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## THREE NEW NORTH AMERICAN PHYLLOTHRIPIDÆ.

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In a collection of *Thysanoptera*, kindly sent me for determination by Prof. H. A. Surface, Economic Zoologist of Pennsylvania, I find three new species, described below. Type specimens are in the writer's collection, and in the collection of the Pennsylvania State Department of Agriculture.

### PHYLLOTHRIPS, gen. nov.

(φυλλον, leaf; θριψ, thrips.)

Head about  $1\frac{1}{2}$  times as long as wide, subcylindrical, broadest across eyes, narrowed posteriorly. Eyes large, finely faceted, bulging. Vertex elevated, prolonged, overhanging insertion of antennæ, and bearing the anterior ocellus at its extremity. Mouth cone subacute, reaching about four-fifths across prosternum. Prothorax about half as long as head. Legs slender; fore femora not enlarged; fore tarsi unarmed in both sexes. Abdomen slender. Male with a scale at base of tube.

Type.—*Phyllothrips citricornis*, sp. nov.

This genus is erected for the reception of *P. citricornis*, sp. nov., and *Cryptothrips aspersus*, Hinds. It is close to *Liothrips*, Uzel, differing from it in the produced vertex, overhanging ocellus, bulging eyes, and longer head.

*Phyllothrips citricornis*, sp. nov. (Fig. 15.)\*

*Female*.—Similar in general appearance to *P. aspersus* (Hinds), from which it may be distinguished as follows:

- a. Antennæ rather stout; segments 5, 6 and 7 slightly more than one-half as wide as long; segments 1 and 2 nearly concolorous with body; segment 3 pale yellow; rest of antenna shading to dark brown at tip, excepting bases of segments 4 and 5, which are yellowish. Prothoracic spines small, inconspicuous; mid-laterals wanting .. *P. aspersus* (Hinds).

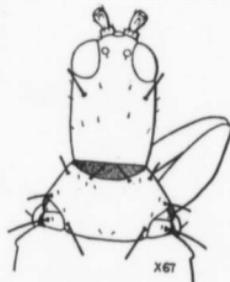


FIG. 15.—*Phyllothrips citricornis*

\*In the figures all membranous portions are stippled.

aa. Antennæ more slender; segments 5, 6 and 7 slightly less than two-fifths as wide as long; segments 1 and 2 nearly concolorous with body; segment 3 pale yellow; segments 4 to 8 bright lemon-yellow. Prothoracic spines large, rather prominent; mid-laterals present, fully as long as anterior marginals . . . . . *P. citricornis*, sp. nov.

The measurements of the female of this species are as follows: Total length, 2.27 mm. (2.08 to 2.46 mm); head, length, .32 mm.; width, .21 mm.; prothorax, length .16 mm.; width (including coxæ) .37 mm.; pterothorax, width, .42 mm.; abdomen, width, .48 mm.; tube, length, .22 mm.; width at base, .078 mm.; at apex, .043 mm. Antennæ: 1, 42 $\mu$ ; 2, 64 $\mu$ ; 3, 115 $\mu$ ; 4, 109 $\mu$ ; 5, 92 $\mu$ ; 6, 87 $\mu$ ; 7, 70 $\mu$ ; 8, 41 $\mu$ . Total, .620 mm.



FIG. 16.—*Megalothrips* (?) *spinosus*.

Described from several macropterous females from the following localities: Illinois—Dubois, Duquoin, Odin, Pulaski, on hickory leaves (L. M. Smith). Pennsylvania—Harrisburg, Rockville, "on wild grape." The dates range from April 28 to July 16.

*Megalothrips* (?) *spinosus*,  
sp. nov. (Figs. 16  
and 17.)

*Female*.—Length about 4 mm. Colour nearly uniform black, excepting tarsi, which are dark blackish-brown.

