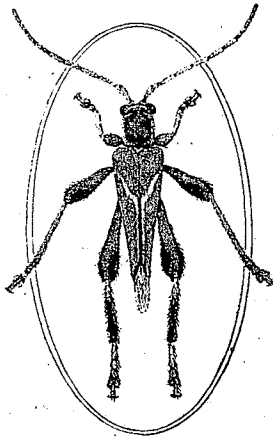


PROCEEDINGS
OF THE
Hawaiian
Entomological Society

I
PART 3



HONOLULU, JULY 1st, 1907

PRICE, 50 Cents

Hawaiian Entomological Society

Founded 1905

LIST OF OFFICERS FOR 1906.

<i>President</i>	R. C. L. PERKINS
<i>Vice President</i>	G. W. KIRKALDY
<i>Secretary-Treasurer</i>	JACOB KOTINSKY
<i>Members of the Executive Committee</i>	{ OTTO H. SWEZEY D. L. VAN DINE
<i>Editors of the Proceedings</i>	{ G. W. KIRKALDY OTTO H. SWEZEY

LIST OF OFFICERS FOR 1907.

<i>President</i>	W. M. GIFFARD
<i>Vice President</i>	O. H. SWEZEY
<i>Secretary-Treasurer</i>	J. KOTINSKY
<i>Members of Executive Committee</i>	{ F. W. TERRY G. W. KIRKALDY
<i>Editors of the Proceedings for 1906-1907</i>	{ G. W. KIRKALDY O. H. SWEZEY

Membership

*Austin, C. J.	Muir, F.
Chambers, W. E.	†Newell, Bro. Matthias
Cobb, Dr. N. A.	*Perkins, Dr. R. C. L.
*Craw, A.	Peterson, Miss M.
Davis, E. H.	*Swezey, O. H.
*Eckart, C. F.	*Swezey, Mrs. O. H.
*Giffard, W. M.	*Terry, F. W.
*Hosmer, R. S.	*Van Dine, D. L.
*Kirkaldy, G. W.	Weinrich, Jr., W.
*†Koebele, A.	Weinrich, Jr., Mrs. W.
*Kotinsky, J.	Wilder, G. P.

*Original. †Honorary.

JULY 5th, 1906.

The eighteenth regular meeting was presided over by Mr. F. W. Terry.

NOTES AND EXHIBITIONS.

Mr. O. H. SWEZEY exhibited specimens of three species of Midges and read "Notes on some Cecidomyidae not previously reported in Hawaii."

1. *Diplosis sorghicola* Coq. was bred from the tops of sorghum. The larvae feed on the juices of the growing seeds causing them to blight. They pupate in the same place where they feed.

2. *Diplosis* sp. was bred from larvae feeding upon the spores of a rust on sorghum leaves. These drop to the ground to pupate.

3. *Contarina solani* was bred from tomato buds where the larvae fed upon the young ovary of the blossom causing the buds and blossoms to blight and eventually fall off. The larvae of this species also pupate in the ground."

PAPERS.

Notes on *Cryptorhynchus Mangiferae* (Coleoptera).

By D. L. VAN DINE.

Without going into the problematical question of the introduction of *Cryptorhynchus mangiferae* into these Islands or its present economic status, I will submit a few observations and notes taken during the year on the occurrence, habits and life-cycle of this recently discovered insect-enemy of mangoes in Hawaii. In reviewing my office records, I find that it is just one year ago today, namely, July 5, 1905, that the weevil was first called to my attention. The first specimen observed was a pupa that Mr. J. E. Higgins had discovered within the seed of a mango that he had collected at Mr. Allan Herbert's former place in Kalihi, Oahu. Two days after, July 7th, I visited the Moanalua Gardens where I knew Mr. MacIntyre, the Superintendent, to be planting seeds and there found within seeds of various varieties what I considered unquestionably the larvae, pupae and adults of the same species. On July 9th, the pupa collected by Mr. Higgins developed into an adult, confirming the identity of the specimens taken at Moanalua. Mr. MacIntyre was not remov-

ing the husks from the seeds he was planting and had not noticed the presence of the weevil. He informed me, however, that for the past eight years for horticultural reasons he had removed the husks from all seeds he planted but that because of a shortage of labor he had not done so for the two previous years. It is reasonable to suppose from this that the weevil made its advent into the Moanalua Gardens not earlier than 1903. Inquiry of Mr. David Haughs, Mr. Higgins and Mr. G. P. Wilder brought out the information that the weevil had not up to that time occurred in Honolulu. All had planted seeds from year to year and Mr. Haughs in his connection with the Territorial Nursery had planted mango seeds for many years and practised removing the husks from them before doing so. The distribution last year, then, so far as is known, was confined to this Island and extended from Kalihi to Moanalua.

On July 11th, specimens of the weevil were forwarded to the United States Bureau of Entomology at Washington for determination. Under date of July 26th, Mr. E. A. Schwarz of the Bureau reported it as *Cryptorhynchus mangiferae* originally described by Fabricius in 1774.

Larvae, pupae and adults were to be found in the seeds of the fruit all through July. During August, the seeds of fallen mangoes contained some pupae and many adults. As late as Sept. 11th, seeds beneath trees in the infested district contained adults but in no great numbers. It appeared that the weevils remained in the seeds for a time after completing their full development. On the last date mentioned three living adults were removed from as many seeds and placed in tightly corked phials beneath a plug of cotton. On Oct. 13th, all these specimens were living. I was absent from my office nearly a month but on my return, Nov. 15th, one weevil had died. On January 3rd, another weevil failed to show signs of life and the third specimen lived until February 10. From these observations I was convinced that the insect could pass a considerable period in a dormant state, a necessary power if it proved to be a special feeder of the mango seed. On the same date as the above experiment was begun, a quantity of the seeds from fallen mangoes from the infested district was placed in a breeding cage to determine the latest date the adults would continue to leave

the seeds or if some would remain within the seed until the next fruiting season. I found that the weevils showed no tendency to remain in the seeds after once making an exit through the husk. No specimens appeared in the cage from the seeds until October 8th, when four specimens were found. On October 15th, one specimen was taken out and on November 16th, two specimens, the last to appear, were found. By this time all traces of the weevil had disappeared in the infested districts. Diligent search failed to show where they were until January 30th when I ran on them after a long hunt, feeling sure they would be found in a state of hibernation somewhere. On that day I found them by the hundred in the crevices of an old board fence and stone wall beneath a group of neglected mango trees in a deserted kuleana* in Moanalua Valley. No precaution had been practised there in regard to the destruction of the fallen mangoes and refuse seeds.

The weevils were to be found in a state of hibernation throughout the following months up to May 16th, when one active adult was observed on the foliage of a mango tree. From the last date on, hundreds of mangoes were opened, at intervals when I could visit the infested district, to find evidences of the larvae. Not until May 28th was the search successful when one specimen within the seed of a nearly full-grown mango was found. This was a very minute larva and a faint discolored line leading from its tiny burrow in the seed through the husk and flesh to the rind indicated its mode of entrance. On other fruits I then observed what I took to be and still think are the eggs of this weevil although I have not succeeded in hatching any of them to note the resulting larvae. The eggs appear on the surface, light yellow in color, oval, and are invariably situated alongside a slight incision in the skin from which has exuded a small amount of juice that envelops them. In several instances I found the faint discolored line leading from the rind to the seed infested with newly hatched larvae but as the larvae develop to a size easily observable to the unaided eye, all evidences of the means of entrance become effaced. It is to be seen from this that the seed is infested rather late in the development of the fruit.

*A small, native homestead.—Eds.

I can add but a few generalizations on the life-cycle of the weevil. Larvae were found in various stages of development up to June 27th, when the first pupae were observed within infested seeds. On July 3rd the first adult weevil to be seen of this year's brood was taken from the seeds of mangoes under observation in the laboratory. To summarize—the adults became active May 16th, the first larva was found May 28th, the pupae appeared June 27th, and the adults on July 3rd. In a very general way the life cycle is approximately 48 days. I am inclined to think there is but one brood a year.

This paper was illustrated by specimens and photographs, and was followed by general discussion. Mr. O. H. Swezey stated that of thirty mangoes collected at Kalihi he found only three free from infestation; on the 12th of June he observed the first adults in mangoes collected at the same place. Mr. F. Muir exhibited a series of weevils from Fiji. One of these was very similar in appearance to *Cryptorhynchus mangiferae* and presumably injured mangoes in Fiji in a similar manner. Of two sugar cane borers one was recognized as identical with the Hawaiian species (*Sphenophorus obscurus*) while the other was entirely different.

AUGUST 2ND, 1906.

