stage and had not yet emerged, furnishing on the spot, proof of what insect was responsible for the mines.

On January 21st the same locality was again visited, and more of this miner collected in all stages. It was found that this weevil existed wherever these particular ferns were found all the way up Mt. Olympus, and then down the ridge between Palolo and Manoa Valleys, as evidenced by the mines in the fern fronds. Many of these mines showed the exit holes of some parasite. Searching for the parasite, finally a parasite pupa was found in one mine and in another a weevil larva was found to have a tiny parasite larva feeding on it. Attempts to rear these to maturity failed, but from mines in fern fronds collected, five parasites emerged, one each on the following dates: February 2, 5, 8, 12, 13. These were *Omphale metallicus,* a small Chalcid which parasitizes many Lepidopterous leaf-miners in the Hawaiian Islands.

Several adult weevils also emerged from mines in these fronds somewhat later. On comparison these were found to differ from the previously known species, some of which are known to inhabit the trunks of tree-ferns, and Dr. Perkins has

*Trans. Am. Ent. Soc. XXXVII, No. 1, p. 23, 1911.

pronounced it a new species. It is quite a different habit as compared with the others of the genus, as the larvae of those whose habits are known, live at the base of the fronds or in the trunks of tree-ferns, and at the base of the leaves and in the stems of *Astelia veratroides,* a plant of the Lily family.

Notes on Two Galleriids.

BY OTTO H. SWEZEY.

Paralipsa modesta Butler.

I have reared two specimens of this moth from larvae handed me by Mr. E. M. Ehrhorn, July 8th, 1911. A large importation of Japanese rice was found by him to be infested with some hitherto unknown Lepidoterous larvae. The shipment was therefore fumigated. A few of the larvae were retained for rearing to ascertain the species.

The larvae were apparently full-grown at the time. They were larger than the larvae of *Ephestia elutella,* dirty whitish, with two or three of the segments at either end tinged with fuscous; head reddish; tubercles minute, fuscous.

By July 20th several cocoons were made. Several of them were inside the cork of the tube containing the specimens, the larvae having burrowed into the cork for that purpose. At intervals of two or three weeks, some of these cocoons were examined, and the larvae found to be lying dormant without pupating. These observations were continued up to October 31st, without finding that any pupae had been formed; but on November 17th, it was found that two moths had emerged; one was still living, but the other had died. To the present date (Feb. 1, 1912) no more moths have appeared, and examination revealed a living larva in one cocoon.

I have recently been able to determine this moth as *Paralipsa modesta* Butler. It is described in Ann. Nat. Hist. (5), IV., p. 455, 1879, where the venation of forewing of the male is given. The peculiarity of the genus is the enlarged cell in forewing of male, and the mass of appressed hair-scales just before middle of cell on underside. Butler described the genus and species from a collection of Japanese moths collected at Yokohama. No habits are given. I have not found anything further of it in literature.

Corcyra cephalonica Stn.

This moth first came to my attention when Mr. J. Kotinsky found it breeding in a feed warehouse in Honolulu in July, 1908. Later, I caught a specimen in my house in Kaimuki, January 10th, 1909. The latter part of January of this year, the moths were found emerging from the remnants of a package of cracked wheat obtained from some Honolulu grocery store some time previously. From these specimens, I have determined it as *Corcyra cephalonica* Stn., a European moth, apparently not yet recorded in the United States, though it certainly must occur there from whence it has reached Honolulu.

MARCH 7TH, 1912.

The eighty-second regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

A Leaf-Mining Proterhinus.

BY OTTO H. SWEZEY.

While on a collecting trip up Mt. Olympus, Oahu, February 11, 1912, I observed that the leaves of *Broussaisia arguta* were very extensively mined. Examining some of these, I was surprised to find in the mines larvae of some beetle, footless grubs of the Curculionid type. Examining the tree further, I found adult beetles of the genus *Proterhinus* very abundant at the tips of growing shoots, feeding on the buds and young leaves, between the latter where they are close together previously to their unfolding in the growth and development of the shoot. Many of the larvae found appeared to be full-grown. No pupae were found. I did not succeed in rearing any adults from the larvae collected. They all died a few days after they were brought down from the mountains. However it is beyond a doubt that the larvae found in the mines in the leaves belong to the species of *Proterhinus* whose adults were so numerously feeding on the same tree. Dr. Perkins has kindly determined the species as *excrucians* P., a very variable species which has been abund-

antly collected by him in numerous places on Oahu; Waianae, Mokuleia, Wahiawa, N. W. Koolau Range, Pauoa and Mt. Tantalus.

All along the trail from Olympus to Konahuanui, the *Broussaisia* trees have their leaves much mined by this weevil. The mines largely follow the larger veins and the midrib, though they also traverse to some extent the parenchyma between veins. This leaf-mining habit has not been previously observed for any species of *Proterhinus,* their larvae being largely dead-wood and bark feeders.

In one mine a pupa of a parasite was found, from which the adult emerged later. One beetle larva was found having a parasite larva feeding on it externally; but it failed to go through to maturity. The parasite was examined by Dr. Perkins, who says that it belongs to the genus *Toxeuma,* or to *Neolelaps*—two genera that are not readily separated and perhaps should be considered identical.

Dr. Perkins, who had determined the species for Mr. Swezey, remarked that of the considerable number collected by Mr. Swezey all were males. He said that this was a very variable species, some being entirely black; and that in his former collection of this species from different localities, those from each locality differed from those of the other localities.

Mr. Swezey exhibited a collection of moths made by Messrs. Giffard and Fullaway at the mountain home of the former, Kilauea, Hawaii during a few nights in the past month. There were about 70 species, several rare ones and three or four new ones. Mr. Giffard said that at the time these moths were being collected, great numbers of Tipulids also came to the lights.

Mr. Fullaway exhibited a specimen of a wingless species of *Phenopria* collected by him March 3, 1912; along the trail going up from Nuuanu Valley at the mauka or back end of Pacific Heights Ridge. He also reported finding a specimen of the Pipturus Delphacid *(Nesosydne pipturi)* parasitized by *Gonatopus perkinsi.* Dr. Perkins said that there was a hyperparasite on this *Gonatopus* that had not yet been described.

Mr. Fullaway also reported having bred two parasites from *Hemichionaspis minor: Aphelinus diaspidus* and *Aspidiotiphagus citrinus.*

Mr. Swezey exhibited some eggs and freshly hatched nymphs of *Prognathogryllus* sp., one of a group of crickets peculiar to the Hawaiian Islands. The eggs of any of the species had never

been observed before. Mr. Swezey had found these eggs on Mt. Olympus, Feb. 11, 1912, in two leaves of a native tree, *Labordea membranacea,* at an elevation of about five feet from the ground. They were placed in the midrib of the leaf, nearly regularly, about 10mm. apart. Apparently the female cricket had bitten off a little of the upper surface of the midrib, then inserted the egg at this place, directing it downward, the end being left exposed. The egg is cylindrical in shape, curved a little near the outer end, the latter being truncate where exposed; whitish, 6mm. long and nearly 1mm. in diameter.

Mr. Swezey reported *Lineodes ochrea* as a pest on egg-plant, having received caterpillars that were feeding on this plant at Kilauea, Kauai, from which he had reared the moth. The habits of the 2 species of *Lineodes* in the Hawaiian Islands had not previously been known. Mr. Swezey said that the only record of the habits of any species of the genus that he could find was that of two species in the Southern States, one feeding on Capsicum and the other on species of Solanum, both related to the egg-plant. Dr. Perkins thought that it was very likely that the Hawaiian species were introduced, probably from America.

Mr. Swezey also reported finding the eggs of *Caryoborus gonagra* on some bananas. Examination had shown that they had hatched and that the young larvae had eaten a little into the rind of the fruit and then died, as though poisoned by some chemical substance in the juice.

APRIL 4TH, 1912.

The eighty-third regular meeting of the society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Synoptic List of Ants Reported from the Hawaiian Islands.

BY MISS LOUISE GULICK.

(Specimens of ants were exhibited, and a presentation of synonomy with references in literature to the descriptions of all the species of ants known in Hawaii, with remarks on the same; also a key for identification of species. In the list 21 species were included as known to occur without a doubt, and a few others that have been reported, but not at present to be found in any collection in Honolulu. See Appendix.)

Preliminary List of the Hymenopterous Parasites of Coccidae And Aphidae in Hawaii.

BY D. T. FULLAWAY.

CHALCIDOIDEA.

Encyrtidae.

Ectromini.

PARASITE.	HOST.
Anagyrus sp?	on *Pseudococcus* sp.

Encyrtini.

Encyrtus fuscus	on *Saissetia hemispherica.*
Encyrtus sp., (banded ant.)	on *Saissetia* sp.
Encyrtus sp.	on *Saissetia hemispherica*

Mirini.

Blepyrus insularis	on *Pseudococcus aonidum, P. virgatus.*
Aphycus terryi*	on *Pseudococcus saccharifolii.*
Aphycus sp?	on *Lepidosaphes* sp.
Microterys flavus	on *Pulvinaria mammae, P. psidii, Ceroplastes rubens, Saissetia hemispherica, S. nigra.*
Apentelicus kotinskyi	on *Lepidosaphes* sp.
Adelencyrtus odonaspidis	on *Odonaspis graminis.*
Cerapterocerus sp.	on *Saissetia hemispherica, Aspidiotus* sp?
Hemencyrtus sp?	on *Saissetia nigra.*
Aphidencyrtus sp?	on *Aphis maidis.*
Encyrtus sp?	on *Pseudococcus citri.*
Encyrtus sp. (near *Aphidencyrtus*)	on *Coccus viridis.*

Pteromalidae.

Eunotinae.

Scutellista cyanea	on *Saissetia hemispherica.*

Sphegigasterinae.

on *Asterolecanium pustulans,Tomocera californica*
Saissetia hemispherica, S. nigra.

on *Ceroplastes rubens.* *Tomocera ceroplastis*

Eulophidae.

Entodoninae.

Astichus sp. on ?

Aphelininae

Aneristus coroplastae on *Ceroplastes rubens.*

Coccophagus orientalis on *Pseudococcus* sp., *A. rapax, Coccus viridis?*

Coccophagus lecanii on *Aspidiotus rapax.*

Encarsia sp. on *Aleyrodes sonchi*

Thysanus sp. on *Asterolecanium pustulans, Aspidiotus cydoniae, A. rapax.*

Aphelinus mali on *Aphis* sp. (on sedge.)

Aphelinus diaspidis on *Diaspis bromeliae, Aulacaspis rosae, Hemichionaspis minor Aspidiotus camelliae, A. rapax.*

Perissopterus sp. on *Lepidosaphes* sp., *Pseudococcus?*

Pteroptrichoides perkinsi on *Coccid* (n. g., n. sp.) [Kot.]

Pteroptrichoides sp. on *Asterolecanium pustulans, Howardia biclavis.*

Aspidiotiphagus citrinus on *Hemichionaspis minor, Chrysomphalus aonidum*

Eretmocerus corni on *Aleyrodes hibisci.*

ICHNEUMONOIDEA

Braconidae.

Aphidiinae

Diaeretus rapae on *Aphis brassicae, Macrosiphum* sp.,*Myzus perisicae.*

CYNIPOIDEA.

Figitidae.

Eucoilinae

Eucoila sp. on *Macrosiphum* sp., *Aphis sacchari.*

Mr. Muir exhibited a deformed specimen of *Dictyophorodelphax mirabilis,* which he caught on Kaumuohona Ridge, March 24th. The prolongation of the head was curved and bent downward, almost doubled on itself below.

JUNE 6TH, 1912.

The eighty-fourth regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Mr. Ehrhorn exhibited specimens of egg-case, young and adult of a mantis. The egg-case was taken off an azalea from Japan, and 246 young hatched from it. There was a great mortality on the second day after hatching; only one had lived through to adult, and one nearly adult. The young fed an aphids. The dates of moulting were as follows: Born Feb. 13; first moult Feb. 29; second moult March 23; third moult April 9; fourth moult May 1; fifth moult May 13; sixth moult June 1. This makes 109 days from hatching to maturity.

Mr. Fullaway exhibited a specimen of *Tettigonia mollipes?* (an American Jassid) taken for the first time in these islands, May, 1912. It was taken by his assistant, J. Nunes, in Ward's meadow at the foot of Sheridan street, Honolulu. Mr. Muir had later visited the spot and found the species numerous on the reeds and grasses round about the swamps in that district.

AUGUST 1ST, 1912.

The eighty-fifth regular meeting of the Society was held in the usual place.

In a communication from Mr. Muir, the information was given of the death of the Rev. Thomas Blackburn. On motion of Mr. Giffard, the chair appointed Messrs. Muir and Swezey as a committee to draft resolutions and obituary of Mr. Blackburn.

ENTOMOLOGICAL PROGRAM.

Some Notes on Insects in Kona, Hawaii.

BY D. T. FULLAWAY.

Mr. Fullaway gave interesting notes on the occurrence of the following insects in that region: The *Pompilus* that made its appearance in Honolulu in 1910; *Crabro fulvicrus;* the recently-introduced Trichogrammid, *Uscana semifumipennis,* on the eggs of the algaroba bean weevil; *Coccus viridis* on coffee, parasitized by *Coccophagus orientalis,* and *Encyrtus* sp.; the caterpillars of *Cryptoblabes aliena* causing some alarm amongst coffee growers, as they occurred on the branches among the berries and occasionally did some eating on the latter; *Ceratitis capitata* breeding in the heaps of decaying pulp from the coffee-cleaning mills, and the maggots considerably preyed upon by ants and other insects that are commonly found in cow dung preying on maggots of hornfly and other flies; *Psilopus* sp.; *Omiodes* caterpillars feeding on wild bananas, apparently a new species, differing little from any of the four other species of *Omiodes* feeding on banana.

Mr. Swezey reported having recently observed a place up in one of the side branches of Makiki Valley where all of the ferns had been killed by the weevil *(Syagrius fulvitarsis)* which is spreading across Mt. Tantalus killing some kinds of ferns, especially *Sadleria cyatheoides.* There was considerable discussion of this insect. Mr. Ehrhorn said that Brother Matthias had reported its occurrence at Hilo, Hawaii, several years ago (1908).

Mr. Swezey gave quite an account of his recent vacation trip to New Zealand, and his experiences in collecting insects in the New Zealand "bush." Although it was their winter season, he was able to secure many interesting specimens and intended to have them mounted for exhibition at some future meeting of the Society.

SEPTEMBER 5TH, 1912.

The eighty-sixth regular meeting of the Society was held in the usual place.

Mr. C. J. Austin was reinstated to active membership.

Mr. Muir exhibited specimens of *Anomala orientalis,* a beetle whose grubs he had found destructive to the roots of sugar cane in certain spots of Honolulu Plantation, Oahu, in June, 1912. He had compared the grubs with some which Mr. Ehrhorn had collected at various times at the roots of plants imported from Japan, and had found them to be the same. They are quite similar to the grubs of the Japanese rose beetle *(Adoretus tenuimaculatus),* and probably have previously been mistaken for them, as the indications are that the *Anomala* has been present for a number of years, grubs having been taken from these same spots but no adult beetles were seen previous to June of this year.

Miscellaneous Notes.

BY O. H. SWEZEY.

Uscana semifumipennis.—An algaroba pod picked up under a tree along the Roundtop Trail, Sept. 2; 1912, was found to have 88 Bruchid eggs on its surface. A later examination showed that 83% of these were, or had been parasitized by this Trichogrammid, introduced by Mr. Fullaway a few years ago, and which is now known to be very widely spread.

Syagrius fulvitarsis.—In conversation with Brother Matthias at Hilo, August 17th, it was learned that the occurrence of this weevil, that he had reported in Hilo in 1908, was at the Shipman house, and that the weevils were in ferns brought from Honolulu. He had not ascertained whether they had gotten rid of the pest or not.

Pompilus sp.—This Pompilus that first appeared in 1910, was observed abundant in the cane fields of the Hilo district, in August of this year.

Mr. Kuhns reported having seen this wasp on Molokai in June.

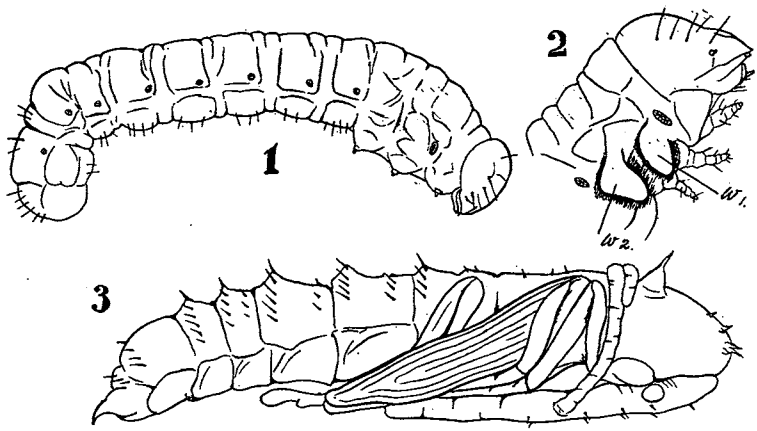
On an Abnormal Larva of *Lasiorhynchus barbicornis* (Fabr.)

BY F. MUIR.

Among the insects collected by Mr. O. H. Swezey on his recent trip to New Zealand are the larvae, pupae and adults of *Lasiorhynchus barbicornis;* one of these larvae is of particular interest, it being a good instance of the precocious development of wings and legs.

The normal larva has very small, two-jointed legs, the thorax is slightly larger than the abdomen, the eighth and ninth abdominal segments are turned ventrally nearly at right-angle to the rest (Fig. 1). In the abnormal specimen, which is not a fully grown one, there arises from each side of the second and third thoracic segments a well-defined wing-pad supplied with tracheae; the legs of this specimen, instead of being minute two-jointed organs, are very much larger and distinctly six-jointed. (Fig. 2.)

In the male pupa the antennae, arising from near the apex of the rostrum, lie along each side of the head, the head and rostrum being deflexed and lie on the ventral surface of the thorax; in the female the antennae, which arise about the middle of the rostrum, encircle the thorax (Fig. 3). Mr. Swezey states that the burrows in which the beetle pupates is only slightly larger than the beetles in circumference, and as half and wholly mature beetles are found in the burrows with the head extended in front, in the normal adult position, it would appear that the head and rostrum are straightened out immediately upon emerging from the pupa, while the insect is still soft. The writer has observed a similar state of things with Brenthids in Larat and it is probably the usual thing with Brenthids.



Lasiorhynchus barbicornis.
Fig. 1—Normal larva. Fig. 2—Abnormal larva. Fig. 3—Female pupa.

Leaf-Miners of the Hawaiian Islands.

BY O. H. SWEZEY.

My first interest in the insects mining leaves in these Islands, was in connection with those that are the larvae of moths. While making observations on these, and being on the lookout for others that I was not already familiar with, I have come across a number of leaf-miners belonging to some of the other orders of insects. Some of these are of extreme interest on account of their differing so widely in habit from their near relatives. I take this occasion to bring my notes together in the form of a paper that they may go on record for publication. Of the leaf-miners herein treated, 21 belong to Lepidoptera, 4 to Diptera, and 2 to Coleoptera.

LEPIDOPTERA.

FAMILY PYRAUSTIDAE.

Promylaea pyropa Meyr.—This is a very rare moth. I have on two or three occasions reared it from larvae found feeding in leaves of *Peperomia pachyphylla,* a low thick-leaved succulent plant. As the larva becomes nearly full-grown, it eats the entire mesophyll of the leaf, then breaks through the epidermis and migrates to another leaf, boring through the epidermis and entering to feed on the mesophyll. This habit is of great interest, as the other Pyraustids here, whose habits are known, are leaf-rollers or feed between leaves, and in moss. The two genera to which *Promylaea* is perhaps nearest related, *Mestolobes* and *Orthomecyna* have many species, but the larvae of none of them have as yet been discovered. It remains yet to be discovered whether they have unusual habits like *Promylaea* or not.

FAMILY GELECHIADAE.

Aristotelia mendax Walsm.—The larvae of this moth mine the leaves of *Gouldia.* I have often found the leaves of very small young plants of this tree all mined, so as to fall off, leaving the plant defoliated. The mine is at first slender and serpentine. As the larva becomes nearly full-grown, it eats out the whole parenchyma of the leaf and sometimes eats down through the petiole of the leaf to the stem, and sometimes also migrates to another leaf. It emerges from the leaf to form its cocoon on the surface of a leaf, or other suitable situation.

Phthorimaea operculella (Zell.)—This is the potato moth, a

pest in the Pacific Coast states of the United States, and in Australia and New Zealand. Here its larvae mine the leaves of potato, tomato, *Datura* and some other Solanceous plants. The larvae also bore into the stems and often into the green fruits of tomato, destroying a good many before they are grown, and also attacking the full-grown or ripening fruit. Tobacco leaves are sometimes mined by the larvae, in which case it is called the "tobacco split-worm." The larvae pupate in some part of the tunnel or place where they have been feeding.

FAMILY HYPONOMEUTIDAE.

Euhyposmocoma trivitella Sw.—This species I have reared from pupae found in their mines in the fronds of *Elaphoglossum gorgoneum* and *E. reticulatum,* in the mountains back of Lihue, Kauai. The larva produces a trumpet-shaped mine at first, but eventually eats all of the mesophyll for a considerable space. Pupation takes place within this in a slight cocoon.

FAMILY CARPOSINIDAE.

Heterocrossa crinifera Walsm.—The larvae mine the leaves of *Rollandia racemosa.* They feed largely in the midrib, following it outwardly, but eat lateral tunnels out into the mesophyll on both sides as they proceed. Usually there is but one larva in a leaf. I have found this in but one locality so far, on Mt. Olympus, Oahu. The leaves of the shrub were very commonly attacked by it. The leaves are quite large and are not entirely killed by the injury, but many may be seen with the injured portion decayed away leaving an irregular hole or space in mid-portion of the leaf. The full-grown larva emerges and passes below to pupate in a slight cocoon amongst dead leaves or trash.

FAMILY TINEIDAE.

Philodoria micropetala Walsm.—The larvae of this very small moth mine the leaves of *Pipturus albidus* very extensively, and also one or two related trees to a slight extent. In *Pipturus,* there are often a hundred and more to a leaf—in extra large leaves. The larvae emerge to pupate in white silken cocoons constructed along beside a rib on the under side of the leaf. This species occurs on all of the Islands.

Philodoria basalis Walsm.—I have reared this species but

once. It was from mines in *Pipturus* leaves in the Kohala Mts., Hawaii. It is a larger species than the preceding, and makes fewer mines per leaf. The larva emerges to pupate within an oval coccoon made flat-wise on the surface of the leaf.

Philodoria splendida Walsm.—The larvae of this species mine the leaves of *Metrosideros polymorpha.* They are found common on all the Islands. The larva emerges to form its oval cocoon, which is made on the surface of the mine, the dead epidermis being cut around a little distance from the cocoon so that it readily falls away carrying the cocoon with it. The silk of the cocoon is light brownish resembling the dead epidermis of the mined leaf.

Philodoria auromagnifica Walsm.—I have reared this beautiful little moth from the leaves of *Myrsine,* in the mountains of Oahu. The larvae emerge from the mines to pupate in oval cocoons on the surface of the leaves.

(Three other species of this genus have been described from these Islands and are probably leaf-miners in some native trees; but so far I have not reared them.)

Gracilaria marginestrigata Walsm.—The larvae of this moth mine the leaves of *Sida* on the lowlands. It is very abundant, often a dozen mines in one leaf. Leaves of the cockle-bur *(Xanthium)* and *Abutilon* are also mined by them. The cocoon is formed within the mine.

Gracilaria dubautiella Sw.—The larvae mine the leaves of *Dubautia plantaginea.* The mine is at first slender and more or less straight, lengthwise in the leaf; later, it becomes an irregular blotch. The cocoon is made within the mine, its position being indicated by a little of its silk being visible through a slit that was made in the epidermis for emergence. I have found this very abundant generally in the mountains back of Honolulu.

Gracilaria epibathra Walsm.—This mines the leaves of *Dubautia laxa.* The mine is more of an irregular blotch than the preceding. The larva usually pupates in cocoon within the mine as in preceding species, but sometimes emerges to pupate in a flat oval cocoon on the surface of the leaf. I have found it only on Mt. Olympus, Oahu.

Gracilaria mabaella Sw.—The larvae mine the leaves of *Maba sandwicensis* and *M. hillebrandii.* The mine is long and slender, and often follows up near the margin of the leaf, gradually widening, and then returns toward the base of the leaf as a wide streak down the middle, which turns deep black with age. The larva emerges to pupate in an oval cocoon on the surface of

the leaf. I have found this species wherever the host trees were found in the Koolau Mts., from Niu to Wahiawa, Oahu.

Gracilaria hauicola Sw.—This species very abundantly mines the leaves of the "hau" tree, *Partitium tiliaceum,* in the mountains, and the lowlands as well, of all the Islands. There are often many mines per leaf. The larvae emerge to pupate in white oval cocoons on the surface of leaves and other objects.

Gracilaria hibiscella Sw.—I found this species quite numerous, mining the leaves of the native Hibiscus on Mt. Tantalus, and occasionally on Hibiscus hedges in Honolulu. There are sometimes several mines per leaf. The mine is at first slender, but eveutually widens and forms a blotch. The larva emerges to pupate in a white oval cocoon on the surface of the leaf.

I have found a Lepidopterous larva mining very abundantly the fronds of *Pteris irregularis* on Mt. Tantalus, but have failed to rear any adults. I have also occasionally found a Lepidopterous larva mining fronds of *Polypodium spectrum,* in various parts of the mountains of Oahu, but have not yet been able to rear an adult, so I do not know whether they belong to the above genera or not.

Opostega maculata Walsm.—The larvae produce serpentine mines in one or more species of *Pelea* in the mountains of Oahu, and perhaps all of the Islands. The larva is very slender and elongate, and quite different from the other Lepidopterous leaf-mining larvae. The mines were known for a ling time, and several entomologists had tried rearing them at various times; but without success. I have finally had the good fortune to rear a pair of moths, and thus the mystery of these mines is settled. The larva emerges from the mine for pupation. In my breeding jar it spun a small brownish lenticular cocoon in moss.

