PROCEEDINGS

OF THE

Hawaiian Entomological Society

Vol. IV, No. 3. FOR THE YEAR 1920. SEPTEMBER, 1921.

JANUARY 8th, 1920.

The 172nd meeting of the Hawaiian Entomological Society was held in the entomological laboratory of the H. S. P. A. Experiment Station, President Crawford presiding. Other members present were Messrs. Rosa, E. H. Bryan, Williams, Giffard, Timberlake, Bridwell, Ehrhorn, Osborn, Swezey, Willard, and Fullaway.

The minutes of the previous meeting were read and approved with corrections.

Mr. F. W. Macfarlane was unanimously elected to membership.

The committee on common names reported that it had not yet completed its work. Mr. Ehrhorn was appointed by the Chair as alternate on the committee.

A letter from Mr. C. S. Judd, Territorial Superintendent of Forestry, was read, asking the opinion of the Society as to the desirability of using in reforestation work, trees whose fruits are known to be attacked by the Mediterranean fruitfly. The following committee was appointed by the Chair to consider the matter: Messrs. Willard (chairman), Giffard and Fullaway.

The report of the Auditor was read and, on motion, duly seconded, was accepted and the Auditor discharged.

ENTOMOLOGICAL PROGRAM.

Note on the Eggs of Araeocerus Fasciculatus De G. (Anthribidae, Coleoptera).

BY O. H. SWEZEY.

In examining some koa pods collected on Sugar Loaf Hill, June 23, 1919, I found several clusters of white, hatched eggs inside the pods where the larvæ of *Cryptophlebia illepida* (Butler) had eaten out the seeds and had made exit holes thru the side of the pod. At the time I could not make a satisfactory determination of these eggs.

On November 9 of the same year, I collected some more koa pods in the south end of the Waianae Mountains. On examining these, many more of the same eggs were found, mostly hatched, but a few that were unhatched, and these hatched a few days later. In the same batch of koa pods were also many egg clusters of *Pantomorus fulleri* (Horn), some hatched and others unhatched. As the unknown eggs were somewhat similar and placed in similar places, and as the young larvæ also resembled those of *P. fulleri* (except that they had legs), and as there is no other related beetle known here of which these could have been the eggs, I feel certain that they belong to *Araeocerus fasciculatus.*

I have looked up many references to this beetle in American entomological literature, and also from other parts of the world, but I could find no mention or description of the eggs, from which one could infer that the eggs were not known. Hence, I herewith give a description of the eggs.

Before hatching the eggs were yellowish; the empty eggshells are pure white. The surface is completely covered with longitudinal rows of pits like the surface of a thimble; short cylindrical, with rounded ends about 0.8 mm. long and about 0.4 mm. in width. They were deposited in rather loose masses of 40 to 60 eggs, yet adhering together, tho not firmly cemented together as is the case with those of *P. fulleri.* They had

apparently been deposited by the female thrusting her ovipositor thru the hole in the pod made by the moth larva which ate the seed, and were in the space formerly occupied by the seed. In one pod five successive seed cavities were occupied by masses of the eggs of *A. fasciculatus.*

NOTES AND EXHIBITIONS.

Strumigenys lewisi.—Mr. Williams exhibited specimens of this ant taken January 4, 1920, under stones at the head of Manoa Valley, at 900 feet elevation, and made the following note: The first record of this species in Hawaii was made in the spring of 1911 by Ehrhorn, who took the species in quarantine, from material originating in Japan. In April, 1917, Bridwell took the species in rotten wood in Palolo Valley. The present record is apparently the third.

Celerio calida.—Mr. Williams reported finding, on the same day, numerous larvae of this native Sphingid on *Scaevola chamissoniana* at the head of Manoa Valley. He remarked that Dr. Perkins stated the larvae to be polyphagous. They have previously been found upon *Straussia, Coprosma,* etc.

Vanessa tammeamea.—Mr. Williams reported observing this butterfly clustering in numbers on the under side of the limb of a koa tree. There were seven in the largest cluster. It resembled the hibernation habit of similar butterflies in the Temperate zone, and may be the relic of an instinct.

Melanocrabro curtipes.—Mr. Williams exhibited a male example of this wasp, collected November 1, at Kilauea, Hawaii. The deeply excavated abdomen and rough sculpture are peculiarities of this wasp.

Plagithmysine larvae in Pittsosporum.—Mr. Bridwell reported rearing successfully four adult beetles from larvae found in *Pittosporum* on the windward side of Konahuanui. He stated that the form is transitional between *Neoclytarlus* and *Plagithmysus,* having the form of body and markings like the former, and form of tarsi and pubescence of hind legs like the latter. He thought, however, that it should be considered a *Neoclytarlus.*

Lepisma sp.—Mr. Bridwell reported capturing in the labora-

tory of the Experiment Station, H. S. P. A., specimens of *Lepisma*-like Thysanuran not previously recorded here. It differs from *Lepisma,* however, and probably belongs to a different genus. It is more or less spotted, the scales on the body, however, are similar to *Lepisma.*

Semnoprepia larvae in ohia.—Mr. Bridwell reported observing caterpillars (probably *Semnoprepia* larvae) attacking the living bark of ohia trees on Mt. Kaala. This is his third record of larvae attacking living wood tissue, which were supposed to attack only dead wood.

Neoclytarlus indecens.—Mr. Bridwell reported finding the larvae of this beetle in *Smilax* stems, December 26, on Mt. Kaala. He found that the eggs were laid at the nodes of green stems, and the work of the larvae at the nodes kills the stem. Later, the entire stem is eaten out by the larvae. This is another instance of a native insect attacking living plant tissue. In the same material was also found the first winged female of an endemic species of *Sclerodermus.* This was *S. polynesialis,* and it was attacking the larvae of *N. indecens.* The same species was also reported attacking the larvae of *Oodemas* in Manoa Valley.

Sierola sp.—Mr. Bridwell reported having reared from *Smilax* stems two species of *Sierola* attacking lepidopterous larvae, probably of the genus *Semnoprepia.*

Periplaneta americana.—Mr. Bridwell reported observing the mating dance of this cockroach, while walking in Palolo Valley in the moonlight, January 4. Fifty to seventy-five individuals were so engaged in the middle of the road. This same roach, Mr. Ehrhorn reported having observed feeding on canna blossoms in Manoa Valley.

Ornithoica sp.—Mr. Bryan exhibited specimens of a Hippoboscid fly reared from pupae found on the neck feathers of a pheasant shot on Kauai by Mr. Broadbent, who stated that the same insect is also found on mynah birds. The fly appears to belong to the genus *Ornithoica.*

FEBRUARY 5th, 1920.

The 173rd meeting of the Hawaiian Entomological Society was held in the usual place, Mr. Crawford presiding, other members present being Messrs. Bryan, Giffard, Osborn, Rosa, Swezey, Timberlake, and Williams.

In the absence of the Secretary, the reading of the minutes of the previous meeting was omitted, and Mr. Timberlake was appointed Secretary pro tem. by the Chair.

NOTES AND EXHIBITIONS.

Vespa occidentalis.—Mr. Williams reported the capture of a fresh specimen of a queen of *Vespa,* to all appearances *V. occidentalis* Cresson, taken by Messrs. Rock and Agee at 4000 feet, Halemanu, Kauai, on January 30th. The insect, which was benumbed with cold, was found clinging to the under side of a fallen post, where it was presumably hibernating. This is the first record of a species of *Vespa* for the Hawaiian Islands, and it seems probable that this species is already established on Kauai. Its natural habitat is the western part of the United States.

Mr. Swezey stated that he had taken this species in Arizona, California, and Oregon, and exhibited his collection of North American species of *Vespa.*

Immigrant Insects Recorded in 1919.*—Mr. Swezey submitted a list of 25 immigrant insects, recorded by the members of the Society for the first time during the year 1919. Mr. Swezey remarked on the economic importance of the included species, and stated that none so far as yet known will become pests of any great importance, and that some are distinctly beneficial. *Calandra taitensis* and *Aphis middletonii* have some economic interest, while *Chrysopa, Silaon,* and some of the parasitic Hymenoptera are beneficial.

Scolia manilae.—Messrs. Swezey and Osborn spoke of the habits of *Scolia* and its preference for cultivated ground. This is detrimental on the whole for the control of *Adoretus* in some

* Printed in Proceedings for 1919, page 448 (Ed.).

localities where it is found more or less abundantly in sod land.

New Syrphid.—Mr. Timberlake exhibited larvae and puparia of an aphidivorous Syrphid new to the islands, collected on corn infested with *Aphis maidis* at the College of Hawaii, Manoa Valley. A single larva was also found a month earlier at the Federal Experiment Station on corn, but it died of disease.

Scarabaeids from Queensland.—Mr. Swezey exhibited a set of 18 injurious Scarabaeids and 7 species of their parasites collected by Mr. Illingworth in Queensland.

MARCH 4th, 1920.

The 174th meeting of the Hawaiian Entomological Society was held at the usual place. Mr. Williams presided, and other members present were Messrs. Bridwell, Bryan, Ehrhorn, Giffard, Rosa, Swezey, Timberlake, and Willard. Mr. Timberlake was appointed Secretary pro tem., and the minutes of the two previous meetings were read and approved.

ENTOMOLOGICAL PROGRAM.

On behalf of Mr. Fullaway, the acting Secretary presented a note on "*Cryptotermes brevis* in Hawaii."

Cryptotermes brevis in Hawaii (Isoptera).

BY D. T. FULLAWAY.

Examples of this immigrant species of *Cryptotermes* found commonly in Honolulu were recently referred by me to Mr. Thomas E. Snyder of the U. S. Bureau of Entomology for determination. Mr. Snyder identifies the species with *Cryptotermes brevis* (Walker) and gives the habitat as South and Central America, the West Indies, and in the United States only at Key West, Florida. In Cuba and at Key West, Florida,

according to Mr. Snyder, this insect is very destructive to the woodwork of buildings and furniture. It is able to work in *dry* wood. This species, through specimens preserved in the collections of the H. S. P. A. Experiment Station, is known to have been in Hawaii previous to 1904, but its generic position was not determined until the discovery of the soldier a few years ago.

A New Immigrant Weevil Attacking Banana (Coleoptera, Curculionidae).

BY O. H. SWEZEY.

On February 19, I found this weevil in the decaying portion of a banana stump at my garden in Kaimuki. It is so small that it was only by chance that it was first discovered. The white larvae were first seen, then with careful search, pupae and adult beetles were found. Continuing the search in the decaying substance, a large number of the beetles were found. They were in the very rotten part of the underside of the corm, the larvae were found feeding in the part that was more solid.

This species is smaller than any of the known native species of *Dryophthorus,* and has a longer and more slender rostrum in proportion to its size. However, it runs to the genus *Dryophthorus* in Blatchley & Leng's Rhynchophora or Weevils of N. E. America, it having five-jointed tarsi, on account of which structure this genus is stated to differ in this respect from all American Rhynchophora except a few species of Scolytidae.

The Hawaiian species of the genus are deadwood feeders, and perhaps all species of the genus have similar habits. It may be that this new form belongs to some other near related genus. Specimens will be sent to Dr. Guy A. K. Marshall for determination.*

* Dr. Marshall's determination received before going to press. He has described it as a new species *Stenommatus musae,* the genus being very closely related to *Dryophthorus.* Publication of the species is in Bulletin of Entomological Research, XI: 277, Pl. VII, fig. 7, 1920. (Ed.)

Jassid on Eragrostis sp.—Mr. Giffard exhibited specimens of an undetermined Jassid collected on an *Eragrostis* near the Halfway House, Kau, Hawaii, at 2500 feet elevation, on August 27, 1919. It is apparently the same species found by Mr. Giffard on *Eragrostis* at Diamond Head, Oahu, several years ago. Specimens have been sent to Professor Osborn for determination. Mr. Timberlake remarked that the flightless Jassid he had taken on Haleakala, Maui, at 8000 feet elevation, shows some points of resemblance to this species. Mr. Giffard spoke further on the progress of Professor Osborn in his work on Hawaiian Jassidae, and of Mr. Van Duzee in his work on the Heteroptera.

Coccus acutissimus Green.—Mr. Ehrhorn reported finding this Coccid at Honolulu on litchi, and stated that it was a new record for the islands, but that it had probably been here a long time. It was recorded by Green on banana.

Plutella on Lepidium.—Mr. Bridwell spoke of finding a *Plutella* on the native *Lepidium* at Makapu Point. The cocoon is similar to that of *Plutella maculipennis* and specimens when reared may prove to be the same.

Plagithmysine on Elaeocarpus.—Mr. Bridwell reported a plagithmysine larva which he had found in the dead bark of *Elaeocarpus,* well up in Makaha Valley, Waianae, Oahu.

Bruchus limbatus.—Mr. Bridwell recorded this Bruchid breeding in the seeds of opiuma, and stated that he had found it spread as far as Castner in the middle of the island, but not yet on the far side of Oahu.

Tephritis.—Mr. Bryan stated that he was working on this genus and wished to examine more material.

Trypoxylon sp.—Mr. Williams reported that he had found specimens of our small, unnamed immigrant *Trypoxylon* in the Experiment Station collection, from Los Banos, Philippines (*Williams*) and Hongkong, China (*Terry*), the species being represented by one specimen from each locality.

APRIL 1st, 1920.

The 175th meeting of the Hawaiian Entomological Society was held at the usual place with Mr. Crawford in the Chair. Other members present were Messrs. Bridwell, Bryan, Ehrhorn, Giffard, Osborn, Rosa, Swezey, Timberlake and Williams, and Messrs. J. Aug. Kusche and C. P. Clausen, visitors.

In the absence of the Secretary, Mr. Timberlake was appointed by the Chair as Secretary pro tem., and the minutes of the last meeting were then read and approved.

Mr. Crawford reported that the Executive Committee had voted to sell the Society's set of the Review of Applied Entomology to Mr. Ehrhorn's office at $3.00 per volume, and the set of Pomona Journal of Entomology to the Planters' Experiment Station for $5.00; he also reported that the Executive Committee had appointed Mr. Swezey, editor, Mr. Pemberton librarian, and Mr. Timberlake custodian of the type collection.

Mr. Crawford then spoke of the preparations that had been made for the Pan-Pacific Scientific Congress to be held in Honolulu in August, and that the Executive Committee had recommended to Dr. Gregory that Dr. L. O. Howard of Washington, D. C., Prof. C. F. Baker of Los Banos, Philippine Islands, and Dr. R. J. Tillyard of New South Wales, Australia, should be brought to Honolulu to attend the Congress, with Dr. Vernon Kellogg of Stanford University as alternate, if Dr. Howard could not be induced to come. A list of other prominent entomologists was also submitted to Dr. Gregory, with a recommendation that a warm invitation to attend the Congress be extended to them. Mr. Crawford also reported that the Hawaiian Sugar Planters' Association had been asked to contribute to the funds of the Congress an amount to be used only for defraying the expenses of the entomologists named above.

The Society by unanimous vote approved of the action of the Executive Committee in regard to this Congress.

Notes From Easter Island.*

BY WM. A. BRYAN.

(Communicated by O. H. Swezey.)

The native inhabitants of the lonely island, Rapanui, or Easter Island, belong unmistakably to the great Polynesian family. Today there is only a small colony of 270 remaining out of a population that at one time must have numbered several thousand. They were avowed cannibals at the time of the discovery of the island, but with this combined a knowledge of cutting stone and building huge cut stone *ahus* or temples that is truly marvelous. They were, so far as is known, the only Polynesian tribe that had any form of writing—which consisted in engraving curious unmatched characters on planks of wood. Taken altogether, their origin and culture forms one of the greatest, if not *the* greatest, of the many great puzzles in Polynesian anthropology and ethnology.

The people at all times have stoutly maintained that their ancestors came in boats from over the sea, but from which islands, or what direction, they have no knowledge whatever. With them they brought a few of the plants of the land of their origin, including two varieties of bananas, the yam, the "ki"; "hauhau," from which they made fish line; perhaps the "tolomilo," of which wooden idols were made, and of special interest in this connection a species of mulberry or "mahute," determined by Professor Francisco Fuentes, botanist of the University of Chili, as *Broussonetia papyrifera* Vent.

From the bark of the "mahute" the natives made a rough grade of tapa cloth. This shrub or small tree, now bordering on extermination on this island, was planted by the natives in the most favorable localities for moisture and soil and tended with great care. A few clumps are still living in the great

* These notes, dated February 7, 1920, were received from Mr. Bryan with the request that they be published in connection with description of the beetles, six specimens of which were sent. (Ed.)

crater of Rana Roa and in scattered lava caves at various places about the island.

The dead and dying twigs of all the trees examined were found more or less infested with a species of bark beetle which seemed to be entirely attached to this one species of growth. None of the other vegetation, native or introduced, was in the least attacked by it. Moreover, the only species of land shell* found on the island, was also found in the channels formed by this beetle in the dead twigs at the ends of living branches and in the decaying limbs under the trees, and nowhere else.

We thus have a beetle and a land shell apparently definitely attached to a plant of ancient native introduction. Doubtless the three were brought to Rapanui by the natives at the time of their first settlement on the island. The locating of a land where these three objects occur intimately associated will go far towards solving the location of the ancient home of the native inhabitants, and furnish indirect testimony of a convincing and novel character, tending to solve a question of very great interest and importance among students of the origin, life, migration and distribution of the primitive inhabitants of the great Pacific Ocean.

* Living specimens of the land shells were sent to Dr. Pilsbry, Academy of Natural Science, Philadelphia, for critical study and determination of the species, and to Professor William Clapp of the Museum of Comparative Zoology, Cambridge, Massachusetts, for study of dentition, etc. Specimens of the plant, beetle and shell will subsequently be deposited in the Bishop Museum.

A New Bark Beetle From Easter Island (Coleoptera, Cossonini).

BY O. H. SWEZEY.

Sericotrogus bryani n. sp.

Color black, more or less shiny; antennae, legs, and anterior margin of pronotum red-brown.

Head globular, smooth and shiny and bearing minute sparse punctures, mostly enclosed in the prothorax. Eyes very convex, prominent, wide apart. Rostrum short, about two-thirds the length of prothorax, stout, slightly curved, sides nearly parallel, a little widened at apex, strongly punctate, the punctures in front of the antennae smaller, those behind antennae larger, the surface almost rugose. Antennae situated just behind the middle, scrobes deep, extending more shallowly to beneath eyes; scape reaching to posterior margin of eye, clavate, nearly straight; first joint of funicle about equal in length to second and third together and about twice as wide as second, third shorter than second, fourth and fifth subequal a little wider than third; club distinct, oval, clothed with white hairs, a few white hairs also on the funicle. Prothorax about one and one-fourth times as long as broad, slightly constricted a little behind the apical margin (the constriction more in evidence ventrally), behind the constriction widening evenly to beyond middle than narrowing roundly to the truncate base; dorsum slightly flattened; punctate with coarse deep punctures, smaller anteriorly, the apical margin impunctate, the sides longitudinally rugose; clothed dorsally with sparse golden decumbent hairs, arising from the punctures, absent in middle of disk (probably abraded) where interspaces are wider, smooth and shining. Elytra about twice as long as wide, wider at base than base of prothorax, truncate with slight humeral prominences, sides nearly parallel, slightly narrowing from base to two-thirds, then more rapidly to the rounded apices; striae moderately deep, interspaces wide, flat, more or less uneven, and their sides somewhat crenate; clothed with golden decumbent hairs in rows rising alternately from the striae and from small punctures in the interspaces. Under surface strongly and evenly punctate, smooth and shining between the punctures; metasternum with a median longitudinal line; ventral abdominal segments 1 and 2 joined, deep transverse grooves between segments 2-5. Legs moderate; all coxae wide apart, hind pair widest; femora clavate, unarmed; tibiae about two-thirds the length of femora, front tibiae shorter, all tibiae uncinate at apex; tarsi shorter than tibiae, third joint moderately bilobed. Length, including rostrum, 3 mm.; breadth, 1 mm.

Habitat.—Rapanui or Easter Island, January 20, 1920 (*W. A. Bryan*).

Proc. Haw. Ent. Soc., IV, No. 3, September, 1921.

Type in the collection of the Hawaiian Entomological Society; paratypes in the Bishop Museum, Honolulu. Described from six specimens (some of them broken) collected by Professor W. A. Bryan, under bark of *Broussonetia papyrifera.*

The genus *Sericotrogus* was erected by Wollaston in 1873 for the New Zealand species *subaenescens.* Several other species were described later on by Sharp and Broun, all from New Zealand. Some of these have been removed to other genera. The present species has resemblances to the other species of the genus, but differs from one and another of them in some details. It does not agree with the descriptions of the genera to which the species have been assigned that have been removed from *Sericotrogus,* and it may meet the fate of these, for it does not more nearly in all particulars exactly agree with Wollaston's description of *Sericotrogus* than some of them did.