The nineteenth regular meeting was held at the usual place, Mr. G. W. Kirkaldy in the chair.

NOTES AND EXHIBITIONS OF SPECIMENS.

Mr. D. L. Van Dine exhibited specimens of *Buprestis aurulenta* (Linn.) collected by Mr. H. L. Sturtevant, Honokaa, Hawaii, on January, 1906, and determined by Mr. E. A. Schwarz. It is common along the Pacific Coast and British Columbia, and was probably introduced into Hawaii in Pine-lumber.

SEPTEMBER 6TH, 1906.

The twentieth regular meeting was held at the usual place, Dr. R. C. L. Perkins in the chair.

NOTES AND EXHIBITIONS.

Mr. J. Kotinsky exhibited specimens of recently introduced economic insects, including *Calosoma* sp., a species of Histeridae,

and other manure beetles; among Hymenoptera, *Eucoila impatiens* Say on Horn-fly and other dung-Diptera, and a new species of *Perissopterus*, the last from China, bred from the Coccid *Lepidosaphes ulmi* (Linn.) on Camphor, and sent by Mr. Compere, all the others being sent by Mr. Koebele. He also exhibited leaves of a Cycas infested by a Coccid, *Chrysomphalus aonidium* (Linn.), also from China. Many of the Coccids were perforated by the exit holes of four or six parasites, a species which has not been seen thus far. The plant was confined in a cage in the Insectary with local plants infested by the same Coccid.

Dr. R. C. L. PERKINS then presented "**Notes on a collection made at Kilauea, Hawaii, during July,**" and exhibited specimens.*

PAPERS.

Observations on the Life History of *Oliarus koanoa* Kirkaldy.

By O. H. SWEZEY.

On August 12th, 1906, while digging for insects among the decaying leaf-bases and fibrous matter of tree-fern trunks, in the forests of Mt. Tantalus, I discovered nymphs of some species of leaf-hopper, which, on rearing, proved to be *Oliarus koanoa*. The nymphs were in cavities or tunnels lined with a white fibrous material which resembled mold, or spider's web, and which is an excretion from the terminal abdominal segments of the nymph. Each nymph had a tuft or brush of straight fibers of this material, extending backward and slightly upwards, and spread somewhat fan-shaped. It is probably rubbed off accidentally in the movements of the insects, and serves to aid in hiding or protecting it. It is rapidly replaced. A specimen from which it was entirely removed, had it completely produced again within 24 hours.

The full-growth nymph is about 5 mm. long, and 2 mm. wide, about even width throughout; the tuft is from 2 to 5 mm. Whole insect whitish, with pale greyish markings on the thorax, and 5 dorsal bands on the abdomen in front of the cottony tuft. Eyes dark brown, partially hidden behind projecting margins of the frons. Rostrum extends beyond 2nd abdominal segment. Sensory pits are very numerous; a row near the margin of frons, many

*This has since been incorporated in Dr. Perkins' Presidential address.—Eds.

on dorsal part of thorax and wing cases, a transverse dorsal row on abdominal segments 2, 3 and 4. The abdomen is obliquely truncated behind the 4th segment, so that the dorsal surfaces of segments 5, 6 and 7 are directed nearly posteriorly. These contain the numerous pores from which the fibers of the tuft are extruded.

The nymphs probably feed upon the fern roots in the fibrous mass of the outside of the fern trunks, or on juices of the decaying material. The largest nymphs collected transformed to adults in a few days.

Very little has been recorded of the life history and habits of the species of the sub-family Cixiinae to which this insect belongs. In *Psyche* VI, p. 353, 1892, Townsend records the discovery of the eggs of *Oecleus decens* laid in the leaves of *Yucca*. A tiny mass of white fluffy material covers each puncture.

In *Ohio Naturalist*, IV, 2, p. 42, 1903, Osborn describes *Myndus radialis*, and gives its habits so far as known. The nymphs are very similar to the ones I have described above, and live on the roots of grasses and other plants, in crevices lined by the white fibrous material from their abdominal tufts.

Dr. Perkins has informed me that he found the nymphs of an Australian species beneath the bark of trees, particularly *Eucalyptus* trees, also nymphs of a Hawaiian species beneath the bark of *Ohia* trees. From these few instances, it may reasonably be inferred that the nymphs of other species of this family of Fulgoroidea, will be found to have similar obscure habits, which accounts for there being so little known concerning them at present.

In the discussion that followed, upon the use of the pulverulence produced by the nymphs and adults of this group of insects, Dr. R. C. L. Perkins stated that while some means of protection may be afforded, by this excretion, to those living exposed, it can hardly apply to such species as are found hiding under bark. Despite this protection, they are heavily parasitized in Australia; for instance, the nymphs of *Jamella australiae* Kirkaldy, a Poekillopterine living on *Pandanus*, were found living under ground and preyed on by *Baccha siphanticida* Terry, a Syrphid-fly, which also preys on *Colgar peracuta* (Melichar) and various species of *Siphanta*.

OCTOBER 4TH, 1906.

The twenty-first regular meeting was held at the usual place, Mr. G. W. Kirkaldy in the chair.

NOTES AND EXHIBITIONS.

Mr. G. W. KIRKALDY exhibited specimens of a large black Staphylinid Beetle, which came to light commonly. Mr. Schwarz has doubtfully determined it, as *Philonthus prolatus* Sharp, a Japanese species. Mr. Kotinsky observed that this species occurs quite often in manure.

PAPERS READ.

Tribolium ferrugineum (Fabr.) [Col.], an Enemy of Megachile palmarum Perkins [Hymen].

By JACOB KOTINSKY.

Among a large colony of cells of the bee, 2 specimens of the beetle were detected. When one of these cells was opened a larva of the same beetle was found within and no trace of any stage of the bee. Several bee cells had the side exit-holes of the beetle. The cells were put away in a breeding tube and several more beetles issued subsequently. The presumption is that the beetle oviposits upon the bee cell, and the grub therefrom bores its way into the cell. Whether its food therein is the pollen bread or the bee larva has not been ascertained, but the latter invariably dies either from starvation or injuries inflicted by the beetle larva. This Megachilid being seriously destructive to many shade and ornamental plants about Honolulu, it was gratifying to find an enemy preying upon it. A remarkable coincidence is that the same species of beetle was collected in a recent large shipment of rice for Honolulu.

Mr. F. W. Terry remarked that the beetle-larva might have been feeding on the pollen in the bee-cells, and therefore it would be only indirectly an enemy of the bee.

NOVEMBER 1st, 1906.

The twenty-second regular meeting was held at the usual place, Dr. R. C. L. Perkins in the chair.

NOTES AND EXHIBITIONS.

MR. O. H. SWEZEY exhibited a collection of eleven species of *Odynerus* collected by him in Iao Valley, Maui, July 29th, 1906, consisting of *O. nigripennis* (numerous), *O. insulicola* (7), *O. molokaiensis* (4), *O. purpurifer* (3), *O. instabilis* (3), *O. konanus* (3), *O. ecostatus* (3), *O. sandwichensis* (1), *O. camelinus* (1), *O. homoeogaster* (1), and *O. naiadum* (1). Both he and Dr. Perkins commented on the good luck that attended him on that day, to have collected eleven out of the sixteen species known to occur in that valley. Dr. Perkins further stated while he collected *O. molokaiensis* on Molokai in 1892, he found none of it on Maui in 1893 and 1894. In 1902 however this species was found very abundant in Iao Valley, from which he concludes that it must have been introduced there by the agency of man. Some of the species collected by Mr. Swezey were not collected by himself in that valley and some of them, as *O. instabilis*, were very rare there. He further remarked that, by a careful study of the habitus, mode of flight etc., of the different species, when in the field, the most closely allied forms could be discriminated, even where they are not easily separated in the study. Thus, four examples of *Odynerus* recently collected on the wing amongst swarms of *O. pseudochromus*, but suspected of being different, were found to include one peculiar variety of that species, one *O. pseudochromoides*, and the two much rarer species *O. paludicola* and *O. leiodemas*. To be able to pick out the choice species from the very common ones which they resemble, is a great help to the collector in these Islands, where large genera of closely allied species are frequent.

Mr. J. Kotinsky exhibited books recently purchased by the Board of Agriculture and Forestry, among them a copy of Ruusscher's "Histoire Naturelle de la Cochenille, Justifiée par les Documens Authentiques," published in Amsterdam, 1729, the even pages being in Dutch and the odd in French. The titles quoted above indicate the method of investigation pursued by the author.