Head slightly more than twice as long as wide, broadly rounded in front, sides subparallel;

dorsal and lateral surfaces finely transversely striate, sparsely and briefly spinose; anterior portion of head with two pairs of prominent, pointed bristles in addition to the postocular, a shorter pair with their bases slightly behind the posterior ocelli, and a longer pair equal in length to

the postocular, with their bases midway between the anterior ocellus and each posterior one. Eyes moderately large, not prominent, scarcely protruding. Ocelli brownish-yellow, anterior ocellus slightly overhanging; posterior ocelli contiguous to light inner borders of eyes, their diameter almost three times that of the facets. Antennæ eight-segmented; segments 3-6 clavate; 7 and 8 fusiform; sense-cones long, slender, transparent. Mouth-cone reaching nearly to base of prosternum, short, broadly rounded; Labium surpassing labrum by the length of the basal segment of the maxillary palpus.

Prothorax three fifths as long as width of head, and (including coxæ) about three times as wide as long; surface finely striate; usual spines all present, slender, pointed, the pair at the posterior angles much the longest; mid-laterals very small. Pterothorax large, rectangular, two-thirds as long as wide. Wings long, reaching about to base of ninth abdominal segment. Anterior femora and tibiæ set with a number of long bristles; anterior tarsus armed with a blunt tooth.

Abdomen moderately stout, equal in width to pterothorax, widest at segment 4, from which it tapers evenly to tube. Tube slightly shorter than head, slender, and of nearly equal diameter throughout, excepting base, which is slightly expanded, and apex, which is slightly constricted; surface spinose.

Measurements: Total length, 4.00 mm.; head, length, .64-.74 mm.; width, .30 mm.; prothorax, length .18 mm., width (including coxæ) .56 mm.; pterothorax, width, .67 mm.; abdomen, width, .74 mm.; tube, length .63 mm., width at base .13 mm., at apex .07. Antennæ: 1, 76 $\mu$ ; 2, 95 $\mu$ ; 3, 185 $\mu$ ; 4, 160 $\mu$ ; 5, 150 $\mu$ ; 6, 122 $\mu$ ; 7, 65 $\mu$ ; 8, 76 $\mu$ . Total, .83 mm.

Described from two macropterous females taken at Harrisburg, Pa., March 10, "in burrows of Lepidopterous or Coleopterous larva in dead willow stem."

Although this species is apparently closely related to *M. bonannii*, Uzel, its generic position is uncertain until the male is known.

*Cryptothrips rectangularis*, sp. nov. (Figs. 18 and 19.)

*Female*.—Length about 2.7 mm. Colour nearly uniform black, excepting tarsi and third antennal segment, which are more or less blackish-brown.

Head rectangular, about one and one-third times as long as wide, sides parallel; lateral and dorsal surfaces faintly reticulate, sparsely and



FIG. 17—*M. (?) spinosus*.

briefly spinose; vertex transverse; postocular spines present, pointed. Eyes moderately large, not protruding, occupying the anterior angles of head. Ocelli small, about equal in size to facets of eyes; anterior ocellus not overhanging; posterior ocelli opposite centres of eyes, slightly separated from their inner margins. Antennæ eight-segmented, general colour black; segment 2 paler at apex; segment 3 with two transverse brownish-yellow bands, one at base, the other at middle; segments 3-6 subclavate; segment 7 oblong, pedicellate; segment 8 small, fusiform. Mouth-cone slightly wider than long, reaching about four-fifths across prosternum, apex broadly rounded.

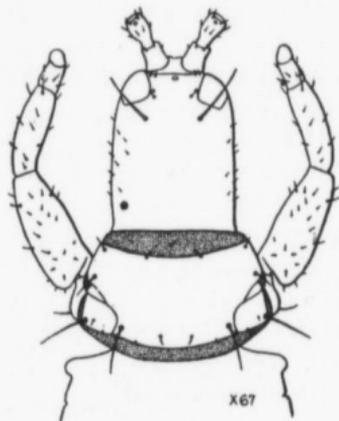


FIG. 18.—*Cryptothrips rectangularis*.

Prothorax about three-fourths as long as width of head, and (including coxæ) slightly more than twice as wide as long; usual spines all present, the two pairs near the posterior angles much the longest; anterior marginals very small. Pterothorax almost twice as wide as long, slightly wider than prothorax; sides subparallel. Wings lacking. Legs

nearly concolorous with body, tarsi somewhat lighter; anterior tarsus unarmed. Abdomen moderately stout, about one and one-half times as broad as pterothorax, widest at about segment 3, from which it tapers evenly to segment 6, and then rather abruptly to base of tube. Tube slightly less than three-fourths as long as head, tapering almost evenly from base to apex; surface not spinose.