Opostega dives Walsm.—On certain species of Pelea, a closely-wound spiral mine is often very abundant. The larvae in these are quite similar to the preceding, and I have no doubt but what this is the other described species of *Opostega,* though no one has yet reared it.

Cremastobombycia lantanella Busck.—This is the introduced Lantana leaf-miner. It is very abundant now, wherever Lantana is found. The mine is a sort of inflated blotch, usually several per leaf. The cocoon is slender spindle-shaped and suspended in the mine by a thread at each end.

Bedellia minor Busck, and *B. somnulentella* Z.—The larvae of these two species are said to mine the leaves of sweet potato and various other vines of the genus *Ipomoea*.. I consider that

the leaf-miners in sweet potatoes and all other *Ipomoea* vines here are the same species, whatever it may be, whether it is the *minor* or *somnulentella* that occurs in America, or something else. Dr. Perkins thinks there must have been an error in the determination of the specimens of *Bedellia* that Lord Walsingham had from him, for Walsingham has identified as *somnulentella* specimens which came from an elevation of 4000 feet, whereas Dr. Perkins says that there are no *Ipomoea* vines growing at that elevation. Some of the specimens that he determined as *minor,* came from an elevation of 4000 also, while others of them Dr. Perkins had bred from *Ipomoea* at lower elevations. More recently, Mr. Busck has determined specimens reared from sweet potato as *orchillella* Walsm.

The species of *Bedellia* are so similar and so difficult to separate, especially if not in a perfect condition, that I now think that the specimens from 4000 feet elevation determined by Walsingham as *minor* and *somnulentella* belong to my species *oplismeniella.*

Bedellia oplismeniella Sw.—This species is very abundant, mining the leaves of *Oplismenus compositus,* a native grass in the mountain forests. It is difficult to distinguish the adult moths from those reared from *Ipomoea* leaves, but there are larval and pupal differences. (See Proc. Haw. Ent. Soc., II. No. 4, p. 184, 1912.) In species of *Bedellia,* the larvae emerge and form pupae unprotected by cocoons. The pupae are suspended amongst a few fibers of silk, there being hooked bristles on the dorsal side which are fastened into the web of fibers. They may be on the surface of a leaf, or in some other protected place. I have sometimes found them 10-15 feet away from the plant that the larvae fed on. The pupae of *oplismeniella* are usually placed on the lower surface of the leaf near the base.

Bedellia boehmeriella Sw.—The larvae of this species mine the leaves of *Boehmeria stipularis,* a native shrub of the nettle family. I have found them on Mts. Olympus and Konahuanui, Oahu.

Bedellia struthionella Walsm.—This must be a miner in some native tree, but I have not yet discovered its food-plant.

DIPTERA.

FAMILY LIMNOBIIDAE.

Dicranomyia n. sp.—I have found the elongate larvae abundantly mining the leaves of a certain species of *Cyrtandra,*

along the trail up Punaluu Ridge, Oahu. It is a very unusual habit for the larvae of this group of flies. They usually feed in rotten wood, beneath dead bark, beneath leaf-sheaths of banana and other plants, also at the roots of plants. I have found no records of any as leaf-miners. Pupation of this species takes place within the mine. I reared several specimens, but none in good enough condition for description. When I next visit the place I shall obtain more of them.

FAMILY AGROMYZIDAE.

Agromyza diminuta (Walk.)—This is a very common introduced insect. The larvae mine the leaves of many plants and weeds, as: beans, peas, radish, melons, *Bidens, Nasturtium, Sida, Datura, Indigofera, Solanum, Sonchus,* etc. They emerge to pupate in the ground.

Agromyza n. sp.—I reared one specimen from a mine in a leaf of *Labordea membranacea,* on Mt. Olympus, Oahu. I found quite a number of mined leaves. The mine is conspicuous, showing by its deep black color. It is very large in comparison with the insect producing it. The larva emerged and formed its puparium on the surface of the leaf.

Agromyza n. sp.—I reared several specimens from mines in leaves of *Cocculus ferrandianus,* on the trail from Nuuanu valley up to the back end of the Pacific Heights Ridge, Oahu. The plants sometimes have nearly all of the leaves mined. The larvae emerge and form their puparia on the surface of the leaf.

Agromyza (?) n. sp.—I have found a miner in the fronds of a fern *Marattia douglassi.* It is probably another species of *Agromyza,* but I have not yet succeeded in rearing adults.

No native species of the family Agromyzidae have as yet been described. I consider these three last species as native, since they occur on native plants in the mountains.

COLEOPTERA.

FAMILY PROTERHINIDAE.

Proterhinus excrucians Perkins.—I have found this species very abundantly mining the leaves of *Broussaisia arguta,* along the Olympus—Konahuanui trail, Oahu. This is quite an exceptional habit for a *Proterhinus,* as those whose habits have been known heretofore are mostly bark beetles, or feed in dead wood, dead fern stems, etc.

FAMILY COSSONIDAE.

Heteramphus n. sp.—I found the larvae of this species mining the fronds of several species of *Elaphoglossum* on Mt. Olympus and the upper part of Palolo Valley, Oahu. Larvae, pupae and adults were found in the mines. The larvae of the other species of *Heteramphus,* whose habits are known, are found in the stems of tree ferns, and at the base of leaves and in stems of *Astelia.*

OCTOBER 3RD, 1912.

The eighty-seventh regular meeting of the Society was held in the usual place.

ENTOMOLOGICAL PROGRAM.

Mr. Swezey exhibited some sugar cane mealybugs, calling special attention to a species first noticed by Mr. Erhorn, and which makes three species now known to attack sugar cane in the Hawaiian Islands.

Mr. Giffard remarked on the apparent diminishing of the numbers of ants recently, and inquired if others had noticed it. Different members gave their observations on the question, some of which agreed with the observations of Mr. Giffard while others reported the usual abundance. The apparent scarcity was evidently local and due to some temporary, or unusual conditions.

Mr. Muir exhibited specimens of leaf hoppers representing four new genera and eight new species. These were collected by him on sugar cane in China and the Malay Islands.

NOVEMBER 17TH, 1912.

The eighty-eighth regular meeting of the Society was held in the usual place.

Dr. E. A. Back was elected to active membership.

NOTES AND EXHIBITIONS.

Mr. Giffard reported that on a recent trip to Maui, he found

the introduced *Pompilus* in Iao Valley; and *Pachodynerus* at Wailuku and at 1200 feet elevation in Iao Valley. The latter species is now known on three Islands: Oahu, Kauai, and Maui.

Mr. Giffard also exhibited 5 specimens of *Formicaleo wilsoni* taken in Kau, Hawaii, December, 1911.

Mr. Kershaw told of seeing *Formicaleo perjurus* near Diamond Head, Oahu, when in company with Dr. Perkins one day last May. This species had not been seen for many years.

Mr. Swezey told of seeing a specimen of *Formicaleo wilsoni* just below Pahala Mill in Kau, Hawaii, in 1905, but was unable to catch it.

Mr. Giffard exhibited a large weevil (*Sipalus gigas*?) taken by Mr. Kuhns on a kiawe tree at the Immigration Station grounds March, 1910; also a large "horntail" taken by Mr. Kuhns on shrubbery at Palama, May, 1910. Mr. Ehrhorn considered the latter the other sex of a 'horntail" exhibited by Mr. Giffard, July, 1908, and was probably the American species, *Tremex columba.*

Mr. Ehrhorn reported having taken a "harlequin" cabbage bug on merchandise on dock.

Mr. Fullaway exhibited *Apomecyna pertigera* bred from cucumber stems; *Crossotarsus externedentatus* from avacado; and *Bracon* sp. from *Gelechia gossypiella,* August 3, 1912.

Mr. Muir exhibited a dead branch of Koa from Mr. Frank Atherton's grounds in Manoa, that had been killed by a scale, *Aspidiotus rapax.* Some of the scales were parasitized, and the following species were bred out; *Aphelinus diaspidus, Coccophagus orientalis, and Thysanus sp.*

Mr. Muir also exhibited specimens of new species of leaf hoppers, to be described in a forthcoming paper.

PAPER READ.

Description of Two New Species of Hawaiian Wasps.

BY WALTER M. GIFFARD.

Odynerus perkinsi sp. nov.

♂ Black; wings deeply infuscate and with blue iridescence. Mandibles largely red. Clypeus very sparsely and obscurely punctate, the apex subtruncate and subdentate, impressed. Head very dull, obscurely and shallowly punctate; face between the eyes narrow.

Mesonotum very dull with surface roughened, subobsoletely and shallowly punctate and clothed in lateral view with extremely short erect pubescence. Scutellum extremely dull, almost flat, obsoletely punctate, having together with post-scutellum (the anterior margin of which is somewhat shining) a longitudinal impressed line through the middle. Propodeum dull, reticulately rugose excepting the posterior concavity which is almost smooth and very obscurely punctate. Abdomen more shining than the head and thorax; the basal segment subvertical in front, with shallow, large and irregular punctures anteriorly, and smaller and deeper posteriorly; the second segment dorsally, slightly more than convex, evenly and somewhat closely punctate; ventrally, similarly punctate except at the base, with the costae always distinct but variable in development and the segment behind these not at all raised, the depression being but very slightly indicated. *Length, 6-9 mm.

♀ Superficially the female is unlike the ♂, the structural differences being as follows: Head with the face in front between the eyes very much wider. Clypeus truncate. Thorax extremely dull and smooth with the anterior portion of the mesonotum distinctly, evenly but not deeply punctate; posteriorly the surface of the mesonotum is either impunctate or the punctures are scattered. Scutellum flat, very sparsely and obscurely punctate. Propodeum dull, less reticulately rugose, posterior concavity being slightly more roughened. Second ventral segment of the abdomen has the costae longer and better developed whilst in certain lights there are signs of a narrowly defined depression. Length, 10 mm.

HAB. Kau, Hawaii, 2,000 feet elevation. Described from 47 ♂ ♂ and 2 ♀ ♀ taken December, 1911, (Giffard), February, May and July, 1912, (Giffard and Fullaway). Both types are in the author's collection. The species is found in localities on the a-a flows flying in company with *O. peles* P., *O. scoriaceus* P., *O. sociabilis* P., *O. rubropustulatus* P., *Nesodynerus egens* P., *Pseudopterochilus pterocheiloides* P. and *Chelodynerus chelifer* P.

I have named this species out of compliment to Dr. R. C. L. Perkins to whom the collectors of Hawaiian *Odynerus* are much indebted for his comprehensive tables of all the species described in Fauna Hawaiiensis.

Odynerus koolauensis sp. nov.

♂ Black, shining with erect but short gray pubescence; rarely with the apical margin of the first abdominal segment faintly and narrowly yellow. Mandibles black, the extreme apex piceous. Wings

*The measurements are taken from the vertex of the head to the apical margin of the second abdominal segment.

darkly infuscate and with violaceous blue iridescence. Clypeus punctate, dentate and emarginate, impressed at the apex the true emargination not very deep but distinct. Head and thorax very closely, strongly and deeply punctate. Propodeum reticulately and strongly rugosely sculptured throughout but more particularly so at the sides near the posterior concavity. Abdomen with the first segment strongly and closely punctate, the punctures becoming larger towards the base. Second segment above, strongly raised from the base (tuberculate when viewed dorsally) the highest point being well before the middle of its length; very distinctly and evenly but shallowly punctate; beneath shining, finely and deeply but not closely punctate, the depression faint and narrow the segment at the sides rising but feebly from the level of the apices of the costae which latter are well developed and at their middle where these meet the base of the depression, long. Length, 7-9 mm.

♀ Clypeus evenly and deeply punctate; apex dentate and slightly emarginate, the emargination distinct; the impression at the apex is less than that in the ♂. The puncturation of the head and thorax is generally the same as in the ♂ excepting that the interstices between the coarse punctures on the mesonotum (which in both sexes is shining), show more definite and more visible signs of being punctulate. In the ♂ these smaller punctures are only microscopically visible. The propodeum and basal segment of the abdomen are practically of the same general sculpture as the ♂. The second dorsal segment of the abdomen is less raised at the base whilst ventrally it is much more shiny, the costae stronger and longer at the middle, whilst the impression is better defined. The sides of this segment where they meet the apices of the costae are more raised than in the ♂. Length, 9 mm.

HAB. Koolau district, Maui, 1,000-1,200 feet elevation in the lower wet forest. Not uncommon. Described from a series of 15 ♂ ♂ and 6 ♀ ♀ taken October, 1912, (Giffard), flying over mixed scrub ohia (Metrosideros) and bamboo, in company with *O. nigripennis* Holmgr., *O. purpurifer* P., and *O. camelinus* P. A single specimen of *O. erythrostactes* P. was taken at the same place. Both types in the collection of the author.

OBS. Evidently allied to *O. hiloensis* Perk. and *O. konanus* Perk., and whilst like these superficially is readily distinguished from *O. konanus* by the difference in the characters of the propodeum and the second ventral segment of the abdomen. From *O. hiloensis* it particularly differs in the emargination of the clypeus, the length of the costae and general appearance of the second ventral segment. In *O. hiloensis* the second dorsal segment of the abdomen is also much more tuberculately raised than in this species. In the ♀ there are further

characters, particularly those of the clypeus and costae, which very readily distinguish it from both *O. konanus* and *O. hiloensis.* It may also be allied and nearer related to *O. lipocharis* Perk. of Kauai, an unique species but lately described (See Suppl. F. H., Vol. II., p. VI., p. 610), by Dr. Perkins from a male only, but of this I cannot be certain as specimens of the latter are not available.

Notes on Certain Undescribed Species Or Varieties of Hawaiian Wasps (*Odynerus*).

BY W. M. GIFFARD.

It is not altogether improbable that at some future period when a general revision and further classification of our Hawaiian Odyneri are made possible that not only will some of these form several distinct genera or sub-genera*, but some species already described and since determined as varieties or island forms may be eliminated from the fauna. As however the prospects for any such new classification and revision are somewhat remote it appears reasonable that the system heretofore adopted of separating and describing the insular forms, should in the meantime continue, particularly when these show sufficient sculptural and constant minor structural characters, as well as differences in coloration, as to easily separate them from their allies of one or more of the islands in the group.

Among others I have for the present selected the following as deserving recognition under the present systm of identification and determination, viz.:

(1). A sea coast species, allied to *O. newelli* Perk. from the island of Hawaii and *O. smithii* D. T. from the islands of Maui and Lanai. A large series of both sexes were taken by the writer on three different occasions in the early spring months of 1911, flying over low-growing vegetation along the rocky coasts of Oahu. This species differs from both its allies in the structure at the apex of the clypeus, the puncturation of the head, thorax and propodeum and in the form of the depression of the second ventral segment of the abdomn. The system of pubescence on the thorax is also quite different from one of the above named species. It further differs in coloration from either, the clypeus of the ♂ being very largely bright yellow and in both sexes the bands at the apex of the first and second segments of

*Fauna Haw. Perkins, Vol. I, pt. I, p. 30.

the abdomen are very widely (consistently so) of the same color, whilst in its allies these latter are very narrowly whitish yellow and in instances inconspicuous.

(2). A species at 1000-1500 ft. elevation on the island of Lanai of which a series of both sexes were taken by the writer in 1907-8, follows the description of *O. monas* P. of Molokai with some of the following exceptions, viz.:

The wings are shining fuscous with a bronze appearance and not with blue iridescence. The head and thorax are very finely and sparsely punctured and the propodeum is practically impunctate and smooth. The coloration of the abdominal segments of the species presents a further difference from that described. There are no specimens in Honolulu of *O. monas* available for comparison, the species having been taken on Molokai and described by Dr. Perkins from one or two ♂ ♂ only.*

***Since writing these notes I have secured a male example of *O. monas* from Molokai and the specimen follows Dr. Perkins description of that species. In this single example there are further differences between it and the species from Lanai which it would be unwise to refer to until a series have been captured.**

Under the circumstances I would hesitate to determine this Lanai wasp either as *O. monas* or as a variety of that species.

(3). Another wasp which may be allied to *O. monas* of Molokai is a species of which the writer captured a series of both sexes in 1910-11 on the scoriae in the district of Kau, Island of Hawaii, at an elevation of approximately 300 feet. Notwithstanding the different structure of the second ventral segment of the abdomen and of the propodeum as well as a difference in the system of puncturation of the thorax and abdomen from that published in the description of *O. monas,* I hesitate for the present and for similar reasons to those explained in the reference to the Lanai examples, to determine this Hawaii *Odynerus* as a good species. There is still a possibility that both this and the Lanai examples are representatives of the *O. monas* of Molokai. Should a series of the latter be secured later on, as is very possible, it may be found that either one or the other of the Hawaii and Lanai examples are intermediate or that they may be determined as varieties only.

(4). On Kauai at an elevation of 3000 feet both sexes of a species were taken by Mr. A. Jordan in 1909 which closely resembles *O. xerophilus* P. of Oahu and is possibly the Kauai variety of that species. The variation is principally in the

puncturation which is generally more rugose and in the coloration which is much more distinct. *O. xerophilus* was not described by Dr. Perkins possibly for the reason that he considered it as a variety or insular form of *O. molokaiensis* Perk. of Maui and Molokai. On the other hand and for the same reasons it is equally possible that *O. molokaiensis* may be only a variety of *O. scoriaceus* P. of Hawaii.

The question of insular forms or varieties among Hawaiian *Odynerus* will undoubtedly be decided sooner or later (possibly later than sooner), but the writer sees no reason why these should not in the meantime be named and described providing series are captured which present acceptable structural or sculptural differences. This would only be following the system heretofore adopted with certain other species of these Hawaiian Aculeates.

Note—All the specimens representing the four species above referred to are in the writer's collection.

Kilauea Moths.

BY OTTO H. SWEZEY.

I hereby present a tabulated list of moths collected at lights by Messers W. M. Giffard, E. M. Ehrhorn, D. T. Fullaway and J. F. Rock at Mr. Giffard's bungalow at 29 miles, Kilauea, Hawaii. These moths were collected at various times indicated in the table whenever Mr. Giffard and one or another of the above mentioned gentlemen visited the place for a few days or weeks during the past twelve months. They were handed to me for determination. I have exhibited the different lots of them at various times, and now present this tabulated list of the whole lot. Among them there are 112 species, ten of which I find to be new, and will describe along with others in a later paper.

FAMILY CARADRINIDAE.	Aug. 1911	Sept. 1911	Dec. 1911	Feb. 1912	May 1912	July 1912	Aug. 1912
Hyssia compsias (Meyr.)		1				1	1
Eriopygodes euclidias (Meyr.)	17	14	14	27	27	25	15
Cirphis macrosaris (Meyr.) ..		1					
Cirphis typhlodes (Meyr.)					1		

	Aug. 1911	Sept. 1911	Dec. 1911	Feb. 1912	May 1912	July 1912	Aug. 1912
Cirphis pyrrhias (Meyr.)							1
Cirphis amblycasis (Meyr.)				3	1	2	2
Cirphis unipuncta (Haw.)		1	1	1	3	2	2
Agrotis ypsilon Rott.	1	2		1	4	1	2
Agrotis crinigera (Butl.)	3		1				1
Agrotis selenias Meyr.					1		
Agrotis cinctipennis (Butl.)				3			
Lycophotia saucia (Hub.)		1		1	1	1	
Episilia ceramophaea (Meyr.)					2	2	
FAMILY PLUSIADAE.							
Hypenodes epichalca Meyr.	1			1	2		
Hypenodes altivolans (Butl.)			2	4	1		
Plusia biloba Steph.		1					
Plusia chalcites Esp.							1
Plusia giffardi n. sp.		1			1	3	1
FAMILY HYDRIOMENDIAE.							
Eucymatoge dryinombra Meyr.		4		2			
Eucymatoge orichloris Meyr.	2	8	2	1	4	11	2
Eucymatoge craterias Meyr.	1	2	1		6	1	
Eucymatoge monticolans (Butl.)	1	3	2	14	30	13	8
Hydriomena aphoritis Meyr.			1	3	3		1
Hydriomena roseata n. sp.	1	1		2	1	4	
Hydriomena giffardi n. sp.	1				1		
FAMILY SELIDOSEMIDAE.							
Scotorythra arboricolans Butl.	1						
Scotorythra aruraea Meyr.				2	18	1	2
Scotorythra paludicola (Butl.)				6	43	58	23
Scotorythra ortharcha Meyr.			1				
Scotorythra oxyphractis Meyr.	2		1	9	16	6	1
Scotorythra capnopa Meyr.		5	1				
Scotorythra pachyspila Meyr.				1	9	1	
Scotorythra rara (Butl.)	10	11		3	63	17	4
Scotorythra hyparcha Meyr.		1		9	21	16	21
FAMILY SPHINGIDAE.							
Sphinx convolvuli Linn.			1				
FAMILY PHYCITIDAE.							
Homoeosoma amphibola Meyr.			1				

	Aug. 1911	Sept. 1911	Dec. 1911	Feb. 1912	May 1912	July 1912	Aug. 1912
FAMILY PYRAUSTIDAE.							
Omiodes accepta (Butl.)	3	4	1	3	2		
Omiodes accepta (white variety)		1					
Omiodes localis (Butl.)		2		1			
Omiodes scotaea Hampson	1	4		4	12	2	1
Omiodes fullawayi n. sp.					1	1	
Phlyctaenia synastra Meyr.	5	1			11	12	
Phlyctaenia iocrossa Meyr.			1	1			
Phlyctaenia micacea (Butl.)				1			
Phlyctaenia eucrena (Meyr.)	1	1		3	20	4	2
Phlyctaenia platyleuca Meyr.				1			
Phlyctaenia metasema Meyr.	2		1	6	16	4	1
Phlyctaenia caminopis Meyr.				1	1		
Phlyctaenia stellata (Butl.)		2		1	1		
Phlyctaenia argoscelis (Meyr.)					1		
Phlyctaenia liopis Meyr.					1		
Phlyctaenia pyranthes Meyr.	2		1	1	7	6	
Pyrausta chloropis Meyr.			2	1	2		
Pyrausta thermantoidis n. sp.	1				2	1	
Nomophila noctuella Schiff.				1			
Mestolobes mesacma Meyr.					6		
Mestolobes ochrias Meyr.	2		4		2		
Orthomecyna metalycia Meyr.	13	8			3	59	7
Orthomecyna epicausta Meyr.	1						
Scoparia balinopis Meyr.	1				5		
Scoparia halirrhoa Meyr.					4	1	
Scoparia actias Meyr.				1	4	1	
Scoparia crataea Meyr.	6		6	10	16		
Scoparia parachlora Meyr.			1	1			
Scoparia ianthes Meyr.			1	3	1		
Scoparia marmarias Meyr.				6			
Scoparia nectarias Meyr.				7	18	2	
Scoparia nectarioides n. sp.			1	4	4		
Scoparia pyrseutis Meyr.					3		
Scoparia erebochalca Meyr.	6		3	16	7		
Scoparia thyellopis Meyr.	1			1			
Scoparia melichlora Meyr.	2		1	3	4	4	
Scoparia hawaiiensis (Butl.)	1		2	4	9	3	
Scoparia geraea Meyr.			1				
Scoparia epimystis Meyr.			2				

	Aug. 1911	Sept. 1911	Dec. 1911	Feb. 1912	May 1912	July 1912	Aug. 1912
Scoparia meristis Meyr.	2		2	22	7	2	
Scoparia platyscia Meyr.	4		6	3	2	1	
Scoparia venosa Butl.			1	3			
FAMILY PTEROPHORIDAE.							
Platyptilia rhynchophora Meyr.					2		
Platyptilia litoralis Butl.			2	2	1		
FAMILY GELECHIADAE.							
Aristotelia gigantea n. sp.			1				
Thyrocopa albonubila Walsm.	1					3	
Thyrocopa fraudulentella Walsm.					1		
FAMILY HYPONOMEUTIDAE.							
Hyposmocoma lupella + *suffusella* Walsm.	1						
Hyposmocoma dorsella Walsm.	1						
Hyposmocoma quinquemaculata Walsm.				3	2		
Hyposmocoma chilonella + *triocellata* Walsm.						1	
Hyposmocoma chilonella + *chilonella* Walsm.							1
Hyposmocoma chilonella + *percondita* Walsm.						1	
Hyposmocoma subnitida Walsm.	1						
Semnoprepia petroptilota Walsm.							1
Diplosara lignivora (Butl.)				1			
Endrosis lactella Schiff.				1			
**Prays fulvocanellus* Walsm.		4					
FAMILY CARPOSINIDAE.							
Heterocrossa herbarum Walsm.					2		
Heterocrossa gemmata Walsm.						1	
Heterocrossa plumbeonitida Walsm.					3		
Heterocrossa latifasciata Walsm.					3		
Heterocrossa inscripta Walsm.				2			
Heterocrossa gracillima Walsm.					2		

	Aug. 1911	Sept. 1911	Dec. 1911	Feb. 1912	May 1912	July 1912	Aug. 1912
FAMILY TORTRICIDAE.							
Eccoptocera foetorivorans (Butl.)				1			
Enarmonia walsinghami (Butl.)			1				
Bactra straminea (Butl.)	1			1			1
Archips longiplicatus Walsm.			1	1	2		
Archips lichenoides Walsm.							
Archips subsenescens Walsm.			1	2	1		
Archips fuscocinereous n. sp.				1			
Archips sublichenoides n. sp.					7		
Tortrix semicinereana n. sp.				1			
Panaphelix marmorata Walsm.			1				1
Capua pleonectes Walsm.							1
FAMILY TINEIDAE.							
Opogona apicalis Sw.	6		13	24	1	1	
Philodoria basalis Walsm.				1			

*Reared from flowers of *Zanthoxylum hawaiiense.*

DECEMBER 12TH, 1912.

The postponed eighty-ninth regular and eight annual meeting of the Society was held in the usual place.

NOTES AND EXHIBITIONS.

Mr. Ehrhorn exhibited an ant taken at Maunawili, Oahu, April 13, 1912. It had been identified for him by Mr. W. M. Wheeler as *Technomyrmex albipes* F. Smith. The species occurs in India, Papua, and Oceania.

Mr. Giffard reported collecting the introduced *Pompilus* at Kilauea, Hawaii, Nov. 23, 1912; at an elevation of 4000 feet. This being the highest elevation at which it has yet been taken.

PAPERS READ.

On Some New Fulgoroidea.

BY F. MUIR.