DR. R. C. L. PERKINS exhibited two species of the Coleopteron *Xyleborus*, a male and female of each. The scooped-out head of the former as distinct from the normal head of the latter was the principal feature of the exhibit. Dr. Perkins also exhibited six species of *Plagithmysus* and one of *Clytarlus*, collected at the Volcano House. One species of the former was undescribed and would shortly be named by him after Mr. Giffard. He also exhibited a specimen of an undescribed species of *Callithmysus*, taken on a stump of Mamake (*Pipturus albidus*) on Mt. Tantalus.

PAPERS.

On a Species of *Proterhinus* from Samoa [Coleoptera].

By R. C. L. PERKINS, D. Sc.

The genus *Proterhinus*, constituting the family Proterhinidae, with not less than 130 known species inhabiting the Hawaiian group, has hitherto been recorded only from these islands. I am now able to describe a species from the Samoan group, distant from the Hawaiian by more than two thousand miles, and lying directly between the latter and New Zealand. It will be remembered that New Zealand is the home of one of the two species of *Aglycyderes*, constituting by themselves a peculiar family, and one which alone amongst the Coleoptera has any possible affinity to the Proterhinidae. I anticipate that when the islands of the Southern Pacific are thoroughly investigated by skilled collectors of Micro-coleoptera that other forms of Proterhinidae will be discovered, and possibly some that will more nearly connect these with *Aglycyderes*. The Samoan species here described is one of the smallest in the genus, and superficially (in form colour and clothing) quite resembles some of the more commonplace Hawaiian forms, so far as the ♂ sex (which alone is known to me) is concerned. The single example was bred from the woody drupe or the stem of attachment of a cocoanut, imported as seed from Samoa. No species of *Proterhinus* is known to affect the cocoanut in the Hawaiian islands, nor indeed is any native wood-eating beetle to be found on the lowlands here, all such having been exterminated by certain foreign ants within the range of which they cannot exist.

Proterhinus samoae sp. nov.

Ferrugineus, elytris circa margines et suturam nigricantibus, parce setis pallidis appressis alisque paucis erectis vestitus ♂ Long. vix 2 mm.

Ferruginous, with the lateral, apical and sutural margins of the elytra bordered with black. Antennae slender and rather long, basal joint elongate but very robustly clavate; second short, roundish or subquadrate; third much more slender, gradually widening to the apex, elongate; fourth to ninth generally resembling the third; the 9th a little longer and wider at the apex than the 8th; 10th and 11th distinctly wider than 9 and forming a feeble two-jointed club. Eyes prominent, but rather small. Prothorax constricted in front and much narrowed, much less so behind, so that the hind margin is much the longer, sparsely clothed with pale setae like those on the head. Elytra similarly clothed and also with a few erect thick whitish setae, the humeral angles subrectangular but not acute nor produced. Legs clothed with pale setae, the lobes of the anterior tarsi of moderate size and the femora moderately strongly clavate for the genus.

 DECEMBER 6TH, 1906.

The twenty-third regular and second annual meeting was held at the usual place, Dr. R. C. L. Perkins in the chair.

NOTES AND EXHIBITIONS.

MR. W. M. GIFFARD exhibited a cabinet-drawer containing a collection of Hawaiian Longicorns and Curculionids, collected almost entirely by himself on Mt. Tantalus, Oahu and Kilauea, Hawaii. He accompanied the exhibit with some observations on the habits of the insects and the rarity of some of them. Dr. Perkins commented upon the excellent condition, appearance and state of preservation of the collection, observing that if well attended to there was no reason why it could not last indefinitely.

MR. KIRKALDY exhibited a specimen of the Blattid *Nauphoeta cinerea* (Oliv.) (*N. bivittata* of the "Fauna Hawaiiensis"). Mr. Kirkaldy also exhibited specimens of a marine and estuarine prawn *Leander debilis* (Dana) which had not been recognized since Dana's time, though very common around Honolulu. Also

specimens of a large red-brown *Julid* (Myriapod), not recorded in the "Fauna Hawaiiensis," and a recent introduction.

Dr. PERKINS made the following three exhibits:

(1) A Jassid, common on the mountains near Honolulu, of a pale yellow or bone colour, is remarkable for the fact that the male has a pronounced pattern of black markings while the female is unicolorous. Rarely the male is like the female, without a pattern. Still more rarely it has the pattern much reduced; the female on the other hand appears very rarely indeed to have black markings. Other Hawaiian Jassids exhibit a similar striking sexual dichromatism. Elsewhere the phenomenon seems not to be common, as I can only recall one species of Jassid amongst our large Australian material that exhibits it, the very abundant green *Nephotettix apicalis* (Motschulsky).

(2) A species of *Reduviolus* (*R. rubritinctus* Kirkaldy, but probably not *R. rubritinctus* of Blackburn) is as is well known, remarkable for the incrassate basal joint of the antennae. Recently on picking up a specimen on Tantalus I noticed with the naked eye a peculiar projection on the head and on examining this at home with a lens I saw that it was one of two stout blunt spines, there being one of these on each side of the head in front of the insertion of the antennae. Blackburn makes no mention of these spines in his long description of the unique type, and as his example was from Maui, while all those mentioned in the "Fauna Hawaiiensis" were from Oahu, it is probable that these are distinct. There is no such structure in any other Hawaiian *Reduviolus* that I possess here.

(3) A collection of over fifty species of bugs recently collected at Kilauea, Hawaii.

The President then read the annual address:

Insects at Kilauea, Hawaii.

By R. C. L. PERKINS, D. Sc.

In last year's address I gave an account of the insect fauna of a portion of the main mountain range of Oahu, to illustrate in a general way what one may expect to find in a reasonably good locality on the leeward side of the less lofty mountains, such as are found on Oahu, Kauai and Molokai. Tonight I will speak of the insects that are found in the vicinity of the crater

of Kilauea, a locality where insect life is particularly abundant, and which is situated at an elevation of four thousand feet in the forest region on the slopes of the lofty mountain, Mauna Loa. Here, for reasons that I shall subsequently state, a very large number of species of insects are to be found within a very limited area.

Like most productive localities in the islands the neighborhood of Kilauea is moderately dry and fine weather is the rule there. In this it contrasts very strongly with the country a few miles to the North-east, and at a lower elevation; where day after day may be passed in drenching rain, while at the same time at Kilauea the forenoons at least are bright and sunny, though later in the day the whole country may be wrapped in dense white mist.

In order that the cause of the richness of this very limited locality may be understood, the number of species that are found being far greater than one would expect in so comparatively recent a portion of the islands, I will give a brief account of the country in the immediate neighborhood of the crater, dividing it into three districts.

(1) The crater itself is surrounded by a nearly level plain, which on the west side supports a stunted and more or less sparse vegetation. This consists of small examples of the Myrtaceous "Ohia" tree (*Metrosiderus*) some of which are almost sure to be found in full bloom at all seasons of the year; beneath and between these the Epacridaceous *Cyathodes*, a New Zealand or Australian element of the flora, and the very variable *Vaccinium reticulatum* are conspicuous, together with species of *Coprosma* and *Raillardia* and, in moister and shadier spots especially, various species of Cyperaceae and the lilaceous *Astelia*, *Dianella* and *Smilax*.

This comparatively open, and in some parts very exposed, country is the home of many interesting insects not found in the adjoining and better wooded parts. Towards Kilauea-iki and southwards the growth is more dense, the ground is damper and the moisture-loving species of plants more numerous, but this denser forest lacks many of the species conspicuous on the open plain.

(2) By walking a mile or more along the Kau road, then facing towards the summit of the mountain and crossing the open country such as I have just described, one enters a totally different locality. The forest here is well-grown and consists of large Koa and Ohia trees, in some places the former (*Acacia koa*), in others the latter predominating; in some spots tree-ferns, in others bracken, abound, while various trees of smaller growth are numerous, species of *Pelea*, *Myrsine*, *Myoporum*, *Sophora*, occasionally *Pipturus* and *Euphorbia* being amongst these. In some spots *Alyxia olivaeformis* forms dense hanging masses in these trees.

(3) Immediately behind the Volcano House Hotel one quickly enters another well marked district. There is a forest that is essentially formed of Ohia, the woods are always damp, the undergrowth largely consists of great tree-ferns, but a variety of smaller trees are scattered amongst these, *Pipturus*, *Myrsine*, *Cheirodendron*, *Broussasia* and occasional arborescent *Lobeliaceae*. The more open parts of this forest have now become invaded by an imported raspberry, which bears an abundance of very pretty but insipid berries of an altogether inferior quality. On the Hilo side, where the forest is generally of a similar character this importation is a still greater pest.