NOTES AND EXHIBITIONS.

Mr. Giffard presented a letter from Prof. Osborn concerning the work on the Jassidae, in which the new Jassid from Kau, exhibited at the previous meeting, was mentioned as a representative of a new genus.

Mr. Clausen spoke of the status of *Popilia japonica,* or the green Japanese beetle, in New Jersey, of the attempt to control it, and of his forthcoming work in Japan in the search of parasites of this beetle.

Herse cingulata.—Mr. Ehrhorn exhibited a diminutive varietal specimen of the convolvulus sphinx, taken at Kahala on March 21, 1920.

Halimococcus sp.—Mr. Ehrhorn exhibited this Coccid, found very numerous in the crevasses of the bark of *Pritchardia kaalae,* at Makaleha, Mt. Kaala, in December, 1919.

Celerio perkinsi.—Mr. Bryan reported finding another specimen of this sphinx moth on March 7 on the ridge west of Nuuanu Valley, half way between Waiolani and Lanihuli peaks, it being the fourth specimen taken. The range of the species is now known to extend from Kalihi to Palolo, and a speci-

men apparently of this species was seen on the ridge west of Wailupe Valley on December 14, 1919.

Herse cingulata.—Mr. Bryan reported seeing this cosmopolitan sphinx moth pollinating the flowers of *Bauhinia spinosa* in the Normal School grounds. At about 6:20 one evening about 20 moths were seen hovering about the blossoms and on another evening about 30 moths were seen.

Kelisia emoloa.—Mr. Swezey exhibited three males and four females of this little Delphacid, collected by him on *Eragrostis,* at an elevation of 600 feet, on the ridge near the south shore of Kaneohe Bay, March 14, 1920. This is a new locality record for the species, it having been collected previously at Kuliouou and Palolo.

Chalcis obscurata.—Mr. Swezey reported rearing this parasite from the chrysalids of *Pontia rapae.* Seven chrysalids were collected on leaves of *Capparis sandwicensis,* March 3, 1920, on the coral plain near Ewa. Five of these produced *Chalcis obscurata* and the other two died.

Calandra remota.—Mr. Swezey exhibited specimens of this weevil found in a decaying banana root at Kaimuki on March 10. Nine weevils were found in the decaying under part of the corm of a feeble standing plant. This is the first time the weevil has been collected by him in the lowlands.

Trichogrammatid in *Elimaea* eggs.—Mr. Swezey reported having found, on February 20, fourteen eggs of *Elimaea appendiculata* in one leaf of an ornamental vine in his garden at Kaimuki, all placed in close series, this being the largest number he had ever found in one place. Four of these eggs were parasitized by a small black Trichogrammatid, five to eight issuing from each egg.

Neoclytarlus indecens.—Mr. Bridwell reported rearing adults of this beetle from *Smilax* twigs from Mt. Kaala, the bulk of the specimens dying within the dry twigs. Two specimens matured in jonts of sugar cane to which they had been transferred. He further emphasized the importance of this method of rearing native plagithmysine larvae, first devised by Mr. Swezey.

Ischiogonus palliatus.—Mr. Bridwell reported this to be

a common parasite of plagithmysine larvae and specifically mentioned it as a parasite of *Neoclytarlus indecens* in material of *Smilax* twigs from Mt. Kaala.

Eupelmus sp.—Mr. Bridwell also reported rearing a native species of *Eupelmus* from *Neoclytarlus euphorbiae* from Ewa Coral Plain.

Bruchidae.—Mr. Bridwell spoke of the serious increase of *Bruchus sallaei* in kiawe pods in Oahu. He reported that *B. limbatus* proves to be generally distributed on this side of Oahu, and that it occurs in the seeds of *Albizzia lebbek,* an Oriental tree, as well as in the seeds of the monkey pod and opiuma. It has also been bred artificially in the seeds of the gluebush and kiawe. It is striking that so many American southwestern species have become established here and attack plants or trees quite diverse. Mr. Bridwell further reported finding *Caryoborus* breeding sparingly in the seeds of *Caesalpinia sepiaria,* the wait-a-bit thorn, in the Kaukonahua gulch.

Coptotermes intrudens.—Mr. Ehrhorn reported on finding this termite destroying sweet corn in a garden on Sand Island. A pile of old lumber near-by was riddled by the termite, and this was probably the source of the colony attacking the corn.

Mr. Giffard spoke of the growing importance of white ants in the Islands, and Mr. Bridwell reported on what might be considered serious injury in the native forest by *Calotermes castaneus,* as he had found this species attacking living wood.

MAY 6th, 1920.

The 176th meeting of the Hawaiian Entomological Society was held in the entomological laboratory of the Hawaiian Sugar Planters' Experiment Station. President Crawford occupied the Chair and other members present were Messrs. Bryan, Ehrhorn, Rosa, Swezey, Timberlake and Willard. In the absence of the Secretary, Mr. Timberlake was appointed Secretary pro tem., and the minutes of the previous meeting were read and approved.

President Crawford reported no further developments in the

effort to secure the presence of noted entomologists at the Pan-Pacific Scientific Congress.

Mr. Willard reported that the committee appointed to consider the use of the loquat as a forest cover in relation to the fruitfly menace had not been able to meet as a body. He, however, stated that the unanimous opinion of the members of the committee was to the effect that as a general proposition 'fruit trees, including the loquat, should not be used for reforestation purposes. In a lengthy discussion entered into by Messrs. Ehrhorn, Swezey, Willard, Crawford, and Dr. Lyon, who dropped in as a visitor, there seemed to be a feeling that the use of the loquat in reforestation might be under certain circumstances a distinct benefit with regard to the parasitic control of the fruitfly, although there was hesitancy among the members of the Society to recommend its use. Dr. Lyon stated that he had proposed the use of the loquat as a barrier along the lower edge of the native forest on the Hamakua Coast, and that there was no fruit-growing industry in that part of the island which could be menaced by a possible increase of the fruitfly. The matter was laid over to the next meeting for further consideration.

NOTES AND EXHIBITIONS.

Ammophorus insularis.—Mr. Swezey exhibited four specimens of this beetle collected in Kaimuki by Horace Sharp, April 5, 1920. More specimens had been collected and some sent for determination to Dr. E. C. Van Dyke at Berkeley, Calif., who considers them to belong to *A. insularis* Boheman. The species was described in 1858 from Honolulu and had never been collected since.

Celerio perkinsi.—Mr. Swezey exhibited an adult of this endemic Sphingid reared from a caterpillar captured on *Kadua,* in Waialae Iki Valley on March 21, 1920. He also exhibited a caterpillar collected on *Kadua* at the same place, on May 2, 1920, and an egg from which 22 parasites (*Trichogramma semifumatum*) had issued a few days after being collected. Four eggs were collected and all were parasitized.

Hypocala andremona.—Mr. Swezey exhibited a specimen of

this moth reared from a caterpillar collected on *Maba sandwicensis* in Waialae Iki Valley, March 21, 1920.

Sternochaetus mangiferae.—Mr. Swezey reported finding mango seeds in Hilo infested by the mango weevil and that Bro. Matthias told him that he had known of this weevil there for several years.

Teratura sp.—Mr. Swezey reported that this new Locustid immigrant at Hilo, Hawaii, was apparently on the increase. Several specimens could be secured any evening at the Hilo Hotel, where they came to lights. All specimens were females, however, and it was not possible to find a male. Brother Matthias is having the same experience with this insect.

Monocrepidius exsul.—Mr. Swezey reported an investigation of the damage to sugar cane by wireworms at Honokaa, Hawaii, in which it was found that the wireworms were the larvae of this Elaterid, which has hitherto been considered predaceous. They were found in cane fields eating out the eyes of recently planted seed cane. This was in an area of several hundred acres and would necessitate much replanting.

The investigation brought out the presence of larvae of the Olinda beetle (*Pantomorus fulleri*) in most of the fields, and it is likely that their presence was the primary cause of the presence of the wireworms. Both larvae were found generally distributed in the plantation, occurring in cane stools of fields being plowed; in the stubbles of fields recently harvested; in standing cane about a year old, as well as in the recently planted fields.

Specimens of the other wireworm, *Simodactylus cinnamomeus,* were scarce in the fields investigated.

Tachinid parasite of *Corizus.*—Mr. Swezey exhibited a small tachinid fly reared from an adult bug of *Corizus hyalinus.* Six of these bugs were collected on *Sonchus* at Puuloa, Oahu, on March 24, 1920. A maggot issued from each of three of these bugs, but only one produced a fly. This may be the undetermined tachinid that Dr. Perkins refers to in the Introduction of the Fauna Hawaiiensis. It has been collected by Mr. Swezey at Naalehu, Hawaii, in 1905, and by Mr. Williams on the Ewa Coral Plain in 1920.

Coptotermes intrudens.—Mr. Swezey exhibited the stump of a pigeon pea bush brought in by Dr. H. L. Lyon from his garden, which was infested by this termite. The roots were partially dead and with large excressences produced by nematodes. The termites had entered from below and worked up through the dead or dying heartwood and were continuing their channels on up into the living wood.

Mr. Ehrhorn reported that he had found this termite doing considerable damage in the lumber yards of the city, and that it always entered the lumber by covered runways connecting with the ground. He had experimented with carbon bisulphide poured into their channels and runways with such good results that the lumber company had continued the work of destruction by the same method.

Mr. Crawford inquired whether the species could establish new colonies by the swarming of the winged stages, and Messrs. Swezey and Ehrhorn believed that new colonies must be established in this way.

Black-banded Anthomyid.—Mr. Timberlake exhibited a series of this fly collected at Kaimuki during the past few months. He reported that this new immigrant is now rather common and can frequently be seen sunning itself on tree trunks, but it is rather difficult to capture.

JUNE 3rd, 1920.

The 177th meeting of the Hawaiian Entomological Society was held at the usual place.

In the absence of the President, Mr. Timberlake was authorized to conduct the meeting. Members present were: Messrs. Ehrhorn, Swezey, Timberlake, Rosa, Bryan, and Fullaway.

The minutes of the previous meeting were read and approved with corrections.

Mr. Swezey spoke of the plans concerning the Pan-Pacific Congress to be held in Honolulu in August.

ENTOMOLOGICAL PROGRAM.

A New Grass Leafroller, Omiodes giffardi (Lepidoptera).

BY O. H. SWEZEY.

Omiodes giffardi n. sp.

Male. 27-32 mm. Antennae brownish fuscous; palpi brownish fuscous, basal segment white below; head and thorax pale fuscous suffused with whitish; abdomen pale fuscous with white apical margins to segments, anal tufts of male dark fuscous; forewings fuscous suffused with pure white, the costa conspicuously fuscous, a darker fuscous oblique streak from tornus to cell and following the dorsal side of outer half of cell, then across end of cell, including discocellular fuscous dot; a fuscous dot about middle of cell; second line white nearly straight across wing at about three-fourths, followed by a stronger fuscous streak; a terminal series of dark fuscous triangular dots, situated between veins; cilia whitish fuscous, a little darker at base. Hindwings light fuscous, with a darker discal dot and a submedian whitish line bordered on both sides with darker fuscous; a nearly continuous terminal fuscous line; cilia as in the forewings. Legs cinereous.

Very closely similar to *O. accepta* (Butl.), but differs especially in the pure white suffusion of the forewings, whereas the whitish markings in *accepta* are with an ochreous tinge; the dark fuscous markings are about the same, but appear more distinct in *giffardi* on account of the contrast with the white suffusion. In *giffardi,* the dark fuscous suffusion beyond second line is not interruptedly paler on the veins as in *accepta.*

Described from three male specimens. Two collected at light by Mr. W. M. Giffard at his bungalow, Kilauea, Hawaii, September, 1911, and September, 1919. One reared by the writer from larva on a grass (*Isachne distichophylla*) at Kilauea, Hawaii, April 22, 1920. The caught specimens are somewhat broken; the reared specimen is the type.

Holotype in collection of Hawaiian Entomological Society; paratypes in collection of Hawaiian Sugar Planters' Experiment Station.

The first two caught specimens were considered by the writer as specially white forms of *accepta* (See Proc. Haw. Ent. Soc., II:235, 1913). When he discovered several larvae on the grass above mentioned at Kilauea, and succeeded in

rearing one moth from them, which was of this white form, he was convinced that this was a different species, especially as the larvae had different markings from those of *accepta,* there being more of the blackish markings on the thoracic segments. Unfortunately no description was made of the larvae, nor any of them preserved. More of these will be looked for on the next visit to the place.

This makes the fifth native species of *Omiodes* whose larvae feed on grass, the others being: *accepta* (Butl.), *continuatalis* (Wall.), *demaratalis* (Wall.), and *localis* (Butl.). Of these, *accepta* is the most abundant, and also feeds on sugar cane, sometimes doing considerable injury.

Notes on Proterhinus abnormis, a Leaf-Miner in Leaves of Broussaisia arguta (Col.).

BY O. H. SWEZEY.

The larvae of *Proterhinus abnormis* Perkins mine the leaves of *Broussaisia arguta* very abundantly on Mt. Kaala, the highest mountain on Oahu. On a trip there May 18, 1920, I collected a number of the beetles. They are found between the unexpanded leaves at the tips of growing branches of the tree. A few were found on the under side of mature leaves, where they oviposit. In doing this a small round excavation is made in the under side of the leaf, or in a vein, the egg deposited in the hole and covered with a little substance apparently obtained by chewing up the hairs and surface of the leaf in a circle about the place where the egg has been deposited. This circle is quite noticeable on the under surface of the leaf (Fig. 1a). Sometimes it is a ring 3-5 mm. in diameter, but frequently the whole surface of the circle has been chewed over and has a pale brownish appearance. There may be from one to ten of these per leaf.

The egg is whitish and very soft, about .4 mm. in diameter. The irregular mines are well shown in the figure (Fig. 1b). The larva is yellowish when full grown and ready to pupate.

Transformation to the adult takes place within the mine, usually where it is in the midrib.

Proterhinus phyllobius Perkins, which similarly mines the leaves of *Broussaisia arguta* on Tantalus, Kaumuahona and Olympus of the Koolau Range, does not make circles as above when ovipositing. The chewing on the leaf for material to cover the egg is done irregularly. This is the insect treated of in "A Leaf-Mining Proterhinus" in Proc. Haw. Ent. Soc., II:212 and 226, 1913. The name *P. excrucians* there used for it was apparently an error in determination.

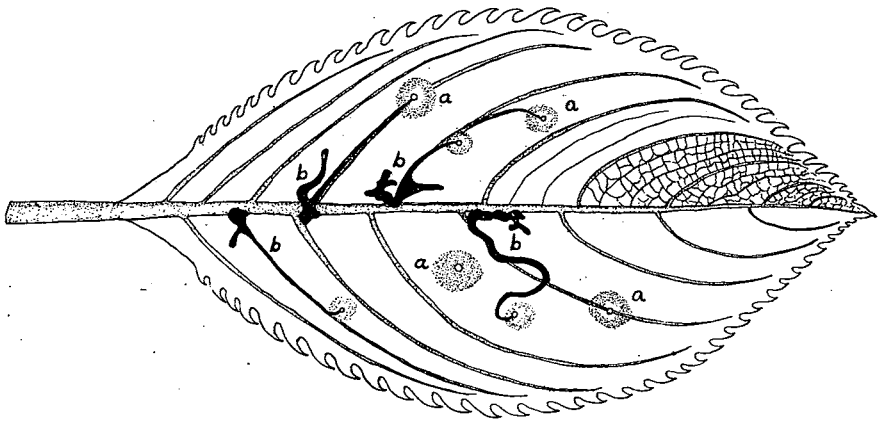


Fig. 1. Leaf of *Broussaisia arguta* with mines of *Proterhinus abnormis*.
a. Places where eggs have been inserted.
b. Mines produced by the larvae.

NOTES AND EXHIBITIONS.

Thoracaphis fici.—Mr. Fullaway placed on record the occurrence of *Thoracaphis fici* Van der Goot in Hawaii. Specimens were collected on *Ficus* March 22, 1918, by Mr. Van der Goot.

Toxoptera aurantiae.—Mr. Timberlake recorded finding *Toxoptera aurantiae* on the tender shoots of mango in Honolulu.

Nesodryas giffardi.—Mr. Swezey exhibited a nymph of this native Delphacid having a Dryinid larva on the under side of

the abdomen. It was taken May 30 at Waiahole on leaf of *Cyrtandra.* Two specimens were seen, but only one secured. This is the first instance of the occurrence of a Dryinid larva on the ventral side of a native Delphacid host, they usually being on dorsal side.

Calandra remota.—Mr. Swezey exhibited 65 specimens of this weevil found at base of one banana plant in his garden at Kaimuki, May 27, 1920. They were beneath the dried-up leaf sheaths, but apparently had matured from larvae that had fed in the corm below the surface of the ground.

Nesiomiris.—Mr. Timberlake exhibited a series of seven species of this endemic genus of Miridae, all of which are sufficiently similar to agree with the description of the single species described, *N. hawaiiensis* Kirkaldy. They are easily separated by the genitalia of the male, the characters being easily seen without dissection. The males are usually dark green and the females paler or more yellowish green. Two species have been found on Oahu, on *Byronia* and *Reynoldsia,* three taken on Haleakala, Maui, one of these on *Byronia,* and three collected in Kona and Kau, Hawaii, on *Byronia, Cheirodendron,* and *Reynoldsia,* the one on the last-mentioned tree being the same as the Oahu species on the same plant.

Maui and Hawaii Insects.—Mr. Timberlake exhibited a collection of insects made during the summer of 1919 on Maui and Hawaii. In the collection was a specimen of *Sulamita lunalilo,* taken on *Freycinetia arborea,* at Kealakekua, Kona, Island of Hawaii, 3500 feet elevation; also a specimen of *Orothreptes callithrix,* taken on *Pisonia,* in the same locality.

JULY 1st, 1920.

The 178th meeting of the Hawaiian Entomological Society was held in the usual place. In the absence of the officers, Mr. Giffard presided and appointed Mr. Timberlake as acting Secretary. Other members present were Messrs. Ehrhorn, Muir,

Rosa, Swezey, Wilder, and Willard, with Mr. L. A. Whitney, visitor.

The minutes of the previous meeting were read and approved with a few minor corrections.

Mr. Ehrhorn brought up for the consideration of the Society whether the Coccid, *Antonina australis,* brought back from Australia by Mr. Muir, should be liberated. Mr. Muir stated that he had observed a field of sugar cane in ratoon in which the *Antonina* had killed 90 per cent of the nutgrass and prevented it from flowering. He had also observed that the nutgrass in cane fields is all seedling and that as soon as it forms corms the Coccid begins to multiply and gradually kills it off. Mr. Muir further stated that he had never found it on sugar cane, but had found it on various grasses and other Cyperaceae. On the other hand, he had observed that the nutgrass is quite as bad in Australia as in Hawaii. Mr. Giffard also mentioned that the *Antonina* was recorded on buffalo grass, which is a valuable forage grass in Hawaii. The question was laid over for further discussion. Mr. Muir stated further that the species on grass brought from Australia is distinct from the one on nutgrass.

NOTES AND EXHIBITIONS.

Thoracaphis fici.—Mr. Ehrhorn mentioned that this aphid on *Ficus* had been known previously and was collected by Dr. Perkins some ten years ago.

Amblychila baroni.—Mr. Giffard exhibited a specimen of this tiger beetle taken in the Huachuca Mountains, Arizona, which he was presenting to the H. S. P. A. collection to take the place of the type specimen turned over to the California Academy of Sciences from the Baron and Harford collection. He also spoke of the rarity of this species in collections, and read a few extracts from the writings of Walther Horn concerning the latter's quest for it.

Corixid from Queensland.—Mr. Muir exhibited specimens of a *Corixid* which he had collected in North Queensland. He stated that this species is interesting in that it kept down all

mosquito larvae in standing water, but that it is not found in temporary pools or puddles.

Sternochaetus mangiferae.—Mr. Swezey spoke of the prevalence of the mango weevil during the present season. Thus out of ten mango seeds from Kaimuki he had found all infested, and out of ten from Kalauao all were infested. Mr. Wilder stated that he had also noticed that the weevil was very prevalent this year.