(Read October 3, November 7 and December 12, 1912.)

The types of the following new species, seven of which are

generic, are in the collection of the Sugar Planters' Experiment Station, Honolulu. Except where otherwise stated they were collected by the writer.

The writer takes pleasure in acknowledging the obligation he is under to W. L. Distant for comparing specimens with types in the British Museum, and for the help he has given him while working on Homoptera.

Delphacidae.

Geoneossus gen. nov.
Type *sacchari.*

Head broader than thorax, vertex at base as wide as an eye, truncate, narrowing slightly to apex, very short, about one-fourth the width of base, medianly, longitudinally keeled, slight keels along all edges and between vertex and face, a little pit in center of each half of vertex. Face broad, widest at lower corner of eyes, then slightly narrowing to apex, keels along sides, also two medio-longitudinal keels from base to apex, a keel down gena from beneath the antenna to base of clypeus. Clypeus a little shorter than face, in profile slightly curved, sides flattened, broad at base, medianly and laterally keeled. Eye as broad as face, with very deep antennal emargination on lower edge. First joint of antenna slightly shorter than second, subtriangular, apex much wider than base, very flat and thin, especially on outer edge; second joint subpyriform in outline, outer edge fairly thick and nearly straight, inner edge thin and broadly curved in outline; other edge beset with several sense organs; arista arising from apex. Ocelli at lower corner of eye. Pronotum medially very slightly longer than vertex, hind margin obtuse-angularly emarginate, medially keeled, lateral keels obscure, arising anteriorly at inner hind angle of eye, curving round and reaching anterior margin at hind angle of eye, not reaching the posterior edge of pronotum; a pit in center of each half. Scutellum distinctly tricarinate. First hind tarsal joint twice the length of the other two together; spur half as long as first tarsal joint, flattish, pointed, inner edge straight, outer edge convexly curved, beset with small spines; hind tibiae with five apical and one small basal spines. Tegmina pointed at apex; subcosta and radia forking before middle, radia joining media for a short distance (no radial cross-vein), first median sector arising at junction of radia and media, touching cubitus (no media cross-vein), cubitus three-veined, bent nearly at right-angle after joining media; clavus reaching five-eighths from base.

This genus is near to *Cochise* Kirkaldy, but has a narrower face, with the keels separate to apex, the antennae also are very distinct.

(1) *G. sacchari,* sp. nov. (♂ ♀)
Pl. 6, ff. 5, 6.

Stramineous, slightly darker on clypeus and apex of face; legs with longitudinal brown marks. Tegmina hyaline, veins white, finely bordered with brown, especially on apical half, veins studded with brown, hair-bearing granules; wings hyaline, white-veined.

Pygophor with a pair of spines arising from medio-ventral edge, reaching one-third across pygophor, contiguous to near their diverging apices; spines on anal segment short, thick, with converging apices; genital styles long, simple, horn-shaped, making one complete inwardly-turned spiral, the apical third bent anteriorly.

In the young stages the vertex and face is round, somewhat as in *Paranda,* the antennae small and sunk into pits at side of rounded face; two rows of sense pits along the lateral margin of vertex and face; keels absent.

Length 2.6 mm.; tegmen 3.8 mm.

Hab. Macao, China. The young and adult female were taken underground, feeding on the roots of grasses and sugar-cane, attended by ants. The adult was also taken feeding on the leaves of sugar-cane.

Cochise Kirkaldy.

(1) *C. apache* Kirkaldy.
Pl. 6, fig. 3, 3a.

I figure the head of this species. I cannot separate the genus from *Bostaera* by any good character.

Belocera gen nov.
Type, *sinensis.*

Head wider than thorax. Width of vertex about twice the length, base truncate, slightly anterior of the middle of the hind margin of eyes, longitudinally keeled in middle; face widest between lower angles of eyes where it is about two-thirds the length of the face, keeled on sides and in middle, the central keel being furcate very near the base forming a small diamond-shaped area, two small semi-obsolete keels from the bifurcations to sides of face slightly anterior to the transverse keel between vertex and face; genal keels distinct, meeting the lateral facial keels at their apices; eyes deeply emarginate on lower margin; first and second antennal joints subequal in length, basal joint sagitate, second joint somewhat longer than broad, slightly flattened, beset with sense organs, arista apical; clypeus bent at sharp angle near base where the median keel is prominently angled. Pronotum slightly longer than vertex, widely and angularly emarginate on hind margin, median keel distinct, reaching hind mar-

gin, lateral keels following hind margin of eyes, then curving inward and reaching hind margin. Scutellum more than twice the length of vertex and pronotum, tricarinate, lateral carinae slightly curved and reaching hind margin. Hind tibia with one small basal, one small submedian and four or five small apical spines; spur more than half the length of first tarsus, flattened, inner edge straight, outer edge convexly curved, one small spine at apex. Tegmen as in *Geoneossus*, but the apex just pointed and the radia and media only just touching, not amalgamated for any distance.

This genus is near *Stobaera* but the shape of the antennae and the angular clypeus distinguishes it.

(1) *B. sinensis* sp. nov. (♂ ♀)

Plate 6, figs. 4, 4a.

Light yellow-brown; face below eyes yellow, legs and ventral surface of thorax and abdomen lighter brown, lateral edges of pronotum and tegulae dark, spines on legs dark brown. Tegmina hyaline, smoky, lighter along costal area, veins light closely beset with light granules, a darker brown mark over base of costal cell, a darker mark along apical half of radia and a brown spot at tip of each apical vein.

Male pygophor with even margins; anal segment without spines; styles narrow, of even width till apex where it is unequally bifurcate, the inner prong being very short, the outer longer and slightly spatulate at end.

Length 2.5mm.; tegmen 3 mm.

Hab. Macao and Sheiklung, China.

Perkinsiella Kirkaldy.

(1) *P. thompsoni* (♂ ♀)

Vertex, face between eyes, antennae and clypeus dark brown, with two darker marks across face between eyes; face below eyes, thorax, legs and apex of clypeus yellow; pronotum and scutellum darker than ventral side, especially along the sides; a brown spot on each front coxa and a round spot on each mesopleurum; front and middle femora longitudinally striped with brown, a faint brown ring on tibia, spur yellow with black teeth; abdomen brown, pleura and margins of segments yellow. Tegmina hyaline, semiopaque, yellowish over clavus; veins light, studded with brown granules, fuscous along edges of third radial and first median apical veins, and over the base and apex of second median and the entire of third median and first cubital apical cells, except for a round white spot at apex of each cell; wings hyaline with brown veins.

Male pygophor rounded, dorsal edge roundly emarginate where anal segment fits in, ventral edge with two thin, long, subparallel, median spines nearly reaching to anal segment; anal segment

with a long, slightly curved, strong spine from each ventral corner reaching more than half across pygophor; styles broad and flattened on basal half, the apical portion thinner, bent inward with the apex broadened out into a small, flat surface, the outer and posterior edges of which are produced into short points.

Length 2.7 mm.; tegmen 3.6 mm.

Hab. Island of Guam, on sugar-cane. No. 3095 of Mr. D. T. Fullaway's collection. I take the pleasure of naming this insect after Mr. J. B. Thompson of Guam.

This species, the fourteenth of the genus, comes next to *sinensis* from which it differs by the greater amount of infuscation on apex of tegmen and the very distinct genitalia.

Stobaera Stal.

I consider Fowler's *Goniolcium* to be this genus. The species of this genus all have somewhat similar facies, and with the additions to it that is sure to be made by more extensive collecting in Mexico and the more southern countries, there will arise great difficulties in identification unless the male characters be studied carefully.

(1) *S. concinna?* Stal.

Specimens from Mexico Valley agreeing with Stal's description have a very distinct feature in the shape of the anal segment. The anus is situated near the base, where the segment is short; beyond the anus the ventral edge is produced into a broad, flattened process, turned down at right angle to the basal portion, the apex being spatulate and trilobed, the process reaching down to the ventral wall of pygophor; the medio-ventral edge of pygophor slightly emarginate, each corner of the emargination being produced into a small spine, the lateral edges cut back so as, in side view, to expose the styles; styles slender and cylindrical at base, slightly broadening to the truncate apex which has each corner produced into a little spine; a spine projects from the base of the styles.

(2) *S. tricarinata* Van Duzee.

The specimens I identify as this species have the ventral edge of pygophor roundly emarginate in the middle, the sides being cut away, exposing the styles in lateral view; anal segment short with a short downwardly turned, apically rounded process on the ventral edge; styles thinly cylindrical at the base, broadening and flattening towards the apex, which is truncate and produced into a spine on the

inner corner, the outer edges of the styles curved, the inner edges sinuous, spine at base pointing upward, not outward.

(3) *S. granulosa* (Fowler)

The specimens I have from Orizaba under this name differ slightly from Fowler's description; from *koebeli* they differ in having the process on anal segment very much shorter and the styles are widest shortly before apex.

(4) *S. koebeli* sp. nov. (♂ ♀)

A very short furcation at base of median facial keel. Scutellum, pronotum, vertex, antennae and face between eyes brown, face below eyes and genae yellow, speckled with brown at apex; clypeus brown; keels on head and thorax lighter in color; female abdomen yellowish with brown spots, male abdomen brown with small yellowish marks near base; femora brown, especially in male, all tarsi and tibiae banded with brown. Tegmina hyaline, veins not colored, dotted with large, brown, hair-bearing granules, a curved brown mark over first median sector and cubitus, a light brown spot in median cell and the clavus slightly fuscous.

Medio-ventral edge of pygophor deeply and roundly emarginate, the corners of the emargination forming subacute points; anus at base of anal segment, the ventral portion of segment beyond anus flattened, gradually narrowed to the acutely pointed apex, and curved under; genital styles curved, meeting together at their bases and forming a "horse-shoe," narrow, subequal in width to truncate apices, which are slightly widened, from their bases where they touch arise two small, stout spines.

Length 2.5 mm.; tegmen 3.4 mm.

Hab. Morelos, Mexico. (A. Koebele coll.)

I take pleasure in naming this species after Mr. A. Koebele.

(5) *S. azteca* sp. nov. (♂ ♀).

Facies very similar to *koebeli*, but inclined to have the lighter marks more extensive. The male pygophor medio-ventrally emarginate, the sides cut back; the anal segment short, the ventral edge beyond anus forming a downward-pointing, short spine reaching about two-thirds to ventral margin; styles slightly curved, thin and cylindrical at base, slightly flattened on apical half, truncate at apex with each corner drawn into a small spine, an outwardly pointing spine at the base of each style, joined together at their bases. This differs from *granulosa* by having a spine on the anal segment and not

a flattened, apically pointed process and by the styles not swelling out before the apices.

Length 2.5 mm.; tegmen 4.0 mm.
Hab. Morelos, Mexico. (Koebele coll.)

(6) *S. testacia* (Fowler.)

I have one female which may be this species. It differs from the typical species in having the pronotal carinae not quite reaching the hind margin and not angulated; the lateral carinae of the face are not sub-parallel but outwardly curved and widest apart at lower angles of eyes. The furcation of median keel more distinct. It is likely to represent a new genus.

Purohita Distant.

(1) *P. cervina* Distant.

One specimen (♀) from Macao on bamboo.

(2) *P. fuscovenosa* sp. nov. (♀)

Two specimens which differ from the type species by their darker color, veins of tegmina broadly fuscous-brown from base to apex and larger size.

Length 4.8 mm.: tegmen 5.4 mm.
Hab. Macao, China, on bamboo.
The absence of males for comparison is regrettable.

Tropidocephala. Stal.

Owing to there being both specific and individual variation of the head, and the facies of many species very similar, the species of this genus are hard to identify with certainty unless the genitalia be described or, still better, figured; it is unfortunate that Matsumura makes no remarks on the genital characters in his monograph. A characteristic of this genus is the long, curved penis and penis guide. All the species I have studied feed on sugar-cane as well as grasses.

(1) *T. neogracilis* sp. nov. (♀)

Vertex slightly longer than pronotum (2.2 to 1). Dorsally green or yellowish green, ventrally inclining to yellow; medio-apical portion of face and the genae below the eyes black; a black triangular spot on mesopleuron; legs yellow with small black spines, abdomen yellowish below, fuscous above. Tegmina hyaline, slightly greenish, granu-

lations very small, a brown triangular mark over inner apical portion, the veins in this portion being darker, cubitus, media and radia each with a small brown spot before cross-veins.

Length 3 mm.; tegmen 3 mm. (with apex of tegmen deflexed.)

Hab. Pontianak, Borneo, on sugar-cane. This species is very near *gracilis,* under which name it is likely that Matsumura has more than one species, it also comes near to *hamadryas.*

(2.) *T. festiva* (Distant)
Plate 6, Figs. 9, 9a

There are specimens in our collection from Borneo and Java that agree with Distant's and Matsumura's descriptions, but the head is just double the length of the pronotum. I figure the male genitalia.

(3) *T. atrata* (Distant).
Plate 6, Figs. 10, 10a.

There are two specimens from Macao, China, which appear to be this species; the male agrees with Distant's description, but the female is more yellowish-brown than green. I figure the male genitalia which differs from *festiva* by having narrower styles, and the prong from the base is more slender, also the outline of the pygophor is different. The vertex is slightly less than twice the length of pronotum. (1.9 to 1.)

(4) *T. saccharivorella* Matsumura.

One specimen from Macao, China.

(5) *T. amboinensis* sp. nov. (♂ ♀)
Plate 6, fig. 12.

Vertex one and a half times the length of pronotum (1.5 to 1). Brownish yellow, darker dorsally; keels on vertex, pronotum and scutellum finely bordered with black; antenna with a black ring on basal segment and two on second segment, the one near apex faint; face yellowish, lateral keels finely streaked with black; genae beneath eyes and the clypeus brown; legs yellowish with black spines; abdomen yellow with brown segmental markings. Tegmina approaching *brunnipennis;* brown with transparent, viteline patches, one from base along inner border of clavus, from end of clavus across to costa, and a small one in the apical subcostal and radial cells, veins darker,

bordered on each side with light granules bearing long, dark hairs, a dark, oval spot on the radia, media and cubitus just behind the cross-veins; wings hyaline, dark-veined. Pygophor with small medio-ventral spine, lateral edges not produced; style somewhat like *atrata* but more curved, broader at apex and with the apical, inner corner produced into a long, narrow process with rounded apex.

Length 2.3 mm.; tegmen 2.6 mm.

Hab. Amboina, on sugar-cane and other grasses.

(6) *T. saccharicola* sp. nov. (♂ ♀)

Plate 6, figs. 7, 7a.

♀ Vertex slightly less than one and a half times the length of the pronotum (1.4 to 1). Yellowish brown, the keels of vertex, pronotum and scutellum finely bordered with black; antenna with a dark ring on each segment; dorsum of abdomen and ovipositor fuscous; tegmina like *amboinensis* but lighter in color and the hyaline marks more extensive. ♂ Like the female, but marks on tegmina not so well defined.

Male pygophor with a small medio-ventral spine and a small spine from the latero-ventral edges; styles narrow and curved, the apices twisted half a turn, a small keel along the basal third; besides the penis and guide there is a long, thin spine from the ventral left side of the anal segment. This species approaches *dryas* in the shape of the male genitalia.

Length 2.8 mm.; tegmen 3.3 mm.

Hab. Pontianak, Borneo.

(7) *T. neoelegans* sp. nov.

Plate 6, fig. 8.

Vertex and pronotum of equal length. Yellowish brown; vertex pronotum and scutellum with keels finely bordered with dark brown, especially the median keels; genae beneath eyes darker, two faint rings on second joint of antenna. Tegmina very like *amboinensis*, with the clear hyaline spaces larger, the black spots on radia, media and cubitus larger and plainer and the granulations along nerves white. Male pygophor with a small, medio-ventral spine, the lateral edges not produced into spines, the styles somewhat like *amboinensis*, but broader and more truncate at apex, with the inner corner developed into a long, narrow, roundly-tipped process.

Length 2.8 mm.; tegmen 3 mm.

Hab. Telok Ayer, Borneo, on sugar-cane.

This is evidently allied to *elegans*, but as I have no description or figure of the genitalia I cannot be sure.

(8) *T. neoamboinensis* sp. nov. (♂)
Plate 6, fig. 11.

Vertex and pronotum of equal length. This species has the facies of *neoelegans* and *amboinensis*, but the genital styles differ considerably, the base being produced into a rounded, thin, concavo-convex process, the apex is less truncate and the apical corner produced into a much wider process..

Length 2 mm.; tegmen 2.5 mm.
Hab. Amboina; Cairns, Queensland.

(9.) *T. brunnipennis* Sign.

I have specimens from Amboina and Java which agree with Kirkaldy's *eximus,* which Matsumura considers the same as the African species *brunnipennis.*

(10) *T.* sp. nov.

I have one damaged specimen from Macassar in which the vertex is much shorter than the pronotum, (.75 to 1) and does not reach to the anterior margin of eyes, the face slopes forward, the apex of face being the most anterior portion of the head. It is too much damaged to describe, but the remarkable shape of the head makes it worthy of mention.

Sardia Melichar
(1) *S. rostrata* Melichar.

Specimens from Java and the Malay Peninsular agree fairly well with Melichar's description, but they are darker in color. The genitalia is near to *pluto* but the styles differ in having the basal portion larger in proportion to the apical portion and produced more acutely, the apical portion also differs. These differences are best seen in a side view of the styles. As there are no figures or descriptions of the male genitalia of *rostrata* from Ceylon I am unable to be sure of my identification. I have one brachypterous female from Java which is lighter in color than Melichar describes.

Phyllodinus Van Duzee.
(1) *P. macaoensis* sp. nov.

Brown; keels on head and thorax lighter, four small light spots

on apical portion of face, with some very indistinct ones at base; front legs dark brown, a small light mark at apex and one at base of tibiae, hind legs lighter brown; thorax and abdomen dark brown marked with lighter spots. Tegmina hyaline, veins light with small brown granules, a light brown mark from apex of costal cell over cross-veins and over cubital and last median apical cells, also fuscous along the sides of third and fourth median apical veins.

Length 2.8 mm.; tegmen 3.3 mm.

Hab. Macao, China.

This is the first Oriental species of this genus. I have only one American species for comparison, viz.: a brachypterous form of *P. nervatus;* from this species it differs in having the forking of the median facial keel reaching to the lower angle of eye, the anterior legs flattened but not quite so wide. The neuration of the tegmen is different from any other Delphacid with which I am acquainted, there being three veins to the subcost-radial system and an extra branch to the cubital system, the media touching both the radia and cubitus; a similar number of veins is also plainly recognizable in the brachypterous *P. nervatus.*

Sogatopsis gen nov.

Type, *pratti.*

In profile face and vertex flattened, subangular at their junction. Head narrower than thorax; vertex longer than wide, slightly narrowed towards apex, divided from face by an indistinct, wide V-shaped keel, a very obscure median keel bifurcate at apex, disk concave, base truncate; length of face nearly three times the breadth, sides parallel, tricarinate; clypeus shorter than face, tricarinate, genal keel distinct, running from beneath antenna to meeting of facial and clypeal lateral keels; antennae longer than face, first and second joints of equal length, first joint triangular in section, second cylindrical. Pronotum tricarinate, lateral carinae slightly diverging, reaching posterior margin, which is shallowly emarginate; scutellum tricarinate, lateral carinae very slightly diverging, reaching posterior margin. Hind tibia with one small basal, one small submedian and six small apical spines, spur cultrate (not lamellate) straight on inner edge, curved on outer, with one small apical tooth. Radial and median cross-veins small but distinct.

This genus is near to *sogata* but the antennae alone place it in a different genus.

(1) *S. pratti* sp. nov. (♀)

Yellow or light brown marked with dark brown and black. Head

and thorax yellowish brown pronotum and scutellum laterad of outer keels darker, two black lines from base of scutellum to apex of clypeus, broadest on face and clypeus where they fill all the space between the yellowish keels, genae beneath eye black, antennae yellowish with three longitudinal black marks, regular on first segment, irregular on second; front legs yellowish, longitudinally striped with brown, hind legs irregularly so; abdomen brown with hind margins of segments broadly yellow. Tegmina whitish hyaline marked with brown the brown marking forming a broad mark from costa across tegmen to middle of clavus extending over outer half of clavus and to base between cubitus and subcosta, also from costa over the yellow cross-veins to posterior border and to first median vein, leaving a triangular hyaline mark with its base from end of costal cell to near first median veins, and its apex touching middle of second median vein, small light mark in apex of first and second median and first cubital apical cells, apex of radial vein fuscous.

Length 3.4 mm.; tegmen 4 mm.

Hab. Amboina.

I take pleasure in naming this species after Mr. Felix Pratt, who took it in my company in Amboina.

Eumetopina Breddin.

(1) *E. flavipes* sp. nov. (♂ ♀)

Dark, shiny brown; clypeus, rostrum, apex of face, legs and posterior edge of pronotum yellowish; abdomen brown, margins of segments lighter brown or yellow. Tegmen brown with a lighter mark at end of costal cell and over cross-veins, veins dark with fine, hair-bearing granules; wings fuscous hyaline, veins dark.

Male pygophor short dorsally, long ventrally, rounded, a small medio-ventral spine; anal segment short with a strong, curved median spine from the ventral edge. Styles small, narrow, parallel-sided, apex pointed, arising from well within the pygophor.

Length 3.8 mm.; tegmen 3.8 mm.

Hab. Pontianak and Telok Ayer, West Borneo; Laloki, Papua; on sugar-cane.

(2) *E. caliginosa* sp. nov. (♂ ♀)

Dark brown; frons, except the base, genae below eyes, sides and posterior margin of pronotum and spur on hind tibia yellow or whitish, trochanters of hind legs and margins of abdominal segments yellowish. Tegmina uniformly brown, veins dark, granules small, dark, hair-bearing; wings smoky hyaline, veins brown.

Male pygophor with two small, contiguous, median spines on ventral border, with a very small projection a little laterad of these;

spine on ventral edge of anal tube fine; styles narrow, subparallel-sided, arising well within the pygophor, apical third slightly curved and the inner edge emarginate, apex rounded.

Length 3 mm.; tegmen 3 mm.

Hab. Amboina; Ceram; Toeal, Kei Islands; Larat; on sugar-cane.

In these two species the median carina on scutellum is obsolete; *caliginosa* appears to be very near to *krugeri,* but the antennae are all dark brown.

Eoeurysa gen. nov.

Type *flavocapitata.*

This genus differs from *Eumetopina* in having the junction of vertex and face acutely angular, the median keel on face and scutellum distinct and the genital styles articulated on the ventral edge of pygophor, not within it.

(1) *E. flavocapitata* sp. nov. (♂ ♀)

Vertex, base of face, pronotum, except the lateral margins, and pleura of abdomen yellowish, rest brown, hind legs lighter. Tegmen lighter brown, veins darker with small, hair-bearing granules; wings smoky hyaline with brown veins.

Male pygophor slightly emarginate medio-ventrally; anal segment short, a strong, inward-pointing spine on each ventro-lateral edge; genital styles reaching to anal segment, attached to the medio-ventral edge of pygophor, gradually enlarged on basal half then gradually tapering to apices which are curved outward.

Length 2.8 mm.; tegmen 2.8 mm.

Hab. Malay Peninsula and South China, on sugar-cane and sorghum.

Punana gen. nov.

Type *brunnea.*

In profile angular at junction of vertex and face, face and clypeus forming a continuous, slight curve, clypeus not angular. Vertex as long as broad, slightly rounded at apex, truncate at base which is slightly in front of middle of eye; an inverted V-shaped keel from middle of apex to latero-basal corners and continuing along back of eye, disk slightly excavate; face about one-third longer than wide, apex and base of equal width, laterally convex and keeled, also medially keeled; clypeus distinctly shorter than face, tricarinate; eyes with very slight antennal emargination on lower edge; antennae as long as face, first joint a little shorter than second, cylindrical, slightly

enlarged towards apex, beset with small spines, second joint flattened ovate, beset with sense organs and small spines, arista at apex; no carinae on genae below antennae. Pronotum as long as vertex, tricarinate, with a puncture in each half of disk, lateral carinae diverging, following curvature of hind margin of eye; scutellum 5-carinate. First joint of hind tarsus longer than the following two together, tibia with one basal, one sub-basal, one sub-apical and three apical spines, tibial spur a little more than half the length of first tarsal joint, awl-shape. Tegmina as in *melanesia*, but the neuration obscured by irregular granulation.

This genus is near *Melanesia*, but the shape of face and antennae easily separate it.

(1) *P. brunnea* sp. nov. (♀)

Brown; face with small light dots along keels, a yellowish mark dividing face from the dark brown clypeus, antennae with three dark rings, legs banded yellow and brown. Tegmina brown with a few lighter spots, thickly studded with light-colored granules, mostly along each side of veins, but irregular; wings brownish, dark-veined. Anal style small, spatulate; ovipositor reaching to end of anal style.

Length 3.5 mm.; tegmen 3.8 mm.

Hab. Mowong, Borneo.

Perimececer gen. nov.

Type *giffardi*.

Head in profile rounded at junction of vertex and face, extending slightly beyond eyes; clypeus continuous with face, not angular. Eyes transverse, antennal emargination on lower edge, extending half across eye; antennae very long, first joint small, claviform, second joint more than four times the length of first, cylindrical, beset with spines and sense organs, apex truncate, arista as long as second joint, arising from apex. Vertex subquadrate, truncate at base which is about level with middle of eyes, slightly rounded apically, depressed in middle, keels obsolete; face long, slightly convex and keeled laterally, a pair of median keels subobsolete at base, gradually converging together and meeting at apex, no keels on genae; clypeus longer than face, tricarinate, median keel reaching apex, lateral ones reaching a little beyond middle. Pronotum a little shorter than vertex, anteriorly truncate in middle, posteriorly shallowly emarginate, median keel subobsolete, lateral keels wide apart, diverging, following curvature of back of eyes. Scutellum slightly broader than long, lateral angles well in front of middle, 5-carinate, medio-lateral keels converging anteriorly. Tegmina narrowly rounded at apex; subcosta and radia amalgamated for basal third, radial cross-vein missing or very

short, radia furcate beyond cross-vein, two median sectors, basal portion of first joining cubitus, four apical cubital veins, a large stigmal spot at end of costal cell. First joint of hind tarsus about twice as long as second and third together, tibial spur awl-shape with one basal, one preapical and four apical spines.