A three mile walk will cover all three of the regions that I have described above, while owing to the fine condition of the roads, over which stages run daily, and further by taking advantage of the Hilo railroad, many other localities can now be visited from Kilauea for the purpose of a day's collecting, which before were inaccessible. Consequently, I have sometimes specially referred to desirable insects that can easily be obtained by making such excursions, though nearly all that I have listed can be obtained in the localities that I have particularly described above.

If I were asked to define these three regions by their most striking productions I should say that the first is remarkable for the great numbers of Nocturnal moths (*Agrotis*) that frequent its more open parts. At certain seasons these moths rise up every few yards, as one walks along, often several take flight together, but in general they are wild and difficult to catch. No doubt on a favorable night they could be obtained in any number on

the flowers of the Ohia trees, to which they resort for food. Practically all the bees and wasps found here are burrowers in the ground, or they nest in holes in the lava blocks, those which nest in tree trunks, being absent or present only as stragglers.

The second region or Koa forest is well characterized by its Longicorn beetles of the genus *Plagithmysus* and *Clytarlus*, by its abundance of Anobiidae, large black *Fornax*, the Cistelid *Labetis*, and the many wasps of the genus *Odynerus*, that frequent the tree trunks.

The third is rich in moths of the genus *Leucania*, in species of Carabid beetles, which, however, excepting in a few cases, are rare in individuals; in special species of Nitidulidae, and in its interesting and peculiar bees of the genus *Nesoprosofis*. It also produces the large and remarkable weevil, *Nesotocus munroi*.

I will now take the Orders of insects seriatim and list some of the species that I have met with at Kilauea. As in my last year's address I shall deal only with the endemic insects, omitting all reference to introduced species.

THYSANURA.

Machilis heteropus is common as in other wooded localities throughout the islands, but no native *Lepisma* nor *Iapyx* have been found at Kilauea and probably they do not occur on the island of Hawaii. The Collembola are numerous in individuals at least, but probably all the species are introduced, excepting possibly some of the *Achoreutidae*, which congregate beneath the bark of trees.

ORTHOPTERA.

The ubiquitous roach *Phyllodromia obtusata* is of course abundant, its egg capsules here, as elsewhere in the islands, being destroyed by the Eupelmine Chalcid, *Solindenia picticornis*. The Locustid *Brachymetopa nitida* only just attains so high an elevation as Kilauea and is not common there, but abounds lower down in the Olaa and Hilo forests, and it is interesting to observe that examples from the different localities exhibit apparently more or less definitely distinct variations, as if tending to become distinct species. *B. nitida* has a not-green form of the female, in Olaa every fourth or fifth specimen of this sex being either fuscous, brownish or yellowish. The males on the other hand are always, or nearly always, green. In Olaa the unique

specimen of *Conocephaloides* was taken on a *Pipturus* tree. Around the volcano the little Gryllids *Paratrigonidium varians*, *grande* and *pacificum* are found, while lower down, towards Olaa, is a rich locality for these, *P. viridescens*, *filicum* and *freycinetiae*, being found in addition to these above named. I have spoken of the distinct habits of these difficult species in the Fauna Hawaiiensis. *Leptogryllus elongatus* is found in the fern forest in some numbers, but *L. similis* is much rarer.

NEUROPTERA.

Of the Hemerobiidae our single species of *Megalomus* is common; *Nesomicromus* is very well represented by *vagus*, *paradoxus*, *longispinosus*, *brunnescens*, *rubrinervis*, *subochraceus* and *minus*. The second and third of these are the most interesting and the rarest. Lacewing flies are very common; *Anomalochrysa peles*, *montana*, *rufescens*, *frater*, *longipennis*, *deceptor*, *raphidioides*, *proteus* and *rhododora* are all found, though *rufescens* and *raphidioides* prefer a lower elevation on the Kau side; *pauros-ticta*, *princeps*, and probably others, are found in the densest forests in Olaa in the winter months. *A. peles*, *rhododora* and its remarkable var. *xerophylla* and *longipennis* are the most desirable of the volcano species. *A. montana* is peculiar in frequenting the low-growing shrubs of the open country (*i. e.*, the first region described by me) where one disturbs it in numbers as one walks along in the daytime, at certain seasons. *Formicaleo wilsoni* is found in the same open country about two miles from the Volcano House on the Kau side.

Of the dragon flies, *Anax strenuus* and *Nesogonia blackburni* may be observed anywhere, owing to their powers of flight. Specimens of *Agrion* are numerous around the hotel vegetable garden in the fern forest, as well as on the path near Kilauea-iki, and generally on the Hilo side of the crater. They are also abundant in Olaa and about Hilo. *Agrion nigro-hamatum*, *asteliae*, *amaurodytum*, race *peles* and var. *fallax*, *calliphya* race *microdemas*, *nesiotes* and *deceptor* are found close to Kilauea, to which at low elevations may be added *A. xanthomelas*, *pacificum* and *blackburni*. *A. nesiotes* is by far the most peculiar and interesting of these species and it is not rare.

Psocidae are very numerous in individuals; but the species being very unstable in specific and even in generic characters are

most difficult to deal with, and unless they be specially collected and carefully mounted, while fresh, are of little practical use. The spread of many imported species amongst the native ones, both belonging to the same genera, has rendered the study of the endemic fauna still more unsatisfactory.

RHYNCHOTA.

At a recent meeting of this Society I exhibited a collection of over fifty species of Rhynchota that I had recently taken in ten days of general collecting in the immediate neighborhood of the Hotel. These included *Capsidae* (10 species), *Reduviolus* (7), *Nysius* (5), *Sephora* (1), *Orthoea* (1), *Ithamar* (1), *Acanthia* (2), *Oechalia* (1), *Coleotichus* (1), *Oliarus* (4), *Jassidae* (7), *Delphacidae* (10), *Psyllidae* (several). By extending one's collecting ground to Olaa and adjoining districts this list could be much increased, or even by special research at Kilauea itself, since the list includes no species of *Emesidae*, *Anthocoridae*, etc. Some of these I have on other occasions found very numerous there. The species of *Acanthia* were found running on tree trunks, high up above the ground, in the damp fern forest. I do not remember to have noticed them in this situation before. Of the other bugs the species of *Reduviolus* are the most interesting, each having its own special habits or habitat, but on the whole the bugs are much less interesting than the Neuroptera of Kilauea.

THYSANOPTERA.

As everywhere in the islands, Thysanoptera are very abundant and the species are probably numerous. They require special collecting and mounting, and as they probably present long series of very closely allied species like the genera of Hawaiian insects, the discrimination of the species is likely to be one of great difficulty. The wingless forms are much more bulky than the winged, as is so often the case in many apterous or subapterous Rhynchota.

COLEOPTERA.

It is not possible at present to compile a complete list of the Kilauea Coleoptera, partly because many species are not as yet described, and partly because some, collected abundantly in other localities, have not specially been registered from this one. This latter remark applies still more strongly to the Lepidoptera.

About a score of species of Carabidae are found in the immediate neighborhood of the volcano, many of the species are rare and require special search. The fern forest near the hotel vegetable garden is about the best locality. The large *Barypristus rupicola* is, however, confined to the neighborhood of Koa trees. The following list includes such species only as are found near the volcano, others no doubt frequenting Olaa and Hilo and lower elevations on the Kau side. *Barypristus rupicola*, *Colpodiscus lucipetens*, *Colpocaccus hawaiiensis*, *C. apicalis*, *Atelothrus hawaiiensis*, *Mesothriscus hawaiiensis*, *Metromenus lentus*, *Mecyclothorax konanus*, *vulcanus*, *pele*, *bembidicus*, *Thriscothorax bembidiodes*, *paradoxus*, *discedens*, *variipes*, *Metrothorax deverilli*, *laticollis* and *Bembidium ignicola*.

The Staphylinidae are represented by a number of excessively minute, but remarkable, native species. They require very special search, if they are to be obtained in numbers, and the most careful mounting, when secured. Few of the species are much more than a millimetre in length and they are of very delicate build, and easily spoiled by rough handling. Probably the species are still more numerous in Olaa.

Histeridae are represented by only one or two minute species, but the Nitidulidae are well represented, one or two of the species being of remarkable structure and not surpassed in interest by any other island species. Probably there are eight or twelve to be found at Kilauea and others in Olaa.

Cucujids are as usual represented by a *Brontolaemus* and a *Laemophloeus*, the latter being rare.

Cioidae yield at least thirteen species of *Cis* and two of *Apterocis*. On my recent visit I took a single specimen of *Cis haleakalae*, described on a unique from Maui, a most interesting and unexpected capture.