Fleas on mongoose.—Mr. Swezey exhibited specimens of an unidentified flea found recently on a young mongoose at Manoa Valley.

AUGUST 12th, 1920.

The 179th meeting of the Hawaiian Entomological Society was held in the usual place.

Present: Crawford, presiding; Williams, Grinnell, Muir, Osborn, Swezey, E. H. Bryan, Rosa, and Fullaway.

Reading of minutes of previous meeting deferred.

A vote of thanks was passed to Mr. Swezey for editing the Proceedings for 1919.

Mr. L. A. Whitney was unanimously elected to active membership in the Society.

ENTOMOLOGICAL PROGRAM.

Preliminary Notes on the Genus Tephritis in Hawaii (Diptera).

BY E. H. BRYAN, JR.

The Fauna Hawaiiensis records three species of *Tephritis* in Hawaii. Of these *T. crassipes* had been described as *Trypeta crassipes* by Thomson in Kongliga Svenska Fregatten Eugenies Resa Omkring Jorden, part II, page 583, the Zoological results of the voyage of the Frigate l'Eugenie around the world in 1851-1853. Grimshaw placed this in the genus *Tephritis* and added the two new species, *T. limpidapex* and *T. cratericola.*

February 3, 1910, Mr. Terry, who had done some very valuable work on Hawaiian Diptera, exhibited specimens and read a note on "A New Oahuan Trypetid, *Tephritis dubautiae*," before the Hawaiian Entomological Society. (See Proceedings, II:147, 1912.) This paper was not published at the time, and it, with many other valuable notes, became lost at the time of Mr. Terry's sudden death on November 7, 1911. His specimens, however, have been preserved, and we have endeavored to redescribe these, using the original name of *Tephritis dubautiae.*

In 1906 a specimen of *Tephritis,* totally distinct from any of these four, was captured in Palolo Valley, the collector being unknown. In 1912 Mr. Swezey added two more specimens, one in March from Kaumuahona and one in September from Pacific Heights on *Dubautia.* On November 17, 1918, Mr. Swezey bred three more specimens from *Dubautia* taken on Kaumuahona. Although these specimens are not identical in wing pattern, yet in our mind they are similar enough to constitute a single species, which we here describe as *Tephritis swezeyi.* Another specimen taken August 29, 1918, by Mr. Swezey on Haleakala is similar, but cannot be placed in the same species. All these specimens are characterized by very dark fuscous wings, bearing an irregular number and arrangement of hyaline spots.

KEY TO THE HAWAIIAN TEPHRITIS.

a. Wings without large, conspicuous, fuscous spots; pattern—a simple network; front purplish; thorax and abdomen slaty-gray. *Tephritis limpidapex* Grimshaw

a′. Wings with two large fuscous spots; the larger extending from costa to 4th longitudinal vein, toward the apex of the wing, beyond the posterior cross-vein, containing one or more small hyaline spots; smaller fuscous spot in the 3rd sub-costal cell; spots and margins of wing connected by fuscous network; front yellow or reddish-brown.

b. Legs dark, black or reddish-brown; abdomen elongate, terminal segments shining black; antennae black. *Tephritis cratericola* Grimshaw

b′. Legs light, yellow-brown; abdomen and thorax plum colored, with white tomentum; front and antennae yellowish.

c. Size larger (length 4 to 5 mm.); 3rd sub-costal cell with hyaline spot in apex. *Tephritis crassipes* (Thomson)

c′. Size smaller (length 2 to 3 mm.); fuscous spot in 3rd sub-costal cell encloses a large hyaline spot in its center, leaving only a ring of fuscous. *Tephritis dubautiae* sp. n.

a″. Wing entirely dark fuscous, with a variable number and arrangement of hyaline spots; thorax bluish gray, white shagreen, with three darker longitudinal stripes; abdomen concolorous, last segment in female shining brown. *Tephritis swezeyi* sp. n.

DISTRIBUTION OF THE SPECIES OF TEPHRITIS IN HAWAII.

Tephritis crassipes (Thomson).

Hawaii: Kona, 4000 ft. (*Perkins*); Pahala, Hakalau (*Swezey*).

Kauai: 2000-3000 ft. (*Perkins*).

Oahu: Honolulu (*Thomson, Bridwell*); Waianae Mts., 3000 ft. (*Perkins*); Honolulu, on *Coreopsis* (*Terry*);

Honolulu and Mt. Tantalus (*Giffard* and *Terry*); Palolo, ex *Campylotheca* (*Swezey*); Konahuanui, Mt. Olympus, on *Campylotheca,* Manoa ex *Bidens,* Kuliouou on *Lipochaeta calycosa,* Mt. Kaala (*Timberlake*); Kaumuahona (*Bridwell*).

Maui: Kaupo Gap, 7000 ft., Hana (*Terry*); Haleakala Crater (*Terry* and *Swezey*); Kipahulu (*Swezey*).

Tephritis cratericola Grimshaw.

Maui: Haleakala Crater, from Silver sword (*Perkins, Terry* and *Swezey*); Gulch near Puu Nianiau, 6200 ft., rim of Haleakala Crater, 8000 ft., swept from *Eupatorium* (*Timberlake*); Haleakala, 10,000 ft., ex *Raillardia* (*Rock*); Gulch near Puu Nianiau, 6200 ft., ex flower head of green sword (*Swezey*).

Hawaii: Kilauea on *Raillardia* (*Swezey*).

Tephritis dubautiae sp. n.

Oahu: Ohulehule, Koolau Range ex *Dubautia plantaginea* (*Terry*); Wahiawa ex *Campylotheca* (Forbes); Lanihuli (*Bridwell*); Kaumuahona, Rooke Valley, Mt. Kaala ex *Dubautia* (*Swezey*).

Tephritis swezeyi sp. n.

Oahu: Palolo, Olympus, Pacific Heights, Kaumuahona ex *Dubautia* (*Swezey*).

Tephritis sp.

Maui: Haleakala (*Swezey*).

Tephritis dubautiae sp. n.

Tephritis dubautiae Terry. Proc. Haw. Ent. Soc. II, p. 147, 1912. (Nomen nudum).

Long. 2-3 mm. al. 2½-3 mm. Front dark cinereous, much excavated between the orbits; orbits lighter, each bearing five bristles. Occiput with single row of pale setae. Face cinereous; proboscis and palpi light yellowish. Antennae yellow-brown, basal joints paler.

Thorax bluish-gray, with fine white pubescence; each side with 9

macrochaetae:—1 humeral, 1 praesuteral, 1 notopleural, 1 supraalar, 1 interalar, 1 postalar, 2 dorsocentral, 1 scutellar.

Abdomen flat; (male) ovate in outline, (female) with long, pointed ovipositor; fuscous or similar to thorax in color, covered with white hairs.

Legs entirely yellow-brown; middle tibia spurred.

Wings hyaline, with much lighter fuscous, reticulate pattern than *T. crassipes* or *T. cratericola*, but similar to them. The spot in the apex of 3rd sub-costal cell encloses a large hyaline spot, which reduces it to a fuscous ring. The large subquadrate fuscous patch toward the apex of the wing, between the costa and 4th vein, includes from none to 4 small hyaline spots along the costal and apical edges. It sends forth two fuscous rays to the apex, along the 3rd and 4th longitudinal veins, and three toward the posterior border of the wing, (2 crossing middle of 2nd posterior cell and 1 along posterior transverse vein). Remaining posterior reticulations very pale.

Habitat:—Oahu: Ohulehule, ex *Dubautia plantaginea* (*Terry*); Wahiawa, ex *Campylotheca* (*Forbes*); Lanihuli (*Bridwell*); Rooke Valley, Kaumuahona and Mt. Kaala ex *Dubautia* (*Swezey*).

Tephritis swezeyi sp. n.

Long. 4½-6 mm. al. 5-6 mm.

Front fuscous and light brown, vertical triangle purplish, with 3 ocelli shining reddish brown; frontal orbits of eye lighter, each bearing 5 large, black bristles; 2 smaller, forward pointing vertical bristles; occiput with single row of pale setae; proboscis, palpi and cheeks yellow-brown, covered with small black bristles; antennae with the two basal joints yellow-brown, third joint subovate, fuscous, with a dorsal, slightly pubescent arista.

Thorax bluish gray, white shagreen and with white pubescence; three more or less distinct, darker longitudinal stripes, much enhanced by the absence of the white pubescence; median stripe narrower and less distinct, scutellum concolorous, with a broad wedge-shaped, darker central band. Ten macrochaetae on each side as follows: 1 humeral, 1 post-humeral, 1 notopleural, 1 supraalar, 2 dorso central, 2 postalar and 2 large scutellar. Plurae light fuscous, halteres yellow-brown. Legs entirely yellow-brown; apex of middle tibia with single large bristle and crown of shorter spines.

Abdomen same color as thorax or lighter, covered with white pubescence and small black hairs, and with strong black bristles on the margins of the segments and sides. Last segment of female dark brown, shining, longer than two preceding segments, bluntly pointed and covered with fine black hairs. Last segment of male abdomen sheath-like, covering genital segments.

Wings fuscous; anterior half darker. Dark fuscous spot in apex of

sub-costal cell. Covered with a variable number and arrangement of white spots, the most constant being as follows: Marginal cell with 6-8 small white spots near costa; 1st submarginal cell with 4-6 small spots in basal half and two at apex near costa; 2nd posterior cell lighter fuscous with 6-8 white spots; discal cell with 12-15 white spots of various sizes; 3rd posterior cell with 10-14 large white spots, roundish; anal and axillary cells, which are separated by a short 6th vein, each with 4 large white spots on a light fuscous field.

Habitat:—Oahu: Palolo, Olympus, Kaumuahona, and Pacific Heights (*Swezey*). The larvae are found singly in terminal buds of *Dubautia*.

Tephritis (Trypeta) crassipes Thomson.*

Dark fuscous, bluish gray, head with antennae and feet yellow, wings white, moderately reticulated with fuscous, with 2 large costal spots of blackish-brown including a white spot on the costa, and sending out 2 lateral rays toward the apex of the wing.

Habitat:—Honolulu.

The ornamentation of the wings similar to *T. leontodontis*, with the anal cell not at all angulated beneath; scutellum with 2 bristles, front on both sides with a row of 5 bristles, usually distinct. Head as broad as thorax, pale yellow-brown, occiput almost truncate, red-brown over the middle; front a little longer than broad, with 5 bristles on both sides, the epistoma short, furrows of the antennae parallel, sufficiently discrete; peristome somewhat rounded, proboscis short, never jointed, pale; eyes rather large, descending below, frontal orbit directed anteriorly, almost converging, facial ones a little diverging. Antennae short, somewhat deflected, bases almost contiguous, pale yellow-brown, 3rd joint rounded, apical angle slightly obtuse. Thorax fuscous, humeri paler, densely clothed with bluish gray, plum colored pubescence; a pair of dorsal bristles placed a little before the middle; scutellum somewhat acute at the apex with 2 bristles.

Wings somewhat hyaline, partly reticulated; base dotted and streaked with 5-6 brown lines; costal spot fuscous, including a white spot at the apex of the sub-costal cell; obliquely below are 5 or 6 white spots. The superior spots are small, sometimes obsoletely noticeable. The posterior spot somewhat round, dark fuscous, including a little spot adhering to the border at the apical marginal branch. Anterior band and four larger costal spots sending out 2 broad diverging branches toward the apex, including a white spot and sending below two entire branches. Infuscation of discal transverse nerve quite broad, 2 whitish spots below cohering with the posterior spot and the common transverse vein. Costal abscission

* Translation from Eugenies Resa, Part II, p. 583, 1868.

armed with two distinct spines; 5th vein half as long again as the 6th; postcosta (sub-costa) reaching the middle of the wing; arms and branches of the cubitus submarginal plainly parallel behind. Transverse vein of the discal cell never behind the middle of the wing, but situated behind the end of the sub-costa, prolonged to the 5th posterior cell. Anal corner almost straight below.

Abdomen fuscous, covered with bluish, faun-colored pubescence and short, pale, depressed hairs. Apex of 5th segment decorated with 6 black spines; 6th segment of the female shining black, depressed, twice as long as the preceding. Feet rather powerful, pale yellow brown. Anterior femora fitted below with 4 or 5 bristles.

On Some Delphacidae from South India (Homoptera).

BY F. MUIR.

Through the kindness of Mr. E. A. Butler I have received a small but interesting collection of Delphacidae made by Dr. T. V. Campbell in British India. It consists of eight genera and ten species, one genus and four species of which I consider as new. *Columbisoga campbelli* was taken at an elevation of 8000 feet in South India, and its nearest ally is known from 10,500 feet in Columbia, South America.

My thanks are due to Dr. Campbell and Mr. Butler for the collection.

Measurements are from the apex of vertex to apex of abdomen, and from the base to apex of one tegmen. The types have been deposited in the collection of the Hawaiian Sugar Planters' Experiment Station, Honolulu.

TROPIDOCEPHALINI.

Tropidocephala signata (Distant).

Orchesma signata Distant (1912) A. M. N. H. (8). IX, p. 192; (1916) Faun. Brit. Ind. Rhynchota VI, p. 142, f. 102. Two female specimens from Chikkaballapura, South India (*T. V. Campbell*).

As the genus *Tropidocephala* stands at present I am unable to separate it from *Orchesma*. Distant (1916 t. c. p. 465) uses

the proportion of length to breadth of the face, but as this varies with the length of the vertex, it is of no generic value.

The species in the collection of the Hawaiian Sugar Planters' Association, Honolulu, can be divided as follows:

a. Apex of face truncate, no keel dividing the face from clypeus; clypeus in profile in line with face or but slightly angled. *T. brunnipennis; dryas; festiva; saccharivorella; neogracilis; atrata; nigrocacuminis; malayana; butleri; indica.*

b. Apex of face rounded, the lateral carinae continuing to middle and forming a carina between face and clypeus; clypeus in profile nearly at right angle to face. *T. amboinensis; saccharicola; neoelegans; neoamboinensis; baguioensis; pseudobaguioensis; formosana; signata.*

I have not seen *flaviceps* Stal, the type of the genus, so I cannot say into which of the groups it will fall, and Stal's description gives no indication. Fieber [1] in describing the genus as based upon *elegans* Costa, says: "Front transversalement convex audessus du clypeus," which would very well describe the condition found in group B. If *flaviceps* belongs to group A and *elegans* to group B, then it might be convenient to use Costa's genus *Nephropsia*. The type of *Orchesma* Mel., *marginepunctata* Mel., comes into group A. Until these three types have been compared and adequate distinctions pointed out, I shall group them all under the one name.

Tripidocephala butleri sp. n.

Male. Macropterous; vertex three times the length of pronotum, carinae of vertex large, face slightly narrowed near base between eyes, apex truncate, no carina dividing it from clypeus; carina across gena obscure; clypeus rounded, tumid, without carinae; a distinct carina from behind eye to tegula making the pronotum 5-carinate.

Pygofer in profile entire, very shallowly emarginate on dorsal edge, medio-ventral edge deeply and roundly emarginate with the corners slightly produced and a small spine-like projection from the bottom of the emargination; anal segment small, hind margin straight all round, a single, strong, curved spine arising on right side near base and lying along side the aedeagus; the latter is semitubular, thickest at base, curved and slightly recurved at apex; genital styles similar to those of

[1] Rev. Mag. Zool. 1875 (3). III, p. 368.

T. saccharicola Muir,[1] broadest at base where there is a small projection, situated far within the pygofer.

Orange buff or light cadmium orange, carinae of vertex and thorax lighter with a small fuscous mark on each side of median carina at apex of vertex; apex of first joint of antennae and two rings on second fuscous; apices of genital styles black. Tegmina hyaline, light cadmium over cross veins and median portion of apical cells, a narrow, faint mark from middle of costal cell to apical portion of clavus and over apical portion of claval cells, a black spot at apex of first and second subcosta, radius and first media, a black mark on hind margin beyond clavus broken by the light Cu 1a; veins light, granules fairly numerous, white, bearing white macrotrichia; wings hyaline with brown veins. Length, 2.8 mm.; tegmen, 3.4 mm.

Female; macropterous. In color light green in place of cadmium orange. Tegmina hyaline with exceedingly faint or no markings, the black spots at apex of subcosta, radial and first media minute; no dark mark on hind margin beyond clavus. Length, 3.3 mm.; tegmen, 3.4 mm.

Described from three males and three females from Kodai Kanal, South India *(T. V. Campbell)*. Type No. 1024.

Tropidocephala indica sp. n.

Male. Macropterous; vertex 1.4 times the length of pronotum; pronotum 5-carinate the shoulder carinae from back of eyes to tegulae distinct; no carina dividing frons from clypeus.

Genitalia on the same plan as *T. butleri*, the medio-ventral emargination of pygofer wider with the projection at bottom larger and broader; the genital styles more slender and the apex turned nearly at right angle, the basal projection larger with its apex long and acute; anal spine thin and curved.

Cadmium orange; carinae lighter, the medium carinae of vertex and nota distinctly edged with black; apex of first and two thin rings on second antennal joints black; the projection at bottom of medio-ventral emargination of pygofer, the apices of genital styles and the spine-like projection at base, black. Tegmina hyaline, slightly tinged with cadmium orange, veins slightly darker, granules fairly numerous, irregular and bearing dark macrotrichia; wings hyaline, veins brown. Length, 2.2 mm.; tegmen, 3.2 mm.

Female; macropterous. Similar to male but the color less bright, nearer to raw sienna. Length, 2.7 mm.; tegmen, 3.2 mm.

Described from two males and two females, the type couple from Kodai Kanal, the others from Devadaga Drug, South India (*T. V. Campbell*). Type No. 1025.

[1] Proc. Haw. Soc. II. 5, (1913). Pl. 6, figs. 7, 7a.

The above described species differ from all others of the genus that I am acquainted with by having a distinctly 5-carinate pronotum.

Columbisoga gen. n. figs. 1, 2, 3.

Type *campbelli*. Width of vertex at base but slightly greater than length, apex half the width of base, sides straight, apex projecting angularly in middle showing the small V at base of face, an obscure, simple carina down middle, a small pit on each side near base; base of vertex sinuous, about middle of eyes; length of face three times the width, widest in middle, sides slightly arcuate, lateral carinae distinct, median carina with a minute fork at base which projects beyond vertex in dorsal view; transverse carina on gena distinct; clypeus tricarinate on basal two thirds, curved on apical third; antennae barely reaching base of clypeus, both joints terete, second joint twice the length of first, first slightly enlarged at apex; pronotum tricarinate, lateral carinae convergingly curved, reaching hind margin, a small pit on each side near middle; mesonotum tricarinate; hind femora not reaching to apex of abdomen, much shorter than tibia, tarsi shorter than tibiae, first tarsus about equal to the other two together, spur nearly as long as first tarsus, thick, concave on inner surface, a small tooth on apex, none on hind margin. Media touching both radius and cubitus; forking of subcosta and radius and the forking of cubitus about the same level.

This genus belongs to the Tropidocephalini and comes near to *Columbiana* Muir[1] and *Sogatopsis* Muir,[2] but nearer the former. It can be distinguished from *Columbiana* by its longer and narrower face, by the shape of the vertex which has an obscure, simple median carina and no Y, and by the lateral carinae of the pronotum curving inward and reaching the hind margin. *Sogatopsis* can be distinguished from it by the angular basal joint of antenna, the rounded apex of vertex, shorter face, and the presence of a cross-vein between the media and radius and media and cubitus.

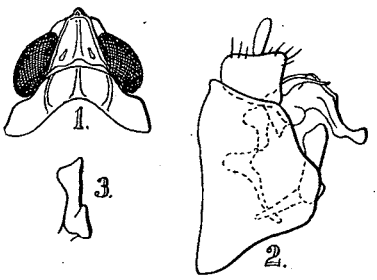
Columbisoga campbelli sp. n. figs. 1, 2, 3.

Male. Macropterous; light chestnut, lighter over carinae of vertex and thorax, especially the median carinae; abdomen darker. Tegmina dark chestnut except the hyaline spot over the middle of median and extending into radial cell, and hyaline in first four apical cells; veins

[1] Can. Ent. 1919, p. 35, figs. 6-a, 7-a.
[2] Pro. Haw. Ent. Soc. II. 5. (1913) p. 247

darker with many irregular, small granules bearing black macrotrichia; wings hyaline with dark veins.

Pygofer with edge entire, opening about as wide as long; anal segment small, without spines; styles small, obliquely truncate at apex, narrowed slightly in middle with a small projection near base; aedeagus



Columbisoga campbelli.