This genus is near to *Ugyops* (and *Bidis*) but its longer antennae, wider vertex and the distance between its median facial keels distinguishes it.

(1) *P. giffardi* sp. nov. (♀)
Plate 6, fig. 13.

Face below eyes, clypeus, legs, ventral surface of thorax and abdomen, vertex and middle of thorax light yellow, eyes, antennae, face between eyes, lateral portions of pronotum and scutellum and dorsal surface of abdomen dark reddish brown; abdomen somewhat mottled. Tegmina brownish, darker over the costal area up to stigma and over the posterior half of apex; veins darker, a row of hair-bearing granules along each side of veins to cross-veins, then a single row on the veins; wings dusky hyaline, veins brown.

Length 4.4 mm.; tegmen 7.8 mm.

Hab. Piroe, Ceram.

I take the pleasure of naming this species after my friend Mr. W. M. Giffard.

Ugyops Guer.

(1) *U. liturifrons* (Walker.)

Specimens from Amboina, Ceram and Larat show considerable variation in extent of markings on tegmina; in some the brown apical mark extends along clavus to base. The genitalia in all these specimens are identical, the medio-ventral edge of pygophor is drawn out into a rounded tongue, the lateral edges curved; anal segment about half the length of ventral surface of pygophor, with a v-shaped excavation on its ventro-basal surface; anal style lanceolate, long, narrow; styles slender, subcylindrical, curved inwardly to near tips which are straight and meet together.

(2) *U. amboinensis* sp. nov. (♂ ♀)

Face with two approximate median keels joined together at apex. Light yellow, vertex and sides of face, genae and apex of clypeus spotted with brown, second joint of antenna with two brown bands, a brown band on apex of front femora and three bands on front tibiae, the bands on middle and hind legs much fainter, lateral edges and keels of thorax darker, abdomen mottled with brown, especially along medio-lateral line of dorsum. Tegmina hyaline, veins yellow with

brown bands, a brown mark in first apical median cell; wings hyaline, brown-veined. Besides being smaller and lighter this species differs from *liturifrous* in having the pygophor and anal tube much smaller, the anal style shorter and broader and the genital styles less curved and their apices, where they meet, not straight.

Length 5.2 mm.; tegmen 5.7 mm.

Hab. Amboina.

(3) *U. lalokensis* sp. nov. (♂)

A single median facial keel, meeting the V-shaped keel of vertex; the first median sector touching the cubitus (no median cross-vein). Light brown; the facial keels, distal half of second antennal joint, apical portion of tibiae and marks on dorsum of abdomen dark brown. Tegmina hyaline, veins brown with very fine, hair-bearing granules, a large stigma at end of costal cell, a brown spot at end of each apical vein, extending along cubital vein to clarus; wings hyaline, fuscous at border, brown-veined. Length of ventral surface of pygophor more than twice the breadth, medio-ventral process about as long as broad, angularly emarginate at apex, ventro-lateral edges of pygophor produced into angular, bent plates; anal segment long, compressed, forming a keel along medio-dorsal line, a long, acutely angular depression on ventral basal surface; anal style very small, narrowly lanceolate, genital styles small, slightly curved, flattened, the apices crossing one another.

Length 6 mm.; tegmen 7.7 mm.

Hab. Laloki, Papua.

This probably represents a new genus, but as there appears to be two forms mixed under *Ugyops* and *Bidis* which I cannot separate I place this form with them.

Melanesia Kirkaldy.

(1) *M. borneoensis* sp. nov. (♀)

Stramineous; a small, black, spatulate-shaped mark on each side of the V-shaped keel of xertex, a round black spot on each side of pronotum behind eyes, ovipositor dark; tegmina hyaline, slightly opaque and yellowish, veins colourless on basal half, brown apically, with numerous inconspicuous granules, a black spot in clavus, another small one at base of subcosta, radia, media and cubitus each with small brown spot; wings hyaline, brown-veined, slightly opaque.

Length 4.6 mm.; tegmen 5.4 mm.

Hab. Mowong, Borneo.

TROPIDUCHINAE.

Tambinia Stal.

(1) *T. macaoana* sp. nov. (♂ ♀)

Length of vertex about two-thirds the width (1 to 1.6), two small keels in a medio-lateral position at base of vertex not reaching half way to apex, length of face slightly more than greatest width below the eyes, median keel broad and distinct at *base*, very fine towards *apex*; posterior margin of pronotum deeply and angularly emarginate; tips of tegmina slightly deflexed at cross-veins; the characteristic apical cross-veins present.

♀ Light green, stramineous or light brown, lighter ventrally; eyes, spines on posterior legs and the ovipositor brown. Tegmina hyaline, slightly stramineous, all the cells of corium slightly granulate. Anal style longer than broad, apex rounded.

♂ One specimen light green, others light brown to yellow. Genital styles broad, thin, convex, similar in shape and size to the median process which lies between and contiguous to them, the three together forming a hemisphere; anal style long, elliptic, projecting well beyond the genital styles.

Length 4 mm.; tegmen 4.6 mm.

Hab. Macao, China.

(2) *T. terryi* sp. nov. (♀)

In color and form of head this is identical with the brown *macaoana* but the granulation over the cells of corium is more distinct and the anal style is lanceolate, with the apex acutely pointed whereas in *macaoana* it is rounded.

Length 4.4 mm.; tegmen 5.2 mm.

Hab. Manila.

Collected by my late friend, Mr. F. Terry.

(3) *T. concolor* sp. nov. (♂ ♀)

Shape of head similar to *macaoana*. Stramineous, legs and thorax ventrally slightly lighter, abdomen slightly fuscous; granulations on corium faint. Male genital styles spoon-shaped, their rounded apices meeting together; between them, in a median position, rises a very small conical process; anal segment longer than broad, slightly widened at apex which is shallowly and roundly emarginate, anal style small, lanceolate.

Length 3.8 mm.; tegmen 5 mm.

Hab. Amboina; Ceram.

The female I associate with this is from Ceram. The anal

segment and style agree with the Amboinese males. The corium is slightly more granulate.

(4) *T. fuscocoriata* sp. nov. (♂ ♀)

The small medio-lateral keels at base of vertex missing, otherwise head and thorax as in *macaoana*. Head and thorax greenish, yellowish or stramineous, on vertex, pronotum and scutellum more or less scarlet between keels, apical half of face brown, legs and abdomen fuscous. Clavus and corium up to apical cross-veins fuscous brown, with a hyaline spot at base of corium and another in the middle, the latter of variable size, corium beyond apical cross-veins hyaline, veins in hyaline portion brown, granulation more distinct in costal cell and clavus where they sometimes form minute white dots; wings hyaline with brown veins.

The one female specimen in the collection has the dark marking on the tegmen reduced to the clavus, base of corium and over the cross-veins.

The genitalia differs from *laratica* only in the apices of the genital styles which are smaller and the apical half of anal style more circular.

Length 3.2 mm.; tegmen 3.7 mm.
Hab. Larat.

(5) *T. laratica* sp. nov. (♂ ♀)

The small medio-lateral keel at base of vertex is obsolete and the median keel sometimes very faint, otherwise this species has the form of *macaoana*. Stramineous to light brown, the dorsum of abdomen fuscous, more or less tinged with scarlet between keels of head and thorax; one specimen has head, thorax and veins of tegmina green and the scarlet more distinct. Tegmina hyaline, slightly stramineous, veins stramineous, brown or green, fuscous over cross-veins making a distinct mark across tegmina separating the apical area, granulation on corium obsolete; wings hyaline with dark veins.

Anal segment of male and female a little longer than wide, broadest at apex where it is roundly emarginate, anal style projecting well beyond end of segment, constricted in middle, apical half circular; genital styles broadest at base, gradually narrowing to apex where it has a very small bifurcation curved round and touching at their apices, from the upper edge arises a curved, pointed process; median process small about twice as long as broad; sides of pygophor slightly and roundly projecting.

Length 3.2 mm.; tegmen 4 mm.
Hab. Larat.

(6) *T. formosa* (Kirkaldy).

Ossa formosa Kirkaldy, H. S. P. A. Ent. Bul. I., p. 413.

The deep emargination of the pronotum and the presence of apical cross-veins as well as the cross-veins places this species in *Tambinia;* it has the head narrowing from front of eyes to apex and comes near to *capitata.* Width of vertex to length as 1 to 1.4.

(7) *T. venusta* (Kirkaldy).

Ossa venusta Kirkaldy, l. c.

This species is congeneric with *formosa,* the head is not gradually narrowed, the length of vertex subequal to width.

Trichoduchus Bierman.

The species I add to this genus agrees in its generic characteristics with *biermani;* there is a small, pointed tubercle in the middle of the clypeus. I follow Bierman in placing this genus in *Tropiduchidae,* but it is so like *Ommatissus* that I consider they must eventually be placed next to one another. *Paruzelia* has a neuration approaching this genus.

(1) *T. biermani* sp. nov. (♀)

Yellowish, marked with brown. Head and thorax yellowish. clypeus and genae below antennae brown, legs and under side of thorax speckled with brown; abdomen yellowish mottled with brown, a round shiny black spot on pleura of penultimate segment. Tegmen reaching slightly beyond end of abdomen, very irregular, disk convex, the disk of each individual cell somewhat concave, the veins elevated; centrally dark brown to black, with yellow veins, margin lighter brown, colorless at apices of veins; three round vitiline spots, one in each of the first and second median cells and the third over the radia; wings totally absent.

Last dorsal plate emarginate in middle where anal segment is situated, the sides of emargination projecting as a rounded plate on each side of anal segment. Anal segment short, anus in middle, apex shallowly emarginate; sheaths of ovipositor broad, rounded at apices, which turn slightly upward.

Length 3.5 mm.; tegmen 2.50 mm.

Hab. Macao, China.

CIXIINAE.

1.	Vertex angularly emarginate at apex.....	*Kirbyana*
	Vertex truncate at apex	2
2.	Vertex with a distinct transverse keel.....	*Leptoclamys*
	Vertex without a transverse keel.....	3
3.	Vertex with a distinct medio-longitudinal keel, quadrate, base subequal to apex.....	*Ptoleria*
	Vertex without a medio-longitudinal keel, or with a very obscure one	4
4.	Vertex distinctly wider than long, base shallowly and roundly emarginate	*Austroloma*
	Vertex not distinctly wider than long, base less roundly emarginate	5
5.	Apex of vertex not perceptibly narrower than base	*Saccharias*
	Apex of vertex narrower than base, the median facial keel breaking the truncate outline of apex..	*Dystheatias*

I cannot find the type material of *Saccharias* among the late Mr. Kirkaldy's collection, but I took specimens in Java which I consider to be topotypes; they agree with the specific description, his generic description being quite inadequate.

The above six genera are closely allied, the first three are easily distinguished, but the last three are very difficult to keep apart; their generic distinctions are not likely to bear the strain that more extensive collecting will place upon them.

Ptoleria Stal.

(1) *P. granulinervis* sp. nov. (♂ ♀)

Lateral carinae of scutellum sinuate.

Light brown, the keels on head and thorax slightly lighter, dorsal part of abdomen fuscous, front legs with faint fuscous rings on femora and tibiae; tegmina light brown, small brown granules covering nerves, darker over stigmal spot; wings hyaline, slightly fuscous, veins brown. Male pygophor laterally compressed, a large emargination on dorsal side in which the anal segment fits, lateral edges sinuate, a small, rounded, median process; anal segment longer than broad, anus a little beyond middle, beyond anus flattish, slightly turned down, truncate at apex, a small, down-turned spine at each apical corner; styles flattish, widest at apex, inner edge convex outer edge concave, apex with a small point.

Female slightly darker in color, with more infuscation over apical portion of tegmina.

Length 2.4 mm.; tegmen 3.5 mm.

Hab. Larat, Timor Laut Islands.

(2) *P. brunnea* sp. nov. (♀)

Lateral keels on scutellum sinuous. Dark brown, keels on head and thorax and the legs lighter, front tibiae with three darker bands; tegmen with apical half fuscous, a small angular light mark at end of costa, and a small spot at end of each apical vein, a brown band from near base of costa to middle of clavus and then to cubitus a little above the furcation, veins with brown granules; wings fuscous hyaline with brown veins.

Length 2.5 mm.; tegmen 3.7 mm.

Hab. Larat, Timor Laut Islands.

(3) *P. communis* sp. nov. (♂ ♀)

Lateral keels on scutellum slightly curved, not sinuous. Brown, keels and legs lighter, front tibiae with fuscous bands, male styles and ventral portion of pygophor light; tegmina hyaline, light brown, apical half fuscous, the veins brown with brown granules, tips of apical veins with small dark spots with light spots on border between them, a faint mark from corium to base of costa; wings smoky with brown veins. Male pygophor compressed laterally, long ventrally, short dorsally, sides roundly produced, medio-ventral process small, conical; anal segment longer than broad, anus two-thirds from base, apex rounded, sides deflexed, forming a hollow on ventral side; styles flattened, curved, narrow at base, gradually increasing to rounded apex.

Length 2.5 mm.; tegmen 4.2 mm.

Hab. Singapore.

This species is near *brunnea* but the absence of the angular light mark at end of costa and the presence of the light and dark marks along the apical border easily distinguishes it.

(4) *P. maculata* sp. nov. (♂ ♀)

Lateral keels on scutellum slightly curved but not sinuate. Female head, thorax and legs light brown, abdomen dark brown, no bands on legs; tegmina hyaline, uniformly yellow brown, veins of same color with light granules, cross-veins dark and a dark spot at tip of each apical vein.

Male with infuscation on cross-veins and spots at apex of apical veins less pronounced, abdomen light brown. Pygophor laterally compressed, sides roundly produced, medio-ventral process small, round; anal segment slightly longer than broad, apex pointed, edges deflexed, anus slightly beyond middle, the whole somewhat like an inverted boat; styles flattish, widening to the rounded apex.

Length 2.8 mm.; tegmen 4.4 mm.

Hab. Malay Peninsula.

(5) *P. magna* sp. nov. (♀)

Lateral keels on scutellum slightly curved but not sinuate; vertex considerably narrowed apically but base much broader than length. Head, thorax and legs brown, abdomen darker, keels on head and thorax lighter, legs without marks, spines on tarsi dark; tegmina broadened towards apex which is more truncate than in the other species, uniformly brown, veins lighter and thickly studded with small brown granules, the darker color spreading out around granules into the cells, a small light spot on boarder in each median apical cell.

Length 3.6 m.m.; tegmen 5.3 m. m. This is not quite as large as the type species but larger than the other four species.

Hab. Mowong, West Borneo.

(6) *P. australis* sp. nov. (♂)

Lateral keels on scutellum nearly straight, medio-longitudinal keel on vertex distinct, first median sector touching cubitus. Vertex and middle of pronotum and scutellum light brown, sides dark brown, face, clypeus, legs and ventral side of thorax brown, face irrorated with small light spots; hind tibiae with a longitudinal brown stripe; abdomen brown, anal segment and pygophor yellowish. Tegmina hyaline, light yellowish brown, with a slightly darker fascia as in *arcuigera*, five or six small dark spots along second claval vein, veins colorless with very small, light granulations. Male pygophor laterally compressed, short dorsally, long ventrally, lateral edges roundly produced, medio-ventral process very small constricted at base (subcordate); anal segment longer than broad laterally compressed, rounded at apex, anus about one-third from base, sides deflexed forming a narrow bonnet over the styles; styles curved, slightly broadened on apical half, in transverse section subangular or sublunate.

Length 2.2mm.; tegmen 3.8mm.

Hab. Cairns, Queensland. Coll. Messrs. Perkins and Koebele.

Austroloma Kirkaldy.

(1) *A. austrina* Kirkaldy. (♂)

Male pygophor laterally compressed, medio-ventral process very small, angular, lateral edges broadly angular; length of anal segment about twice the breadth, slightly narrowed to rounded apex, lateral edges near apex turned down and slightly produced, anus slightly behind middle; styles curved, narrow at base, slightly spatulate at apex, keeled longitudinally and bent so that it is angulate in cross section.

Female unknown.

(2) *A. pallidula* sp. nov. (♂)

Yellow or light brown, scutellum lateral of outer keels and dorsum of abdomen darker; tegmina hyaline, yellowish, veins yellow with a stigmal spot; wings hyaline with brown veins. Male pygophor laterally compressed, long ventrally very short dorsally, medio-ventral process small, conical, lateral edges roundly produced; length of anal segment about twice the breadth of base, gradually narrowing to rounded apex. The edges near apex turned down and produced into a fine spine on each side, anus a little beyond middle; styles small, curved, basal portion thin, apex roundly spatulate. This species differs from *austrina* by the large anal segment with spines on sides of apex, rounded sides of pygophor and the styles being more roundly spatulate at tip and without a longitudinal keel.

Length 2.50mm.; tegmen 4mm.

Hab. Larat, Timor, Laut Islands.

(3) *A. pallida* sp. nov. (♂)

Yellow or light brown, very slightly fuscous on dorsum of abdomen; tegmina hyaline slightly yellowish, veins yellow, a minute fuscus spot in clavus, the tips of first three apical veins slightly fuscus. Male pygophor laterally compressed, long ventrally, short dorsally, lateral edges roundly produced, medio-ventral process angular, broader than long, length of anal segment slightly more than twice width of base, anus in middle, in dorsal view constricted before anus and gradually narrowed after anus to the roundedly-pointed apex, two downward pointing knobs on ventral edges about middle; styles small, flattish, regular about middle, apex slightly widened.

Length 2.50 mm.; tegmen 4mm.

Hab. Amboina; Larat.

(4) *A. fusconervata* sp. nov. (♀)

Dark brown; face, legs, pleurae and edges of abdominal segments and keels of head and thorax lighter; tegmina hyaline with dark brown veins with small graulations, three small brown spots, one in clavus, one on cubitus and one on media, all apical cells more or less fuscous, darker along veins. There are twenty specimens from Amboina of which the above description is typical, the infuscation varies in intensity, the two spots on the corium being absent in some specimens; there are also seventeen specimens from Larat which conform to the lighter Amboina specimens. It is possible that we have here the females of *pallida* and *pallidula*.

Length 3mm.; tegmina 4.6mm.

Hab. Larat, Timor Laut Islands; Amboina.

(5) *A. bicolor* sp. nov. (♀)

Scutellum, lower portion of face, clypeus, legs and ventral aspect of thorax yellow, upper portion of face, vertex, pronotum, tegulae and abdomen dark brown or black; tegmina dark fuscous, veins dark and granulated; wings dark fuscous with dark veins.

Length 2.8mm.; tegmina 4.8mm.

Hab. Piroe, Ceram.

(6) *A. grandis* sp. nov.

Vertex and middle of pronotum and scutellum, sides of pronotum and scutellum, face clypeus and genae dark brown, keels of face and clypeus with light spots, legs yellow with fuscous bands, one on femora, two on tibiae and one on first tarsal joint, abdomen brown marked with yellow. Tegmina hyaline marked with brown, veins mostly white with brown granules; the brown markings are over middle of clavus and forking of cubitus to near costa, at base of costa, an irregular broad angular mark from end of costal cell to cubitus and then to radial apical vein, apical area suffused with brown; wings hyaline with brown veins, slightly suffused with fuscous.

Length 3.6mm.; tegmen 5.4mm.

Hab. Amboina.

This species has the typical wing of the genus, but there is an indication of a median longitudinal keel on vertex which confuses it with *Ptoleria.*

Kirbyana.

(1) *K. javana* sp. nov. (♀)

Stramineous; keels of head and thorax lighter, pronotum and scutellum outside the lateral keels darker; all tibiae with a longitudinal brown mark; tegmina stramineous, veins light, granules very small and colorless; wings hyaline with white veins. This species is easily recognized from *pagana* by the absence of the dark granules.

Length 2.6mm.; tegmen 4.4mm.

Hab. Doro, Java.

(2) *K. pratti* sp. nov. (♂ ♀)

Yellowish brown; keels on head and thorax lighter, face with small light spots, lateral edges of pronotum and scutellum darker, pygophor lighter, tibiae with longitudinal brown mark; tegmina hyaline variegated with brown, veins colorless with small brown granules; the brown markings covering inner half of clavus and extending to cubitus and, near base, to costa, a large, irregular, brown, triangular mark with its base from middle of costa to second radial vein

and its apex reaching the cubitus, dark over apical portion of tegmina, especially along apical veins, some small dark spots on claval veins.

Male pygophor narrow, compressed laterally, the sides produced into obtuse angles, a small median process on ventral edge; anal segment short, anus in middle where it is raised, the edges turned downward, apical edge with small, round emargination; styles short, reaching to end of anal segment, flattened; with end shaped like a bird's head.

Length 2.8mm.; tegmen 4.2mm.

Hab. Parit Buntar, Malay Peninsula.

I take the pleasure of naming this little insect after Mr. C. Pratt who caught the first of my specimens.

Mundopa Distant.

The species I place under this genus agree with *cingalensis* in neuration, shape of head, etc. The vertex is short, divided from face by transverse keel, with or without a longitudinal keel; median keel of face furcate at base.

(1) *M. lunata* sp. nov. (♀)

Yellow or yellowish brown; pronotum and scutellum darker, a brown mark across posterior portion of scutellum, brown over front and middle coxae, middle of pronotum, edges of tegulae and apex of abdomen; tegmina hyaline, very slightly yellowish and opaque with waxy secretion, veins brown, a brown stigmal mark, a curved mark at base from subcosta to edge of clavus which joins with the band over scutellum when wings are at rest and forms a crescent-shaped mark.

Length 3mm.; tegmen 4.4mm.

Hab. Mowong, Borneo.

(2) *M. fasciolata* sp. nov. (♂)

Vertex without a median longitudinal keel. Dark castaneous; clypeus, legs, ventral surface of thorax, anal styles, keels of vertex, lateral keels of face and antennae yellow, margins of ventral plates of abdomen yellowish; tegmen hyaline slightly opaque and dirty with waxy secretion, veins yellowish, base of tegmina fuscous, a mark at stigma, a spot at end of clavus, another a little beyond clavus, a broad band across tegmina over the cross-veins; wings hyaline, veins brown, apices broadly fuscous.

Male pygophor compressed laterally, ventral edges produced an-

gularly, lateral edges evenly curved; anal segment large, anus about middle, sides curved and turned down; styles small, clavate.

Length 2.5mm.; tegmen 3.8mm.

Hab. Mowong, Borneo.

(3) *M. caliginea* sp. nov.

Dark brown; the coxae of hind legs yellowish, tegmina and wings brown with dark veins. Male pygophor very large; ventral edge sinuate and slightly emarginate, lateral edges curved and turned slightly inward, medio-ventrally there projects a plate which in ventral view is thin with two small projecting points at apex, in lateral view wide at base and curving off to thin apex; styles a little longer than median process, slightly swollen in middle, bifurcate at apex, the ends of the bifurcations rounded; anal segment very large, projecting well beyond styles, in dorsal view flat, subovate, the anus at apex, the edges turned down and apically meet beneath anus, thus forming a large concavity on the ventral side of segment, in which lies the large and complex penis.

Length 2.8mm.; tegmen 3.8mm.

Hab. Mowong, Borneo.

(4) *M. neocaliginea* sp. nov. (♂ ♀)

This differs from *caliginea* by the lateral keels of vertex and face being yellowish. Male pygophor with a medio-ventral spine, lateral edges evenly and roundly produced; anal segment not reaching to end of styles, little longer than broad, in dorsal view subtruncate at apex, where anus is situated, edges turned down thus forming a concavity on ventral side; styles boomerang shape, narrowest at base, outer edge concave inner convex.

Length 2.8mm.; tegmen 4.2mm.

Hab. Malay Peninsula; Mowong(?). I have specimens of females from Mowong which I associate with this species, but it is possible that they are only light forms of *caliginea*.

(5) *M. albocacuminis* sp. nov. (♀)

Brown; apex of face, clypeus, legs and ventral surface of thorax light yellow, lateral keels on face, keels on vertex and scutellum yellow, the lateral keels on scutellum broadly so; tegmina brown tinged with yellow over the clavus and across middle of cubitus, a crescent-shaped dirty white mark over apex from radial to last median apical veins.

This species differs from the former four in having a median longitudinal keel on vertex, and the transverse keel is v-shaped in

middle so that, together with the bifurcation of median facial keel, it forms a small diamond-shaped area.

Length 2.6mm.; tegmen 4mm.

Hab. Mowong, Borneo.

Borysthenes Stal.

This genus, like *Mundopa,* has the subcosta and radia separated from near the base, the radia being furcate about the middle and one or both branches again furcate near the apex; the media has three sectors, the first furcate near the apex. The tegmina are ampliated on the hind margin beyond the clavus, and when at rest these areas overlap and are not appressed as in *Mundopa Kinnara* etc., Another feature which separates this genus from *Mundopa* is the presence of a keel across the gena below the antenna (subantennal keel) which touches the edge of the face at its widest point, from which point the face narrows to the apex. It is difficult to separate the species of this genus without the help of the male genitalia. The tomentosity on species of this genus mentioned by their describers is due to waxy secretions and not to hairs or scales, and may be present or absent.

(1) *B. certus* sp. nov. (♂)

Head, thorax, legs and base of abdomen stramineous, rest of abdomen fuscous; tegmina hyaline, slightly fuscous, subopaque with waxy secretion, veins brown on basal half, fuscous apically, infuscation darker over apical cells and along base of subcosta, radia and media, and over cross-veins; third apical median and first and second apical radial cells each with a lighter spot.

Male pygophor compressed laterally; ventral edge deeply and roundly emarginate, a small, rounded, median process, slightly longer than wide; on each side of the emargination the edges are produced into a small, flat, spine above which on the right side the edge is slightly produced, then straight for a short distance and then cut away to the base of the anal segment, on the left side it is not produced but nearly straight to the base of the anal segment; anal segment large, anus near base, beyond which the segment curves under, the apex being irregular. Styles asymmetrical, right one flattened, the apical portion projecting nearly at right angle to basal portion, but in the same plane, at the angle the inner edge drawn out into a small point, the apex spatulate and rounded, the bent apical portion nearly as long as the straight basal portion, a minute emargination on inner edge near base, left style of the same shape as the right but the

bent apical portion much shorter and the spatulate apex slightly larger.

Length 3mm.; tegmen 4.4mm.
Hab. Telok Ayer, Borneo.