Anobiidae are very numerous in individuals and the species are also numerous; in fact their extreme abundance is, as I have noted, a feature of the forest on the Kau side. Hundreds of specimens can be taken in an hour or two. The three genera, *Holcobius*, *Xyletobius* and *Mirosternus* are all represented, the two latter most numerously.

Elateridae are numerous in individuals and both *Itodacnus* and *Eopenthes* are found. The species are not yet described.

Eucnemids are less numerous, the large black *Fornax* on Koa trees being the most conspicuous and always attainable. With it the large Cistelid *Labetes hawaiiensis* is also always to be found.

Of weevils *Acalles lateralis*, *callichroma*, *melanolepis*, *tuberculatus*, and one or more undescribed species are all rare. None have been collected in Olaa, where other species must occur. *Dryophthorus squalidus*, *distinguendus*, and *peles* are the common Kilauea species; *gravidus*, *declivis*, *modestus* and *insignis* are found at lower elevations, though I have not noted them from Kilauea, nor should I have taken these common insects, had I seen them. *Pentarthrum prolixum* is abundant, and often very large; *Deinocossomus nesioties* rare, *Nesotocus mumroi* always attainable both at Kilauea and in Olaa. *Oodemus* requires special study, individuals being very abundant, but the species are as yet very imperfectly known, being excessively difficult to determine. Of the Scolytids several species of *Xyleborus* are found, and others again towards Hilo. It is especially desirable to obtain the rare males and associate them with their females, to which they bear no superficial resemblance. On my last visit I was able to take the sexes of two species in company.

The Longicorns of the genus *Plagithmysus* and *Clytarlus* are better represented than in any other locality in the islands. No less than a dozen species are to be found in the limits of a little over two miles of country, and a visit to Olaa may yield one or two other species. I discovered a new* *Plagithmysus* recently about half a mile from the Hotel, near the vegetable garden. The species are *P. vitticollis* (Kau side), *P. longulus* (Hilo side), *P. bishopi*, *P. bilineatus*, *P. perkinsi*, *P. varians*, *P. darwinianus*, *P. lamarckianus*, *P. sulphurescens*, *P. giffardi* and *P. gracilis* (which I believe is distinct from *P. bishopi*). Also *Clytarlus filipes*, *C. claviger*, and in Olaa *C. abnormis*.

Parandra puncticeps and *Aegosoma reflexum* are both common.

HYMENOPTERA.

About fifty bees and wasps are here named, mostly from the immediate neighborhood of the volcano, but I have added a few that are easily obtained in Olaa or near Hilo. It will be seen

**P. giffardi* sp. nov. very closely allied to *P. sulphurescens* Sh., but at once distinguished by the entire absence of a basal fulvous or rufescent area on the elytra. It is attached to a species of *Myrsine*.

that the locality is very rich, more than one-fourth of all the Hawaiian Aculeata being found in this region. Each of the three localities that I enumerated and described at the beginning of this paper has its peculiar species. Where a species is restricted to, or is chiefly found in, one of these only, I have put the number of the locality after its name, where no number is given the species are generally distributed. *Nesomimesa hawaiiensis*; *Deinomimesa hawaiiensis* (2), *D. punae* (Olaa); *Xenocrabro hawaiiensis*, *polynesiensis*, *atripennis*, *curtipes* (1), *fulvicrus* (Olaa); *Hylocrabro tumidoventris* var. *leucognathus*; *Nesocrabro rubrocaudatus* and var. *bidecoratus* (1); *Odynerus venator* (1 and 3), *erythrognathus* (2), *cyphotes*, *vulcanus*, *orbis* (2), *peles* (1), *sociabilis* (1), *scoriaceus* ? (1), *dromedarius* (1), *heterochromus* (2), *rubropustulatus*, *obscure-punctatus*, *dyserythrias* (2), *cyanopteryx* (2), *pterocheiloides** (1), *chelifer* (1), *nigripennis*, *newelli* (Hilo), *hiloensis* (Olaa), *mesospilus* (Olaa), *eutretus* (Olaa); *Nesoprosopis simplex* (1 and 3), *difficilis* (1), *volcanica* (1), *rugulosa* (1), *vicina* (1 and 3), *comiceps* (3), *dumetorum* (3), *specularis* (3), *crabronoides* (3), *inquilina* (1), *sphecodooides* (1), *pubescens*, *setosifrons*, *insignis* (3), *erythrodemas* (3).

The parasitic Hymenoptera are well represented by the usual Hawaiian types, and now also by a good many imported species. The finest species are the curious Ophionine, *Bancho-gastra nigri*, and the Pimpline, *Glyptogastra hawaiiensis*, both found in the fern forest. Ophions of various species and genera are extremely numerous, and often scores of individuals may be seen resting under a single large leaf, while frequently a regular swarm flies off, as one disturbs the dead fronds of the large tree-ferns.

LEPIDOPTERA.

The Lepidoptera are probably the most richly represented of all the Orders of insects at Kilauea, the great number of species that frequent Olaa coming up to within a mile or two of the crater. I will merely mention some of the more interesting species. *Deilephila pyrias*, particularly common in Olaa, is frequent, and its caterpillar is often met with on forest trees, *Euphorbia*, *Bobea* and others, being polyphagous. A beautiful *Plusia*, of which I have drawn up a description under the name of *P. newelli*, after its discoverer, Brother Matthias Newell,^r of

Hilo, is closely allied to the remarkable *Tantulus* species, which I specially noticed in last year's address on the insects of that mountain. The giant species of *Scotorythra* are common, and the still larger *Acrodrepanis* occurs on the Olaa side. Six out of eight of the native species of *Leucania* occur, and all of the most remarkable species. Species of *Scoparia* are a feature of the locality being extremely numerous, as also are individuals of several species of *Orthomecyna* and *Mestolobes*. Many other nice Pyralidina are conspicuous, species of *Margaronia*, *Omiodes*, *Phlyctaenia*, *Talis* and the remarkable *Hyperectis*, while a Pterophorid swarms amongst the *Vaccinium*. Tineina are in profusion at certain (and irregular) seasons, and a number of large species of Tortricina occur, but the latter are generally scarce. The Microlepidoptera require special collecting. They should always be killed with ammonia and pinned in the field on silver wires, directly they are caught. I shall not attempt to draw up a list of species of this Order, which would be of great length, the genera *Agrotis*, *Leucania*, *Scotorythra* and *Scoparia* including many species. The butterfly *Pyrameis tameamea* is very abundant and very variable in color on the underside, while the little blue, *Lycaena blackburni*, swarms on the bushes of *Dodonaea viscosa*, on which the caterpillar feeds.

DIPTERA.

The flies are represented by numerous endemic species, mostly very small and obscure forms. The Drosophilidae and Dolichopodidae include most of these, and they are probably still more abundant at lower elevations in Olaa. Most conspicuous are the Sarcophagid flies of the genus *Dyscritomyia* and *Prostethochaeta*. They may be seen buzzing round the herbage or shrubs in a very Tachina-like manner and in fact often in company with these parasites. Their habits are yet unknown. I had long supposed them to be parasitic on cutworms, but the discovery by Mr. Terry, that they produce living maggots of large size, makes this supposition less probable. The fact that they often frequent the driest and most arid localities, where there is little or no decaying vegetable matter, and that, in other places where such matter exists, one does not find fly maggots therein, that could produce these large species; the further fact that animal matter under natural conditions in the islands was necessarily almost

wanting, there being only birds to supply this, makes the problem a puzzling one. In spite of this, the species of these flies are numerous, the individuals sometimes abundant, so much so as to furnish the food supply for the larvae of various Hawaiian Crabronidae.

Five species of *Pipunculus* (parasitic here on Delphacid leaf hoppers) are known to me from Kilauea, and several of *Caenosia*, and these with the groups previously mentioned, as well as species of *Lispe*, *Asteia*, *Tephritis* and *Sarcophaga* complete the Dipterous fauna.

Throughout this paper I have used generic and specific names, as published in the "Fauna Hawaiiensis," so that it has not been necessary to cite the authors. In the Hymenoptera I have used the genera proposed by me subsequently for the genus *Crabro* of that work.

PAPERS.

On Some Peregrine Aphidae in Oahu [Hem.]

By G. W. KIRKALDY.

With the exception of certain Chermidae, all the Sternorrhynchous Homoptera yet observed in the Hawaiian Archipelago appear to be recent arrivals. As is natural in families so little studied till lately, many of the species cannot be identified with any of those already described from other Faunas and consequently their endemic habitat remains unknown. I now enumerate four Aphidae occurring near Honolulu; about six more are known to me, but as they belong to obscure genera with many, poorly differentiated species, I have not yet positively determined them, and must leave them for a future communication.