1. Dorsal view of head and pronotum.
2. Lateral view of genitalia.
3. Left genital style.

large, slightly compressed laterally, broadest at base, strongly curved before middle, the apex rounded, a strong curved spine arises from the dorsal edge of the base, curves over and lies along the left side. Length, 2.8 mm.; tegmen, 4.2 mm.

Female; macropterous. Similar to male but lighter in color, especially the tegmen; the granules along veins light in color. Length, 3.5 mm.; tegmen, 5.2 mm.

Described from two specimens from Dodabetta Hill, Ootokamund, Nilgiri Hills, South India, elevation 8000 feet. On bamboo (*T. V. Campbell*). Type No. 1026.

Pundaluoya ernesti (Kirby).

One male and one female from Chikkaballapura, South India (*T. V. Campbell*). The female is considerably lighter in color than the male and confirms my remarks elsewhere [1] that *P. simplex* (Kirby) is only the light colored female of *P. ernesti.*

[1] Can. Ent. (1919) p. 7.

DELPHACINI.

Perkinsiella insignis (Distant).

Pundaluoya insignis Distant (1912) A. M. N. H. (8). IX, p. 190; (1916) Faun. Brit. Ind. Rhynchota VI, p. 135; Muir (1919) Can. Ent., p. 7.

One male specimen from Chikkaballapura, South India. The medio-ventral edge of pygofer forming a plate with each apical corner drawn out into a short, flat spine; the anal spines long and thin reaching nearly to base of genital styles which are slightly curved.

Phyllodinus pulchellus (Distant).

Pundaluoya pulchella Distant (1912) t. c. p. 190; (1916) t. c. p. 135; Muir Can. Ent. 1919, p. 7.

One female specimen from Chikkaballapura, South India (*T. V. Campbell*).

Sardia campbelli sp. n.

Male. Macropterous; head greatly produced in front, vertex half the length of thorax and abdomen, base slightly wider than apex, lateral carinae well developed, an obscure median carina on basal fourth faintly furcate at apex; frons long and narrow, lateral margins carinate and subparallel to near base where they become obscure, the lateral carinae of vertex contined on to middle of frons separate to middle where they form a single carina, in lateral view apex truncate, a carina from front of eye to near apex where it becomes obscurely fused with lateral carina of frons; clypeus small, tricarinate, curved at apex; antennae small, reaching base of clypeus, basal joint about as long as wide, second joint about double the length of first. Pronotum tricarinate, lateral carinae convergingly curved, not quite reaching hind margin. Tibial spur large, thin, laminate, with many small teeth on hind margin.

Black; antennae, legs and base of abdomen yellow or light brown. Tegmina black or deep fuscous, veins slightly darker with minute granules bearing black macrotrichia; wings lighter fuscous with dark veins.

Pygofer opening about as wide as long, margins entire, dorsal emargination deep with the anal segment sunk into it; anal spines slender, near together at base but not contiguous; genital styles flat, short, truncate at apex. Length, 3 mm.; tegmen, 2.7 mm.

Described from three specimens, one of them, the type, from Coonoor, Nilgiri Hills, 5000 feet elevation, and two from Lovedale, Nilgiri Hills, 7500 feet elevation, on grass in marshy places. Type No. 1027. I have taken Australian species in a similar situation in the lowlands.

Female. Brachypterous; vertex only one-third the length of thorax and abdomen. The median carina of face simple, otherwise the carination similar to the male. Tegmina reaching to posterior margin of sixth abdominal segment, rounded at apex.

Color similar to male but lighter, the carinae of head and thorax brown. Tegmina brownish with similarly colored veins. Length, 2.8 mm.; tegmen, 1.2 mm.

Described from two females from Kodai Kanal, South India. It is possible that they are the females of a distinct species, but only the capture of the male will settle the question.

There is a tendency for species of this genus to vary in the length of the head and this one only differs from the genotype in the amount of the elongation.

Gelastocephalus fasciatus (Distant).

Akilas fasciatus Dist. (1916) Faun. Brit. Ind. Rhynchota, VI, p. 138, f. 99.

One female from Kodai Kanal, South India *(T. V. Campbell)*. After comparing it with the type of *Gelastochephalus* Kirk. I can find no generic differences. The length and shape of the tegmina in these brachypterous specimens is not of generic value.

Megamelus furcifera (Horv.).

One male and one female, the former from Chikkaballapura and the latter from Nandidrug, South India *(T. V. Campbell)*.

A Dermestid Infesting Garden Seeds (Col.).

BY O. H. SWEZEY.

June 4, 1920. In a tin biscuit box (8″ x 9″ x 7.5″) in which Dr. H. L. Lyon had garden seeds stored, were found great numbers of a Dermestid * beetle. The garden seeds of various kinds had been placed in the box in 1918, late in the year. According to Dr. Lyon the box had not been opened during the intervening time. It is impossible to account for the great abundance of beetles, except that a very few unnoticed specimens were in one or more of the packages of seeds at the time when put in in 1918. The box was closed sufficiently tight so that it hardly seems possible that any beetles could have got in, especially as there was nothing which would seem to be attractive to them.

The box and contents were put in a fumigating box and fumigated with carbon bisulphide and all beetles killed before a thorough examination of contents was made. Among the packages of seeds were several that had not been opened, having come from W. Atlee Burpee & Co., Philadelphia, Pa. Others had been opened at some time and probably some of the contents used. They were mostly in paper packages but two or three were in cloth bags.

The seeds badly eaten were sweet corn, both in package and on the ear. The embryo part of the kernels was first eaten, then considerable of the starchy portion as well, so that there were only fragments of the kernels left. Yellow field corn was not so badly eaten, nor white Guam corn.

Other seeds badly eaten were:—Milo maize, tomato, ground almond, carrot, martynia, fordhook squash and bachelor button.

Seeds only slightly eaten:—Peas, radish, alfalfa, papaia, Swiss chard, Russian sunflower.

* Specimens were later sent to Dr. E. C. Van Dyke who determined it as *Eucnocerus anthrenoides* Sharp (?), a species found in Mexico and Panama. (Ed.)

Only broken seeds eaten:—Pumpkin and pole lima bean.

Seeds not eaten:—Golden wax bean, black wax bean, white egg-formed gourd, beet, bauhinia, red sunflower, climbing mallow and salsify.

This Dermestid had not previously come to our notice, but Mr. Timberlake finds that he has a specimen taken last year, probably at the Experiment Station laboratory. We are unable at present to distinguish the species, there being several species that are very similar.

New Maui Records.

BY O. H. SWEZEY.

Chrysopa sp.—The undetermined immigrant first recorded in Honolulu in 1919. Lahaina, July 6, 1920. Two reared from larvae on *Cassia gaudichaudii* infested with a mealybug, *Pseudococcus virgatus*. Puunene, July 9, 1920. A larva seen on cane leaf infested with *Aphis sacchari*.

Epyris extranea.—Hana, July 14. Taken on window. Previously known in middle and west part of Maui.

Megachile timberlakei.—2 males at Puunene, July 9.

Trypoxylon bicolor.—Waihee, July 11; Iao Valley, July 12; Keanae, July 17.

Hydrobius sp.—Iao Valley, July 12.

Caryoborus gonager.—Lahaina in Tamarind pods, July 6.

NOTES AND EXHIBITIONS.

Rhyncogonus blackburni.—Mr. Williams recorded the capture of 27 adults of this weevil on *Scaevola chamissoniana* on a hillock in Monoa Valley August 1, 1920. Heretofore they have usually been taken sparsely. They had been feeding on the *Scaevola* leaves and some were copulating.

Silaon rohweri.—Mr. Williams recorded finding a nest of this wasp in a cactus twig, part of the hedge around the grounds of Punahou College, Honolulu, July 20th, 1920. Five adults emerged later.

Cyrtorhinus mundulus (Bred.).—Mr. Muir stated that this predacious bug was introduced into Honolulu on June 21, 1920, to prey upon the eggs of *Perkinsiella.* The first liberation was on July 12th, 1920, at Ewa. Three weeks later recently hatched young were found.

**Nesithmysus* n. sp.—Mr. Swezey exhibited a specimen of an undescribed species of this recently described genus of Cerambycidae. The beetle was picked up by Mr. Chas. Haas on the upper part of the Wahiawa trail July 4, 1920. It will be the second species of this genus, the first species, *bridwelli,* being from Mt. Kaala of the Waianae Range.

**Nesithmysus* n. sp.—Mr. E. H. Bryan exhibited a specimen of another species of this newly described genus, which was captured by C. N. Forbes on *Pelea* on the west bank of Haipuaena stream, East Maui, elevation about 3100 feet, June 29th, 1920.

Ticks.—Mr. Bryan exhibited a long series of ticks caught by Mr. Stokes, who said they were infesting his dog's ears in Kaimuki, July 11th, 1920. He reported that the larger ones were slow, sluggish, and deeply imbedded in the flesh, making their removal difficult; the smaller ones were very lively and difficult to catch.

Phora sp.—Mr. Bryan exhibited a series of a species of *Phoridae* which were bred from a bottle of landshells, genus *Auriculella,* collected along Haipuaena stream, East Maui, June 29th, 1920. The bottle had been filled with alcohol, which subsequently leaked out. Whether the maggots lived through the alcoholic period or got in afterward is not known, although the bottle was tightly stoppered and was carried in a cigar box.

Nesotocus giffardi.—Mr. Swezey exhibited two specimens of this large weevil which he had cut out of a *Cheirodendron*

* These two species are described by Dr. Perkins on pages 503, 504 of this issue. (Ed.)

tree on the crest of the ridge where the Wahiawa-Kahana trail crosses the Koolau Range, July 4th, 1920. This is an extension of the range of this species. It had not previously been taken beyond the ridge on the west side of Nuuanu Valley.

SEPTEMBER 2nd, 1920.

The 180th meeting of the Hawaiian Entomological Society was held at the usual place.

Dr. Williams presided; other members present were Messrs. Giffard, Muir, Ehrhorn, Willard, and Fullaway.

Minutes of the previous meeting were read and approved.

Mr. Muir reported on the Scientific Congress in Honolulu.

ENTOMOLOGICAL PROGRAM.

Recent Observations on Plagithmysus Spp. and Nesotocus Munroi at Kilauea Hawaii (Coleoptera).

(With exhibition of specimens)

BY W. M. GIFFARD.

Numerous specimens of *Plagithmysus* and of *Nesotocus munroi* were recently collected by the writer during a short summer visit to some of the forest regions at Kilauea, Hawaii. These regions were all within a radius of approximately two and a half miles of the Volcano House, and included areas in the dry, intermediate, and wet forests. In addition are shown several single specimens taken at large and otherwise on previous visits to Kilauea.

Examples of all but the commonest of these will be sent to Dr. R. C. L. Perkins for final determination of the species so that they may, if possible, be added to our reference collections. The exhibit included the following species:

Plagithmysus	*darwinianus*	attached to	*Sophora chrysophylla.*
"	*varians*	"	" *Acacia koa.*
"	*bishopi*	"	" *Pelea* sp., also taken running on *Xanthoxylum* sp.
"	*vitticollis*	"	" *Perrottetia sandwicensis.*
"	*giffardi*	"	" *Suttonia* sp.
"	*lamarckianus*	"	" *Pipturus albidus.*
"	*bilineatus*	"	" *Metrosideros* sp.
"	*perkinsi*	"	" *Myoporum sandwicense.*
"	*blackburni* *	"	" *Sophora chrysophylla.*
"	*vitticollis* ** var. *longulus*	"	" *Bobea elatior.*

Two very desirable species viz.: *P. sulphurescens* and *P. vicinus,* captured in these forest regions by Dr. Perkins, were not observed and have yet to be re-taken in this and adjacent country. No examples of either of these last-named species are in local collections. *P. sulphurescens* is said to be attached to a species of *Urera,* and *P. vicinus* to a species of *Pelea.*

While the series of *P. vitticollis* exhibited were undoubtedly attached to a *Perrottetia* † when captured, yet this species has been taken before, somewhere in the neighborhood of Kilauea, on akala *(Rubus macraei),* and is so recorded. Further observation of *Rubus hawaiiensis* and *Rubus macraei* should be made by those who search for our native longicorns in and around Kilauea.

At Kilauea, *P. varians, P. bilineatus,* and *P. darwinianus* appear to be the most common of all the species in the region, although most of the others are not uncommon when the trees to which they are attached are found to be in the right condition for attack. Heretofore *P. perkinsi, P. vitticollis, P. giffardi,* and *P. lamarckianus* have been found by the writer to be the least abundant in individuals. No doubt the rare *P. sulphurescens* and *P. vicinus* will be taken in similar numbers

* The series of this species was taken in North Kona. It has not as yet been taken at Kilauea.

** This was taken in the dense wet forest in upper Puna.

† Taken from three trees in dying condition, all near each other.

when the right tree and region is discovered. *P. vitticollis* var. *longulus* so far as learned in previous years from Dr. Perkins, is quite common on *Bobea* in the dense wet forests of Puna. The few visits made by the writer in this particular region have not been very successful in so far as securing a series of that species. This, perhaps, is due to the large clearings which have been made in that forest region by homesteaders and farmers during late years, as well as to the fact that *special* search for longicorns has not been attempted by the writer up to the present time. The forests in the Puna region have, for the reason stated above, receded to such an extent as to make them in a large measure almost inaccessible in a day's outing from the Volcano House.

The fact that *P. blackburni* has not, so far as known, been seen or captured in the neighborhood of Kilauea, but only on the Kona slopes of Mauna Loa, and that it is attached, in the latter region, to the same tree as *P. darwinianus* is at Kilauea, is of interest. Perhaps it may be possible to secure some information as to this, as well as to all the other Kilauea species of *Plagithmysus,* from Dr. Perkins, and also secure from him an example of *sulphurescens* and of *vicinus,* both of which are badly needed in our reference collections. The same may be said of certain species from other islands.

The large series of *Nesotocus munroi* were all taken in the wet forest off *Cheirodendron gaudichaudii* growing in a recently burned area on a new homestead. The two trees observed were in a scorched and dying condition and in perfect condition for these insects, to which they are well known to be attached. A fair series of extraordinary large males were taken on one of the trees, without females, and the males seen in copula on the other trees were all of the ordinary size. The series represents both sexes about equally. The writer has visited scores and scores of *Cheirodendron* trees in the neighborhood of the wet forests at Kilauea during recent years, but he never found these attacked by *Nesotocus* when the tree was in a healthy condition. The same may be said of all trees to which *Plagithmysus* are attached.

Notes on Hawaiian Plagithmysides and Anobiides (Col.) with Descriptions of New Species.*

BY R. C. L. PERKINS.

The following notes have been made on examination of a small, but very interesting collection of Hawaiian Longicorns, submitted to me by Mr. O. H. Swezey, the greater number of the specimens being from the collection of Mr. W. M. Giffard. In most cases the trees from which the species were obtained have been carefully noted, but a considerable number of specimens were taken at large. The numbers attached to Mr. Giffard's captures are here quoted, but the order is not preserved, because the same species is sometimes sent under numbers that are not consecutive, owing to the different circumstances under which the individuals were obtained.

1. A dark specimen of *Plagithmysus blackburni* taken on bastard sandal wood *(Myoporum sandwicense)* on the high plateau (6000 ft) Puulehua, Kona, Hawaii, by J. F. Rock. Mr. Giffard's note says, "It was probably only resting on that tree." This is likely to be correct, as the species is common on Mamani *(Sophora chrysophylla)* in the neighborhood, being attached to that tree, and I have taken specimens on the wing on the plateau. Dark examples occur also on *Sophora* with the paler ones.

16. Three examples of a series taken on Mamani *(Sophora chrysophylla)* at Puuwaawa, N. Kona, Hawaii, are also *P. blackburni* and are quite similar to my own from that locality and from Mauna Loa.

17. Three examples from a series taken on Mamani *(Sophora chrysophylla)* near Kilauea, Hawaii (4000 ft) are rightly named *P. darwinianus,* and three others from a series of twelve (No. 15) taken from a dead tree, which could not be identified, but was not *Sophora,* are also typical specimens of the same. Under (19) are two examples of *darwinianus* from a series of *Plagithmysus* taken on *Xanthoxylum dipetalum*

* This paper by Dr. Perkins (dated Jan. 14, 1921) was received before going to press and is very appropriately included here. (Ed.)

in the above named district (the series consisting of *darwinianus* and *bishopi* mixed) and under (20) four other individuals from another series found on the same species of tree are also *darwinianus*. Whether this series consisted entirely of the latter or partly of *bishopi* I do not know. In July, 1906, I obtained one or two specimens of *darwinianus* on a dying *Xanthoxylum* tree which was full of *Plagithmysus* larvae. The tree was decaying and the bark gave out a strong odor. From material carried away I subsequently bred a series of *P. bishopi,* nine examples of which series I still possess. No specimen of *darwinianus* was bred, and I thought it probable that those I took were merely attracted by the scent, the species being abundant on *Sophora* near by, but Mr. Giffard's experiences lead one to suspect the probability of its breeding both on *Sophora* and *Xanthoxylum.*

14. Three examples of *P. bishopi,* being part of a series taken on *Pelea cinerea* near Kilauea, are quite ordinary, as also are two taken on *Xanthoxylum* from a series of mixed *darwinianus* and *bishopi* referred to above under (19). The series that I bred from the latter tree showed no differences whatever from another series (also bred) from *Pelea.*

13. The larger specimen taken at 1800 ft. Olaa, 19 miles from Hilo, Hawaii, resting on Mamake *(Pipturus albidus),* is a not uncommon variety of *P. lamarckianus,* in which the pubescent lines of the elytra are yellow and very wide basally, so that the insect closely resembles *sulphurescens* in appearance. It is, however, perfectly distinct from this, and *lamarckianus,* so far as I know, always has red antennae in this variety, while in *sulphurescens* they are black. Sharp has specially alluded (F. H. II, p. 111) to the alliance between these species.

13a. The second and smaller example is of the more black-legged variety, but also has flavescent lines of pubescence, and was taken on *Suttonia*—"no doubt an accidental capture"—at 3800 ft., Olaa. The flavescent color of the lines in *lamarckianus* is not a constant character of the species. I have myself bred specimens from the same piece of *Pipturus* both with pure white and with flavescent lines, and no doubt these soon fade to white, so that the latter color is likely to be more usual in

captured examples. In other species (e. g. *vitticollis*) yellow hairs are sometimes substituted for white.

18. Five examples of *P. giffardi* from a very long series obtained on dying *Suttonia (Myrsine* of Hillebrand's Flora) agree entirely with those that I obtained at a rather higher elevation and a few miles distant on the same tree. Mr. Giffard's great series, he informs me, exhibits no variation except in the color of the hairs of the hind tibiae, which is usual, and therefore no approach is made to the closely allied *P. sulphurescens,** which is attached to *Urera.* The species is remarkably constant.

11. Three examples from Olaa, 29 miles from Hilo on the way to Kilauea, being part of a large series collected on dying trees of *Perrottetia sandwicensis,* are typical *P. vitticollis* (except that in one the pubescent spots are yellow) as also is (9), one taken at large in the same locality (8) is a very unusual variety with the femora wholly red and (12) found on a dead *Pipturus* tree, standing near those of *Perrottetia* above mentioned, is a variety with the elytra to a large extent yellowish brown and the antennae, except the apical joints, similarly pale. This example does not differ much from a variety in the original series of *vitticollis,* captured by me on *Rubus* at a considerably higher elevation, and now in the collection at the British Museum.

The original specimens described by Dr. Sharp were all obtained from the native *Rubus,* on the stems of which they were running, and several of them were in copula. Later I took casual examples on the wing or settled on leaves or ferns in the forest about a mile and a half below the volcano along the Hilo road. Frequent search of the native *Rubus* there (imported species were not then evident) failed to yield the beetle and almost certainly those that I caught were stragglers from trees of *Perrottetia,* as Mr. Giffard's observations in the same locality would show.

7. A single specimen taken in Olaa, 19 miles from Hilo, on *Bobea elatior,* is *P. vitticollis* var. *longulus* of the ordinary

* The fig. in Fauna Haw. was, I believe, drawn from a *giffardi* included in the series of *sulphurescens.*

form. This variety was observed by me in great numbers in the same district, as well as in other parts of Puna and in the Hilo district, breeding always in *Bobea,* but in no other tree. No conspicuous variations were observed except that one example had the legs entirely black, and this occurred among numbers of ordinary individuals.

* 5 and 6. Three examples from above Waimea, Kauai, at elevations of 3300, 3500, and 4000 ft., each taken at large, are exactly similar to those taken by myself on Ohia-ha, in which they were observed ovipositing, and with those given me by Mr. G. C. Munro, which are now in the British Museum. Except in size and depth of coloring the species does not seem to vary greatly.