(2) *B. incertus* sp. nov. (♂)

The color and marking of this species is nearly the same as *certus* but the male genitalia differs as follows: Ventral emargination not so deep, median process broader, the spines at the sides of emargination broader and shorter, the lateral edges project as broad angles, the right much longer and more acute than the left; anal segment long, anus about third from base, the apex pointed, turned downward slightly and swollen; styles not so flat as in *certus*, the apical portion shorter and turned in an opposite plane to the base, the apical portion on left side being pointed and curved, not spatulate.

Length 3.4mm.; tegmen 5.2mm.
Hab. Mowong, Borneo.

(3) *B. simulans* sp. nov.

Color and marking as in *certus* but the hyaline spots larger. Ventral edge of pygophor deeply emarginate, the median process thin and spine-like, the sides roundly produced, forming a continuous curve with the sides of emargination without any spines on edge; anal segment large, anus near base, beyond anus broadened and flattened, the apex drawn out and slightly spatulate, turned downward and split down the middle, forming two contiguous processes; styles broad, flat, apical portion curved slightly outward, rounded at apex, a round emargination on inner edge near base.

Length 3mm.; tegmen 5mm.
Hab. Mowong, Borneo and Malay Peninsula.

(4) *B. magnus* sp. nov. (♂ ♀)

Clypeus, back of genae below eyes, scutellum, middle of pronotum and all of abdomen brown, rest of body and legs yellow; tegmina brown with white hyaline areas, costa and first branch of subcosta red, other veins brown; the hyaline areas are a patch over basal area, cut up by the brown veins, and nine or ten spots in the disk, the spot in second radial cell continued as a fine hair-streak to near apex; wings fuscous brown, veins dark with the darker color spreading into the cells.

Male pygophor slightly compressed laterally, medio-ventral edge produced into an angular plate, the basal half narrowing slightly, the apical half more acutely; lateral edges obtusely angularly produced;

anal segment in dorsal view projecting slightly beyond lateral edges, widest at base where anus is situated, the apex produced into two contiguous processes which are turned down at right angle to main portion; styles reaching end of anal segment curved narrow at base, wide at apex, the inner edge convex, with a small emargination at base, outer edge concave, bent along the longitudinal axis so that a transverse section shows a right angle, the apex at the bend drawn out into a point, the outer apical angle pointed, the inner apical angle rounded.

Length 4.6mm.; tegmen 6.5mm.

Hab. Mowong, West Borneo.

The bifurcation of the apex of anal segment and the shape of the styles places this species next to *simulans*.

Kinnara. Distant.

The presence of the median ocellus and the large anal wax plate of the female shows that this genus should be placed among the Cixiidae and not among the Achilidae. When at rest the tegmina have their posterior borders beyond the clavus appressed, and not overlapping as is normally the case with the Achilidae. The meeting of the claval suture with the claval vein is very obscure and should not overbalance the characters mentioned. A distinguishing feature of this genus is the large costal cell and the conspicuous stigmal area near its apex, also a subantennal keel across the gena.

(1) *K. brunnea* sp. nov. (♀)

Shiny dark brown; lateral keels of face and the legs lighter brown, pleurae of abdomen red; tegmina dark brown with three minute transparent spots near apex; wings fuscous with dark veins.

Length 2.8mm.; tegmen 3.8mm.

Hab. Mowong, West Borneo.

(2) *K. flavifrons* sp. nov. (♂ ♀)

Head, pronotum, tegulae and legs yellow or brownish yellow, scutellum dark, shiny brown, lateral facial keels tinged with darker brown, abdomen brown with reddish pleurae; tegmina dark brown with lighter spots in the middle of the apical cells; wings fuscous with dark veins.

Male pygophor compressed laterally, ventrally long, dorsally very short, ventral edge truncate, lateral edges cut back squarely to base of anal segment; from near the base of the styles a thin process arises

and remains attached to the lateral edges to their angulation when it continues as a long, free process, finely pointed and slightly twisted; styles small, not reaching to end of lateral spines, subparallel sided and rounded at apex; anal segment large, with its edges deflexed, forming a large hollow on ventral side, anus near the rounded apex; penis large and complex. Female styles (outer sheaths of ovipositor) with an indentation near apex or inner edge with a projecting flange at base.

Length 2.7mm.; tegmen 4.3mm.
Hab. Java; Mowong, Borneo.

The type is from Java, the Borneo specimens being all females and differing slightly from the female from Java. Males from Borneo may show them to be a distinct species.

(3) *K. fulva* sp. nov. (♂ ♀)

Yellow; dorsal portion of abdomen and anal segment fuscous; tegmina hyaline, subopaque with waxy secretion, slightly infuscate over the apical cells from radia to cubitus; wings hyaline, semiopaque with waxy secretion, veins dark.

Male pygophor long, compressed laterally, the ventral edge truncate, the lateral edges roundly produced, foliate and turned outward slightly, from each side near to the attachment of styles, arises a long, thin, curved process reaching to the extremity of the anal segment; anal segment long, anus about middle, beyond anus segment drawn out into a long, curved, downward-turned spine; styles not so long as the lateral processes, keeled along the outer edge, slightly expanded at apex, penis large and complex. Female styles broad, without a process at base, truncate at apex where there is a small emargination and another slight indentation below the apex on the upper edge.

Length 3.2mm.; tegmen 5.3mm.
Hab. Mowong, Borneo.

(4) *K. sordida* sp. nov. (♂)

Dorsally a sordid brown, ventrally yellowish also lower portion of face and the clypeus; tegmina hyaline, subopaque with waxy secretion, veins slightly yellowish, wings slightly fuscous, subopaque with waxy secretion, veins dark. Male pygophor compressed laterally, a thin cylindrical, roundly-pointed process arises from each lateral edge near the attachment of styles, another sharply pointed and curved process arises from the lateral edges near the base of the anal segment; anal segment long, rounded and slightly broadened at apex where anus is situated; styles shorter than lateral processes,

curved, slightly flattened, with the inner corner of apex slightly produced and rounded at apex.

Length 2.3mm.; tegmen 3.4mm.

Hab. Mowong, Borneo.

Ommatissus Fieber.

(1) *O. lofouensis* sp. nov. (♂ ♀)

This species differs from *binotatus* in the vertex narrowing slightly more towards the apex and the face towards the base, the medio-apical portion of clypeus raised as a short, angular keel. Median ocellus absent, clypeus rounded at base, keelless. Subcosta and radia amalgamated to near apex where three small apical veins arise, media simple with one sector arising a little before the branching of radia from subcosta, cubitus forking slightly before first median sector, claval vein joining commissural margin very near apex of clavus.

Dirty yellow or light brown; eyes dark brown, keels slightly lighter, abdomen darker, a dark fuscous spot on each side of pronotum as in *binotatus*, a dark patch at base of face, basal half of clypeus dark; tegmina and wings hyaline, veins brown. Male pygophor slightly compressed, ventral and lateral edges subtruncate; anal segment less than half the length of genital styles, slightly narrowed to the broadly rounded apex, anus about middle; styles large, subangular, length greater than width at base, apex slightly rounded.

Length 2.6mm.; tegmen 3.2mm.

Hab. Lo-fou Mountains, South China; 3500 feet elevation, on grasses.

(2) *O. chinsanensis* sp. nov.

This species is in form and color like *lofouensis*, but the genitalia differs; the anal tube is short, not reaching to end of genital styles; genital styles nearly circular, with a small indentation on the dorsal edge. This appears to be near to *O. binotatus*, but the styles are much larger in proportion to the anal segment.

Length 2.5mm.; tegmen 3mm.

Hab. Chin san, China (near Macao.)

Neommatissus gen. nov.

Type *spurcus*.

Head narrower than thorax; vertex longer than wide, deeply excavate so that the apex and sides stand up as deep, laminate keels, especially above the eyes, base slightly emarginate, with a very small keel; face much longer than wide, sides subparallel, slightly widening at apex, tricarinate, the median carina continued down middle of

clypeus and strongly curved before apex of same, sides of clypeus rounded, without keels; eyes round, slightly emarginate on lower posterior edge; first joint of antennae small, second cylindrical, little longer than broad, truncate at apex, arista long. Pronotum deeply and roundly emarginate on posterior margin, tricarinate, lateral keels strongly diverging, sharply bent and partly interrupted just before they reach the hind margin above the tegulae; scutullum more than twice the length of head and pronotum, with three large carinae, lateral ones diverging, reaching posterior border. Tegmina with subcosta and radia amalgamated to a little beyond middle, both with short furcation near apex, media with three sectors, first arising about middle of tegmen and furcate about its middle, cubitus furcate about middle of tegmen, radial cross-vein from radia to near base of second median sector, median cross-vein from near base of first median sector to near furcation of cubitus, claval veins amalgamating about one-third from base, joining commissural margin near apex; first joint of hind tarsus a little shorter than the others together, hind tibia with a median and a subapical spine.

This genus is near *Ommatissus* but is easily distinguished by the laminate keels on sides of vertex and the more complex neuration of tegmina.

(1) *N. spurcus* sp. nov. (♂ ♀)

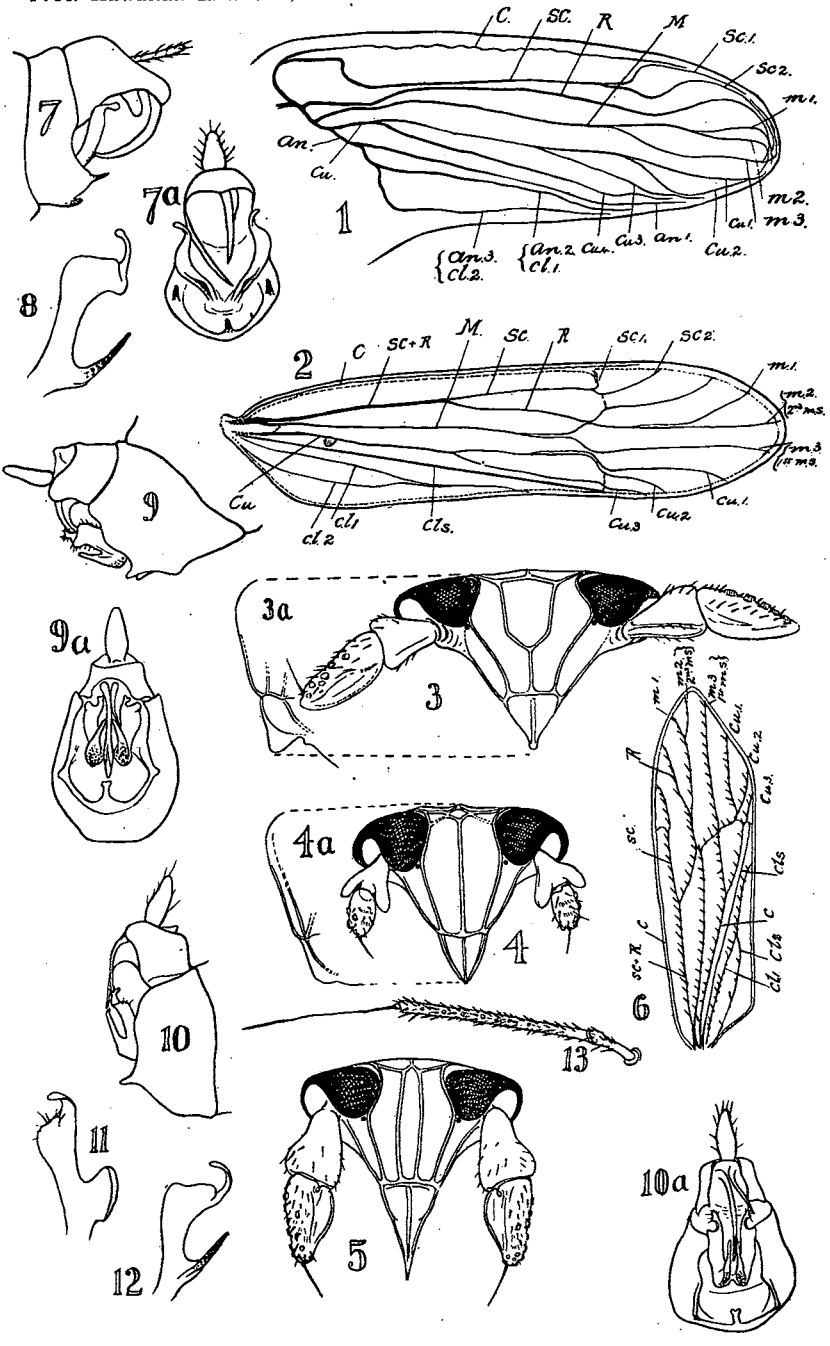
Sordid yellow or sordid light brown; abdomen and between keels of scutellum darker, two small dark marks on apex of vertex; tegmina and wings hyaline, veins yellow, beset with fine hairs on the *underside.* Male pygophor small, slightly compressed laterally, vertex and lateral edges subtruncate, dorsal edge with deep emargination in which anal segment fits; anal segment very short, rounded; genital styles narrow at base, gradually widened to truncate tip, apical corners rounded, outer apical angle with a small outward and downward turned spine, a small spine near apex.

Length 2.3mm.; tegmen 3.8mm.

Hab. Amboina.

Note.

The reason for the horismology of the tegmen employed in this paper is fully explained by figures 1 and 2 of Plate 6, which illustrates the tracheal system in the nymph and recently hatched adult of *Perkinsiella saccharicida,* a typical Delphacid tegmen. The radia and media both bend out of the straight and amalgamate for a short distance, likewise the first median sector (third median vein) and the cubitus, the latter taking a sharp bend immediately afterwards; thus there are neither radial


C.
SC.
R
M
Sc.1.
Sc2.
m.1.
An.
Cu.
m2.
m3.
Cu.1.
Cu.2.
Cu3.
An.1.
An.2.
Cu.1.
An.3.
Cl.2.
Cl.1.
1
7
7a
8
2
C
SC+R
M.
SC.
R
Sc.1.
SC2.
m.1.
m.2.
m.3.
Cu
cl.1
cl.2
Cl.s.
Cu3
Cu.2.
Cu.1.
9
9a
3a
3
4a
4
6
10
10a
11
12
13
5

nor median cross-veins. The fourth cubital vein lies close to, and parallel with, the second anal vein, and together they form the claval suture, the second and third anal forming the first and second claval vein.

In using the neuration of Homoptera for systematic purposes care must be exercised in the selection of the characters used, especially for generic purposes, as there is a fair amount of variation, as in the wings of all insects.

EXPLANATION OF PLATE 6.

1. Nymphal tegmen of *Perkinsiella saccharicida,* showing tracheae.
2. Immature adult tegmen of same.
3. Head of *Cochise,* front view.
3a. Ditto, profile.
4. Head of *Belocera,* front view.
4a. Ditto, profile.
5. Head of *Geoneossus,* front view.
6. Tegmen of *Geoneossus.*
7. Male pygophor of *Tropidocephala saccharicola,* side view.
7a. Ditto, full view.
8. Right genital style of *T. neoelegans.*
9. Male pygophor of *T. festiva* (?), side view.
9a. Ditto, full view.
10. Ditto of *T. atrata* (?), side view.
10a. Ditto, full view.
11. Right genital style of *T. neoamboinensis.*
12. Ditto of *T. amboinensis.*
13. Antenna of *Perimececera.*

C—costa, SC—subcosta, R—radia, M—media, Cu—cubital, Cl—claval, An—anal, MS—median sector.

One New Genus And Eighteen New Species of Hawaiian Moths.

BY O. H. SWEZEY.

During the past three years, in rearing moths from caterpillars found in the mountains and elsewhere, I have discovered a number of species not hitherto described. I have for description also a number of new species found amongst a lot of spe-

Proc. Haw. Ent. Soc., II, No. 5, July, 1913.

cimens collected by Mr. W. M. Giffard at lights, at his bungalow at 4000 feet elevation, Kilauea, Hawaii, at various times in 1911 and 1912. I have also one new species from Brother Matthias Newell of Hilo, Hawaii, and one from Mr. D. T. Fullaway. Some of these new species may have been included in a later collection of Dr. Perkins, sent to the British Museum, but which were never worked up completely.

Family Plusiadae.

Nesamiptis newelli n. sp.

Female; 31mm. Head cinereous-fuscous, pale ochreous on vertex. Antennae ochreous, profusely speckled with fuscous. Palpi cinereous-fuscous. Thorax pale ochreous. Abdomen ochreous and fuscous mixed. Forewings light ochreous, first line dark fuscous angulated outwardly at middle; second line dark fuscous nearly straight, slightly angulated inwardly at one-third from dorsum; space between the lines medium fuscous, somewhat suffused with whitish between cell and costa; a slight suffusion of fuscous on costa near apex; a few fuscous scales in terminal fourth of wing; cilia cinereous-fuscous. Hindwings cinereous-fuscous, darker terminally; a darker discal spot; a median darker line, sinuate in dorsal half; cilia cinereous; termen waved. Legs cinereous-fuscous.

Hab. Hilo, Hawaii, one female, 1911 (Brother Matthias Newell.)

Plusia giffardi n. sp.

Female, 40mm. Antennae fuscous-ochreous, basal half above barred with black and ochreous, bipectinate for three-fourths of length. Palpi very dark fuscous-brown with a few fuscous scales, terminal segment minutely tipped with ochreous. Head and thorax very dark brownish fuscous; collar, patagia, and crests of thorax tipped with violet. Forewings dark fuscous-brown suffused with pale violet, especially in basal and subterminal areas; sub-basal, first, and second lines metallic brassy-yellow; first line angulated outwardly near costa; second line angled outwardly just before middle, dorsal portion irregularly sinuate-dentate; subterminal line incomplete, indicated by metallic brassy-yellow scales; three spots of metallic brassy-yellow scales in disc, first beginning just beyond second line, extending along submedian vein for about one-third of the width of the median band, an extension along vein 2 which terminates in a roundish enlargement dorsal of vein 2, in the disc above this spot and connected with it are a few scales of the same color crescentically arranged; second spot sub-circular, beyond the first, situated dorsal of vein 2; in one specimen connected with first spot; third spot irregular and situated in a dark fuscous discal spot; a slight suffusion of brassy-

yellow scales in dorsal portion of the area before first line; considerable of the same scales in tornal half of the area beyond second line. Abdomen light grey fuscous, dorsal tufts very dark fuscous tipped with violet. Legs very dark brownish fuscous, with tibiae and tarsal joints tipped with white. Hindwings fuscous, darker terminally, a darker transverse discal mark; termen waved, cilia spotted fuscous and dirty whitish.

Hab. Kilauea, Hawaii, 6 females collected at lights, Sept., 1911, May, July, August, 1912 (W. M. Giffard).

Evidently this is related to *pterylota* from its bipectinate antennae and general pattern of wings. It may prove to be the female of that species. Dr. Perkins informs me that Hampson so considered some female Plusias collected by him at Kilauea several years ago. However, my specimens differ very much in general coloration from Meyrick's description of *pterylota,* and in the color and shape of the metallic spots in the disc.

Family Hydriomendiae.

Hydriomena roseata n. sp.

Male and female. 27-31mm. Antennae cinereous. Palpi pale brown. Head and thorax cinereous mixed with a few rosy-pink scales. Forewings whitish much strigulated with rosy-pink and scattered fuscus scales; median band with some suffusion also of brownish ochreous, anterior edge wavy, posterior edge wavy outwardly prominent in middle; discal spot small, of a few fuscous or brown scales. Hindwings of the same color and stringulation as forewings, but median band not so distinct. Abdomen cinereous, rosy-pink and fuscous mixed, apical margins of segments ringed with white, a series of dark fuscous dorsal spots. Legs cinerous and fuscous mixed, anterior pair with femora and tibiae much suffused with rosy-pink, tarsi banded with fuscous.

Hab. Kilauea, Hawaii, 9 specimens taken at lights, Aug., Sept., 1911, Feb., May, July, 1912 (W. M. Giffard).

Hydriomena giffardi n. sp.

Male and female. 23-24mm. Antennae and palpi pale ochreous. Head and thorax white, slightly mixed with fuscous. Forewings white with a few scattered fuscous scales and much strigulated with fuscous; median band with anterior and posterior edges nearly straight and marked with blackish lines, the anterior line discontinued between cell and costa; discal dot round, black. Hindwings similar to forewings but with the strigulations less distinct. Abdomen fusco-cinereous with segmental margins white. Legs cinereous-fuscous, front pair darker.

Hab. Kilauea, Hawaii, 2 specimens taken at lights, Aug. 1911, May, 1912 (W. M. Giffard).

FAMILY PYRAUSTIDAE.

Omiodes fullawayi n. sp.

Male, 32mm. Color and markings of *musicola*, but the first line of forewings is bent above middle at an acute angle instead of being almost rectangular as in *musicola*, it is also bent outwards at its termination on dorsum instead of ending straight as in *musicola*; the outward angulation of second line below middle terminates acutely, whereas it is rounded in *musicola*.

Hab. Kona, Hawaii, July, 1912; one specimen reared from caterpillar on wild banana (D. T. Fullaway); Kilauea, Hawaii, May, July, 1912; two specimens taken at lights (W. M. Giffard).

Omiodes anastreptoidis n. sp.

Male and female, 25-28mm. Color and markings of *anastrepta*, except that second line of forewing is not sinuate outwardly beneath costa, and is sinuate outwardly below middle; and the sinuation of the postmedian line of hindwings is more pronounced.

Hab. Kohala Mts., Waimea, Hawaii, 5 specimens reared from caterpillars on sedge, Dec. 1911; one specimen reared from caterpillar on sedge, Kilauea, Hawaii, April, 1906.

Caterpillar 20-25 mm., grass green; head green, eyes black, with a dark streak extending obliquely upward from them, the usual roundish black spot in each lobe in front with a black streak extending obliquely upward and outward connected with it, a black spot between this and the streak from the eyes, a black spot near suture in front, a spot between this and the frontal spot, three or four blackish spots near vertex, a blackish line on margin above postero-ventral angle; cervical shield sometimes faintly black on lateral margin, two black dots in each lateral lobe the anterior one about thrice the size of the other; tubercle "ii" of segment 3 ventrally black-margined; tubercle "ii" of segment 12 faintly ventrally black-margined, tubercle "iii" of segment 12 dorsally black-margined most conspicuously posteriorly; spiracles yellowish.

The caterpillar has the head markings nearly like *anastrepta*, but with more black spots; and there are not such prominent markings on the tubercles. They were in spun together leaves of a small sedge. The pupa was formed in same place. Pupa

11-12mm. long, brownish, and simliar to the pupa of other species of *Omiodes*. Pupal period is 12-13 days.

Pyrausta thermantoidis n. sp.

Male and female, 18-20mm. Antennae whitish-ochreous, barred with fuscous above. Palpi projecting about one and one-half the length of head in front of it, ochreous mixed with fuscous, white at base. Head white on vertex, ochreous and fuscous mixed on face. Thorax white. Forewings brownish ochreous, with a few dark fuscous and whitish scales mixed; base white on dorsal half; first line white, angled outwardly at middle, bent outward on dorsum, indistinct towards costa; second line white, waved, broadly curved outward at middle, broken inward below discal spot on vein 2; roundish orbicular and reniform discal spots faintly outlined with black scales; a terminal white suffusion from tornus touching second line and narrowing to near apex; a terminal series of black dots and four or five black spots on apical third of costa; cilia whitish, barred with dark fuscous. Hindwings pale brownish to cinereous-fuscous, two obliquely placed darker discal spots, a postmedian outwardly-curved whitish line; a terminal series of blackish dots; cilia cinereous, darker at base. Abdomen cinereous-fuscous, segmental margins white. Legs cinereous-fuscous, fore legs darker.

In Meyrick's table this runs to *thermantis*, but it differs from that species in being paler, not ferruginous, thorax and head white, and the first and second lines not having the same form.

Hab. Kilauea, Hawaii, 4 specimens taken at lights, Aug. 1911, May, July, 1912 (W. M. Giffard).

Scoparia nectarioides n. sp.

Male, female, 17 mm. Antennae and palpi light brownish-fuscous. Head ochreous. Thorax white, patagia ochreous with tips of some of the scales fuscous. Forewings ochreous, considerably mixed with dark fuscous especially the anterior half of middle third of wing; first line white, double, very oblique, indented in middle, often suffused with ochreous in middle; claviform, orbicular, and discal spots not distinct in outline, represented by undefined darker fuscous spots, between orbicular and discal a transverse white spot, often a white dot beyond discal; second and subterminal lines well-marked, white, confluent in the middle; a terminal line of dark fuscous dots; cilia ochreous-fuscous, barred with white. Hindwings pale cinereous-ochreous; cilia white. Abdomen cinereous. Legs cinereous, outer side and tarsi fuscous spotted with cinereous.

Related to *nectarias*, to which it runs in Meyrick's table in

Fauna Hawaiiensis. It differs particularly from that species by the undefined orbicular, claviform, and discal dots, and the dark fuscous suffusion on costal region between first and second lines.

Hab. Kilauea, Hawaii, 9 specimens taken at lights, Dec., May, 1912 (W. M. Giffard).

FAMILY GELECHIADAE.

Aristotelia gigantea n. sp.

Female, 28 mm. Antennae ochreous barred with dark fuscous above. Palpi, head and thorax brownish ochreous. Forewings whitish ochreous, a few orange scales at base; middle half of costa fuscous, bordered irregularly with a streak of ochreous brown; a fuscous spot near middle of fold, another near dorsum about midway between this and anal angle; an orbicular and a discal fuscous dot; a streak of brownish suffusion in dorsal half of cell, extending to termen, gradually widened to apex; cilia whitish ochreous, black-spotted at base on termen. Hindwings with termen bisinuate; pale brownish ochreous; cilia whitish ochreous, light fuscous near base. Abdomen brownish fuscous. Legs brownish fuscous, tibiae and tarsi tipped with ochreous, middle and hind tibiae ochreous in middle.

This is much larger than any other species described from the Hawaiian Islands.

Hab. Kilauea, Hawaii, one specimen taken at light, Dec., 1911 (W. M. Giffard).

Thyrocopa sapindiella n. sp.

Male, female, 18-21 mm. Entire insect pale whitish-cinereous. Forewings sometimes with a slight sprinkling of light fuscous scales; sometimes a fuscous dot in cell, another beyond it on fold, and two dots at end of cell. Is nearest to *argentea*, but of more uniform coloration.