Several of these species are of considerable economic importance, *Myzus citricidus* doing much damage to Orange trees, whilst *Aphis sacchari* is a pest of Sugar-cane.

Aphis Linnaeus.

1758 Systema Naturae, Ed. 10, p. 451.

1. *sacchari* Zehntner.

Aphis sacchari Zehntner 1897 Arch. Java Suiker. V. p.? and 1901 op. c., IX (sep., p. 1) Pl. I f. 1-10; Krüger 1899 Das Zuckerrohr und seine Kultur 313.

This is the "Sugar-Cane Aphis," which is found in Java and Hawaii, wherever cane is grown. The following enemies attack it here:

Diptera: *Xanthogramma grandicornis* and *Leucopis* sp.

Coleoptera: *Coccinella repanda* and *abdominalis*; *Scymnus notescens* and *vividus*.

It is visited and milked by *Pheidole megacephala*.

The following attack it in Java:

Hymenoptera: *Aphelinus mali* cf. Zehntner Pl. 2 f. 21; a sp. of Encyrtinae, f. 22-24.

Neuroptera: *Chrysopa* sp. and *Osmylus* sp.

Diptera: a Syrphid, Pl. 2 f. 17-20.

Coleoptera: a Coccinellid, Pl. 1 f. 11-16.

Zehntner has figured the *Aphis*, its metamorphoses and enemies.

N. B. An *Aphis sacchari* from the Antilles was mentioned by an anonymous writer in 1833 in Loudoun's Magazine of Natural History, VI, 407-9 (with appendix by Westwood 409-13), fig. 54, and it might be thought that Zehntner's name was invalid. The Grenadan insect, however, was not described and was confused with the Asiracid *Stenocranus saccharivora* (Westwood), the drawings actually being those of the latter. I think, therefore, that Zehntner's name is not preoccupied and can stand.

Macrosiphum Passerini.

1860 Gli aphidi 27.

1. *rosae* (Linne).

Aphis rosae Linn. 1758 op. c. 452.

This widely distributed form is found on cultivated roses in these islands; it occurs in my own garden. It is attacked by:

Diptera: *Xanthogramma grandicornis*.

Coleoptera: *Coccinella repanda* and *Orcus chalybeus*.

Myzus Passerini.

1860 Gli Aphidi 27.

1. *citricidus* n. sp.

Form and general appearance of *M. cerasi* Fabr. Black, shining, closely reticulate on the tergites; 4th and 5th segments of the antennae largely whitish; eyes blackish; rostrum whitish, last segment and a cloud on the penultimate darker. Venation pale fuscous, the longitudinal vein and the stigma whitish, sordidly. Coxae and the base of the fore femora whitish, the tibiae whitish, except apically. Abdomen above and below often widely dark brownish, medio-longitudinally, (blackish in certain lights).

Vertex broad, not prominent anteriorly; no capitate hairs on the head. Antennae attaining to about the middle of the cornicles; (2-tubercles) 4, 2½, 16, 16, 11½, 6, 26, tubercles far apart; frons convex, not sulcate. Rostrum reaching to hind coxae. Style longer than hind tarsi, hairy. Cornicles longer than the 4th segment of the antennae, slightly tapering, mouth oblique, more than twice as long as style.

Length of body 1⅘-1¾ mill., expanse of flight organs about 5¼-5½ mill.

The above description is taken from living winged females; the apterous adult is similar, the form being that of *M. cerasi*; I have not seen males. I cannot identify this species with any described *Myzus*, and it cannot be the "Orange Aphis" of North America, as that is described as a *Macrosiphum (citrifolii)*, dark green, with garnet-red eyes. The young of *Myzus citricidus* are brown, while those of *Macrosiphum citrifolii* are said to be light yellowish-green or rusty-green.

Myzus citricidus is probably an introduction from China, and is very common on Citrus all over the Hawaiian Islands. It is not parasitized here, so far as I know, and immediately the young Orange shoots appear, they are covered by this pest. It is, however, preyed on by a number of insects, which very soon make a clean sweep of it; these are as follows:

Neuroptera: *Chrysopa microphya* and *Anomalochrysa biseriata*.

Diptera: *Xanthogramma grandicornis*.

Coleoptera: *Coccinella repanda* and *conformis*; *Cryptolaemus montrouzieri*; *Platyomus lividigaster*; *Scymnus notescens*; *Coelophora pupillata* and *Rhyzobius ventralis*.

Hemiptera: *Zelus peregrinus*, but not often.

Mr. Terry tells me these Aphids have a decided Citrus taste.

Myzocallis Passerini.

1860 Gli Afdi; Schouteden 1906 Mem. S. E. Belg. XII. 211.

kahawaluokalani sp. nov.

Winged Female:

Pale yellowish, marked with pale brownish fuscous, principally as follows: head dorsally with a mediolongitudinal line and a speck on each side of this, and lateral margins broadly, posterior margin narrowly; irregular, broad submedian bands down the pronotum, lateral margins narrowly; a suboval, interiorly pale, sublateral spot on mesonotum, a goblet-shaped mark in the middle (the bowl anteriorly, the stem posteriorly), posterior margin broadly; a large irregular transverse spot near the base of abdomen; antennae whitish, first two segments and apices of 3rd-5th pale brownish fuscous. Eyes bright pale vermeil. Abdomen dorsally

and sublaterally with numerous fuscous-ringed tubercles which bear scarcely perceptible hairs, with 2 contiguous fuscous mammiform tubercles near the base in the middle, etc. Tegmina hyaline, very strongly particoloredly iridescent, subcostal ('costal') cell and stigma, veins and a V apically, pale fuscous. Legs pale, fore and middle femora with a fuscous annulation, hind femora broadly fuscous apically, hind tibiae fuscous basally; coxae more or less fuscous. Honeytubes short, pale fuscous. Antennae scarcely as long as body, 6, 5, 30, 24, 22, 14, 12, the seventh not really separated from the sixth. Stigma rather long, longer than broad, curved. Length to apex of abdomen about 1.25 mill., to apex of flight organs about 2 mill.

Hab. Oahu, Honolulu, on *Lagerstroemia indica* an introduced plant (G. W. K.); also on other shrubs.

Nymph: pale yellow, eyes red as in adult. Head, nota and abdomen multituberculate dorsally and laterally, each tubercle with a black, capitate bristle.

This species agrees with *Monellia* in that it carries its organs of flight horizontally while walking and in repose, but its structure is that of *Myzocallis*.

On Two Hawaiian Thysanoptera.

By G. W. KIRKALDY.

No Thysanoptera have yet been described from the Hawaiian Islands; a large number were, I believe, collected by Dr. R. C. L. Perkins for the Hawaiian Exploration Committee, but they have apparently not been yet worked out.

Agnostochthona gen. nov.

Belongs to the Tubulifera and differs from *Aniotohrips* Uzel by the vertex being very slightly longer than wide anteriorly and slightly though distinctly wider anteriorly than posteriorly; it is also longer than the pronotum medianly. Face elongate, angularly rounded at the apex, reaching nearly to the base of the prosternum. First segment of antennae as long as, or longer than, the second, and is much stouter; third and fourth a little wider than the others. Tegmina not constricted medianly. Spine on the fore tibiae somewhat large in the female.

1. *alienigera* sp. nov.

Sordid yellowish-brown, dark fuscous on head and pronotum and on 6th-8th, antennal segments. Eyes rounded, not protruding. Ocelli widely separated, large, posterior pair contiguous with the internal margin of the eyes, front one almost between first segments of the antennae, which are subcontiguous. Relative lengths (from base) 6, 6, 8, 10, 8, 8, 6, 5; 3rd 6th, basally subpedicellate; hairs moderate. Postocular bristles very long, one on each side. Cheeks without bristles. Pronotum roundly emarginate apically, rounded posteriorly, lateral margins distinctly diverging

posteriorly, posterolateral angles rounded. Fringe-hairs of wings simple, long. Abdominal bristles sparse, slender, mostly large.

♀ Tube about one half longer than the preceding segment.

Length about $1\frac{1}{4}$ mill.

Hab: Oahu, Mt. Tantalus, 1500 feet, under bark of dead tree, in numbers and in all stages (F. W. Terry).

Nesothrips gen. nov.

Allied somewhat distantly to *Liothrips* Uzel. Flat above, convex below. Strongly chitinized, with a shining, polished surface.

Head dorsally about as long as the pronotum, a little longer than wide, lateral margins subparallel. Antennae about twice as long as head, Ocelli present. Eyes not very prominent laterally. Face long, lateral margins subparallel, then narrowing apically. Pronotum anteriorly as wide as the head, posteriorly distinctly wider, warts absent. Flight-organs absent. Anterior legs unarmed, femora incrassate, more than twice as long as the tibiae.