6a. Two examples taken by Mr. H. T. Osborn at Kokee, Kaui, and labeled *P. munroi,* agree with the original specimens. One of these was taken on ohia lehua and probably this is the food plant. As in *P. aequalis* the femora are either black or red.

4. A single example of *P. aequalis* from Kaholuamano, Kauai, is a typical specimen of the red-legged form. It was taken at large, but the species is entirely attached to *Acacia koa,* in the bark of which I have seen very large numbers ovipositing.

3. A single example taken "at large" at Kaholuamano, Kauai, is *P. ignotus,* originally discovered by Mr. G. C. Munro at a considerably lower elevation. Its food plant still remains unknown. The only specimens known have red femora, but whether the species is constant in this, like *concolor,* or variable, like *munroi, aequalis,* and *arachnipes,* remains to be discovered.

These Kauai species bear a very great superficial resemblance to one another, and even the larger *concolor* might in the case of smaller and darker individuals be easily confused in the field, if captured away from its food plant. The following table will distinguish the species on characters, which are visible to the naked eye and can be used by the collector.

* Exact determinations not given by Dr. Perkins. I suppose he means these to be *P. munroi.* (W. M. Giffard.)

Table for Separation of Kauai Plagithmysus.

1 (2) Metepisterna with a general clothing of fine white hairs, which do not form one or more very dense, definite, and conspicuous spots, though often more dense at the apex than elsewhere. (Hind femora rufescent, never black; the largest species.) ..... *concolor.*

2 (1) Metepisterna with a very dense and definite tomentose spot at the apex and sometimes one at the base, or else very densely covered over all or nearly all the surface.

3 (4) Hind femora with a very long, pallid (almost white) basal stalk, which is nearly half the length of the whole joint; surface of metepisterna concealed entirely (or almost so) beneath dense short hair or tomentum..... *arachnipes**.

4 (3) Hind femora with the stalk sometimes not thus pallid, or if so, then only about one-third the length of the joint; metepisterna with a dense tomentose spot at the apex and sometimes another at the base, but the middle bare.

5 (8) A single dense tomentose spot on the metepisterna at the apex, the rest bare. (N. B. There may be a spot on the mesopleura also.)

6 (7) Longitudinal stripes on either side of pronotal crest indistinct to the naked eye (the crest itself being covered with minute white hairs); pubescense along the suture of the posterior half of the elytra practically continuous, not forming distinct, separate spots..... *aequalis.*

7 (6) Longitudinal stripes of pronotum quite distinct to the naked eye; pubescence along the suture of the posterior part of the elytra forming distinct separate spots or flecks..... *munroi.*

8 (5) Metepisterna with a dense conspicuous spot in front and another behind (apically).
(Along the suture posteriorly the pubescense is broken up into separate spots, placed in a single row, while the basal part of the elytra is pubescent, but the hairs there are not grouped into well separated distinct spots, as they are in *munroi*) ..... *ignotus.*

The species of the *blackburni* group which occur on Hawaii, being subject to much variation in several cases, can generally

* These characters were taken from females, the only sex before me when the table was written. The female in this species is not like its allies in superficial appearance, but the male resembles them very closely.

be easily distinguished by the characters given in the following table. Very large numbers of all these species have passed through my hands but I cannot remember to have seen any doubtful specimen, although many have borne no indication of the food plant. No doubt extreme aberrations of some of the species may be found, which might not be distinguished by the table. Owing to the great variability in the size of the individuals, so far as possible the characters of different species should be compared in examples of about equal size, where the characters are comparative.

Table for Distinguishing Blackburni Group of Plagithmysus.

1 (10) Pubescent lines of the elytra rarely yellow and wide and in that case the antennae have more than the scape red.

2 (3) Elytra without distinct black or dark fuscous color between the furcation formed by the pubescent lines; antennae black, the scape at most sometimes more or less red.
(Elytra often entirely pale externally to the pubescent lines, more rarely these are margined with black outwardly; hind femora in one common variety conspicuously red on the apical portion, black in the middle, and unlike any other species in this case).....*varians.*

3 (2) Elytra distinctly black or very dark colored in the furcation; antennae often wholly or largely red (sometimes dull, dark red) but in extreme cases only the second joint is of this color.

4 (7) Hind femora wholly red, sometimes suffused with black, apically at the sides, but on the upper side the red extends to the apex.

5 (6) Basal joints of the antennae with the black, bristly hairs long, dense and conspicuous; usual food plant *Sophora* .....*darwinianus.*

6 (5) Basal antennal joints evidently less setose. (When series are placed side by side the present species appears to have the elytra evidently wider at the base than the preceding and its food plant is *Pipturus.*).....*lamarckianus ab.*

7 (4) Hind femora either largely or wholly black except the basal stalk, or at least with a considerable portion at the apex entirely black, even on the upper surface.

8 (9) Basal joints of the antennae with dense and very conspicuous bristly black hairs; hind femora normally black (except the basal stalk) and partially red-legged examples infrequent.
(On *Sophora*, Kona side of Hawaii).....*blackburni.*

9 (8) Antennae evidently less strongly setose, examples with largely red hind femora are common, though perhaps more are like typical *blackburni.*
(Pubescent lines of elytra either white or distinctly yellow being variable; food plant *Pipturus*).....*lamarckianus.*

10 (1) Antennae black or practically so throughout, except that in some examples the scape is pitchy or, more rarely, distinctly red; the pubescent lines on the elytra yellow and wide, not or hardly furcate at the base, though the basal edge is emarginate.

11 (12) Elytra yellow or rufescent basally and at the sides.
(Food plant *Urera.*).....*sulphurescens.*

12 (11) Elytra yellow at the sides as far forward as the base of the yellow pubescent marking or somewhat in advance of this, but black above from the base of this marking to the base of the elytra themselves.
(Food plant *Suttonia.*).....*giffardi.*

P. vitticollis is best distinguished from the var. *longulus* by the dense white clothing of the hind tarsi, that of the latter being black, sometimes with a few white hairs mixed, just as the other may have a few black ones. In life, *vitticollis* always appeared to me a brighter insect, owing, I think, to the rather greater development of the yellow pronotal stripes. So far as is known the var. *longulus* never produces varieties with more or less yellow elytra.

The species of *Plagithmysus* which are attached to *Pelea,* whether on Hawaii or other islands, are always distinguishable from the members of the *blackburni* group at the merest glance by the deep velvety black spot in the furcation of the pubescent lines of the elytra, which to my eyes gives them a more pleasing appearance than the others. The following form appears to be either a new species or at least a new race of *P. vicinus* Sh. Originally I possessed a small series of this new form, but having given away specimens under the name *vicinus,* I now have only a pair left. It was found on a species of

Pelea in N. Kona, but in a drier locality and a good many miles from the spot where the typical *vicinus* occurred.

Plagithmysus frater sp. n.

Red, the head above obscure red or reddish black, the face black. Antennae dark red or blackish red. Pronotum entirely red, the median crest appearing more or less darker, and there is a broad, dark, longitudinal band on each side in dorsal aspect, but even here the surface is not black, though darkened. Elytra red, with the usual dark velvety spot in the furcation of the pubescent lines which are subflavescent; beneath the dense black hairs, which form the velvety spot, the surface is red as elsewhere. Legs red, the apices of the femora black, the tarsi with very dense snow-white hairs, the hind tibiae with very dense black hairs, which are directed backwards and not long. Pronotum with the vittae on either side of the crest broad, but very feebly developed or indistinct. The hairs being minute and not very dense, entirely different from the vittae of *bishopi*. Consequently to the naked eye the greater part of the pronotum in dorsal aspect appears greyish on a red surface, the grey color divided by a narrow darker line. Antennae with the setae very dense, black and bristly. The base of the elytra is very densely, rugosely punctured, considerably more so than in several examples of *bishopi*, with which it was directly compared. Size of *bishopi*. Probably closer to *vicinus*, which has a black pronotum and differs in other respects. So far as I can judge without dissecting, the examples are males.

Hab.—N. Kona, Hawaii, about 3000 ft., on *Pelea* sp. Perhaps no more than a local race of *vicinus*. The type is in my collection.

Plagithmysus decorus sp. n.

Black, the femora entirely red (except for the paler basal stalk) as in *P. elegans*, the antennae dark red basally, the more apical joints of a dark fuscous color, the setae on the basal joints not strongly developed.

Pronotum black on about the middle third or more in dorsal aspect, the rest densely covered with minute yellow hairs, the dorsal and lateral vittae of ordinary species having merged into one broad band as in *elegans;* on the sides beneath this band the surface is bare and as densely punctured as possible. Elytra very densely and rugosely punctuate on the basal part, more so than in *vitticollis*, which the species considerably resembles in the pattern of spots, and with this sculpture extending farther back, the white spots along the upturned lateral margin much more developed and almost forming a continuous line. Size probably less than the average of *vitticollis*.

Hab.—Olaa, Hawaii, near Kilauea (29 miles from Hilo) in the forest. The unique example of this beautiful species was taken "at large" by Mr. W. M. Giffard in August, 1913, and is in his collection. This specimen has a slight bare mark in the yellow pronotal bands and this may be due to abrasion, as the hairs of the tibiae and tarsi appear to have been wet. This bare mark is not present in my bred *elegans*. It is No. 10 in the consignment of species.

21. Six examples of *P. aestivus* from Kalamaula, Molokai, taken in April, 1907, I must have seen previously, as I have a note of their occurrence. They differ in no wise from the original examples, the locality lying between the two spots, whence these came, and only a short distance from either. The species is always on *Ohia lehua.*

1. *P. solitarius* female, with the femora thick and well developed for this sex, the specimen collected by Koebele. This species is generally distributed over the Koolau range from the neighborhood of Honolulu to parts above Waialua and Waimea wherever the Ohia ha *(Eugenia)* grows. However, on one occasion specimens were actually bred from the Ohia lehua on Tantalus. In 1900 nearly all the larvae in that locality (though numerous) were parasitized by the two species of *Ischiogonus,* but in February, 1903, a series of the beetle, including black-legged examples, was taken there, and in October, 1906, a single example, flying across the road. I did not attempt to breed any from more distant localities, so do not know whether it was similarly parasitized in these.

A single specimen, not numbered but labeled by myself "*Clytarlus* undescribed sp.," is a female of *P. immundus* Sh., which was bred by me from dead wood brought from Kona, and supposed to be that of the tree *Charpentiera.* It is a most variable species, red, black, or particolored, and has the weak clothing of the hind tibiae and metatarsi characteristic of *Clytarlus.*

Callithmysus.

As recorded by Swezey (Proc. Haw. Ent. Soc. 1919, p. 265), *C. microgaster* var. *hirtipes* was bred by him from *Perrottetia*

and I think I am right in saying that the actual type of that variety was obtained from the same kind of tree, although recorded from *Bobea*. This individual was found resting amongst dead leaves of a broken branch, on a day when it rained heavily and continuously, and collecting was almost impossible. The "on *Bobea*" was added later, when I had become aware that *C. microgaster s. l.* was attached to that tree, having found fragments of the beetle and larvae therein, and was not intended to refer to this particular example, but to the species. Though so infrequently met with alive, the beetle must be quite numerous on occasion, as in 1903, and also on a former occasion, I brought down large numbers of the larvae to Honolulu from different localities, but owing to my absence from home, these nearly all died for want of attention and the few beetles that emerged were dead and in poor condition when I returned. One or two of these that were in moderate condition I sent away, and one or two of the worst I still have. All the larvae were in *Bobea*. Two of those recorded in the Fauna Haw. were taken on the trunks of this tree near Waialua, and are said to differ from the typical form. The late W. H. Ashmead, when collecting with me, captured one on the wing as it flew over a bare ridge in the mountains below the forest. I took one flying on the Tantalus road a little above the house then owned by Mr. Giffard in November, 1906—a small specimen newly emerged, which I still possess, and another in nearly the same locality on another occasion. All these probably belonged to the form with the tibial hairs shorter than the type and the base of the tibiae is not bare to the extent shown in the original figure of the species. If the variety *hirtipes* from *Perrottetia* proves constantly different from these *Bobea* specimens, the case would be similar to that of *P. vitticollis* and its var. *longulus*, which are found on these trees on Hawaii, the most evident difference between the beetles being found in the tarsal hairs. One may suspect that the typical *microgaster* found by Blackburn was attached to some different tree, as the form on *Bobea* seems to occur over most, if not the whole of Oahu. At the same time one must remember that in some *Plagithmysus* there are

very great differences in the hairs of the tibiae and of other parts, as variation or according to sex, and sufficient material of *C. microgaster* for a proper investigation has not yet been secured.

In *Plagithmysus bishopi,* even in examples bred from the same wood, there is variation in the density and arrangement of the hairs of the hind tibiae, and they may be pale or black, even in examples of the same sex. *P. giffardi* notably exhibits dimorphism in these hairs, while some others seem to exhibit neither variational nor sexual differences in these.

The two following species of *Nesithmysus* are very distinct species of this remarkable genus.

Nesithmysus forbesii sp. n.

Black, the head slightly aeneous, the pronotum slightly so in some lights, the elytra very conspicuously metallic, with greenish tint. Head with yellow hairs, not densely clothed. Pronotum on each side about the middle with a strongly prominent angle; the median crest is represented by a strong prominence in front, in lateral view triangular, like a large blunt thorn, on its hind surface rugosely punctate, and a posterior prominence, which in side view is subtruncate and rugosely sculptured on its upper surface; between these and on most of its surface the pronotum is smooth and shining, irregularly and finely punctured, clothed with sparse yellow setae, representing the vittae of *Plagithmysus.* On either side between the posterior median prominence and the lateral angle, and on a line with the former, is another strong prominence, rounded at the apex, and between this and the lateral angle is another broad, but not dense, patch of yellow hairs. The elytra are shining and thinly and irregularly clothed with yellow setae like those on the thorax, but no definite pattern is formed. The sculpture consists of shallow depressions and larger punctures, mixed with finer ones, which are more definite. There is a dense line of yellow hairs extending from the hind coxae to the patch covering the ends of the metepisterna; on either side of the ventral segments 1-3 at the apex is a distinct spot of these hairs; the 5th ventral segment is conspicuously excised in the middle. The specimen is no doubt a female, the antennae short, about three-quarters of the length of the elytra, the 10th joint not twice as long as wide. Length about 20 mm.

Hab.—East Maui, Haipuaena, 3100 ft. A single example from *Pelea* on June 29th, 1920 *(C. N. Forbes).*

Nesithmysus haasii sp. n.

Black, scape of the antennae to a large extent, as also the small 2nd joint, the next two basally and the others on one side at least, though very obscurely, red or reddish. The trochanters, basal part of femora, tibiae for the most part, and basal portion of first tarsal joint also red. Face for the most part densely clothed with yellow hairs, the top of the head rather less densely. Pronotum with the median crest greatly raised in front, less strongly behind, coarsely rugosely sculptured, the anterior prominence bluntly triangular in lateral aspect, the hinder one curved, the prominences on either side of this strong and blunt, the lateral angles near the middle of the length of the pronotum obtuse and not strongly prominent, much less so than in the preceding species. The yellow vittae on either side of the median crest are conspicuous, widely separated, and irregular in width and are connected with the outer ones broadly in front and narrowly behind; these latter occupy all the flanks of the pronotum downwards from their origin except that the prominent lateral angles form a smooth glabrous area amongst the yellow hairs. The metepisterna have a dense yellow patch of hair posteriorly and there is another anterior to this on the mesopleurae. The elytra are about five times the length of the pronotum, very densely, finely and distinctly punctured all over, a yellow line on each just within the suture from apex to base, continued across the deflexed basal surface to near the shoulders and then continued backwards as a second longitudinal oblique line, which adjoins the sutural one at about the middle of the length of the elytra. Along the upturned lateral margin of these is a dense narrow line of similar yellow hairs extending from base to apex. The first four ventral segments of the hind-body have a pair of distinct yellow spots apically, the 5th is simply rounded or slightly truncate at the apex and not at all emarginate. Length about 25 mm. Female.

In the unique specimen described the yellow pubescent lines are in parts interrupted owing to abrasion, but are here described as if they were entire. The longitudinal ridges of the elytra, similar to those in some *Plagithmysus,* in which they often vary in individuals, are very definite in this specimen, the inner ones reaching behind the middle, the outer ones still further.

Hab.—Oahu, Wahiawa *(Chas. Haas).* A single example in the collection of Mr. O. H. Swezey.

In the thick forest behind Waialua, twenty years ago, large exit holes of a Longicorn supposed to be *Plagithmysus* were found in some of the big *Pelea* trees growing there. Very

few were seen and no beetle was obtained, but it is possible that they may have been made by this large *Nesithmysus*. The heavy hind body and more cylindrical form of *Nesithmysus* have deprived the genus of the elegant shape of *Plagithmysus*, and one could imagine the insects to be much less active than the latter.

ANNOBIIDES.

The Annobiid here described belongs to the very difficult genus *Xyletobius* in a wide sense, but the many species described by me are in my opinion not always congeneric and the present species is an abnormal one and unlike any known to me.

Xyletobius timberlakei sp. n.

Dark fuscous, the pronotum at the sides and posteriorly (and sometimes entirely excepting the disc) the apex, sides (more or less) and the basal margin of the elytra evidently red. The antennae, under side of the whole thorax, the coxae, femora and tarsi also red or reddish testaceous, the tibiae and abdomen darker, mostly dark fuscous.

Remarkable for its long cylindrical form as compared with most species. Eyes very large, in a front view of the face these together are fully as wide or wider than the space between them. The antennae are very long, the small second joint distinctly angulate beneath or with the lower apical angle a little produced in some aspects, third triangular and hardly as long as its greatest width, fourth, fifth and sixth increasing in length and becoming more slender, distinctly emarginate at the apex, seventh strongly elongate and evidently less wide than the sixth, the apical joints are wanting, except in one case where the antennae lies beneath the body, and in this the tenth joint appears to be more than twice as long as wide. Pronotum at the sides very widely explanate or flattened (at the hind margin the flattened parts are together as wide as the space between them) perceptibly emarginate in the middle, anteriorly, finely but distinctly margined both in front and behind, distinctly emarginate on each side between the hind angles, which are rounded, and the middle. Seen from above the pronotum has a distinct pattern formed of golden tomentum in the middle and other spots or marks external to this on each side. The elytra are fully three and a half times the length of the pronotum, and are notably compressed at the sides, so that a great subtriangular area appears bare on each wing case, the apex of each triangle coming rather near to but not reaching the suture at about the middle of the length of the elytra. From each apex an oblique

more or less broken line, of pale tomentum runs towards the side of the elytra behind the shoulders, defining more clearly one side of the triangles, which is in reality a feeble ridge, formed where the lateral compression meets the basal part of the wing cases. The second and third striae (the first being as usual abbreviate) unite at the apex, the fourth and fifth do so also, but do not extend so far back as the inner ones. In lateral view of the elytra the punctures in the outer striae are easily seen. Length 5.5 mm.

Hab.—Hawaii, Kealakekua, 3500 ft. *(Timberlake)*. One on *Clermontia caerulea* and one on *Byronia sandwicensis*.

Holcobius hawaiiensis Perkins.

This species was originally described from a single example taken in the stem of a tree fern in Kona, Hawaii, and in the "Fauna" I referred to it others, taken later at Kilauea, also on tree ferns. The Kona example is smaller than the others and has dark antennae, but in the allied Maui species these organs showed some variation in color (Fauna Hawaiiensis III, 583). Mr. Giffard has taken five examples in his house at light, close to the spot where I found it near Kilauea. These agree well with mine and differ from the allied *H. haleakalae* in being evidently more robust and in the point of sculpture mentioned in the description of the original example from Kona. The length of the Kilauea specimens averages 9 mm., and this form may be called var. *vulcanus*. These large species of *Holcobius* seem to be almost entirely nocturnal and difficult to collect by day. By night those which have burrows in dead trees come out and sit on the bark, and may be found paired in some numbers, as I experienced in a thick forest on Haleakala. The dead trees that they frequented, mostly Ohia lehua, were unfortunately a considerable distance from my tent and I found such difficulty in regaining this by the light of a lantern that I had to give up this method of collecting the beetles. *Holcobius affinis, granulatus* and *glabricollis* as well as *hawaiiensis* have all been taken attracted by light.

OCTOBER 7th, 1920.