Hab. Niu, Oahu, 8 specimens reared from caterpillars feeding on leaves of *Sapindus oahuensis*, June, August, 1909, Dec., 1910.

An egg-mass was found on the upper surface of a leaf beside the midrib near base. It contained 25 eggs, each one pale yellowish, roundish, about 1mm. in longest diameter, finely reticulated, flat and overlapping shingle-like similarly to the eggs of *Omiodes*.

The caterpillars were quite numerous on some trees. The small ones feed on the under surface of the leavs, each producing a web covered with frass under which it feeds, eating off the

surface of the leaf. The larger ones hide in rolled-together leaves, often several leaves in a bunch fastened together and there may be two or more caterpillars, each in a silken tunnel.

Small caterpillars are yellowish or pale green, with two lateral fuscous lines; cervical shield with black lateral margins and black dorsal spots; head with two black spots in front and lateral blackish markings, eyes black. Full-grown caterpillar about 30 mm.; pale yellowish with pale brown markings; most of surface above spiracles more or less brownish; head pale yellowish brown with some darker markings on sides and vertex, eyes black, several black dots in middle in front; cervical shield pale yellowish with several blackish dots dorsally, and two black spots longitudinally placed near each lateral margin; tubercles "i" and "ii" in direct longitudinal line slightly infuscated, "iii" a little above spiracles each with a dark fuscous ring; setae pale; spiracles black, slightly oval.

Pupa 9 mm. Medium brown, darker dorsally; tips of wing-sheaths and antenna-sheaths extend a little beyond apex of fourth abdominal segment; a low slightly serrated ridge at apical dorsal margin of metathorax and on abdominal segments; a somewhat interrupted median dorsal ridge on segments 1-4; minute longitudinal ridges on dorsum of abdominal segments, more or less reticulate on the anterior ones; thorax reticulated, somewhat transversely; cremaster with two ventrally curved spines, a minute one near base of each. The pupa is formed within the spun-together leaves where the caterpillar fed.

FAMILY TORTICIDAE.

Archips fuscocinereus n. sp.

Male, 21 mm. Antennae, palpi and head cinereous. Thorax brownish cinereous, patagia with some olive green basally. Forewings cinereous, a little orange suffusion basally; basal fourth lightly suffused with pale olive green with dorsal extension between vein 1b and dorsum to near middle of wing, bounded outwardly by a whitish sinuate line inwardly indented on fold; and bordered on inner side with dark fuscous; five fuscous spots on costal fold; from near middle of costa a broad whitish-margined fuscous band crosses the wing, much widened in the cell, a roundish protuberance forward and the backward extension nearly reaching the end of cell dorsally terminating in an obtusely rounded point near vein 1b, near this on dorsum a rounded dark fuscous spot bordered with whitish except on outer side; a little before this spot a dark fuscous posteriorly whitish-edged bar extending from dorsum to vein 1b; median band slightly

suffused with olive green in cell; beyond median band 4 dark fuscous spots on costa, diminishing in size towards the apex. Hindwings cinereous with a faint fuscous transverse submedian streak and several scattered pale fuscous markings. Abdomen fuscous cinereous. Legs cinereous, fore and middle legs with tibiae and tarsi and hind tarsi fuscous, dotted with cinereous.

Hab. Kilauea, Hawaii, one specimen taken at lights, Feb., 1912 (W. M. Giffard).

Archips sublichenoides n. sp.

Male, female, 28-37 mm. Antennae brownish-fuscous, in male with middle third serrated and all finely short-ciliated. Palpi brownish-fuscous, yellowish-brown on outer side, extending twice the length of head beyond it. Head and thorax very dark brownish-fuscous. Forewings very much mottled with dark brownish-fuscous and purplish grey; an oblique basal fascia with crenate outer margin; an oblique median fascia with crenate margins; a triangular black blotch at end of cell; a costal series of black spots; dull orange scales plentifully sprinkled all over wing, most numerous at base and tending to margin the black fascia. Costal fold of male on basal third. Hindwings cinereous, much mottled with fuscous. Abdomen cinereous. Legs dark fuscous-brown, posterior pair paler.

Much resembles *lichenoides,* except that it lacks the olive green of that species.

Hab. Kilauea, Hawaii, May, 1912, 2 males and 6 females taken at lights. (W. M. Giffard).

Tortrix semicinereana n. sp.

Male (?), 20 mm. Antennae greyish-fuscous. Palpi whitish internally, greyish-fuscous externally. Head brownish-ochreous. Thorax dark brownish-fuscous, patagia greyish. Forewings cinereous, basal sixth fuscous; a dark fuscous triangular spot extending from one-fourth of costa half across wing; apical portion of wing suffused with light fuscous, the inner boundary of which extends from just before middle of costa obliquely to three-fourths of dorsum; a few darker fuscous costal spots, also a dark fuscous spot at end of cell; a few scattered spots of yellow scales. Cilia light greyish-fuscous. Hindwings and cilia uniformly light greyish-fuscous. (Abdomen missing). Legs cinereous, front and middle tibiae and tarsi fuscous externally.

Hab. Kilauea, Hawaii, Feb., 1912; one male (?) taken at light. (W. M. Giffard).

Capua santalata n. sp.

Male, 10-11 mm. Antennae brownish-ochreous, banded with brown above. Palpi very short, brownish-ochreous. Head brownish-

ochreous. Thorax brownish-ochreous, light yellow posteriorly, patagia pale yellow on apical portion. Forewings rich chestnut; outer half of costal fold yellow; basal portion before an oblique line from the end of costal fold to middle of dorsum has 10 or 12 light yellow spots; a large yellow spot extending inward from middle of costa, another similar one a little beyond it; a large oval white spot occupying the outer fourth of cell; a few scattered bluish scales in the chestnut portion; terminal cilia pale yellow, dorsal cilia fuscous. Hindwings pale ochreous-whitish, terminal portion a little darker, cilia pale whitish-ochreous. Abdomen pale grey. Anterior legs brownish; mid and posterior legs whitish.

Female, 12-13 mm. Antennae whitish-ochreous, ringed with brownish above. Palpi very short, bright yellow. Head and thorax bright yellow, in places slightly tinged with brownish. Forewings bright yellow; a chestnut patch at base of costa, two or three spots on basal portion of wing towards dorsum; an oblique straight chestnut band from one-third of costa to two-thirds of dorsum, connecting with a broader subterminal band extending from dorsum to apex; a few scattered bluish scales in the chestnut portion; cilia pale yellow. Hindwings and cilia pale whitish-ochreous, terminal portion of wing a little darker. Abdomen and legs pale whitish-grey.

Hab. Diamond Head, Oahu, May, June, July, 1911; 24 specimens reared from caterpillars on leaves of sandalwood. Palolo Ridge, Oahu, June, 1912; one specimen reared from sandalwood.

Full-grown caterpillar about 8 mm.; pale green; head concolorous, eyes black and a black dot at postero-ventral angle; anal comb of 6 pale stiff bristles.

Pupa 5mm.; pale greenish or yellowish; wing-sheaths and posterior leg-sheaths extend about to apex of fourth abdominal segment, antennae-sheaths not quite so long; two transverse rows of short backwardly-directed spines on abdominal segments 3-7, one row on segments 2 and 8; cremaster with two strong downwardly-curved hooks wide apart, and a few hooked bristles. The pupa is formed within the folded-over edge of a leaf. The pupal period is about a week.

FAMILY HYPONOMEUTIDAE.

Euhyposmocoma n. g.

Has the characters of *Hyposmocoma*, except that the labial palpi have a large spreading tuft extending forward on the median segment. The male has no subcostal hair-pencil on hindwings.

Type, *Hyposmocoma ekaha* Swezey,, Proc. Haw. Ent. Soc., II, No. 3. p. 105, Pl. 3, figs. 3, 4; 1910.

Euhyposmocoma trivitella n. sp.

Male, female, 13-16 mm. Antennae whitish-ochreous, fuscous above. Palpi white, median segment with large forward-projecting tuft of hair-scales fuscous externally on basal half; terminal segment minutely fuscous at apex. Head white, sometimes a few fuscous scales on vertex. Thorax white, tipped with brown posteriorly, patagia brown. Forewings distinctly three-banded longitudinally; costal band white, not quite reaching base or apex; dorsal band extending from base to and including apex, pinkish; between these bands a more-or-less irregular light brown band extending from base and terminating on costa just before apex, about its middle is a slight widening into the white costal band; a series of black dots on margin around apex and on termen, three of them on costa before apex; cilia brown on costa before apex, on termen white with wide brown basal band, dorsal cilia white. Hindwings and cilia white. Abdomen whitish-ochreous. Forelegs fuscous, mid and hindlegs whitish mid-tarsi spotted with fuscous.

Hab. Lihue, Kauai, March, 1912; 6 specimens reared from mines in the fronds of ferns *(Elaphoglossum reticulatum* and *E. gorgoneum)* in the mountains in the vicinity of the head of the Grove Farm ditch.

Full-grown larva 8 mm.; dirty whitish yellow; head very pale brownish, much retracted into segment 2; eyes dark brown; cervical shield concolorous; tubercles concolorous, "i" and "ii" almost in a longitudinal line, "iii" close above spiracle and a little anterior of it, "iv-v" below spiracle and farther from it than "iii" is; setae long, pale; spiracles minute, circular, pale; abdominal prolegs on segments 7-10.

Pupa 7 mm., light yellowish-brown; eyes black; wing-sheaths and antennae-sheaths extend to apex of seventh abdominal segment; a cluster of bristles at apex of abdomen hooked into silk cocoon. The pupa is formed within the mine in a slight cocoon covered with pellets of frass.

Gracilaria dubautiella n. sp.

Male, female, 7 mm. Antennae one and one-third, light fuscous. Palpi whitish, a fuscous spot at apex of median segment and near middle of terminal segment. Head dirty whitish. Thorax brownish-ochreous. Forewings brownish-ochreous, with three outwardly oblique white dorsal streaks, and two slender outwardly oblique white costal streaks at middle and two-thirds of costa respectively; all of these streaks margined with a few black or fuscous scales; three white costal spots near apex; a spot of bluish scales at apex and a few

bluish scales in a more or less fuscous streak between apex and end of third dorsal white streak; cilia whitish, at apex terminally fuscous, at tornus fuscous at base also. Hindwings and cilia greyish-fuscous. Abdomen greyish-fuscous. Legs fuscous with white tarsal spots.

Hab. Pacific Heights Ridge, Oahu, Aug., Sept., 1909; Hillebrand's Glen, Oahu, Dec., 1912; Mt. Olympus, Oahu, Jan., 1913; numerous specimens reared from mines in leaves of *Dubautia plantaginea.*

The eggs are deposited singly on the surface of the leaves; circular, about .5 mm. in diameter, broadly convex and with the surface reticulated and somewhat irridescent. The young larva on hatching, immediately eats into the leaf, at first producing a very slender mine lengthwise in the leaf and back and forth a few times, but eventually broadening to a blotch. A purplish discoloration is produced in the leaf by the mining larva, forming streaks following the course of the mines. Often several mines are begun in the same leaf. I have found as many as 11, but not all of the larvae reach maturity, however, often 3 or 4 cocoons are found in the same leaf.

The full-grown larva is 6-7 mm. long; pale greenish-yellow, head pale brownish, eyes black; head very deeply notched and retracted into segment 2 which is widened and has a fuscous longitudinal dorsal streak each side of median line, darkest at posterior margin; ventrally there is a large squarish patch of fuscous which is minutely roughened, cervical shield also slightly roughened. Abdominal prolegs on segments 7-10.

Pupa 4mm., pale greenish, a little browned on thorax, and middle of dorsum of abdomen, leg—and antenna-sheaths; wing-sheaths extend about to apex of fifth abdominal segment; antenna-sheaths extend beyond apex, curved up over abdomen to near middle. The pupa is formed in a cocoon within the mine, its position being indicated by a bit of white silk showing where the larva ate a slit through the epidermis for the emergence of the moth.

Gracilaria hibiscella n. sp.

Male, female, 9-10 mm. Antenna one and one-third, pale ochreous barred with dark fuscous. Palpi pale ochreous-whitish, terminal segment somewhat fuscous on outer side. Head and thorax pale brownish-ochreous. Forewings ochreous, three dorsal outwardly-oblique white streaks, widened and black-margined at base; a white slender outwardly-oblique narrowly black-margined costal streak at three-fourths of costa, beyond this 3 or 4 white costal spots; a wide sub-

terminal streak black with a few bluish scales; cilia at apex black, on termen grey with a black line at base. Hindwings and cilia greyish-fuscous. Abdomen greyish. Legs pale ochreous, anterior legs fuscous on outer side.

Hab. Tantalus, Oahu, October, 1911, 3 specimens reared from mines in leaes of native Hibiscus.

The mine usually begins towards base of leaf, proceeding upward irregularly and following the margin for a part of its course, it eventually reaches the apex, then follows down the opposite margin of the leaf rapidly widening until the larva has finished its growth. It then breaks through the epidermis to form its white oval cocoon on the surface of the leaf.

The full-grown larva is about 9 mm.; pale bluish-green; head with blackish mouth-parts, eyes, and 2 lines bordering the paraclypeus, much retracted into segment 2 which is widened and has a large black spot ventrally and 2 black spots near anterior margin dorsally; thoracic legs minute; abdominal prolegs on segments 7-9.

Pupa 5 mm.; pale testaceous-greenish, with a few fuscous markings ventrally; wing-sheaths extend to apex of fifth abdominal segment, free beyond fourth segment, dark fuscous at tip; posterior leg-sheaths extend to apex of abdomen; antenna-sheaths extend beyond apex of abdomen, recurved over the back forward to base of fourth abdominal segment. Pupal stage about a week.

Opogona purpuriella n. sp.

Male, female, 10-11 mm. Antennae and palpi whitish-ochreous. Face in front and between antennae whitish-ochreous, vertex dark purple. Thorax dark purple. Forewings dark purple, iridescent, with two lemon yellow costal spots at one-third and three-fourths of costa; a wide lemon yellow streak along basal half of dorsum; cilia dark fuscous. Hindwings brownish-fuscous, cilia dark fuscous. Abdomen brownish-fuscous. Legs whitish-ochreous, hind tibiae fuscous externally and tarsi dotted with fuscous.

Hab. Kona, Hawaii, Oct., 1912, 18 specimens collected from leaves of sugar cane. Several pairs were in cop., end to end in the position so often observed in *Opogona aurisquamosa*. Probably the larvae feed in cane trash or rotten cane the same as those of the latter species. No doubt it is a species that has recently become introduced from some southern Pacific region.

A New Species of Mealybug Parasite (Aphycus terryi).

BY D. T. FULLAWAY.

Aphycus terryi n. sp.

♀ Length of body 1.09 mm., expanse of wings 1.85 mm., greatest width of forewing .37mm. Microspocilally reticulate and finely punctured, punctures bearing short hairs; orange yellow, head, pronotum superiorly and antennae paler (shading into white), scape below, pedicel and first four funicle joints, pronotum anteriorly, scutellum, metathorax and a broad band on abdomen infuscated (shading into black). Head transverse, fairly wide anterior-posteriorly, indistinctly lenticular, eyes large, somewhat bulged, front between, rather narrow, face slightly retracted and widening immediately below the eyes to meet the cheeks which are also rather broad below, ocelli arranged in a slightly acute triangle, the lateral members close to margin of eye, antennae arising just below middle of face, moderately long, with 6-jointed funicle, scape long but not greatly widened below, pedicel obconic, funicle joints extremely short but lengthening and expanding outwardly, the last about half as long as wide, the club expanded and indistinctly jointed. Pronotum extremely thin, mesonotum short, about half as long as wide, without parapsides, axillae meeting in the middle, scutellum almost triangular, apex bluntly pointed. Abdomen conic ovate, collapsing after death so that the dorsal surface is deeply concave, ovipositor slightly protruding. Legs moderate, middle tibiae with long apical spur, tarsi with several rows of spines on inner face. Wings hyaline, marginal vein short and thick, submarginal extremely long, reaching middle of wing, postmarginal a mere spur, stigmal well developed, a hairless line reaching obliquely inwardly from stigmal and a faint infumation below it.

Male—Length about 1 mm., slenderer, the body and legs reddish yellow, eyes red, antennae brownish black, scape beneath paler, head thin, anterio-posteriorly and lenticular, eyes smaller, front between wide, lateral ocelli as far from margin of eye as from each other, inner margin of eyes parallel and far removed, face widening below to narrow cheeks, antennae arising far apart on level with lower margin of eye (as in female), funicle long, as long as scape and pedicel together, the joints submoniliform, first a little longer than wide, width increasing on length outwardly but not becoming extremely transverse as in female, scape slender (not expanded leaflike, as in female) nearly twice pedicel, club longer than pedicel by half and rather thick. Thorax and abdomen rather depressed, the latter acutely triangular, apex truncated. Wings hyaline, the fumation beneath the stigmal vein absent.

Hab. Hawaiian Islands. Bred from *Pseudococcus sacchari-folia* at Olowalu and Hana, Maui by F. W. Terry, June, 1909, and at Hilo, Hawaii, August, 1912, by O. H. Swezey.

Proc. Haw. Ent. Soc., II, No. 5, July, 1913.

ANNUAL ADDRESS.

Report on a Collection of Hymenoptera Made in Guam, Marianne Islands.

BY DAVID T. FULLAWAY.

The species of hymenoptera listed and described below were taken by the writer in 1911 on the island of Guam in the course of some entomological work for the local government experiment station. Fifty-three species are included, of which 11 are described as new to science. It is regretted that many species can only be referred to their genera but in view of natural difficulties surrounding descriptive work in certain groups of the hymenoptera and the inability of the writer to use any of the large collections for comparison of material, it seemed the only safe plan. The most interesting feature of the work is the recovery and comparatively easy recognition of Holmgren's species collected by the Swedish expedition in the "Eugenie" in 1851-3. This list does not include the Formicidae, which were done by Dr. W. M. Wheeler of Harvard University, cf. Jour. N. Y. Ent. Soc. vol. XX (1), p. 44.

APIDAE.

1. *Apis mellifera* Linn.
   Introduced from the Hawaiian Islands in 1907.

MEGACHILIDAE.

2. *Lithurgus* sp.
3. *Megachile* sp.
4. *Megachile* sp.

ANDRENIDAE.

5. *Halictus* sp.

PROSOPIDAE.

6. *Prosopis* sp.

Dr. Perkins has kindly furnished me with the following note on this species: "Belongs to group with largely developed wings of 7th ventral segment, a bifurcate apex to 8th segment,

the bifurcations expanded as in *Prosopis cressoni;* see Metz's paper, Tr. Am. Soc. XXXVII., pl. IV, fig. 53 etc. This group is American, Austral. and European, and probably cosmopolitan."

LARRIDAE.

7. *Pison* sp.
8. *Pison* sp.
9. *Pison* sp.

VESPIDAE.

10. *Polistes hebraeus* Fab.
11. *Polistes semiflavus* Holm.
12. *Icaria marginata* Sauss?=*I. cagayanensis* Ashm.

EUMENIDAE

13. *Rhynchium brunneum* Sauss.

BETHYLIDAE.

14. *Gonatopus* sp.
15. *Scleroderma duarteanum* n. sp.

♀ dimorph. Length 5mm. Black, smooth and shining, with a delicate miscroscopic reticulation, and sparsely clothed with pale golden hairs set in shallow punctures. Antennae 13-jointed, honey yellow, outwardly fuscous, scape long, clavate and curved outwardly, pedicel much shorter, obconic, funicle filiform, less than twice the length of the scape, joints short and subequal except the last, which is nearly twice as long as the preceding. Legs honey yellow, short and stout, femora greatly swollen.

Wings narrow with two short completely closed basal cells, the basal nervure reaching the costa, the nervures brown and the disc largely infuscate.

Hab. Chance's ranch, Jigo, Guam. Described from 9 specimens bred from a coleopterous larva in cacao *(Theobroma cacao)*. Named for Cap't. P. Duarte.

16. *Parasierola cellularis* Say.

SCELIONIDAE.

17. *Caloteleia elegans* Perk.
18. *Macroteleia manilensis* Ashm.
19. *Platyscelio wilcoxi* n. sp.

♂ Length about 4mm. Greatly flattened, with a sparse clothing of fuscous hairs which is thicker on the two last abdominal segments.

Head subquadrate, horizontal, very thin anterior-posteriorly (dorso-ventral), smooth and shining, the vertex somewhat striated, a medial furrow on the face which bifurcates dorsally just below the apical ocellus and ventrally above the insertion of the antennae; eyes elonggate elliptic and convex, basal ocelli distant on the summit of the vertex; antennae 12-jointed and flattened, the scape greatly dilated apically, pedicel small, obconic, joints of the flagellum small, expanding outwardly, the last three or four subquadrate. Prothorax, mesothorax except scapulae and abdomen longitudinally punctuate-striate, thorax otherwise smooth and shining; prothorax narrowed before into a neck, mesonotum ample, parapsidal grooves well defined, the anterior portion of the scapulae punctate, the scutellum transverse, posteriorly a single row of punctures interrupted in the middle; metathorax with some fine striations and a medium furrow bifurcating behind. Abdomen broadly attached, elongate elliptic and depressed, the intersegmental furrows broad but shallow, a well-defined lateral carina on both sides from base to middle of 5th segment. Legs slender, wings fairly long and narrow, the disc hairy, more or less clouded, marginal vein moderately long, about one-fourth the length of the submarginal, the distal end at about the middle of the wing, radius short, postmarginal absent.

Black except the scape, pedicel, first five joints of the flagellum and the tip of the abdomen, which are rufo-testaceous. The legs are testaceous; the veins of the wings brown.

Hab. Guam. Described from a single specimen. Named for Mr. George N. Wilcox, U. S. Navy.

PLATYGASTERIDAE.

20. *Allotropa thompsoni* n. sp.

♀ Length .75mm. Brown, smooth and shining, feebly but uniformly punctate, the punctures enclosing short hairs. Head transverse, slightly convex, eyes black, ocelli red, arranged in a triangle, the lateral members of which are close to the inner margins of the eyes, antennae 9-jointed, inserted on either side and at about the middle of the clypeus, scape large, clavate, pedical smaller, obconic, the three funicle joints filiform, a little longer than the pedicel, four-jointed club about as long as the pedicel and funicle together and somewhat expanded. Prothorax broadly joined to the head and extremely narrow, mesothorax convex, mesonotum subquadrate, parapsidal grooves distant, scutellum obtusely triangular; metathorax indistinct. Abdomen short ovate, depressed. Legs moderate. Wings with a fuscous cloud in the middle of the disc, submarginal vein ending in a club near the costal margin, before the middle of the wing.

Hab. Guam. Described from a single specimen bred from a mealybug (*Pseudococcus* sp.) on *Abrus abrus*. Named for

Mr. J. B. Thompson, Director of the Government Agricultural Experiment Station at Guam.

DIAPRIIDAE.

21. *Phaenopria* sp.
22. *Tropidopria* sp.

CHALCIDIDAE.

23. *Chalcis* sp.
24. *Neochalcis* sp.
25. *Stomatocerus* sp.
26. *Conura* sp.

EUCHARIDAE.

27. *Chalcura upeensis* n. sp.

♂ Length about 4mm. Punctate, the notum coarsely folded or reticulate, and hairy, the abdomen with a few punctures, otherwise smooth and shining. Head fairly large and convex, triangular in outline, anterior-posteriorly thin, the front longitudinally striate, eyes small and convex, the lower margin distant from the base of the mandibles, face and cheeks rather broad, occipital margin distinct on the vertex, the ocelli in a straight line below, antennae 12-jointed, pubescent, inserted on the middle of the face, scape scarcely as long as the first joint of the flagellum, pedicel very short, 2nd flagellar joint a little more than half the length of the first, joints 5 to 10 subequal, joint 11 one and one-half times 10, and 12 twice 11, joints 4 to 11 with a long ramus apically on the outer side; clypeal sutures distinct; mandibles large and falcate with two strong teeth near the base; trophi slender. Thorax extremely short and convex, pronotum invisible from above, mesonotum well developed, parapsidal furrows convergent but not quite meeting at the base, inner angles of the axillae almost or quite meeting in the middle, scutellum triangular, rounded behind, posterior face and the metathorax almost vertical. Abdomen long petiolate, hatchet shaped, the petiole longitudinally striate. Legs slender, the coxae fairly stout. Wings much narrowed basally, the disc hairy and clouded, marginal and post-marginal veins fairly long, radius short and stigmatic.

Metallic green with purplish reflections, the abdomen with the exception of the petiole dark brown. Legs and basal joint of the antennae light brown, the flagellum fuscous brown, mandibles honey yellow, wing veins almost black, a brownish suffusion beneath the stigma.

Hab. Upe, Guam, in the forest. Described from a single specimen.

AGAONIDAE

28. *Blastophaga innumerabilis* n. sp.

♀ Length 1.25mm. Black, smooth and shining, the anterior portion of the head including the oral cavity, mandibles and first three joints of the antennae, and the legs honey yellow. The head horizontal, subquadrate, thin anterior-posteriorly (dorso-ventral), a broad and deep groove on the face from the vertex to the mouth, which has a rather large opening, defined laterally by the large, bidentate and acutely pointed mandibles, which reach the base of the eyes; antennae 11-jointed, inserted together just above the mouth, 1st joint short and stout, dilated in front, 2nd slenderer and about twice as long as wide, 3rd with the basal portion short while the outer face is produced apically into a long spine and the inner face receives the short 4th joint, 5th and 6th joints larger than the 4th, a little longer than wide, 7th to 11th joints widening outwardly, the individual segments (except the last) cyathiform, and each from the 5th outwardly bearing broad plate-like hairs. Thorax rather flat, pronotum transverse, narrowed before, the posterior lateral angles produced, the hind margin therefore curved inwardly; mesonotum also transverse, parapsidal furrows merely indicated behind, scutellum fairly long, the hind margin rounded and two longitudinal grooves on the disc laterally; metathorax broad and truncate, posterior angles well defined. Abdomen about as long as the thorax and somewhat compressed, broadly joined basally, and apically produced to a point, the dorsum ridged; ovipositor hair-like and longer than the abdomen. Legs moderate, front and hind femora swollen. Wings hyaline, marginal and postmarginal veins subequal, stigmal vein a trifle shorter and almost perpendicular.