1. *oahuensis* sp. nov.

Polished, shining, pitchy-blackish; apices of anterior tibiae, the tarsi etc., paler. Face bristles absent. Antennae 5, 5, 9, $8\frac{1}{2}$, 8, 6, 8. Two longish bristles (lateral and sublateral) near the posterior margins of at least five tergites.

♀ Tube with 2 terminal bristles.

Length $1\frac{1}{4}$ mill.

Hab: Oahu, Mt. Tantalus, 1300 feet (O. H. Swezey) probably on flowers.

On Two New Vitian Chermidae [Hem.]

By G. W. KIRKALDY.

So far as I am aware, no Vitian Chermidae have yet been described. Mr. F. Muir recently, in collecting and studying leafhoppers and their parasites in that group of Islands, secured two species of the genus *Trioza*.

Trioza Foerster.

1. *vitiensis* sp. nov.

♀. Vertex obscure testaceous with a narrow blackish brown line down the middle and an obscure spot on each side at the base between this line and the ocelli. Frons orange, the middle ocellus pale yellow, ringed with blackish-brown, the others at the posterolateral angles of the vertex and conspicuously orange. Antennae pale yellow. Eyes red brown. Pronotum, dorsulum and mesonotum pitchy, with the following yellowish-feruginous marks; dorsulum with a median and a curved lateral line. Mesonotum with 4 lines, the inner curved inwardly, the outer curved outwardly; scutellum pale with a black median line, abdomen black, genital segment

yellowish. Tegmina and wings byaline, veins pale fuscous. Legs yellowish brown, femora basally more or less piceous. Vertex flat, transverse, foremargin truncate, mediolongitudinally narrowly sulcate and shallowly pitted on each side nearer the base. Head nearly as wide as thorax, frontal cones rounded apically. Pronotum scarcely as wide as vertex, very short. Dorsulum longer than wide, suboval, narrower than the mesonotum, which is transverse. Scutellum small. Tegmen about $2\frac{3}{4}$ times as long as wide in form like that of *T. koebelei* Kirkaldy and with similar venation, except that the brachial (lower branch of cubital) forks basal of the middle.

♂ largely orange yellow. Head dorsally yellow cinereous with a line down the middle as in the other sex. Cones bright orange. Nota orange brown, rather feebly lined with fuscous and yellow brown. Tegmina and legs as in the ♀, but the veins of the former yellower. Abdomen ferruginous, last tergite deeply excavated apically, wavily reflexed, the reflexed part creamy; genital segment diamond shaped.

Length to apex of abdomen $2\frac{3}{4}$ mill.; to apex of tegmina folded $5\frac{1}{2}$ mill.

Hab. Viti, Rewa (III o6. Muir 1 ♂ 2 ♀ ♀) .

2. *vanuae* sp. nov.

♀ yellowish, abdomen (except genital segment) black. Head dorsally with a very slender black sulcation, ocelli orange red. Pronotum very transverse, obtuse-angularly emarginate posteriorly, very narrowly margined there with black. Dorsulum about as long as mesonotum and scutellum together, scarcely longer than wide. Tegmina in form like *T. vitiensis*, hyaline, veins yellowish fuscous, venation like that of *T. koebelei* but the median (upper branch of cubital) forks close to the apex of the tegmen.

Length $1\frac{1}{2}$ (to apex of abdomen) and 4 mill. (to apex of tegmina folded.)

Hab: Viti, Rewa, (III o6. Muir, 1 ♀).

An Extraordinary Leaf-hopper from Mt. Konahuanui, Oahu.

By OTTO H. SWEZEY.

Dictyophorodelphax gen. nov.

This aberrant genus of Delphacidae is erected for a single species discovered on a southern ridge of Mt. Konahuanui, Oahu, February, 1906. The genus is chiefly distinguished from other genera of Delphacidae by the extremely long, narrow, forward prolongation of the head giving it a superficial resemblance to *Scolops*, or some others of the Dictyophorinae. Its position in Delphacidae is determined by the presence of a movable spur at the apex of posterior tibia.

The prolongation of the head is as long as the rest of the insect. It is narrow and tapers gradually to a blunt apex. It has a median carina ventrally; two lateral carinae, the ventral

one terminating about two-thirds the distance from the base, the dorsal one not quite reaching the apex; two carinae on dorsal surface extending full length, a slight short median carina between the eyes. The clypeus has median and lateral carinae corresponding with those of ventral side of prolongation of head. Antenna has second joint cylindrical, longer than first, and well supplied with sense organs. Head narrower than thorax. Pronotum has three carinae, the lateral ones straight, diverging and reaching the posterior margin; carinae of scutellum similar to those of pronotum. Posterior tarsi shorter than their tibiae.

Dictyophorodelphax mirabilis sp. nov.

Length from apex of prolongation of head to apex of abdomen 8 mm.; prolongation 4 mm. Testaceous; clypeus and apex of rostrum black; eyes dark brown, very little excavated below; black line on anterior of first segment of antenna, brown spot on cheek below antenna; prolongation of head with the outer two-fifths bent slightly downward, blunt at apex, carinae with black line on edges and hairy along their bases. Pronotum and scutellum brown outside of lateral carinae; abdomen with brown markings on sides of segments. Tegmina pale testaceous, nearly transparent, oblong, not quite reaching the apex of abdomen; veins with scattered dark brown dots, a series of dark brown spots on termen between veins, an elongate spot on costal margin, and also on sutural margin but a short distance from termen, the one on sutural margin the longer and farther from termen; wings absent.

Femora and tibiae lineated with dark brown or black; anterior and intermediate tibiae black-ringed near apex; anterior and intermediate tarsi; brown, black at apex; posterior tarsi brown at apex of first segment, black at apex of last segment. Calcar at apex of posterior tibia about three-fourths length of first segment of tarsus, 7 to 8 teeth, these and the two spines on outer side of tibia at apex of tibiae and at apices of first and second joints of tarsi black-tipped. Anal tube large, style small, included. Ovipositor pale. Pygofers of male truncate, with a large ventral notch; styles broad, laterally compressed, near together, their tips very slender and bent upwards nearly at right angles and curved forward a little, slightly diverging, dark brown.

Two males and two females of this species were swept from

the stunted bushes and ferns, at an elevation of about 2500 feet, along the path on the southern ridge leading up to the summit of Mt. Konahuanui, Oahu. On account of the general sweeping by the insect net, when these were caught, it was impossible to determine their food-plant. It is hoped that at some future time further observations may be made at this same locality and more learned of this remarkable insect.

Life History and Notes on the Pink-winged Tryxalid (*Atractomorpha crenaticeps* Blanchard).

By OTTO H. SWEZEY.

This grasshopper is a somewhat recent arrival to the Hawaiian Islands. It probably came from Australia, as it occurs there and also in New Guinea. It has been seen in and around Honolulu for several years, and is probably generally spread thruout Oahu; but has not as yet been seen on the other islands of the group. It has not as yet become much of a pest, altho it is strictly a vegetable feeder. It is not, however, a grass feeder particularly, but feeds upon most all kinds of garden plants and weeds, without much particular choice.

This species is dimorphic as regards color, there being a green form and a grey form. This applies to both sexes. Probably the numbers of each form are about equal; but locally sometimes one form is the more numerous and sometimes the other. This dimorphism appears as early as the second instar of the nymph; but is not constant thru the succeeding instars; as there may be several changes before the final molt. This is shown in the following table, which is the record of nymphs that were captured of various ages and reared to maturity:

DIMORPHISM OF NYMPHS.

2nd instar molted		3rd instar molted		4th instar molted		5th instar molted		adult
grey	Oct. 7	grey	Oct. 17	green	Oct. 26	green	Nov. 12	grey male
green	Oct. 22	grey	Nov. 1	green	Nov. 12	green	Nov. 26	grey male
						grey	Nov. 8	grey male
						grey	Dec. 5	grey female
				green	Dec. 8	green	Jan. 2	grey female
		green	Dec. 28	green	Jan. 18	green	Feb. 10	grey female
grey	Nov. 15	grey	Dec. 19	grey	Jan. 19	grey	Feb. 22	grey female

Life-history: A female of the grey form deposited a batch of 8 eggs, Dec. 28, 1905. They were inserted in soil, in a cylindrical mass about 12 mm. long by 4 mm. in diameter, held together by a yellowish brown, dried frothy material. The eggs are 4 mm. long by 1 mm. thick, cylindrical with rounded ends, finely reticulated, and of a dull testaceous color. One female under observation deposited four clusters of 27, 28, 36 and 38 eggs respectively. Of the first lot of these, the first egg to hatch was Feb. 13th; four more hatched Feb. 15th, giving 47-49 days for the egg-stage. Three of these were reared to maturity. Observations were interrupted so that the time of all the molts was not observed, but their number was determined by the counting of exuviae in the breeding jar: five times for the males and six times for a female. The period between molts has been observed to range from 10 to 20 days.