The 181st meeting of the Hawaiian Entomological Society was held at the usual place. Present: Crawford, presiding; Swezey, Mant, Giffard, Timberlake, Muir, Whitney, Ehrhorn, and Fullaway.

The minutes of the 178th and 180th meetings were read and approved.

ENTOMOLOGICAL PROGRAM.

New Hawaiian Delphacidae (Homoptera).

BY F. MUIR.

The present paper deals with part of the collections made by Mr. W. M. Giffard and not dealt with in my last paper,* and with collections made by Messrs. Timberlake and Giffard in 1919, also with a few other species. They add eleven new species and one variety to our list, as well as new localities. A number of species in the collections are not mentioned as they are not new. That such a well worked locality as Castle trail, Oahu, should yield new species indicates that we are far from the end of our list of species. While it is hoped that the recently introduced Miridae, *Cyrtorhinus mundulus* (Bred.), will be of benefit in the cane field and reduce the number of *Perkinsiella saccharicida* Kirk., it is to be hoped that it will not take to the native forest and interfere with the native Delphacidae.

The genus *Ilburnia* White now stands as the second largest genus in the family with eighty species; *Delphacodes* Fieb. *(Liburnia)* being the largest with about 180 species.

With the increase in the number of species some of them are becoming more difficult to define, even by the genitalia; at the same time isolated forms such as *I. sulcata* are turning

* Proc. Haw. Ent. Soc. IV. 1. (1919) p. 84.

up. The intermediate forms will give us a better idea as to the line of evolution.

The varieties of such species as *Aloha ipomœae, Ilburnia blackburni* and *I. ipomœicola* attached to different food plants, require special study, and experiments of change of food and cross breeding should be carried out.

The cause of the variation of the male genitalia is the fundamental problem of the evolution of these insects. How many genetic characters the ædeagus contains is difficult to estimate. It is also difficult to understand why the genitalia should be the organs chiefly affected by crossings if Lotsy's theory be maintained.

Weismann and his followers have overemphasized the difference between the germ and somatic cells. There is but one cell and that is the germ cell. The somatic cells being only differentiated germ cells and the differentiation apparently lies wholly within the cytoplasm. Although the chromosomes may be the "bearers of heredity," yet they do not enter into the formation of the "characters." At most they only act upon the cytoplasm.

If cell division be quantitative (as polyembryony indicates) and not qualitative, how do similar nuclei acting upon similar cytoplasm bring about various differentiations? The nucleus cannot be the sole causation of the differentiation of the cytoplasm unless we admit a selective and qualitative division of the chromosomes.

There is experimental evidence to show that the relative position of the cell in the early stages of the embryo influences its development quite irrespective of the nucleus. The influence of certain cells, or their secretions, upon the growth and development of other cells in an organism has been demonstrated by experiments. Among Delphacidae there is a corelation between the germ plasm and the external male genitalia, as is indicated by the effect upon the latter brought about by injury to the former by parasites. It is therefore thinkable that an alteration in the germ plasm could bring about an alteration in the male genitalia without any special change in any particular chromosome or chromomere. It is only along

these lines that I can at present understand the specific differences of the genitalia.

The types of the new species have been deposited in the collection of the Hawaiian Sugar Planters' Experiment Station. Measurements are from the apex of the vertex to the anus and from base to apex of one tegmen.

DELPHACINI.

Kelisia swezeyi Kirk.

A small series on *Eragrostis* from Olokele Canyon, Kauai (*Swezey,* Sept., 1920).

Kelisia sporobolicola Kirk.

A male and a female on *Eragrostis* from Puu Ka Pele, Kauai, elevation 3500 feet, and a series of both sexes from Mana, Kauai, on *Sporobolus* (*Swezey,* Sept., 1920).

There is another series from Haleakala, Maui, elevation 6200 feet, on *Eragrostis* (*Timberlake,* July, 1919) which is lighter in color than the typical and the granules smaller but quite distinct.

Kelisia sporobolicola immaculata var. n.

In the typical *K. sporobolicola* Kirk. the granules on the veins are black. In this variety they are the same color as the veins so the tegmina are not spotted. The genitalia are similar.

A series from a steam crack, Kilauea, Hawaii, elevation 3800 feet, on *Deschampsia australis.* Another series on the same plant in the same district, elevation 4000 feet (*Giffard,* Aug., Sept., 1919). In coloration this variety is very like *K. swezeyi,* but the genitalia is that of *K. sporobolicola.*

ALOHINI.

Leialoha lehuae mauiensis Muir.

A small series from Keanae Pali, Haleakala, Maui, elevation about 5000 feet, on *Ohia lehua* (*Timberlake,* July, 1919).

Nesodryas (Nesothoe) haa sp. n. Fig. 1.

Male. Macropterous; length 2.5 mm. tegmen 3.6 mm.

Opening of pygofer subdiamond shape, anal angle fairly well pro-

duced; genital styles with apical, curved portion small; anal spines strong, slightly curved; aedeagus long, thin, tubular, slightly curved on basal half, apex produced into a crescent, one horn of which is small and truncate at apex.

Light chestnut, lighter over the carinae of pronotum and vertex; apical portion of face and genae white or light yellow, two transverse, white bars on middle of face and a smaller one near base, none of them reaching the lateral margins; four or five white spots along tempora; first joint of antennae and basal part of second dark; femora dark, tibiae and hind tarsi banded dark and light; abdomen light over pleura and hind margins of sternites, on edge of pygofer opening and genital styles. Tegmina chestnut, a large hyaline arc-shaped patch covering apex of costal cell and apical radial cells, also hyaline in apical portion of 3, 5, and 6 apical cells; the brown over the apical half darker and fuscous, light marks in clavus with a dark mark at apex; granules small, bearing brown macrotrichia.

Female. Macropterous; similar to male. Length 3.4 mm; tegmen 4 mm.

The genitalia of this species are near to *N. dryope* and *N. munroi* but they are quite distinct from both. Described from nine males and twelve females from 29 miles, Olaa, Hawaii, elevation 2300 feet, feeding on *Antidesma platyphyllum,* the native name of which is haa (*Giffard,* Aug., 1918, Jan., 1919). Also 9 males and 5 females from 23 miles, Olaa, Hawaii, on the same food plant (Giffard, Aug., Sept., 1919). These were all taken in company of *N. dryope.*

Aloha myoporicola Kirk. Fig. 8.

The figure of the genitalia of this species given elsewhere * was drawn from a distorted specimen. I now give a more correct figure.

Ilburnia dubautiae sp. n. Fig. 10.

Male. Brachypterous; length 2.5 mm., tegmen 1.8 mm.; length of vertex 1.3 times the width, apex wider than base, slightly rounded, base about middle of eyes; length of face twice the width, sides slightly arcuate, median carina simple; antennae reaching middle of clypeus, second joint 1.8 times the length of first; tegmina reaching to apex of pygofer; hind femora reaching to end of abdomen, first hind tarsus longer than the other two together.

Opening of pygofer similar to *I. nigroceps* (Muir), the anal spines much smaller but diverging as in that species. The aedeagus has a

* Proc. Haw. Ent. Soc. III (1916) p. 217. Pl. 2. fig. 18.

row of six teeth on a dorso-lateral position, the ventral spines do not proceed to the left side as in *I. nigroceps* and there are more spines on the right side at the apex of the ventral row. The genital styles are like those of *I. nigroceps*. Head, antennae, legs, abdominal pleura, and middle of tergites light brown or yellow; face, vertex, and genae dark brown between carinae; pronotum, mesonotum, front and middle coxae, abdominal sternites, lateral portions of tergites, pygofer, and apices of tarsi dark brown. Tegmina hyaline, light yellow, veins same color, granules minute, sparse, bearing black macrotrichia, a small brown spot at apex of clavus and a minute one at apex of costal cell.

Female. Brachypterous; length 3.6 mm.; tegmen 2.5 mm. Hind femora not reaching to apex of abdomen; tegmina reaching to apex of seventh abdominal tergite. Uniformly light brown or yellow, the spot at the apex of costal cell slightly larger than in the male.

Ridge south of Iao valley, Maui, elevation 2000 feet, on *Dubautia plantaginea* (*Timberlake,* July, 1919).

This is a Maui representative of *I. nigroceps* of Lanai; the lighter color of both sexes as well as the difference of aedeagus and anal spines makes them easy to separate. A figure of the aedeagus of *I. nigroceps* is given for comparison. Fig. 7.

Ilburnia nesopele sp. n. Fig. 6, a.

Male. Brachypterous; length 2.4 mm., tegmen 1.6 mm.; length of vertex 1.3 times the width, sides parallel, apex slightly curved, subequal to base in width, base slightly anterior to middle of eyes; length of face twice the width broadest on apical half, carinae obscure, median carina simple slightly thickened at base; antennae reaching to middle of clypeus, second joint 1.8 times the length of first; tegmina reaching to eighth tergite; hind femora reaching slightly beyond apex of abdomen, hind tarsi nearly as long as tibia, first tarsus slightly longer than other two together. Opening of pygofer slightly longer than wide, margins entire, a slight prominence on medio-ventral edge, dorsal emargination wide, shallow, not embracing more than half the anal segment; armature on diaphragm shield-shape, prominent, ridged down the middle, the sides strongly shagreen; anal spines large, flat, narrow, bases contiguous, slightly diverging at apex; genital styles reaching two-thirds to anal segment, broad, flat, broadest on basal half, apex truncate with angles projecting, the outer one more so than the inner; aedeagus near to that of *I. pele* (Kirk.) but the base larger and the spines on the dorsal aspect continued on to the right side to near base, the ventral spines forming a single row.

Dark brown; vertex, carinae of face and clypeus, antennae, femora, tibiae and tarsi of front and middle legs, tibiae and tarsi of hind legs, and basal portion of abdomen light brown or yellow. Tegmina hyaline, slightly fuscous, veins slightly darker, a small dark mark at

apex of subcostal cell and a larger one at apex of clavus from which it spreads out towards the middle and base, granules minute, sparse, bearing black macrotrichia.

Female. Brachypterous; length 3 mm.; tegmen 2.1 mm.; hind femora not reaching to apex of abdomen. Much lighter in color than the male; light brown or yellow, dark between carinae of face, genae, clypeus, last joint of tarsi and hind femora. Tegmina hyaline, a dark mark at apex of subcostal cell and apex of clavus.

Ukulele pipe line, Haleakala, Maui, 5000 feet elevation, on *Astelia veratroides* (*Timberlake,* July, 1919). The nymphs are yellow, brown on face, clypeus, wing pads, hind femora, and apical tarsi.

Described from seven males, three females, and three nymphs. This small series shows some color variation in the usual direction of the reduction of the dark areas. This species comes near to both *I. pele* (Kirk.) and *I. raillardicola* Muir. From the former it can be easily separated by the shape of the base of the aedeagus and the spines along the right side; from the latter it is easily separated by the long anal spines. Figs. 9a and 5.

Ilburnia amamau sp. n. Fig. 19, a.

Male. Brachypterous; length 2.9 mm.; tegmen 2 mm. Vertex slightly broader than long, apex slightly rounded, the two median carinae projecting, base slightly before middle of eyes, length of face twice the width, narrowest on basal half, median carina forking near base; antennae reaching beyond base of clypeus, second joint 1.6 times the length of first; hind femora reaching to apex of abdomen, first tarsus slightly longer than other two together; tegmina reaching base of pygofer.

Opening of pygofer longer than wide, anal emargination shallow, margins entire, a small projection from the medio-ventral edge; anal spines large, acute, slightly curved, not contiguous at base; genital styles narrow, flat, produced on inner basal edge, apex truncate with inner angle projecting; aedeagus flattened laterally, in lateral view deep with a deep emargination in middle of ventral edge, base narrowed, functional orifice near apex, three small spines on right near upper angle and a cluster of them on ventral aspect near apex which continues onto left side.

Light brown, fuscous between carinae of face, genae and clypeus and over carinae of thorax; darker over abdominal sternites and lateral portion of tergites. Tegmina hyaline, light brown, veins slightly darker, granules minute, sparse, bearing black macrotrichia.

Female. Brachypterous; length 3.5 mm.; tegmen 2.4 mm. Tegmen reaching to apex of eighth tergite. Similar in color to the male.

Haleakala, Maui, elevation 6100 feet (*Timberlake,* July, 1919). Described from forty males and one hundred and thirteen females and some young, taken on *Sadleria,* the native name of which is Amamau. The nymphs are uniformly light brown. There is the usual tendency for some specimens to be lighter than others and for the females to be lighter than the males. This species comes next to *I. painiu* Muir, to which it is closely related.

Ilburnia aku sp. n. Fig. 14, a.

Male. Brachypterous; length 2.5 mm.; tegmen 1.8 mm. Vertex considerably longer than wide, apex slightly rounded, the same width as base, base about the middle of eyes; length of face 2.6 times the width, slightly narrower at base than at apex, median carina simple; antennae reaching beyond base of clypeus, second joint 1.8 times the length of first; hind femora reaching to apex of abdomen, tibiae longer than femora, first joint of hind tarsus slightly longer than the other two together, spur with eight teeth; tegmina reaching slightly beyond the apex of abdomen.

Opening of pygofer large, the ventral edge somewhat straight, anal angles produced and curved inward; anal spines well developed, situated toward the base of the anal segment, their bases touching, slightly curved and diverging; the armature of the diaphragm oval, shiny; genital styles flat, slightly wider on basal half, apex truncate, sides subparallel; aedeagus tubular, slightly flattened laterally, orifice at apex which is slightly enlarged, a small row of minute spines on ventral aspect at apex and another on the right side of apex.

Dark brown; antennae, carinae of head, metathorax, legs, and base of abdomen yellowish, pleura and seventh and eighth tergites light. Tegmina hyaline, yellowish, with a dark brown mark from apex of costal cell to apex of clavus, more or less fading out in the middle. There is a tendency in some specimens for the carinae of thorax to be light.

Female. Brachypterous; length 2.7 mm.; tegmen 1.8 mm. Similar to male, but hind femora not reaching to apex of abdomen.

Olaa, 23 miles, Hawaii, elevation 2300 feet, feeding on *Cyanea tritomantha* (native name Aku). Described from eleven males and three females (*Giffard,* January, 1919).

This species is fairly isolated. At present I would place it near to *I. blackburni.* It is possible that it comes near to *I.*

procellaris (Kirk.) but I have not seen the aedeagus of this species.

Ilburnia blackburni (Muir).

A series of both sexes and young on *Clermontia coerulea* Hbd., Kona, Hawaii (*Timberlake,* August, 1919). A long series of both sexes and young from 29 miles, Olaa, Hawaii, feeding on *Urera sandwicensis* Wedd. (*Giffard,* August, 1918). One macropterous male from Crater Road, Kilauea, and one macropterous female from 23 miles, Olaa, Hawaii (*Giffard,* September, 1919).

Ilburnia waikamoiensis (Muir). Fig. 2.

A series of both sexes and young on a species of *Cyanea,* Haleakala, near Puu-o-luau, Maui, elevation 5800 feet (*Timberlake,* July, 1919). The former figure of the aedeagus of this species * is reversed. It is slightly concave ventrally; the spines on the right side are small and form a row near the ventral aspect, those on the left are larger and towards the apex run on to the dorsal surface.

Ilburnia boehmeriae sp. n. Fig. 12, a.

In general build and coloration this species is similar to *I. pipturi* (Kirk.), but there is a difference in the genitalia which is visible externally. The genital styles are much narrower in the middle and the inner apical corner considerably produced; the aedeagus is more curved on the apical third, the basal projection is much smaller and narrower at base and the spines on the right side fewer and form a line; the anal spines are stouter.

Length of male 2 mm.; tegmen 1.2 mm.; female 2 mm.; tegmen 1.3 mm.

Makaleha Valley, Oahu, on *Boehmeria* sp. (*Swezey,* August, 1919). Described from five males, one female, and one young, the latter being uniformly yellow.

This is a case of a different food plant being associated with a small but distinct difference of the genitalia while the external body characters and coloration is apparently the same.

* Proc. Haw. Ent. Soc. IV. 1. (1919) p. 105. Fig. 8.

The aedeagus and right genital style of *I. pipturi* are figured (Figs. 11, 11a) at the same magnification as those of *I. boehmeriae.*

Ilburnia chambersi (Kirk.).

A small series on *Raillardia ciliolata* from Crater Road, Kilauea, Hawaii (*Giffard,* July, 1919).

Ilburnia geranii sp. n. Fig. 13, a.

Male. Brachypterous; length 2.2 mm., tegmen 1.7 mm. Vertex nearly as broad as long, apex slightly rounded, base considerably before the middle of eyes; length of face 2.2 times the width, sides slightly curved, broadest in middle, median carina simple; antennae reaching to base of clypeus, second joint twice the length of first, tegmina reaching to apex of abdomen; hind femora reaching slightly beyond apex of abdomen; tarsi subequal in length to tibiae, first hind tarsus as long as the other two together.

Opening of pygofer round, edges entire, dorsal emargination shallow exposing anal tube, anal spines small, stout; genital styles fairly short, flat, narrowest in middle, apex truncate with inner angle slightly produced; aedeagus tubular with a dorsal projection at the base, apex acute with orifice along ventral aspect of apex, a ring of eight or nine spines about one-third from apex, a comb of five spines on the ventral aspect just basad of the ring of spines; the armature on diaphragm forming a raised knob with shagreen surface.

Light brown; dark brown or black between carinae of face, gulae and clypeus, on lateral portion of pronotum, over carinae of mesonotum, on front and middle coxae, abdominal sternites and mediolateral portion of tergites. Tegmina hyaline, a broad, irregular, fuscous band from apex of costal cell to apex of clavus extending in middle down to junction of media and cubitus, granules sparse, small, black, bearing short, black macrotrichia.

There is the usual amount of color variation, in some specimens the dark fades out considerably.

Female. Brachypterous; length 2.7 mm., tegmen 1.7 mm.; tegmina reaching to apex of seventh tergite. In coloration lighter than the male, some specimens being nearly uniformly light brown.

Haleakala, Maui, 6000 feet elevation, on *Geranium arboreum* (*Timberlake,* July, 1919). The young are light brown with dark brown at base of tegminal pads and sides of abdominal tergites. Described from eighteen males, sixteen females and a number of young. This species comes next to *I. acuta* Muir, but the aedeagus is easily distinguished by the large comb of five teeth on the middle of ventral aspect.

Ilburnia sulcata sp. n. Fig. 4.

Male. Brachypterous; length 2.5 mm., tegmen 1.5 mm. Length of vertex 1.4 times the width, apex slightly rounded with median carina projecting in middle, base well behind the middle of eyes; length of face 2.3 times the width, slightly widest at apex, median carina simple but base wide, showing trace of fork; antennae reaching beyond the middle of clypeus, second joint 1.5 times the length of first; tegmina reaching middle of sixth abdominal tergite; hind femora projecting slightly beyond apex of abdomen, first tarsus longer than the other two together.

Opening of pygofer about as long as wide, margins entire, dorsal emargination shallow, not embracing more than half the anal segment; anal spines large, flattened laterally, strongly curved outward, apices acute; genital styles long, narrow, flat, outer margin slightly concave, inner margin produced on basal third, apex truncate with the angles slightly projecting, a slight ridge in middle near inner edge; aedeagus large, flattened laterally, apex curved ventrad, a deep, longitudinal sulcus along the dorsal surface from base to the curve near apex, three rows of broad, flattened spines surround the apex at the point where sulcus ends, three or four shorter rows basad of these, functional orifice at apex.

Antimony yellow; a fuscous streak between the carinae of face, clypeus and genae, a longitudinal, faint fuscous mark on femora, darker on hind pair, faintly fuscous between carinae of nota. Tegmina hyaline, light yellow, a black mark at apex of costal cell and another at apex of clavus, veins slightly darkened, subcosta more so, basal margin of clavus black, granules minute and sparse, bearing black macrotrichia.

Female. Brachypterous; length 2.7 mm., tegmen 1.6 mm. Hind femora not reaching apex of abdomen; tegmina reaching seventh abdominal segment. Young uniformly yellow.

Ditch trail east of Keanae, Maui, elevation about 1500 feet, on *Cyrtandra* sp. (*Timberlake,* July, 1919). Described from two males, five females, and one young. The genitalia of this species isolates it from all others. For the present I place it next to *I. mauiensis.*

Ilburnia coprosmicola Muir.

A series of both sexes and young from Kau desert, Kilauea, Hawaii, elevation 3800 feet, on *Coprosma ernodioides.* There is little difference in color compared with the type specimens from 29 miles, Olaa, in spite of the difference in climatic conditions.

Ilburnia raillardiae (Kirk.). Fig. 18.