Hab. Guam. Described from many specimens.

ENCYRTIDAE.

29. *Eupelmus* sp.
30. *Eupelmus* sp.
31. *Pentelicus* sp.
32. *Ooencyrtus* sp.

PTEROMALIDAE.

33. *Pteromalus* sp.
34. *Isoplata* sp.
35. *Tomocera californica* How.
36. *Spalangia cameroni* Perk.
37. *Spalangia metallica* n. sp.

♀ Length about 1mm. Smooth and shining, the head oblong,

wider than the thorax, moderately thick and convex, the anterior margin medially incised; ocelli arranged in a small triangle close to the vertex, eyes small and dorsal, face and cheeks broad; antennae fairly long, cylindrical and hairy, 10-jointed, inserted above the recessed mouth, scape not reaching the level of the vertex, pedicel small and obconic, joints of the flagellum small and subequal except the last which is small and indistinctly separated from hte penultimate joint. Thorax convex, prothorax well developed, nearly as long as the rest of the thorax and narrowed in front to a small neck which is transversely striated, mesothorax fairly long, the parapsidal furrows on mesonotum distinct and much bent towards the sides, the inner angles of the axillae meeting in the middle, scutellum flat, a trifle longer than wide, parallel sided and straight across the hind margin; metathorax transverse, the hind margin rounded. Abdomen small, petiolate, broadly oval and depressed, the ovipositor slightly exserted. Posterior legs longer than the others, the coxae especially long and well developed. Wings rather narrow, with a marginal fringe, marginal vein rather long, stigmal short, a brownish cloud on the disc beneath; where the marginal and submarginal veins merge, the costal cilia are greatly thickened and tangled, forming a pseudo-spine.

Pale or reddish to olivaceous brown with metallic reflections, the head, last five antennal joints, mesothorax and abdomen dark, blue to black and metallic; basal joints of the antennae and the legs from straw yellow (or almost white) to reddish brown.

Hab. Guam. Described from a single specimen.

ELASMIDAE.

38. *Elasmus philippinensis* Ashm.

EULOPHIDAE.

39. *Closterocerus* sp.
40. *Coccophagus orientalis* How.
41. *Aphelinus* sp.
42. *Tetrastichus hagenowii* Ratzeburg.
43. *Cirrospiloideus guamensis* n. sp.

♀ Length 2.5mm. Microscopically reticulate and shining with a few sparse hairs. Head transverse but not especially thin, eyes fairly large and convex, face and cheeks wide, the temples rounded, occiput deeply impressed, ocelli arranged in a triangle on the vertex, antennae filiform, 10-jointed, inserted on the middle of the face, scape reaching the vertex, pedicel obconic, four funicle joints longer by half than the scape, club short and pointed, indistinctly divided; clypeus distinct, the labrum shortly projecting. Prothorax greatly narrowed in front, mesonotum transverse, parapsidal grooves distinct,

inner angles of axillae not quite meeting in the middle, scutellum broad and flat with two distinct longitudinal grooves, the hind margin very slightly curved; metathorax declivous, with two median carinae which converge behind. Abdomen conic-ovate, collapsed after death. Legs fairly long and slender. Wings hairy, marginal vein long, postmarginal and stigmal veins shorter and equal.

Yellowish to testaceous, the ocellar triangle, upper margin of occiput, pronotum, metathorax and part of the abdomen black, eyes red, antennae outwardly fuscous brown.

Hab. Guam. Described from several specimens bred from lepidopterous miners in "abas duendes" and *Terminalia catappa.*

Closely corresponding male specimens differ as follows: Length less than 1mm. Antennal scape expanded and leaf-like. Abdomen short, depressed and broadly rounded at the apex. Head, prothorax, and abdomen outwardly black. Bred from lepidopterous miners in *Heritiera littoralis.*

TRICHOGRAMMIDAE.

44. *Trichogramma* sp.

EVANIIDAE.

45. *Evania appendigaster* Linn.

ICHENEUMONIDAE.

46. *Lissopimpla nigricans* n. sp.

♀ Length 7mm. Smooth and shining, the head transverse, anteriorly punctate and hairy, the punctuation more pronounced on the clypeus and labrum, eyes large and convex, emarginate within and continguous with the occipital margin behind, ocelli large and arranged in an obtuse triangle near the vertex, face and cheeks rather narrow, antennae setaceous, nearly as long as the body, 43-jointed, inserted near the middle of the face in rather prominent sockets, labrum fairly large and subquadrate, clypeal suture distinct, a broad median longitudinal elevation between it and the antennal sockets. Thorax convex, elongate, pronotum invisible from above, mesonotum anteriorly punctate, lobed, parapsidal furrows broad and deep, meeting beyond the middle but not attaining the posterior margin, scutellum reduced to a punctate knob or disc with lateral carinate wings enclosing a broad deep basal fovea, postcutellum continuous with the knob or disc of the scutellum, the narrow transverse areas on either side towards the wings greatly sunken, mesopleura clothed with short

white hairs, the hind border costate, metathorax subquadrate and rugose, petiolar area hexagonal and more or less smooth. Abdomen highly polished, elongate, depressed, widening slightly outwardly, apically somewhat compressed, 1st segment rather long, 2nd subquandrate, others shorter and transverse, segments 2-4 with transverse median depression and anterior lateral angles separated by deep grooves. Ovipositor exserted about half the length of the abdomen. Legs moderately stout, posterior pair larger, with greatly lengthened coxae, a spine on the lower face of the femur and a double row of short spines on the outer face of the tibia and tarsus. Claws stout and simple. Wings fuliginous, veins and stigma almost black, areolet quadrate, narrowed outwardly, receiving the 2nd recurrent nervure at the lower outer angle, submedian cell a trifle shorter than the median, discoidal nervure arising from the lower third of the 2nd discoidal cell, transverse median nervure of the hind wings broken well beyond its middle.

Black with some brownish tints, face and basal joints of the antennae reddish brown, front legs brown, middle and hind legs and abdomen deep reddish brown.

Hab. Guam. Described from three female specimens.

47. *Echthromorpha continua* (Brulle). ?

48. *Paniscus latro* Holm.

ALYSIIDAE.

49. *Aspilota pitiensis* n. sp.

♂ Length about 2mm. Black, the two basal joints of the antennae, prothorax, abdomen basally and legs pale to reddish brown; smooth and shining, the head transverse, temples broad and rounded; face broad, convex, retracted below, antennae inserted at about the middle on a well-defined frontal prominence, setaceous, 21-jointed, mandibles exserted, 3-dentate, maxillary palpi 5-jointed, long; labial palpi 4-jointed, short; pronotum narrow in front and extending on sides almost to the tegulae; mesonotum convex, without parapsides, scutullum small, triangular, with a deep forvea at the base divided by a median carina; metathorax short, declivious, with a well-defined petiolar area; abdomen elongate oval, petiolate; legs long and slender; wings hyaline, veins black, stigma long and slender, marginal cell complete, radius reaching the tip of the wing, recurrent nervure joining the 2nd cubital cell.

Hab. Guam. Described from a single specimen.

BRACONIDAE.

50. *Macrocentrus pallidus* n. sp.

♀ Length 4mm. Flavo-testaceous, eyes, ocelli and tips of man-

dibles black; feebly punctate, shining, clothed with pale hairs. Head transverse, wider than the thorax and fairly thick; eyes round and bulged; ocelli large, arranged in a small triangle near the vertex; face wide, cheeks narrow; clypeus prominent; antennae setaceous, a trifle longer than the body, inserted above the middle of the face, 45-jointed; trophi pendulous, slender, maxillary palpi 5-jointed, labial palpi 3-jointed. Pronotum invisible from above; mesonotum lobed, parapsidal grooves convergent, meeting before the posterior margin, scutellum small, convex, postscutellum represented by two large, shallow foveae with smooth bottoms; metathorax arched, shallowly rugose. Abdomen elongate, slender, compressed towards the apex, 1st segment rather long, 2nd and 3rd shorter, following segments transverse; ovipositor exserted and longer than the abdomen. Legs slender, hind coxae longer than the others. Wings hyaline with well-developed stigma and parastigma, veins light to fuscous brown, marginal cell complete, radius not reaching tip of wing, 3 cubital cells, submedian cell longer than the median, subdiscoidal nervure joining the discoidal below the middle.

♂ Paler, yellowish, white beneath, abdomen slender, depressed.

Hab. Guam. Described from 2 ♀ and 2 ♂ specimens.

51. *Phanerotoma melanocephala* n. sp.

♀ Length 2.75 mm. Testaceous, the head, antennae and tip of abdomen fuscous, minutely shagreened or granulated and opaque, the abdomen longitudinally striated. Head subquadrate, slightly wider than the thorax; eyes black, prominent, bulged; ocellar area small, black; temples and face broad, antennae inserted at about the middle, a trifle shorter than the body, setaceous, 23-jointed; clypeal sutures distinct, laterally ending in a fovea, trophi short and slender; occiput concave and distinctly margined. Pronotum invisible from above; mesonotum subquadrate, parapsidal grooves only faintly indicated, scutellum small, triangular; metanotum flat and parallel sided. Abdomen oval, convex above, concave beneath, only three visible segments. Legs moderately long and stout. Wings hyaline, stigma and veins fuscous, marginal cell complete, radius not reaching tip of wing, 1st abcissa extremely short, recurrent nervure interstitial with the 1st cubital cross vein, submedian cell much longer than the median, subdiscoidal vein joining the discoidal near the posterior angle of the cell.

Hab. Guam. Described from a single specimen.

52. *Apanteles guamensis* (Holm.)

53. *Spathius* sp.

Election of Officers for 1913.

President ..... F. Muir
Vice-President ..... W. M. Giffard
Secretary-Treasurer ..... O. H. Swezey

On a New Genus of Hawaiian Chironomids.*

BY F. W. TERRY.

Only two species of this abundant family have hitherto been described from the Hawaiian Islands, namely, *Chironomus hawaiiensis* Grims, and *Tanytarsus lacteiclavus* Grims.; two other genera, *Orthocladius* and *Ceratopogon* being also represented, but none are described. The endemic genus under discussion is so far represented by two species, the larger occurring on both islands of Hawaii and Maui, and the smaller on Kauai. The latter island, owing doubtlessly to its greater age and isolation, has produced a somewhat distinctive fauna from the rest of the archipelago, and this characteristic again presents itself in the peculiar sexual structures of the Kauaian species.

The simple palpal and antennal characters of this endemic genus suggest Clunionine affinities, as represented by *Halirytus* and *Eretmoptera.* But the apparently still plastic condition of the palpi has led me to attach less importance to this similarity, and its proper location would appear to be in the *Chironominae.* The venation is extremely like that of *Thalassomyia,* and the larval habits of the latter appear to be similar; the peculiar spatulate and pectinate structure of the male claw in the Kauaian species, has a parallel apparently in *Scopelodromus,* but its real affinities are undoubtedly with *Telmatogeton.* Besides agreeing with the latter in general larval and adult characters, the remarkable obliquely-truncate formation of the pupal abdomen, with its peculiar terminal plate, is practically identical with that of *Telmatogeton* as figured by Schiner.** I therefore propose to place it near *Telmatogeton,* erecting for it the new genus *Charadromyia.* Should this position prove to be correct, its presence on this isolated archipelago in the North

*This is part of the paper, "Biological Notes on Hawaiian Diptera," presented by Mr. Terry as Presidential Address, Dec. 15, 1910. The manuscript of the address was not available for publication at the time of publication of the Proceedings for 1910, as Mr. Terry had taken it away with him on a vacation trip to England. After his demise, some manuscripts and notes were returned, among them some portions of his address were found, but not in complete form for publication. Mr. Muir has arranged this much of them for publication. It seemed desirable to do so, being descriptions of an interesting new genus and two new species, with biologic notes.—[Ed.]

**Novara Reise Zool., 1868, Bd. II, pl. II, ff, 1e, 1f.

Pacific, becomes less remarkable upon learning that *Telmatogeton alaskensis* Coq. is recorded from Alaska, Oregon and California. Strangely enough the only other recorded representatives of this allied genus (*T. sanctipauli* Schin.) occurs on the island of St. Paul (New Amsterdam) in the South Indian ocean.

Charadromyia nov. gen.

Type *C. torrenticola.*

This genus is evidently allied to *Telmatogeton*, differing in the following characters: Front not deeply excavated; palpi normally two-jointed, the basal large and bulbous, the apical smaller and more elongate. Apex of each tarsal joint bears a pair of minute ventro-lateral spines; claws not furcate at extreme tip, either simple in both sexes or bearing a peculiar spatulate comb in the male; 4th tarsal joint equal to 3rd. Wings only slightly longer than abdomen; auxiliary vein starting from wing base, but not reaching the costa; 3rd and 4th longitudinal veins connected by oblique cross-veins; furcation of 5th longitudinal vein before the middle of wing; 6th well defined, 7th obsolescent.

DIAGNOSIS OF SPECIES.

1. *C. torrenticola.* Large, black or rusty black; claws of male simple, basal antennal joint longer than broad, terminal joint much longer than the three preceding.
2. *C. abnormis.* Small, pruinose; claws of male complex; basal antennal joint not longer than broad, terminal joint not longer than the three preceeding.

Charadromyia torrenticola sp. nov.

Length 5.3mm.; wing 5mm.

♂ **Head, thorax and abdomen velvety black, the body moderately pruinose especially the pronotum; legs, scutellum, postscutellum and wings rusty-black, humeral angles often dull testaceous. The small cubital head deeply inserted and hidden by the projecting mesonotum. Eyes small, oval, non-emarginate and widely separated by the projecting face, ocelli absent. Antennae short and simple, about equal to width of head, (identical in both sexes), 7-jointed and a basal ring-joint, 1st very large and thickened, length about one and the breadth, bearing several stout hairs and setae; 2nd much smaller and showing**

by the presence of a median constriction evidence of the fusion of two segments, 3rd-6th small and sub-moniliform, the terminal 7th large and conical, bearing a few scattered bristles and longer than the sum of the three preceding. Maxillary palpi simple and two-jointed, bearing several fine scattered hairs, basal joint large, bulbous, apical smaller and somewhat falcate* Mesonotum large, the anterior margin arched and overhanging the head, scutellum sub-elliptical, post-scutellum large. Abdomen 8-segmented, narrow and elongate. Hypopygium forcipiform, bearing a pair of falcate, two-pointed claspers.

Hab. Types ♂ and ♀ Nahiku, Maui (400-800 ft.) also Lahaina, Maui (1000 ft.); Kohala, Hawaii (1200-1500 ft.) Terry coll.

In rapid streams and water-falls.

This species is a decidedly characteristic inhabitant of certain mountain streams in Maui and Hawaii. The black-winged, active adults continually dancing over the rushing water, fre-

*This organ appears to be very plastic, exhibiting considerable variation of form, regardless of sex; one specimen examined possessing a single-jointed left palp, the right being normal.

Legs long and slender (anterior pair used in walking); tarsi five-jointed and cylindrical. Anterior: 1st tarsal joint nearly three times as long as 2nd, which is equal to the sum of 3rd and 4th. Median: 1st tarsal joint nearly three times as long as 2nd, which is hardly equal to the sum of 3rd and 4th. Posterior: 1st tarsal joint rather more than twice as long as 2nd, which is equal to the sum of the 3rd, 4th and 5th. Claws well developed and simple in both sexes, empodia large and pectinately plumose; pulvilli absent. Median and lateral lobes of apical tarsal joint large.

Wings large, reaching a little beyond the apex of abdomen, membrane somewhat coriaceous, posterior margin parallel with the costal, costa bearing numerous minute hairs; anal angle rectangular, mid-cross-vein arising slightly before the middle, auxiliary becoming obsolescent just before reaching the costa; 1st longitudinal bearing a few scattered hairs, and extending beyond the middle of the costa, forming an acute-angle at point of junctures; 2nd longitudinal absent; 3rd and 4th longitudinal united by oblique mid-cross-vein; furcation of 5th longitudinal before middle and forming an acute angle, the lower branch curved; 6th longitudinal well defined becoming obsolescent just before reaching the wing margin; anal angle rectangular.

♀ Very similar to the male, with the following differences: Legs shorter, the tarsal ratio however is the same; wings not extending beyond the apex of abdomen; the abdomen stout, parallel-sided, posterior extremity pointed, the terminal (8th segment) triangular in dorsal aspect, apically pointed, and bearing laterally a pair of flattened appendages. The ventral terminal segment is also triangular and also bears a pair of small flattened appendages.

quently getting caught in the spray but apparently none the worse for their temporary submergence. The females are less abundant than the males, the usual ratio being about 1 to 5.

Egg. Ovoid, the micropylar end more acuminate, bright yellow, becoming olivaceous as the contained larva develops; chorion shiny, micropyle conspicuous; length .3mm., width .2mm.

These eggs are deposited just below the water surface, on the rocks or submerged timber. They are placed in single layers, often consisting of several thousands in a mass, evidently the product of several females. The micropylar end is always uppermost and no gelatinous medium surrounds them.

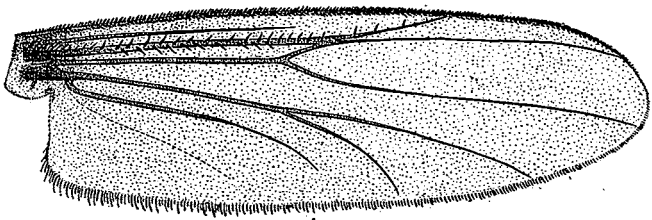
Larva—The larva is elongate and cylindrical, of the usual Chironomid type, and closely resembling that of *Telmatogeton,* judging from Johannsen's figure.* The body pale greenish when young, becoming olivaceous later; full-grown larva 18-20mm. Head brown, darker along clypeal suture, oval, no eyes present; antennae very small, each consisting of a single tubular segment bearing a pair of pointed papillae; labium broadly triangular, bearing a broad apical tooth and seven lateral ones; mandibles well developed, each bearing five teeth. First segment of thorax longer than the following two (which are equal) and bearing a pair of prolegs armed with hooklets and setae. Abdomen with first eight segments cylindrical and bare, the ninth and terminal bearing a pair of prominent prolegs, each well armed with a cricket of hooklets.

The larvae construct tough silken galleries over the rock or other submerged surfaces, preferably where the water rushes over the rock ledges with greatest force. These whitish silken galleries are quite noticeable in these situations, and it is astonishing that they are not often beaten to pieces after a heavy mountain shower.

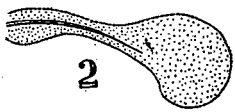
Pupa. Thorax and wing-sheaths brownish, abdomen and legs olivaceous; length 7mm.; the last abdominal segment terminates obliquely and abruptly in a large sucker-like disk, resembling in this character *Telmatogeton.*

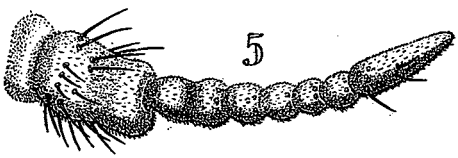
---

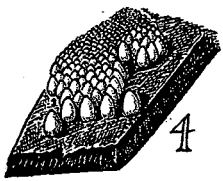
*New York Mus. Bull. 86; Entom. 23, pl. xxxiv, f. 12-13 (no description.)

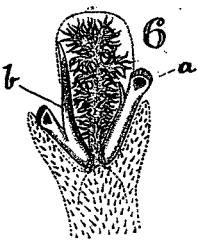

1


3


2

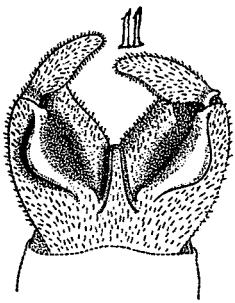

5

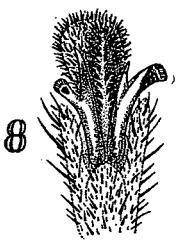

4

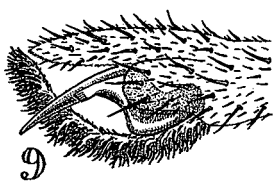

6
a
b

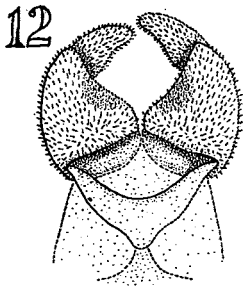

7

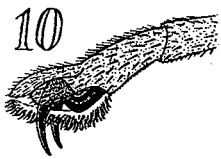

a

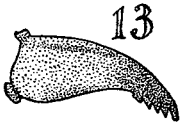

11


8


9


12


10


13


14


15


16

Charadromyia abnormis sp. nov.

Length 2.7mm., wing 2.2 mm.

Except for its much smaller dimensions and the remarkable claws of the male, this species closely resembles its larger congener, differing in the following characters:

Head, thorax and abdomen dark brown, and decidedly pruinose; legs rusty brown; wings pale fuscous, having a whitish appearance in life; antennae seven-jointed and identical in both sexes, the basal joint large and bulbous, but not longer than broad and without the slight median constriction present in *C. torrenticola*; tarsal ratio as in *C. torrenticola*; claws of male with lateral pectinations, evidently an elaboration of the bifid type. Male claspers, wings and venation as in *C. torrenticola.*

Hab. Kilauea, Kauai.

EXPLANATION OF PLATE 7.

1. Wing of *C. torrenticola* x15.
2. Halter of *C. torrenticola* x80.
3. Egg of *C. torrenticola* x50.
4. Egg-mass of *C. torrenticola* x10.
5. Antenna of *C. torrenticola* x80.
6. Front tarsus of *C. abnormis* ♂, ventral view, x300. a—outer claw, b—inner claw.
7. Middle tarsus of *C. abnormis* ♂, ventral view, x300. a—outer claw of same x600.
8. Hind claw of same x300.
9. Middle claw, lateral view x400.
10. Tarsus of *C. torrenticola* ♂ x59.
11. Hypopygium of male *C. torrenticola,* dorsal view x22.
12. Same, ventral view, x22.
13. Mandible of larva, *C. torrenticola* x35.
14. Labium of larva, *C. torrenticola* x25.
15. Maxillary palp, adult, *C. torrenticola* x80.
16. Antenna of larva *C. torrenticola,* x200.

Report of Committee on Common Names of Economic Insects in Hawaii.

(*Adopted March* 6, 1913.)

It is the sense of your Committee that most of us being members of the Association of Economic Entomologists it is incumbent upon us to use those popular names of economic insects

common to these islands and the mainland that were adopted and published by the Association. We have included these just as found in their list, with one or two exceptions where a local common name semed more advisable. With reference to the others, a simple short, most commonly used name is best adopted, especially such as are already extensively in use by entomologists and others. Workers elsewhere will have little occasion to use these, but if they do they will probably submit to our nomenclature. Guided by this we beg to present the following list.

E. M. EHRHORN,
D. T. FULLAWAY,
O. H. SWEZEY,

Committee on Common Names of Economic Insects in Hawaii.

HYMENOPTERA.

Big brown ant	*Camponotus maculatus, hawaiiensis* Forel.
Big-headed ant	*Pheidole megacephala* (Fab.)
California tomocera	*Tomocera californica* (How.)
Carpenter bee	*Xylocopa brazilianorum* (Linn.)
Ensign fly	*Evania appendigaster* (L.)
Fairchild's leaf-hopper parasite	*Echthrodelphax fairchildii* Perk.
Fig wasp	*Blastophaga psenes* (Linn.)
Fire ant	*Solenopsis geminata, rufa* Jerdon.
Hawaiian limnerium	*Limnerium hawaiiense* Cam.
Hawaiian pimpla	*Pimpla hawaiiensis* Cam.
Leaf-cutter bee	*Megachile palmarum* Perk.
Leaf-hopper egg-parasite	*Paranagrus optabilis* Perk.
Muddauber	*Sceliphron caementarium* (Drury).
Scutellista	*Scutellista cyanea* Motsch.
Spotted-winged ichneumon	*Echthromorpha fuscator* (Fab.)
Stable fly parasite	*Eucoila impatiens* (Say).
Yellow Jacket	*Polistes hebraeus* (Fab.)

DIPTERA.

American blue-bottle ..... *Lucilia caesar* (Linn.).
Cheese Skipper ..... *Piophila casei* (Linn.).
Chin fly ..... *Gastrophilus nasalis* (Linn.)
Day mosquito ..... *Stegomyia scutellaris* (Walk.).
English blue-bottle ..... *Lucilia sericata* (Meigen).
Heel fly ..... *Hypoderma lineata* (Villiers).
Horn fly ..... *Lyperosia irritans* (Linn.).
Horse bot-fly ..... *Gastrophilus equi* (Clark).
House fly ..... *Musca domestica* Linn.
Lantana gall-fly ..... *Eutreta sparsa* (Wied.).
Lantana seed-fly ..... *Agromyza* sp.
Mediterranean fruit-fly..... *Ceratitis capitata* (Wied.).
Melon fly ..... *Dacus cucurbitae* Coq.
Night mosquito ..... *Culex fatigans* Wied.
Pomace fly ..... *Drosophila ampelophila* Loew.
Root maggot ..... *Pegomyia fusciceps* (Zett.).
Sheep blow-fly ..... *Calliphora dux* Esch.
Sheep head-maggot ..... *Oestrus ovis* Linn.
Stable fly ..... *Stomoxys calcitrans* (Linn.).
Warble fly ..... *Hypoderma bovis* DeG.
Yellow fever mosquito ..... *Stegomyia fasciata* (Fab.) [*S. calopus* (Meigen)]

LEPIDOPTERA.

Angoumois grain-moth ..... *Sitotroga cerealella* (Ol.).
Army-worm ..... *Heliophila unipuncta* (Haw.)
Australian leaf-roller ..... *Archips postvittanus* (Walk.).
Bean pod-borer ..... *Lycaena baetica* Linn.
Beet web-worm ..... *Hymenia fascialis* (Cram.).
Black cutworm ..... *Agrotis ypsilon* Rott.
Cabbage web-worm ..... *Hellula undalis* (Fab.).
Cocoanut leaf-roller ..... *Omiodes blackburni* (Butl.).
Grass army-worm ..... *Spodoptera mauritia* Boisd.
Green garden looper ..... *Plusia chalcites* Esp.
Imported cabbage worm ..... *Pontia rapae* (Linn.).
Indian-meal moth ..... *Plodia interpunctella* (Hbn.).
Lantana leaf-miner ..... *Cremastobombycia lantanella* Busck.
Lantana plume moth ..... *Platyptilia* sp.