The freshly-hatched nymphs were 5 mm.; green, dotted and marked with white; anterior and intermediate legs grey-spotted. (In subsequent lots of 37 and 14 freshly-hatched nymphs, all were of this same coloration). The first molt occurred after 17 days, and then the nymphs were green, the anterior and intermediate legs green like the posterior ones. They remained green thruout their subsequent stages. Two matured to green males, May 24 and May 25 respectively; and one matured to a green female, June 6. This gives about 100 days for the nymphal period of the male, and about 112 days for the female. This may be longer than it would have been in a state of nature; as the conditions of the breeding jar may not have been at all times the most favorable for growth and development. The egg-stage plus the nymphal stage gives about five months from egg to maturity.

The Literature of 1906 Dealing With Hawaiian Entomology.

By G. W. KIRKALDY.

1. CRAW, A: "Report of the Division of Entomology for the Year Ending December 31, 1905," 2 Rep. Agr. For. Hawaii, 99-166, figs. 1-11 and Plates VII-VIII (including subreports by J. Kotinsky) (Oct. 13).
2. HIGGINS, J. E.: "The Mango in Hawaii," Bull. Hawaii Agr. Sta. XII, 1-32, Plates I-X.

Brief Notes on Insects, p. 24 Pl. III f. 3.

3. KELLOGG, V. L.: "Yellow Fever and the Panama Canal,"
Science, n. s., XXIII, 114. (Jan. 19).
Deals with *Stegomyia fasciata* in Hawaii.
4. KIRKALDY, G. W.: "Random Notes on the Entomology of
the Lowlands of Oahu," Proc. South London Ent. Soc.
1905-1906, pp. 17-18.
5. ID.: "Brief Note on Hawaiian Butterflies," Entom. XXXIX
138-9 (June).
6. ID.: "Leafhoppers and Their Natural Enemies, Part IX
Leafhoppers—Hemiptera," Bull. H. S. P. A., Ent. I
269-479, Plates XXI-XXXII (Feb. 3).
Deals inter alia with *Perkinsiella saccharicida*.
7. KNAB, F.: "The Yellow Fever Mosquito," Science n. s.
XXIII 270-1 (Feb. 16).
Danger to Hawaii from *Stegomyia fasciata*.
8. KOTINSKY, J.: "History of Economic Entomology in
Hawaii," Bull. U. S. Ent. LX, 58-66 (Sept. 22).
9. ID.: "Preliminary Notes on Lantana Insects in Hawaii,"
Proc. Haw. Livestock Breeders' Asso., 69-78, figs. 3-8.
10. ID.: "Hornfly and Its Parasites in Hawaii," op. c., 78-80,
f. 9. See also Crow.
11. LEONARDI, G.: "Generi e specie di Diaspiti. Saggio di Sis-
tematica delle Fioriniae," Redia III 16-65, figs. 1-22
(Jan. 26).
Fiorinia fioriniae 32-6, f. 11.
12. NØRGAARD, V. A.: "Division of Animal Industry, Report
for 1905," 2 Rep. Agr. For. Hawaii, 167-228 (Oct. 13).
Compsomyia macellaria 212-8; *Haematobia serrata* on sheep, 211-2.
13. PERKINS, R. C. L.: "Leafhoppers and Their Natural Ene-
mies. Part VIII Encyrtidae," etc., Bull. H. S. P. A.
Ent., I 239-67, Plates XVIII-XX (Jan. 6)," Part X
Dryinidae, Pipunculidae Supplement," op. c., 481-99,
Plates XXXIII-XXXVIII (Mar. 1) and "Introduction,"
op. c., p. I-XXXII, 8 figs. (May 1).
14. VAN DINE, D. L.: "The Avocado Mealy-bug (*Pseudococcus
nipae* Mask.)", Press Bull. Hawaiian Agr. Sta., XVI,
1-12, figs. 1-3 (Jan. 13).

15. ID.: List of Insects on p. 16 of J. G. SMITH'S "The Black Wattle (*Acacia decurrens*) in Hawaii," Bull. Haw. Agr. Sta. XI, 1-16.
16. ID.: "The Mango-weevil (*Cryptorhynchus mangiferae* Fabr.) op. c., XVII 1-11, Plates I-II (Aug. 14).

Also numerous articles and notes in

(a) The Hawaiian Forester III ex. pp. 1-422 (Jan.-Dec).

(b) Proceedings of the Hawaiian Entomological Society pp. 1-36, Plates I-II (Ap. 3) and 37-78 (Dec. 1st.)

Reviews of the entomological work done in Hawaii have appeared in

(a) Canadian Entomologist XXXVIII, 148 (May).

(b) Zeitschrift für Wissenschaftlichen Insektenbiologie II 66-70 (Mar. 6) and 126-7 (May 15).

(c) Entomologist XXXIX 168 (July), 216 (September) and 283-6 (Dec.).

(d) Experiment Station Record XVII 477 (Jan.) and vol. XVIII.

(e) Nature LXXXV 82 (Nov. 22).

(f) Zeitschrift für Pflanzenkrankheiten XVI 296 (Dec. 1)

(Omitted from 1905).

REUTER, O. M.: "Capsidae stalianae," O. F. V. F. XLVII No. 12, pp. 1-20.

p. 2, *Hyalopeplus pellucidus*.

After the reading of the foregoing papers, the following officers were elected for the ensuing year:

President..... MR. W. M. GIFFARD
 Secretary and Treasurer.....MR. J. KOTINSKY
 Other members of the Executive Committee.....
MR. G. W. KIRKALDY AND MR. F. W. TERRY

The President, on being inducted into the chair, appointed MR. O. H. SWEZEY as *Vice-President*.

ANNOUNCEMENTS

Meetings are held the first Thursday of each month at 7:30 P. M., notice of the place of assembly being sent to each member by postcard one week previous.

* * * * *

Members exhibiting specimens at meetings of the Society are requested to hand to the Secretary, *at the meeting*, a note in writing of the generic and specific names of all specimens exhibited together with localities, and any remarks thereon which the exhibitors wish published. In the absence of such notes in writing, the Secretary and Editors will not be responsible for the accuracy of the report of such exhibition or for entire omission of any reference thereto in the Proceedings.

* * * * *

The Society, having no separate Library, does not exchange its publications.

* * * * *

The annual dues are five dollars (\$5.00) payable on the first day of January in every year. There is no admission fee.

* * * * *

All correspondence to be addressed to the Secretary-Treasurer at the Bureau of Agriculture and Forestry, from whom copies of the Proceedings may be purchased.

* * * * *

Proceedings No. 1, pt. 1, 38 pages, 2 Plates..... 50c.
pt. 2, 42 pages 50c.
pt. 3, 31 pages 50c.

CONTENTS OF I, PART 3

List of Officers for 1906-1907.....	ii
Membership, 1906-1907.....	ii
Announcements	iii
D. L. VAN DINE: "Notes on <i>Cryptorhynchus mangiferae</i> · · (Fabr.) [Col.].....	79
O. H. SWEZEY: "Observations on the Life-History of <i>Oliarus</i> · · <i>koanoa</i> Kirkaldy [Hem.].....	83
J. KOTINSKY: " <i>Tribolium ferrugineum</i> " (Fabr.) [Col.], an · · enemy of <i>Megachile palmarum</i> Perkins [Hym.].....	85
R. C. L. PERKINS: On a Species of <i>Proterhinus</i> from Samoa · · [Col.]	87
R. C. L. PERKINS: Insects at Kilauea, Hawaii [President's · · Address.].....	89
G. W. KIRKALDY: On Some Peregrine Aphidae in Oahu [Hem.]	99
G. W. KIRKALDY: On two Hawaiian Thysanoptera.....	102
G. W. KIRKALDY: On two Vitian Chermidae (Hem.).....	103
O. H. SWEZEY: An Extraordinary Leafhopper from Kona- huanui [Hem.]	104
O. H. SWEZEY: Life History and Notes on <i>Atractomorpha</i> · · <i>crenaticeps</i> Blanch. [Orth.].....	106
G. W. KIRKALDY: The Literature of 1906 Dealing with Hawai- ian Entomology	107