A long series of both sexes and young on *Raillardia scabra*

from 25 miles, Olaa, Hawaii, elevation 2300 feet. A small series on *Raillardia ciliolata* from the a-a flows, Kau desert, Hawaii, 3800 feet elevation (*Giffard,* June, July, 1918).

Ilburnia neoraillardiae sp. n. Fig. 17.

Male. Brachypterous; length 2 mm., tegmen 1.4 mm. The external characters of this species are similar to those of *I. raillardiae* (Kirk.). In the genitalia the aedeagus is proportionally longer and not so deep, the genital styles are not so long at the apical outer angle and the inner edge is not so concave. The species are very closely allied.

Buckthorn brown or ochraceous tawny, lighter at base of abdomen and darker on abdominal dorsum; apex of genital styles dark. Tegmina light tawny, veins obscure, granules very minute bearing small, black macrotrichia.

Female. Brachypterous. Similar to male. Length 2.4 mm.; tegmen 1.9 mm. Macropterous. Length 2.7 mm.; tegmen 3.0 mm.

Described from forty-seven males and thirty-six females from Kahuku, Kau, Hawaii, elevation 1800 feet, feeding on *Lipochaeta subcordata* (*Giffard*).

Ilburnia ipomoeicola (Kirk).

A long series of males, females and young from Kakuku, Kau, Hawaii, elevation 1800 feet, on *Ipomoea* sp., in which are represented the light and dark forms and also intermediate. (*Giffard,* July, 1918). Four males and seven females and young from Lower Puna, Hawaii, elevation 30 feet, on *Mucuna gigantea* (*Giffard,* August, 1918). There are dark forms tending towards the intermediate.

Ilburnia gigantea sp. n. Fig. 15.

Male. Brachypterous; length 4.5 mm., tegmen 2.5 mm. Length of vertex nearly double (1.8 to 1) the width at base, projecting considerably beyond the eyes, apex slightly broader than the base, the carinae form a broad projection in the middle of the apex, base at middle of eyes; length of face 2.7 times the width, sides slightly arcuate, widest in middle, the furcation of median carina forming a thickened ridge on basal third; antennae reaching to the middle of clypeus, second joint 1.6 times the length of first; femora not reaching to apex of abdomen, tibiae longer than femora, first tarsus longer than the other two together, spur with ten teeth.

Brown; carinae of head and thorax lighter, antennae and legs mottled light and dark, light over abdominal pleura and in middle of tergites. Tegmina hyaline, yellowish, black over veins except the apical, a dark mark at apex of clavus and at apex of costal cell.

The shape of the pygofer is similar to that of *I. koebelei* (Muir),* anal spines small, bases wide apart; genital styles flat, broadest on basal two-thirds, apical third narrowed to pointed apex; aedeagus slightly flattened laterally, curved, orifice large situated on dorso-apical half, a row of small, curved spines on ventral aspect one-third from apex bending to left side, a few scattered spines on sides of apical half; armature on diaphragm consisting of two small, curved processes flattened laterally.

Castle trail, Oahu, elevation about 2000 feet, taken on *Pritchardia* sp. (*Swezey*, August, 1920). As only a single specimen was taken this may not be its food plant. The species comes near to *I. koebelei* (Muir). It is of interest as showing the line by which a more normal type, such as *I. neowailupensis* (Muir) can proceed to such a form as *I. halia* (Kirk.).

* Proc. Haw. Ent. Soc., III, 4 (1917). Pl. V, fig. 10.

PLATE VIII.

LIST OF FIGURES.

1. *Nesodryas haa*, aedeagus, p. 509.
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4. " *sulcata*, aedeagus, p. 516.
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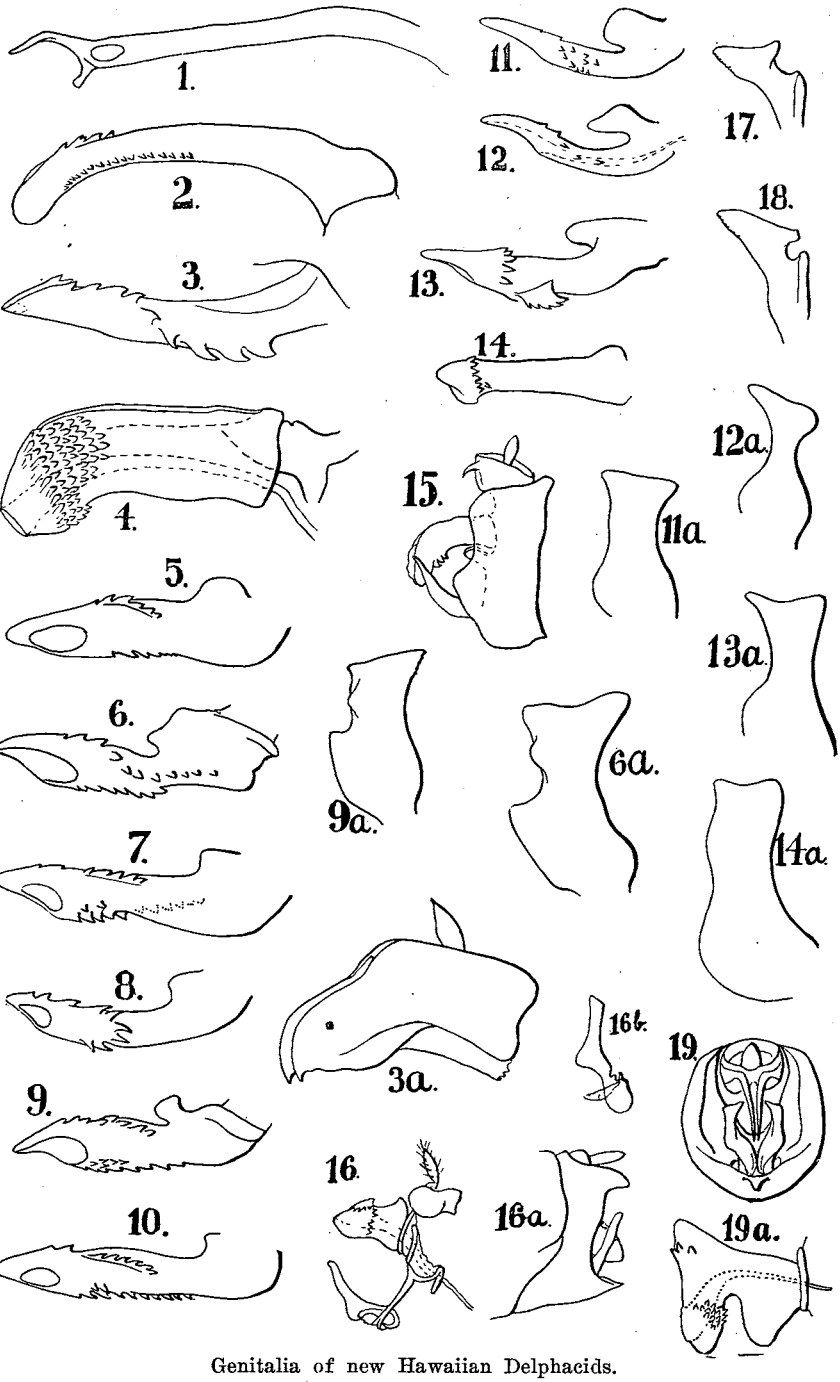
17. " *neoraillardiae*, left style, p. 517.
18. " *raillardiae*, left style, p. 516.
19. " *amamau*, full view of pygofer; *a*, aedeagus, p. 512.



Genitalia of new Hawaiian Delphacids.

Ilburnia olympica sp. n. Fig. 16, a, b.

Male. Brachypterous; length 3.3 mm., tegmen 2.4 mm. Length of vertex 1.7 times the width, base slightly behind the middle of eyes, slightly narrower than apex, the carinae projecting well forward in middle of apex; length of face 2.7 times the width, slightly broadest on apical half, forking of median carina near the apex, but they do not form two distinctly separate carinae, but a broad, flat ridge narrowing towards the apex; antennae reaching near to the middle of clypeus, second joint 1.4 times the length of first; hind femora reaching a little yeyond the apex of abdomen, tibiae longer than femora, first hind tarsus considerably longer than the other two together, spur with nine or ten teeth. Opening of pygofer broader than long, anal angles produced and curved nearly enclosing the anal segment, medio-ventral edge produced into a pointed process; anal segment without spines; genital styles flat, broadest at base, narrowest in middle, apex truncate, slightly oblique; aedeagus short, slightly compressed laterally, deep, more so at base, the orifice large, occupying the apical half of the dorsal aspect, the edge set with several small spines, a circle of small spines slightly apical of middle.

Vertex and face dark shiny chestnut, clypeus lighter with darker marks between carinae; antennae fuscous, thorax fuscous, lighter between carinae, legs fuscous, abdomen fuscous lighter at base. Tegmina light brown or yellowish, veins black, a black mark at apex of clavus and a smaller one at apex of costal cell, granules small bearing black macrotrichia.

Female. Brachypterous; length 2.7 mm., tegmen 1.9 mm. Much lighter in color than the male.

Castle trail, Oahu, elevation about 2000 feet, on *Lobelia* sp. (*Swezey*, August, 1920). Described from three males and one female. This species is very isolated; it might equally well be placed near *I. halia* or *I. asteliae*.

Ilburnia lobeliae (Muir). Fig. 3, a.

The genitalia has not been previously figured.

Kauai Insect Notes and Records.

BY O. H. SWEZEY.

While on the Island of Kauai during the first week of September, 1920, I was able to collect insects in a few places where I had never been before, but the great amount of rain prevailing at the time prevented collecting more than for about three days altogether. Some interesting captures were made of native insects, and several immigrant insects were found for the first time on that island.

First Records of Immigrants for Kauai.

Allograpta obliqua (Say).—Two specimens of this Syrphid fly were caught in Olokele Canyon at about 1400 feet elevation. I did not see it anywhere else on the island. This is the aphis-feeding Syrphid that was first noticed in Honolulu the first part of this year.

Bruchus pruininus Horn.—The Bruchid which attacks the seeds of *Lucaena glauca.* I collected several specimens of the weevil on the flowers of its host tree in Olokele Canyon at an elevation of 1400 feet.

Bruchus obtectus Say.—The common bean weevil was obtained in a store at Waimea.

Diachus auratus (Fab.).—This Chrysomelid, first recorded in Honolulu in 1913, I collected in Olokele Canyon (1400 feet) and at Puu Ka Pele (3500 feet).

Hyperaspis jocosa (Muls.).—The ladybeetle introduced from Mexico to prey on the lantana *Orthezia,* I collected at Puu Ka Pele and at Summit Camp.

Chrysidid.—The Chrysidid which has been known in Honolulu since 1914, I saw one specimen of on a fence at Lihue, but failed to collect it.

Epyris extraneus Bridwell.—I collected this Bethylid among morning glory vines on a stone wall at Lihue. Mr. Osborn tells me that he has seen this parasite on Kauai previously but had not recorded it.

Dolichurus stantoni Ashmead.—I collected this Philippine roach parasite at Lihue and at Waimea at the edge of cane fields. This was first liberated in Makiki Valley near Honolulu in 1917. No attempt was ever made to spread it, but it has already reached Kauai and become widely dispersed there, for the two places mentioned are thirty miles apart.

Megachile timberlakei Ckll.—I collected this bee in company with *M. palmarum* Perkins at Waimea.

Pison argentatum Ashm.—This wasp was collected in company with *P. iridipennis* at Waimea.

Dendryphantes sp.—This is a jumping spider first found in Honolulu about 1911. It is distinguished by the male having red on the back. I found it in a number of places on the lowlands of Kauai.

Other Records of Interest.

Atractomorpha crenaticeps Blanch.—This grasshopper was found on Kauai for the first time in 1917, at Makaweli. I now found it at Puu Ka Pele (3500 feet) and at Lihue (1000 feet).

Monocrepidius exsul Sharp.—This Elaterid, whose predacious larvae have lately become a pest in cane fields in the Hamakua district of Hawaii, I collected abundantly at lights at Waimea. I also found it wherever I went in various parts of the island.

Orthodera prasina Burm.—This little Mantid, known only at Kilauea Plantation, I found a nymph of at the coast near Haena cave.

Records of Native Insects.

Kelisia swezeyi Kirkaldy.—I collected this little leafhopper in tussocks of *Eragrostis* in Olokele Canyon at 1400 feet elevation. The first record of the species on that island.

Kelisia sporobolicola Kirkaldy.—I collected this species abundantly on the grass, *Sporobolus virginicus,* at the beach near the barking sands of Mana. I also secured two specimens from *Eragrostis* at Puu Ka Pele at 3500 feet elevation. The first record of the species for the island.

Melanocrabro discrepans Giffard.—I secured four males of this rare wasp on the trail following the Kauai Electric Power

Line going up to the Summit Camp. This was only collected previously by Mr. Giffard, two males at Kaholuamano, and one male at Waialeale by Mr. Hardy.

Euhyposmocoma trivitella Swezey.—I found the larvae of this pretty little moth abundantly mining the fronds of *Elaphoglossum reticulatum* along the trail to Summit Camp. I reared five specimens of the moth from larvae and pupae brought home.

Omiodes n. sp.—On banana plants at Summit Camp I found leafroller caterpillars, from which I succeeded in rearing one specimen. It much resembles *meyricki,* but the caterpillars were very different from that species, and I consider it another undescribed species. I previously reared *maia* from caterpillars on wild banana plants in the mountains west from Lihue.

NOTES AND EXHIBITIONS.

Holochlora venosa.—Mr. Swezey exhibited a twig of *Sapindus oahuensis* containing eggs of this large Locustid which he found in Waimalu Valley, October 3, 1920, the farthest from Honolulu that this insect has been reported.

Kelisia swezeyi.—Mr. Swezey exhibited a specimen of this little Delphacid collected August 22 in tussock of *Eragrostis* growing on the crest of the S. E. Koolau Range between Konahuanui and Mt. Olympus, at one of the places where the Castle trail reaches the crest.

Rhabdocnemis obscura.—Mr. Swezey reported the capture of a cane borer beetle on a leaf of the native palm, *Pritchardia martii,* on the Castle trail between Konahuanui and Mt. Olympus, August 22nd, 1920.

Kelisia emoloa.—Mr. Swezey reported collecting this little Delphacid in Waimalu Valley, Oahu, July 11th, 1920, on *Eragrostis.*

Scale Insect Records on Maui.—Mr. Ehrhorn reported the collection of *Saissetia oleae* on the akala berry and *Antonina indica* on manienie grass in Alexander Canyon, near Olinda. The latter scale insect was also found on paspalum grass at Haiku.

Plestia sp.—Mr. Muir exhibited two species of *Plestia, anomola* and *kellersi,* showing abnormal venation. The cross-veins in one case form a marginal border. The insects were collected in Samoa.

Megachile sp.—Mr. Swezey exhibited five males of a *Megachile* collected at Mokapu on the windward side of Oahu, on *Scaevola koenigii,* which differs from other species of *Megachile* here, in having a furrowed front metatarsus.

Snuff Box Bean.—Mr. Swezey recorded finding a heavy growth of this leguminous plant on the trail following the electric power line crossing the Kauai Mountains, and stated that Mr. Lydgate claimed to know of its presence there since twelve years ago. The appearance of *Eupatorium* on the duck-ponds of Waikiki two or three years ago was also noted.

Eucnocerus anthrenoides?—Mr. Fullaway reported that on looking over the beetle collection at the Board of Agriculture and Forestry he discovered a specimen of the Dermestid beetle recorded by Mr. Swezey at the August meeting. This example, according to the label, was collected by Mr. W. M. Giffard in October, 1919. Mr. Timberlake collected the same beetle on a window of H. S. P. A. Experiment Station in May, 1919.

NOVEMBER 4th, 1920.

The 182nd meeting of the Hawaiian Entomological Society was held at the usual place. Present: Crawford, presiding; Wilder, Willard, Osborn, Timberlake, Whitney, Muir, Ehrhorn, Swezey and Fullaway. Dr. Tillyard and Mr. King, visitors.

The minutes of the previous meeting were read and approved with corrections.

ENTOMOLOGICAL PROGRAM.

On Some Interesting Archaic Insects (with exhibitions).

BY DR. R. J. TILLYARD,

Chief of the Biological Department, Cawthron Institute of Scientific Research, Nelson, New Zealand.

The insects exhibited consist partly of archaic Australian and New Zealand forms and partly of other interesting forms gathered during my present trip around the world, which will be completed next month when I return to New Zealand. For convenience they may be dealt with under the separate Orders which they represent.

Order Thysanura.

A female specimen of a gigantic Japygid, belonging to the genus *Heterojapyx* (sp. undescribed), from near Sydney, N. S. W.

Specimens of this insect have been found up to fully two inches in length. They live in the soil often at considerable depths, and behave very much like the common centipedes of the genus *Scolopendra,* their mode of progression, in spite of the absence of the paired abdominal legs, being very similar to that of the centipedes. They also have the peculiar habit of working backwards and upwards in the soil until the forceps lies level with the surface, when they will lie in wait for their prey, which they seize with the forceps, dragging it under ground and devouring it when dead.

Two interesting points about the morphology of this fine insect may be mentioned here. The paired stylets of the abdomen show a definite coxite and two distal joints. Hence they would appear to be definitely the serial homologues of the thoracic legs; i. e., they are endopodites instead of epipodites, as has been formerly supposed, on the analogy of the unjointed stylets of other Thysanura with the epipodites of the thoracic legs of *Machilis.* The arrangement of the spiracles, as in all

Japygidae, is very peculiar, the metathorax having two pairs, while the abdomen has only seven pairs, the last being situated on segment seven instead of eight. Börner has suggested that this arrangement has come about through a forward movement of all the abdominal spiracles on to the segment next in front of that on which each pair was originally developed.

Order Grylloblattoidea.

A fine female of the wingless *Grylloblatta campodeiformis* Walker, the only known representative of this order. I took this on October 12 last at 7000 feet elevation on Sulphur Mountain, near Banff, Alta., Canada, during a snowstorm. This is at present the only known locality for this insect, but I have little doubt that it lives on all the snow mountains around Banff and elsewhere in the Rockies. It was first discovered by Mr. N. B. Sanson, Curator of the Rocky Mountain Museum, Banff, more than twenty years ago, but escaped notice, as it was taken for a larval form. A few years ago Professor Walker of Toronto took it, and the result of his study of the insect was its elevation to the dignity of being the sole representative of a new Order. It shows relationships with the Blattoids, Mantoids and also with the Isoptera, and apart from its secondary winglessness, must be regarded as an exceedingly generalized type. Only about six specimens are known.

Order Zoraptera.

A tube containing wingless specimens of *Zorotypus snyderi* Caudell, together with a slide showing the fore and hind wings of the only winged specimen of *Zorotypus hubbardi* Caudell, both being from Florida. The Order was founded by Silvestri on specimens from South Africa and Java; *Zorotypus* is the only known genus.

I visited the laboratory at East Falls Church, Virginia, where these little insects are being kept alive. They live in association with Termites in rotten logs. In life they bear a strong superficial resemblance to Psocids, but morphologically they are more closely related to the Isoptera. The wing-

venation is very puzzling, being of a very reduced type, not like that of the Isoptera, but perhaps related to the very archaic Psocopterous type still preserved in the genus *Amphientomum*.

Order Perlaria or Plecoptera.

A series of archaic genera from Australia and New Zealand, representing the two families *Eustheniidae* and *Austroperlidae*.

After studying the Stoneflies of Australia and New Zealand for many years, it has at last become possible to offer a new classification of this Order, based on the recognition of the existence of a very archaic Antarctic fauna, now confined to Australia, Tasmania, New Zealand, and Chile. Of these, the *Eustheniidae* appear to be the primitive Perlid stock; since, on a calculation based on sixteen important characters used in classification, they are 100 per cent archaic. The genera are: *Eusthenia*, with many species in Tasmania and Victoria; *Stenoperla*, with one widely distributed species in New Zealand; *Diamphipnoa*, with one species of great size in Southern Chile; and two new genera from Australia, not yet described. All these were exhibited except *Diamphipnoa*. The *Austroperlidae*, specialized by reduction of the cerci and by some slight alterations in the venation, contain only the two genera *Austroperla* from New Zealand and *Tasmanoperla* from Tasmania.

A third family of archaic Perlaria, not exhibited, are the *Leptoperlidae*, which is represented by many genera throughout Australia, Tasmania, New Zealand, the Sub-antarctic Islands, and South America as far as Brazil.