Lantana butterflies .....*Thecla echion* Linn. and *T. agra* Hewiston.
Mexican leaf-roller .....*Amorbia emigratella* Busck.
Larger native cutworm .....*Agrotis crinigera* (Butl.)
Pink cotton boll-worm .....*Gelechia gossypiella* (Sndrs.).
Smaller native cutworm .....*Agrotis dislocata* (Walk.).
Sugar-cane leaf-roller .....*Omiodes accepta* (Butl.).
Sugar-cane bud-moth .....*Ereunetis flavistriata* Walsm.
Sweet potato horn-worm .....*Sphinx convolvuli* Linn.
Sweet potato leaf-miner .....*Bedellia orchilella* Walsm.
Sweet potato vine-borer .....*Omphisa anastamosalis* (Guen.)
Tobacco horn-worm .....*Phlegethontius quinquemaculata* (Haw.).
Tobacco pod-borer .....*Heliothis obsoleta* (Fab.).
Tobacco split-worm .....*Phthorimaea operculella* (Z.).
Variegated cutworm .....*Peridroma saucia* (Hbn.).
White-lined sphinx .....*Deilephila lineata* (Fab.).

COLEOPTERA.

Algaroba bean-wevil .....*Bruchus prosopis* Le Conte.
Algaroba pod-weevil .....*Caryoborus gonagra* (Fab.).
Anomala beetle .....*Anomala orientalis* (Waterh.).
Bean weevil .....*Bruchus obtectus* Say.
Black ladybird .....*Rhizobius ventralis* (Erich.).
Cadelle .....*Tenebroides mauritanicus* (Linn.).
Carpet beetle .....*Anthrenus scrophulariae* (Linn.).
Cigarette beetle .....*Lasioderma serricorne* (Fab.).
Coffee-bean weevil .....*Araecerus fasciculatus* (De Geer).
Cowpea weevil .....*Bruchus chinensis* Linn.
Eight-marked ladybird .....*Coelophora inaequalis* (Fab.).
Fuller's rose-beetle (Olinda bug) .....*Aramigus fulleri* Horn.
Japanese beetle .....*Adoretus tenuimaculatus* Waterh.
Mango weevil .....*Crytorhynchus mangiferae* (Fab.).
Mealybug ladybird .....*Cryptolaemus montrouzieri* Muls.

Ochreous ladybird ..... *Chilocorus circumdatus* (Schoen.).
Oriental potato weevil ..... *Cylas formicarias* (Fab.).
Rice weevil ..... *Calandra oryzae* (Linn.).
Steel-blue ladybird ..... *Orcus chalybeus* (Boisd.).
Sugar-cane borer ..... *Rhabdocnemis obscurus* (Boisd.).
Sweet potato weevil ..... *Euscepes batatae* (Waterh.).
Ten-spotted ladybird ..... *Coelophora pupillata* (Schoen.).
Tobacco flea-beetle ..... *Epitrix parvula* (Fab.).
Vedalia ladybird ..... *Novius cardinalis* (Muls.).
Yellow-shouldered ladybird ..... *Platyomus lividigaster* Muls.

HEMIPTERA.

Assassin bug ..... *Zelus renardii* Kol.
Banana aphis ..... *Pentalonia nigronervosa* Coq.
Cabbage aphis ..... *Aphis brassicae* Linn.
Corn aphis ..... *Aphis maidis* Fitch.
Corn leaf-hopper ..... *Peregrinus maidis* (Ashm.).
Chrysanthemum aphis ..... *Macrosiphum sanborni* Gillette.
Fern aphis ..... *Idiopterus nephrolepidis* Davis.
Lantana leaf-bug ..... *Teleonemia lantanae* Dist.
Palm aphis ..... *Cerataphis lataniae* (Boisd.).
Rose aphis ..... *Macrosiphum rosae* (Linn.).
Sugar-cane aphis ..... *Aphis sacchari* Zehnt.
Sugar-cane leaf-hopper ..... *Perkinsiella saccharicida* Kirk.
Torpedo bug ..... *Siphanta acuta* (Walk.).
Violet aphis ..... *Rhopalosiphum violae* Perg.

HEMIPTERA (COCCIDAE).

Acuminate scale ..... *Coccus acuminatus* (Sign.).
Avocado mealybug ..... *Pseudococcus nipae* (Mask.).
Avocado scale ..... *Aspidiotus persearum* Ckll.
Black scale ..... *Saissetia oleae* (Bern.).
Cactus scale ..... *Diaspis echinocacti* (Bouche).
Chaff scale ..... *Parlatoria pergandii* Comst.
Citrus mealybug ..... *Pseudococcus citri* (Risso).
Cottony cushion scale ..... *Icerya purchasi* Mask.
Cottony guava scale ..... *Pulvinaria psidii* Mask.
Cottony mealybug ..... *Pseudococcus filamentosus* (Ckll.).

Fern scale .....*Hemichionaspis aspidistrae* (Sign.).
Flat black-scale .....*Saissetia nigra* (Niet.).
Florida red-scale .....*Chrysomphalus ficus* Ashm. [*aonidum* (Linn.)]
Gray sugar-cane mealybug .....*Pseudococcus saccharifolii* (Green).

Gredey scale .....*Aspidiotus rapax* Comst.
Green scale .....*Coccus viridis* (Green).
Hemispherical scale .....*Saissetia hemisphaerica* (Targ.).

Ivy scale .....*Aspidiotus hederae* (Vall.).
Latana blight .....*Orthezia insignis* Dougl.
Large cottony scale .....*Pulvinaria mammeae* Mask.
Long brown scale .....*Coccus longulus* (Dougl.).
Mediterranean scale .....*Parlatoria ziziphus* (Lucas).
Oleander scale .....*Phenacaspis eugeniae* (Mask.).
Orange scale .....*Aonidiella aurantii* (Mask.).
Pineapple scale .....*Diaspis bromeliae* (Kern.).
Pineapple mealybug .....*Pseudococcus bromeliae* (Bouche.).

Pink sugar-cane mealybug.....*Pseudococcus sacchari* (Ckll.).
Pit scale .....*Asterolecanium pustulans* (Ckll.).

Purple scale .....*Lepidosaphes beckii* (Newm.).
Red wax-scale .....*Ceroplastes rubens* (Mask.).
Rose scale .....*Aulacaspis rosae* (Bouche).
Soft scale .....*Coccus hesperidum* Linn.
Striped mealybug .....*Pseudococcus virgatus* (Ckll.).
Thread scale .....*Ischnaspis longirostris* (Sign.).

MISCELLANEOUS.

American cockroach .....*Periplaneta americana* (Linn.).
Cypress roach .....*Eleutheroda dytiscoides* (Serv.).
Dragon-fly.....*Pantala flavescens* (Fab.).
Long-horned grasshopper .....*Xiphidium varipenne* Sw.
Mole cricket .....*Gryllotalpa africana* Fab.
Silver-fish .....*Lepisma saccharina* Linn.
White ant .....*Calotermes marginipennis* (Latr.).

OBITUARY.

The Reverend Thomas Blackburn.

On May 19th, 1912, at Woodville Vicarage, Adelaide, South Australia, the Rev. Thomas Blackburn, one of the honorary members of the Hawaiian Entomological Society, died at the age of more than 70 years.

Mr. Blackburn can justly be styled the father of Hawaiian entomology, for his pioneer work revealed the highly interesting endemism of our fauna, and eventually led to the systematic exploration by Dr. Perkins, and the publication of the "Fauna Hawaiiensis." His residence in the Hawaiian Islands extended over nearly six years (1876-1882) but his duties as Chaplain to the Bishop and as Senior Priest of the cathedral, allowed very little opportunity for entomological explorations. He availed himself of every oportunity, however, visiting each of the larger islands and doing more or less collecting thereon, though his main collecting was done on Oahu, as his residence was chiefly at Honolulu, from where he made trips almost fortnightly to the neighboring mountains. On Kauai, he spent only four days; on Molokai but a few hours. To Maui he made several visits of a few days each, taken altogether amounting to 42 days. He had a week on Lanai, and two trips to Hawaii of 17 days and 6 days respectively.

Of the collections made, the Coleoptera were worked up by himself and Dr. David Sharp; the Lepidoptera by Mr. A. G. Butler; the Hymenoptera by himself, Mr. Peter Cameron and Mr. W. F. Kirby; the Neuroptera by himself and Mr. R. McLachlan; the Hemiptera by himself and Mr. F. B. White; the Orthoptera by Mr. A. de Bormans. Apparently he did not collect in the other Orders of insects. As the result of his collecting, the number of beetles known in the Hawaiian Islands was increased to 428 species, 352 of which were not known elsewhere. The number of species in the other Orders was substantially raised also, but not to the same extent as the Coleoptera for he was particularly interested in this group.

Many species in several different Orders of insects have been named for the man who was the first to do important work on the entomological fauna of these Islands. In Coleoptera there are 15 species and 1 genus; in Lepidoptera 3 species; in Hymenoptera 4 species; in Neuroptera 2 species; in Orthoptera 1 species; and in Hemiptera 3 species. Altogether, 1 genus and 28 species.

From Hawaii Mr. Blackburn went to Australia, where he remained to the time of his death, engaged in clerical work, yet devoting every opportunity to his favorite recreation, the results of which yielded extensive contributions to the knowledge of the insect fauna of that country. His attention was mostly given to Coleoptera, of which he described several hundred species, his papers being published chiefly in The Proceedings of the Linnean Society of New South Wales.

In his death, entomology loses a valued worker, and to us it seems like the loss of a friend, for although not favored with his personal acquaintance, yet we seem to have known him through his works and our acquaintance with and interest in, the same insect fauna in which he was so keenly interested.

Species of Hawaiian Insects named for Mr. Blackburn:

COLEOPTERA.

Plagithmysus blackburni (Sharp).
Rhyncogonus blackburni Sharp.
Pentarthrum blackburni Sharp.
Proterhiuus blackburni Sharp.
Gonioryctus blackburni Sharp.
Itodacnus blackburnianus Sharp.
Nesopetinus blackburni (Sharp).
Nesopetinus blackburnianus Scott.
Ptillides blackburni Matthews.
Thoracophorus blackburni (Sharp).
Blackburnia Sharp (new genus).
Metrothorax blackburni Sharp.
Gnatholymnaeum blackburni Sharp
Xyletobius blackburni Perkins.
Mirostenus blackburni Perkins.
Mirostenus blackburnioides Perkins.

LEPIDOPTERA.

Lycaena blackburni (Tuley).
Omiodes blackburni (Butler).
Hyposmocoma blackburni Walsingham.

HYMENOPTERA.

Odynerus blackburni Kirby.
Nesoprosopis blackburni (Smith).
Limnerium blackburni Cameron.
Chelonus blackburni Cameron.

NEUROPTERA.

Nesogonia blackburni (McLachlan).
Agrion blackburni (McLachlan).

HEMIPTERA.

Arctocorixa blackburni (White).
Reduviolus blackburni (White).
Coleotichus blackburniae White.

ORTHOPTERA.

Brachymetopa blackburni (Bormans).

List of Papers on Hawaiian Entomology by Mr. Blackburn:

1877—"Insect Notes from the Hawaiian Isles," E.M.M., XIII, pp. 227-228.
1877—"Characters of a new Genus, and Descriptions of new species of Geodephaga from the Sandwich Islands." E.M.M., XIV, pp. 142-148.
1878—"Observations on the Known Species of *Oodemas* and their Distribution and Habits, with new Species from Hawaiian Islands." Ann. Soc. Ent. Belg., XXI, pp. 73-75.
1878—"Characters of new Genera and Descriptions of new Species of Geodephaga from the Hawaiian Islands, II." E.M.M., XV, pp. 119-123, 156-158.
1879—"Characters of new Genera and Descriptions of new Species of Geodephaga from the Hawaiian Islands, III." E.M.M., XVI, pp. 104-109.
1881—"Some new Species and Observations on Anchomenides, IV." E.M.M., XVII, pp. 226-229.

1882—"*Saronychium* new Genus and 16 new Species of Anchomenides, V." E.M.M., XIX, pp. 62-64.

1880—(Blackburn & Kirby) "Notes on Species of Aculeate Hymenoptera occurring in the Hawaiian Islands." E.M.M., XVII, pp. 85-89.

1881—"Descriptions of four new Species of Cossonidae from the Hawaiian Islands." E.M.M., XVII, pp. 199-201.

1882—"Descriptions of the Larvae of Hawaiian Lepidoptera." E.M.M., XIX, pp. 55-56.

1884—"Notes on some Hawaiian Carabidae." E.M.M., XXI, pp. 25-26.

1884—"Notes on Hawaiian Neuroptera, with Descriptions of new Species." Ann. M. N. H., (5), XIV, pp. 412-421.

1885—(Blackburn and Sharp)—"Memoirs on the Coleoptera of the Hawaiian Islands." Tr. Dublin Soc., (2), III, pp. 119-290.

1886—(Blackburn and Cameron)—"On the Hymenoptera of the Hawaiian Islands." P. Manchester Soc., XXV, pp. 134-176.

1888—"Notes on the Hemiptera of the Hawaiian Islands." P. L. S. N. S. W., (2), III, pp. 343-354.

APPENDIX.

KEY	Family FORMICIDAE (Heterog
A1—A distinct constriction between 1st and 2nd segments of gaster Pedicel consisting of a single segment Pupae always in cocoons	PONERINAE Mayr.
a1—Antennae 12 jointed. Eyes present though small	
b1—Mandibles triangular with broad dentate masticatory margin	(Tribe PONERII) PONERA Latr.
c1—Dark brown or reddish	
d1—Median frontal groove extending to top of occiput. With hand lens head appears somewhat shiny	P. kalakauea Forel
d2—Median frontal grove extending about half way to occiput. Head dull and lusterless	P. perkinsi Forel
c2—Light, testaceous yellow; thorax above flat and depressed	P. gleadowii Forel r. decipiens Forel
b2—Mandibles edentate, long, slender curved, without distinct masticatory border	LEPTOGENYS Roger L. falcigera Roger v. insularis Smith
a2—Antennae 9-jointed. Eyes absent	(Tribe CERAPACHYSII) CERAPACHYS Smith C. silvestrii Wheeler
AII—No marked constriction between 1st & 2nd segments of gaster	B (I and II)
BI—Pedicel consisting of 2 segments. Pupae naked	MYRMICINAE Mayr.
a1—Antennae 12-jointed	
b1—Antennae without distinct club	
c1—Thoracic dorsum without any traces of suture or impression	(Tribe MYRMICII) POGONOMYRMEX Mayr. [P. occidentalis Cresson]
c2—Thoracic dorsum impressed at the meso-epinotal suture	STENAMMA Westwood [S. longiceps Smith]
b2—Flagellum of antennae with distinct club	
c1—Metanotum without spines; clypeus bicarinate	MONOMORIUM Mayr.
d1—2mm. or less in length	

*1—Collection of United States Exp. Sta.; 2—Collection of Territorial Board of Agriculture and Forestry; 3—Collection of Planters' Exp. Station; 4—Bishop Museum; F—Identified by A. Forel; W—Identified by W. M. Wheeler.

ROM THE HAWAIIAN ISLANDS.

)UISE GULICK.

llections Which ecimens Found*	Reported From the Hawaiian Islands in Following Publications.	Literature In Honolulu Giving Species Description, and Libraries Where Found.**
3	Fauna Haw. Vol. 1, Pt. I, p. 116.	1, 2, 3 and 4, Fauna Haw. 1899, vol. I, Pt. I, p. 116.—(See Note 1.)
2, 3, 4 F	Fauna Haw. Vol. 1, Pt. I, p. 117. Boll. d. Lab. Zool. et Agr. d. Portici Vol. III. p. 271.	1, 2, 3, and 4 Fauna Haw. 1899, p. 117; 2, 3, Boll. d. Lab. Zool. et Agr. d. Portici, 1909, vol. III, p. 271.
4 F	Fauna Haw. Vol. I, Pt. I, p. 118.	3, Fauna Brit. India, Bingham, 1903, vol II, p. 91; (r. decipiens: Fauna Haw.)
w, 3, 4F	Fauna Haw. p. 118. Ent. Mon. Mag. 1880, p. 88; (under name L. insularis)	3 Fauna Brit. India. Bingham, 1903, vol. II, pp. 52and 53.
	Boll. d. Lab. Zool. et. Agr. d Portici. Vol. III, p. 269.	2, 3, Boll. d. Lab. Zool. et Agr. d. Portici, 1909, vol. III, p. 269.
	Fauna Haw. p. 119.	(See Note 2.)
	Fauna Haw. p. 118.	

**1—United States Experiment Station Library; 2—Territorial Board of Agriculture Library; 3—Planters' Experiment Station Library; 4—Bishop Museum Library.

KEY	Family FORMICIDAE (Hetero
e1—Head and thorax chestnut brown; abdomen black. Hairs sparse 2nd node of pedicel broader than 1st node.....	M. minutum Mayr. v. lilioukalani Forel
e2—Head and gaster dark. Thorax yellow to reddish brown. Hairs very sparse. 2nd node of pedicel broader than 1st node..	M. floricola Jerdan.
d2—More than 2mm. in length.....	
e1—Head and thorax reddish yellow; whole gaster dark brown.	M. gracillimum Smith
e2—Head, thorax and base of abdomen reddish yellow; apical 2-3 of gaster nearly black.....	
f1—Head more or less smooth and shining	M. destructor Jerdan
f2—Head more or less regulose, opaque	M.pharaonis Linn.
c2—Metanotum armed with well developed spines. Clypeus not bicarinate	
d1—Workers highly dimorphous. Back of occiput smooth.....	PHEIDOLE Westwood P. megacephala Fab.
d2—Workers monomorphous. Whole occiput regulose	
e1—Less than 2.5mm. in length..	CARDIOCONDYLA Emery
f1—Yellowish brown	C. wroughtonii Forel v. hawaiiensis Forel
f2—Dark brown	C. nuda Mayr. v. minutior Forel
e2—3mm. or more in length.....	(Tribe TETRAMORII) TETRAMORIUM Mayr. T. guineense Fab.
a2—Antennae 10-jointed	(Tribe SOLENOPSIDII) SOLENOPSIS Westwood S. geminata Fab.

ROM THE HAWAIIAN ISLANDS.

)UISE GULICK.

ections which cimens Found*	Reported From the Hawaiian Islands in Following Publications.	Literature in Honolulu Giving Species Description, and Libraries Where Found.**
w, 4F	Fauna Haw. p. 119.	3 Novara Reise Mayr, 1865, p. 91; 2 Hymen d'Europe et d'Algerie Andre, 1881, p. 332; 3, Fauna Brit. India, 1903, vol. II, p. 210; (v. liliuokalani; Fauna Haw.)
, 3, 4F	Fauna Haw. p. 119.	3, Ann. and Mag. of Nat. Hist., 1854, vol. XIII, p. 49, Jerdon (under Atta floricola); 3 Fauna Brit. India, 1903, vol. II, p. 211.
2w		3 Fauna Brit. India, 1903, vol. II, p. 210.
3, 4F	Fauna Haw. p. 119, (under name M. vastator Sm.)	3 Ann. and Mag. of Nat. Hist., 1854, vol. XIII, p. 47, Jerdon (under name Atta destructor); 3 Fauna Brit. India, 1903, vol. II, p. 209.
2w, 3	No published report. Identified by Wheeler.	3 Novara Reise Mayr, 1865, p. 90; 3 Ann. and Mag. Nat. Hist. 1854, vol. XIII, p. 47, Jerdon (under name Atta minuta); 3 Fauna Brit. India, 1903, vol. II, p. 202.
2, 3, 4F	Fauna Haw. p. 118. Boll. d. Lab. Zool. et Agr. d. Portici, vol. III, p. 272. Ent. Mon. Mag. 1880, p. 89, (under name P. pusilla.)	(Property of Mr. Ehrhorn) Hist. Nat. d. Fourmis. Latr. 1802, p. 232 (under name Form. megacephala) also fig. 67; 3 Cat. Hymen. Ins. Brit. Museum, Smith (under name P. Janus) 1858, Pt. VI, p. 175; 2 Hymen d'Europe el d'Algerie, Andre, 1881, p. 383; 3 Fauna Brit. India, 1903, vol. II, p. 242.—(See Note 3.)
2, 3, 4F	Fauna Haw. p. 119.	3 Fauna Brit. India, 1903, vol. II, p. 287 (v. hawaiiensis: Fauna Haw.)
r, 4F	Fauna Haw. p. 120.	3 Fauna Brit. India, 1903, vol. II, p. 287, (v. minutior: Fauna Haw.)—See Note 4.)
r, 4F	Fauna Haw. p. 118. Boll. d. Lab. Zool, et Agr. d. Portici, vol. III, p. 272. Ent. Mon. Mag. 1880, p. 88.	Prop. of Mr. Ehrhorn) Hist. Nat. d. Fourmis, Latr. 1802, p. 285 (under name Formica guineensis); 2 Hymen. d'Europe et d'Algerie, Andre, 1881, vol. II, p. 287; 3 3 Fauna Brit. India, 1903, vol. II, p. 184.
w, 3, 4F	Fauna Haw. p. 119; Ent. Mon. Mag. 1880, p. 89.	3 Ann. and Mag. Nat. Hist., 1854, vol. XIII, p. 48, Jerdon (under name Atta rufa); 3 Cat. Hymen. Ins. Brit. Museum Smith, (under name Myrmica virulens); 3 Fauna Brit. India, 1903, vol. II, p. 158.

KEY	Family FORMICIDAE (Heterc
BII—Pedicel consisting of 1 segment. No constriction between 1st and 2nd segments of gaster	C(I and II)
CI—Anal orifice slit-shaped unciliated.....	DOLICHODERINAE For
Anal orifice inferior not apical.....	TAPINOMA Forster T. melanocephalum Fab.
Anal orifice apical	TECHNOMYYRMEX Mayr. T. albipes Smith.
C-II—Anal orifice terminal, circular, surrounded by a fringe of hairs.....	CAMPONOTINAE Forel (Tribe PLAGIOLEPIDII
a1—Antennae 11-jointed	PLAGIOLEPIS Mayr.
b1—Antennal scapes reaching a little beyond posterior border of occiput..	P. exigua Forel
b2—Antennal scapes reaching considerably beyond posterior border of occiput	P. mactavishi Wheeler
a2—Antennae 12-jointed	(Tribe FORMICII)
b1—Less than 4mm. in length	PRENOLEPIS Mayr.
c1—Scape of antennae extending beyond posterior edge of occiput by more than half its length.....	P. longicornis Latr.
c2—Scape not so long. Extending beyond posterior edge of occiput by less than half its length.....	
d1—Dark brown, 2.5 or more mm. in length	P. bourbonica Forel
d2—Abdomen brown, head and thorax brownish yellow 2.3 or less mm. in length	P. sharpii Forel
b2—More than 6mm. in length.....	(Tribe CAMPONOTII) CAMPONOTUS Mayr. C. maculatus Fab.

Note 1—Blackburn and Kirby report P. contracta (Ent. Mon. Mag., 1880, p. 88). Dr. Perkins believes this to be a misidentification for P. kalakauae or P. perkinsi.

Note 2—Pogonomyrmex appears not to be present in the islands now.

Note 3—There may be more than one Pheidole sp. here.

Note 4—Dr. Perkins reports that a Cremastogaster sp., probably from Japan, is established here. In Cremastogaster the apex of the

OM THE HAWAIIAN ISLANDS.

JISE GULICK.

ctions hich imens ound*	Reported From the Hawaiian Islands in Following Publications.	Literature in Honolulu Giving Species Description, and Libraries Where Found.**
3, 4F	Fauna Haw. p. 120; Boll. d. Lab. Zool, et Agr. d. Portici, vol. III, p. 272.	(Prop. of Mr. Ehrhorn) Hist. Nat. d. Fourmis, Latr., 1802, p. 261 (under name Formica melanocephala); 3 Ann. and Mag. Nat. Hist., 1854, vol. XIII, p. 108, Jerdon (under name Formica nana); 3 Fauna Brit. India, 1903, vol. II, p. 304. (See Note 5.)
2w		3 Fauna Brit. India, 1903, vol. II, p. 301.
2w	No published report. Identied by Wheeler.	3 Fauna Brit. India, 1903, vol. II, p. 323.
w, 3	No published report. Identified by Wheeler.	2 Bull. Am. Museum Nat. Hist., 1908, vol. XXIV, p. 166.
3, 4F	Fauna Haw. p. 120.	(Prop. of Mr. Ehrhorn) Hist Nat. d. Fourmis. Latr., 1802, p. 113, (under name Formica longicornis); 3 Novara Reise, Mayr., 1865, p. 50; 2 Hymen. d'Europe et d'Algerie Andre, 1881, vol. II, p. 203; 3 Fauna Brit. India, 1903, vol. II, p. 326.
r, 3, 4F	Fauna Haw. p. 120; Boll. d. Lab. Zool, et. Agr. d. Portici, vol. III, p. 272.	3 Fauna Brit. India, 1903, vol. II, p. 328 (under name P. bengalensis) (r. hawaiiensis: Fauna Haw.)—(See Note 6.)
. 4F	Fauna Haw. p. 121.	1, 2, 3 and 4 Fauna Haw. 1899, p. 121.
3, 4F	Fauna Haw. p. 122; Boll. d. Lab. Zool. et Agr. d. Portici, vol. III, p. 272.	3 Fauna Brit. India, 1903, vol. II, p. 355 (v. hawaiiensis: Fauna Haw.)—(See Note No. 7.)

pedicel is attached to the dorsal surface of 1st abdominal segment.

Note 5—There may be another Tapinoma sp. established here.

Note 6—Blackburn and Kirby report P. clandestina (Ent. Mon. Mag., 1880, p. 88). Blackburn and Cameron report P. obscura. (See Fauna Haw.). These are both misidentifications for P. bourbonica according to Dr. Perkins.

Note 7—Blackburn and Kirby report C. sexguttatus (Ent. Mon. Mag. 1880, p. 89). This probably should have been C. maculatus.

CONTENTS OF VOL. II, NO. 5.


PARAMOUNT PACIFIC