The Perlaria of the Northern Hemisphere possess no representatives of these three families, but consist exclusively of more highly evolved families representing two separate lines, of which *Pteronarcidae* and *Perlidae* form one, arising from Eustheniid-like ancestors, and the *Nemuridae* and *Capniidae* the other probably arising from an old Leptoperlid stock.

Order Coleoptera.

A tube containing the larva, pupa and imago of the archaic beetle *Cupes concolor* Westw. from Virginia. Fossils closely

resembling this, and almost certainly belonging to this genus, have been found in the Upper Trias of Ipswich, Queensland, where there exists a very rich Coleopterous fauna, which is the oldest so far discovered.

Order Neuroptera Planipennia.

A series of tubes containing specimens to illustrate the complete life history of the remarkable Australian Moth-Lacewing, *Ithone fusca* Newman. The female of this insect possesses a peculiar sandplough or *psammarotron,* with which it ploughs up the soil when laying its eggs. Each egg, when laid, is sticky, and is rolled in the sand so as to become enclosed in a small sand-cocoon. The larva hatches in about three weeks, at the beginning of December, and at once burrows into the soil. It is a white grub, of melolonthoid form, with strong burrowing legs, a curved body, small head, no eyes, and short, strong sucking mouth parts of the true Planipennian type. It is very active, and feeds voraciously on the larvae of *Scarabaeidae,* which it so much resembles. When digging for these larvae, their presence is at once made known by the delicious odor of citronella which they give out.

There are only three instars, the larva growing very rapidly. It then spins a cocoon in the form of a cylinder with hemispherical ends, and of a whitish, papery consistency, not unlike that of some of the Hymenoptera. In this the larva remains for a long time, finally pupating as a *pupa libera* in which, unlike those of the other Planipennia, the abdomen is not curved round. The pupal stage lasts only three weeks or less. The pupa cuts its way out of the cocoon by means of its powerful mandibles, and the imago crawls up out of the sandy soil and climbs the nearest tree trunk, where it rapidly expands its wings. The imagos fly only at dusk during the first week or so in November, the males assembling around the females on the tree trunks. Their rapid, dashing flight resembles that of *Hepialidae;* and, indeed, they bear a strong superficial resemblance to these moths, for which they are often mistaken by collectors.

In view of the depredations caused by the Green Japanese

Beetle in New Jersey, and by many other *Scarabaeidae* in all parts of the world, the importance of the discovery of this life history can scarcely be overestimated. It took many years to work out, without any thought that the results might even prove of economic value. There could scarcely be a better illustration of the value of pure research in entomology than this.

Order Mecoptera.

Three specimens of the wingless Snow Scorpion-fly, *Boreus* sp., from Banff; one specimen of *Chorista australis* Klug, belonging to the archaic family *Choristidae,* and specimens of *Nannochorista dipteroides* Till., from Tasmania, and *Choristella philpotti* Till., from New Zealand, both belonging to the remarkable family *Nannochoristidae.*

The *Choristidae* contains a number of genera confined to eastern Australia, which are the direct descendants of fossil forms found in the Upper Permian and Upper Trias of the same area (genera *Permochorista* and *Mesochorista,* respectively). In all the many millions of years which have elapsed from the Permian until now, during which much of Eastern Australia has never again been submerged, the wings of these insects only show the loss of one terminal branch of vein M; in other respects they have remained quite unaltered.

The *Nannochoristidae* are very small Panorpids which may well be termed "four-winged Diptera." In flight and habits they resemble Diptera very closely. They are aquatic in their larval stages. The head closely resembles that of a primitive Dipteron, and there is a true labellum formed by the fusion of the palpi basally, though the distal joints remain still partially separated. This suggests that the Dipterous labellum has also been evolved by fusion of the palps, and not from the paraglossae. The venation of these insects is similar to that of the Brachycera as regards the main veins, but there are some cross-veins present.

All stages of the larva of *Chorista australis* were also exhibited, together with the pupa, which lies free in the earth.

Order Diptera.

A specimen of the wingless Snow Cranefly, *Chionea valga* Harris, from Banff. The superficial resemblance of this insect to *Boreus* is quite striking.

Order Lepidoptera.

Specimens illustrating the families of the Jugo-frenata, which forms the most archaic division of the Sub-order Homoneura, the other division being the Jugata, families *Hepialidae* and *Prototheoridae*.

In the oldest family *Micropterygidae*, specimens of the New Zealand genera *Micropardalis* and *Sabatinca* were shown, together with specimens of *Micropteryx* from England. The larvae of these insects feed on moss, and are remarkable in possessing a retractile head with three-jointed antennae and small compound eyes, while the abdomen carries a pair of jointed legs on each segment. The newly discovered larva of *Sabatinca barbarica* Philpott was also shown, together with some microscopic preparations of the same, one of which showed very clearly the five-facetted compound eyes.

These insects have been placed by Comstock in the Trichoptera and by Chapman in a new Order Zeugloptera; but a study of the venational characters of the imagines shows very clearly that they are properly to be regarded as true Lepidoptera.

The next family, *Eriocraniidae*, have leaf-mining larvae without either thoracic or abdominal legs. Imagines and young larvae of *Eriocrania purpurella* Haw. were shown.

The third family, *Mnesarchaeidae*, is represented only by the Plutellid-like *Mnesarchaea* from New Zealand. Nothing is known of its life history, but it is probably a moss feeder and a specialized offshoot of the *Micropterygidae* proper; both fore and hind wings have lost one of the original eleven apical veins.

The Green Japanese Beetle in New Jersey

BY J. L. KING,

Of the Pennsylvania Department of Agriculture.

Mr. King discussed at some length the invasion of the States of New Jersey and Pennsylvania by the green Japanese beetle *(Popilia japonica)* and the progress of the work being done to suppress it. He was en route to Japan in search of parasites of this beetle.

Opostega in the Hawaiian Islands (Lep.).

BY O. H. SWEZEY.

In the "Fauna Hawaiiensis," two species of this genus were described and figured: *maculata* Walsm. and *dives* Walsm. The former on a single specimen from Molokai, and the latter on two specimens from Halemanu, Kauai. These are very small moths, and in all of my collecting in the Hawaiian forests I have only once collected a specimen of this genus. It was on the summit of Mt. Kaala of the Waianae Range, Oahu, and was not either one of the described species. I have, however, reared four different species from mines in the leaves of various species of *Pelea,* from various localities on Oahu.

Peculiar mines were discovered in the leaves of *Pelea* a long time ago, but the insect producing them was not ascertained. Finally larvae were found in some of the mines, but at first it could not be determined to what order of insects they belonged. The larvae are very slender, and the head structure very peculiar. In 1910, when I was at the National Museum at Washington, D. C., Mr. Busck showed me some larvae which he had recently received of a species of *Opostega* which is a cambium-miner in *Ribes.* I at once noted the similarity of these larvae to those found in the mines in *Pelea* leaves, and, hence, since then considered that these mines were produced by *Opostega* larvae.

I have repeatedly brought in *Pelea* leaves with mines and

attempted to rear moths from the larvae in them. Many times these have resulted in failure, but occasionally I have secured a moth, and these have proved to be of the genus *Opostega*. There are six different types of the mines in *Pelea* leaves, and probably others not yet known may occur in some of the regions not yet fully explored. The moths that I have reared from these mines are very closely related, but I consider that those from each of the different kinds of mines are different species respectively. Four new species are described herewith.

Some of the mines seem to occur only in certain species of *Pelea,* and sometimes as many as two kinds of mines are found in the same leaf. As far as my observations go, five of the species occur quite generally throughout Oahu. Often I have found these five on the same day in some particular place, as for example: October 31, 1920, in the Koolau Range above Wahiawa, Oahu. Very little is known of their occurrence on the other islands, but three kinds of mines have been found in *Pelea* leaves on Kauai, and there is no doubt that there are other kinds yet to be found.

The types of the species here described are in the collection of the Hawaiian Entomological Society.

Opostega callosa n. sp.

Head white. Eye-caps white, the rest of the antennae very pale brownish. Thorax white. Forewings white with a slight brownish suffusion near base, a midcostal patch of very pale brownish, the apical third of wing suffused with the same shade; a dark fuscous apical spot within a pale brownish line at base of cilia; cilia whitish with a very pale brownish line near tips; expanse 6 mm. Hindwings and cilia creamy white. Abdomen and legs pale tawny buff, front legs with fuscous markings outwardly.

Hab.—Three specimens Waialae Nui, Oahu, February 16, 1919 *(Swezey);* bred from *Pelea rotundifolia.*

The mine of this species (Fig. A) when complete, is a circular callous-like structure about half an inch in diameter, on the upper surface of the leaf. It is formed by the young larva producing at first a very slender mine, and after wandering for a time finally coming to a perfect circle, and then continuing in a close spiral inside of this till the center is reached.

A proliferation of tissue is produced and the upper epidermis thickened up, and the larva feeds beneath it till fully grown, when it escapes for pupation. The cocoon is probably made amongst moss or debris on the ground, and is lenticular in shape, of a pale reddish brown silk. I have never found them in the open. The description is from those made in the moss at bottom of breeding jar in insectary.

Besides *rotundifolia,* I have found the mines of this species in the leaves of *lydgatei* and several undetermined species of *Pelea.* They have been found occurring on all of the ridges of the Koolau Range, Oahu, that I have visited, from Kuliouou to Hauula.

Opostega maculata Walsm.

Walsingham, Fauna Hawaiiensis, I, Part V, p. 711, Pl. XXV, fig. 12 (1907).

I have reared two specimens of this species from *Pelea oblongifolia,* Palolo, Oahu, September 18th, 1915. I have found the mines also in *rotundifolia* and several other undetermined species of *Pelea,* at Waialae Nui, Manoa, Mt. Olympus, Mt. Tantalus, Pacific Heights, Wahiawa, and Punaluu, Oahu.

The mine of this species (Fig. B) is a close spiral produced outwardly from the center where the egg was laid on the upper surface of the leaf. The spiral may turn to the right or to the left. Just before issuing, the larva tunnels a short distance from the spiral. No proliferation of plant tissue takes place in connection with this mine as does with the mine of *callosa,* in fact that is the only species having a proliferation of plant tissue in connection with its mine.

Opostega serpentina n. sp.

Head white. Eye-caps white, remainder of antennae pale brown. Thorax creamy white. Forewings creamy white, a faint brown suffusion on basal third; from one-third of dorsum a brownish streak extends obliquely to near a brownish patch just beyond middle of costa; some faint brownish suffusion in apical third; a small fuscous spot at apex within a brownish line at base of cilia; cilia whitish with a faint brownish line near tips, at apex some are shorter and fuscous tipped while just at each side of these are some longer and fuscous tipped. Expanse 6.5 mm. Hindwings and cilia greyish. Abdomen grey above, tawny buff below. Legs tawny buff, front legs outwardly fuscous.

Hab.—Two specimens Mt. Olympus, Oahu, January 19th, 1919 *(Swezey);* bred from mines in leaves of *Pelea elliptica.* The mines have been found also in leaves of *P. clusiaefolia* and some other undetermined species at Waialae, Palolo, Konahuanui, Wahiawa, and Punaluu, Oahu, and from *P. sapotaefolia* on Kauai.

The mine of this species (Fig. C) is made at first along the margin of the leaf. As it enlarges it becomes very serpentine, and finally has quite long back-and-forth loops nearly half across the width of the leaf. The cocoon is similar to that of *callosa.* Moths issued from cocoons twenty days after cocoons were formed.

Opostega filiforma n. sp.

Head creamy white between antennae, purplish grey on occiput. Eye-caps white, remainder of antennae missing. Thorax purplish grey. Forewings purplish grey, dorsum fuscous brown except near base, at one-fourth of dorsum a fuscous brown streak extends obliquely to end of cell, at two-thirds of costa a fuscous brown patch with an outwardly oblique extension, costa white before and beyond this patch, a fuscous apical spot preceded by fuscous streak at base of cilia; cilia greyish with a fuscous line about middle, some at apex shorter and fuscous tipped, a few in front of this longer and light fuscous. Expanse 9 mm. Hindwings and cilia purplish grey. Abdomen purplish grey above, creamy below. Legs greyish, front legs outwardly fuscous.

Hab.—One specimen Mt. Kaala, Oahu, September 26th, 1920 *(Swezey);* caught on *Pelea clussiaefolia* tree, whose leaves were very much mined by the mine shown in Fig. D. As no other kinds of mines were present, I feel certain that this is the mine of this species of *Opostega.* This same mine is found abundantly in *Pelea elliptica,* where it occurs on Mt. Konahuanui and the other ridges near Honolulu. I have also found them in undetermined species of *Pelea* at Wahiawa. It is a very slender thread-like mine, wandering without any special order throughout the leaf, at the last going down into the petiole and mining in the cambium layer.

Opostega peleana n. sp.

Head white, a creamy tinge on crown. Eye-caps white, the remainder of antennae creamy white. Thorax pale ochreous brown. Forewings pale

ochreous brown, more intense on the outer third, about middle of costa a spot with a slight fuscous tinge, the costa whitish just before and after this spot; cilia creamy, the costal and terminal brownish at base, at apex a dense bunch of them are shorter than the rest with fuscous tips and a black band at middle, just before this a few cilia are darker than the rest. Expanse 7 mm. Hindwings and cilia creamy. Abdomen creamy white. Legs ochreous.

Hab.—One specimen, Mt. Olympus, Oahu, January 12th, 1919 *(Swezey)*, bred from mine in leaf of *Pelea sandwicensis.* The mine of this species is chiefly found in *P. sandwicensis,* but has also been found in *P. rotundifolia* and some undetermined species of *Pelea.* I have found these mines at the following ridges on Oahu: Waialae, Palolo, Mt. Olympus, Wahiawa and Punaluu, and also on Kauai. The mine of this species is shown in Fig. E. It is at first a thread-like mine with numerous longitudinal somewhat parallel loops nearly the length of the leaf and somewhat curved with the concavity towards the margin, the enclosed area eventually becoming a large blotch mine. The whole mine is usually situated on one side of the midrib and occupying nearly that whole half of the leaf.

Opostega sp.

Figure F shows a mine found in leaves of several different species of *Pelea (anisata, kauaiensis* and *gayana)* at Kaholuamano, Kauai *(J. A. Kusche).* It is an irregular tangle, gradually enlarging as the larva increases in size. No moths have been reared from these mines yet. It would be another new species, unless perchance it were the beautiful species *dives,* described in the "Fauna Hawaiiensis," two specimens of which were collected at Halemanu, Kauai.

These interesting little moths need much further study here in Hawaii. In a paper on the Lepidopterous Genus *Opostega* and its larval Affinities (Proc. Ent. Soc. Wash., 20:27-38, 1918), Carl Heinrich figures the head structure and mouth parts of the larva of one of the Hawaiian species of *Opostega* from material which I had collected. He makes use of this to show affinities of *Opostega* and Opostegidae to the families Nepticu-

lidae, Tischeriidae and Leucopterigidae, as shown by larval characters.

In the forewings of *Opostega* there are no cross veins and only three longitudinal veins. Meyrick speaks of this as the extreme of neural degeneration, while Busck and Heinrich say that this venation of *Opostega* is the most advanced in Lepidoptera.

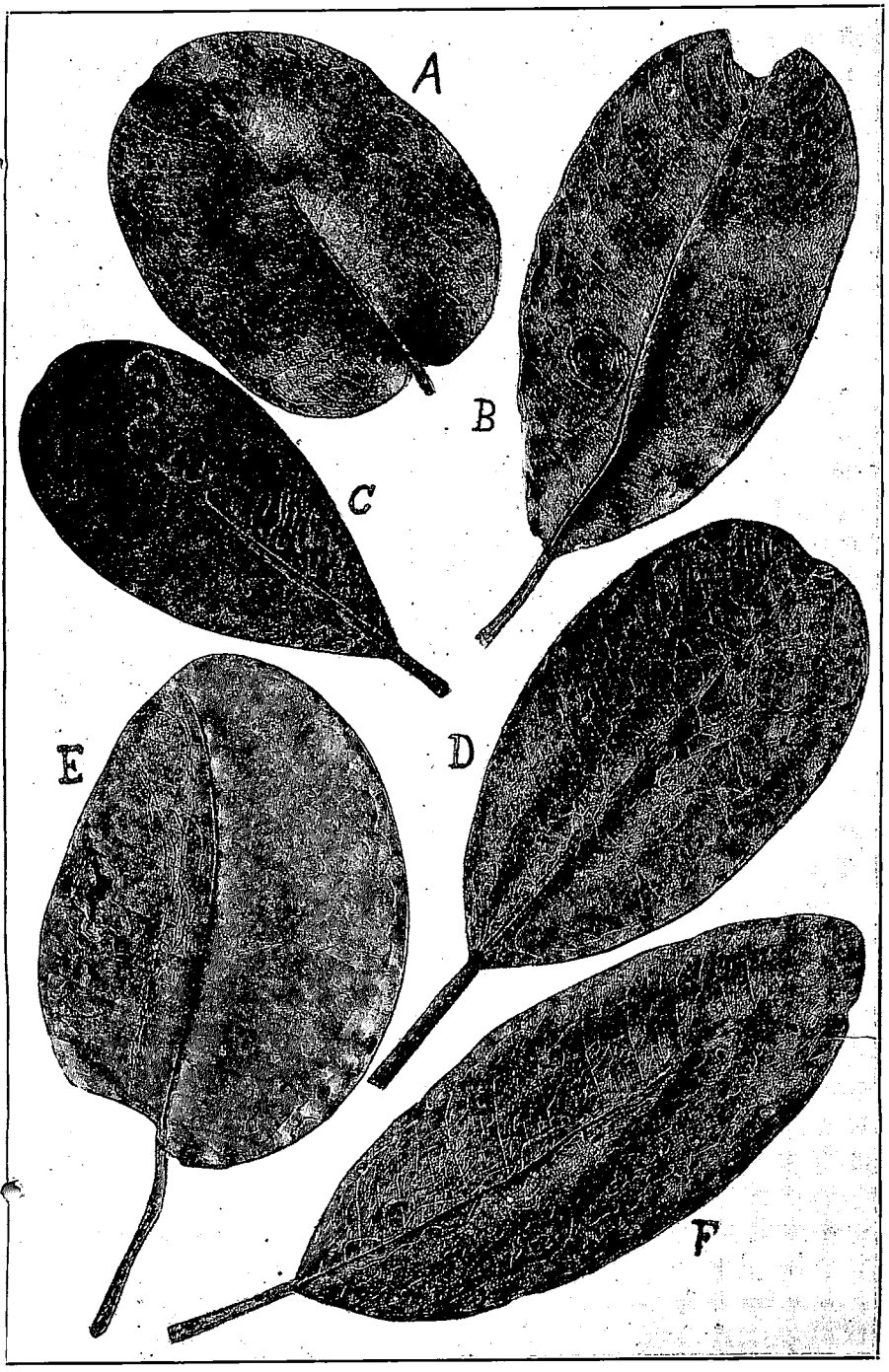
Meyrick has described seven species of *Opostega* in Australia (P. L. S. N. S. W. (2), VII:605-608, 1893), which is more than is known elsewhere. Four are known in England and three in United States. Not much is known of the larval habits, probably the observations above reported are more than known elsewhere.

Chalcid parasites have been bred from the mines in *Pelea,* but their identity is not yet known. Sometimes more parasites issue than moth larvae from the mined leaves brought in.

EXPLANATION OF PLATE IX.

Leaves of various species of Pelea showing mines of larvae of Opostega.

A. Mine of *Opostega callosa.*
B. " " *maculata.*
C. " " *serpentina.*
D. " " *filiforma.*
E. " " *peleana.*
F. Mine of an undetermined species.



Opostega Mines.

DECEMBER 2nd, 1920.

The 183rd meeting of the Hawaiian Entomological Society was held in the usual place, President Crawford presiding. Other members present: Messrs. Willard, Giffard, Timberlake, Muir, Ehrhorn, Whitney, Osborn and Fullaway.

Minutes of previous meeting were read and approved.

Report of the Executive Committee on common names of insects in Hawaii was received and accepted for publication.

A vote of thanks was extended to the Hawaiian Sugar Planters' Association for the contribution of $500 towards the expenses of publication of the Proceedings of the Society.

The Secretary-Treasurer submitted his annual report showing a balance in the treasury of $560.57.

Officers were elected as follows for the year 1921:

President.....P. H. Timberlake
Vice-President.....H. T. Osborn
Secretary-Treasurer.....D. T. Fullaway
Additional members of Executive Committee:
W. M. Giffard
F. Muir