Measurements: Total length, 2.74 mm.; head, length, .37 mm.; width, .26 mm.; prothorax, length, .20 mm.; width (including coxæ), .42 mm.; pterothorax, width, .46 mm.; abdomen, width, .64 mm.; tube, length, .26 mm.; width at base, .10 mm.; at apex, .05 mm. Antennæ: 1, 61 $\mu$ ; 2, 73 $\mu$ ; 3, 98 $\mu$ ; 4, 90 $\mu$ ; 5, 87 $\mu$ ; 6, 78 $\mu$ ; 7, 55 $\mu$ ; 8, 42 $\mu$ . Total, .58 mm.

*Male*.—Smaller than female (total length about 1.83 mm). Anterior femur slightly swollen; fore tarsus armed with a stout tooth. Tube twice as long as its greatest basal width, and two-thirds the length of head,



FIG. 19.—*C. rectangularis*

narrowing rather rapidly in its basal third, and then tapering evenly to apex; surface scarcely visibly spinose.

Described from four wingless individuals collected as follows: Illinois—Urbana, May 12, ♀ and ♂, under dead bark on peach tree (J. D. H.); Urbana, April, ♂, reared from nymph taken on willow tree (J. J. Davis); Pennsylvania—Harrisburg, March 10, ♀, "in burrow of Lepidopterous or Coleopterous larva in dead willow stem."

This species is very close to *C. carbonarius*, Hood, but differs from that species in being much smaller, in lacking the two pairs of prominent bristles in the region of the ocelli, and in the shape of the tube. The prothoracic sclerites differ in size and shape in the two species, and the prothoracic spines do not exactly correspond.

#### NOTES ON MOSQUITO WORK.

BY HARRISON G. DYAR AND FREDERICK KNAB, WASHINGTON, D. C.

In using the recent literature on mosquitoes, several points have been noted which it seems worth while to record, in order, if possible, to arrest certain errors that have crept into the subject and are being perpetuated. One author copies from another (usually without credit) until the original error becomes almost a classic fact. We wish, therefore, to emphasize these corrections as much as possible in order to counteract this tendency. Some of these errors refer to characters that have been considered of fundamental value in classification, and it is important that they should be pointed out, even if the system of classification now in vogue be not adhered to. They further illustrate the weakness of this system, which we have on several other occasions attacked.

The mosquitoes have suffered in their classification from the fact that the earliest generic separations were made upon the relative lengths of the palpi in the sexes. This is a secondary sexual character, as we have pointed out. Nor have the systematists who have used the palpi in classification made any study of their actual structure, except Neveu-Lemaire, whose results were obtained upon the study of too small material, and when extended show only intergradation. Now, while the separation of these genera on such characters may have been allowable (for even yet many systematists found genera on secondary sexual characters), their elevation to higher groups and subfamilies, as has been done by Theobald and his followers, is indefensible. We are unaware of any other case

where authors have presumed to found subfamilies on secondary sexual characters in normal bisexual animals. Furthermore, the system becomes beset with difficulties when one is confronted with a considerable series of species and attempts their classification on these lines. As the characters have really no fundamental importance whatever, it is not surprising to find that they tend to insensibly intergrade. Again, the relative length of the palpi to the proboscis depends in large part upon the length of the proboscis itself, a very variable character, and one of doubtful generic value, which has been wholly ignored in this connection. Dr. Lutz, in an attempt at a concise classification, in drawing the lines between his Metanototrichæ-Heteropalpæ and Metanototrichæ Isomicropalpæ, has been forced to use such distinctions as "♂ palpi one-third as long as the proboscis (*Goeldia*); ♂ palpi a little longer than in the ♀ (*Sabethinus*)." Genera in which the males are unknown are placed on assumption, and happen to have been generally placed wrongly. *Sabethoides*, for example, which he places in the Isomicropalpæ, has long palpi in the male. In genera of homogenous structure and coloration, the length of the male palpi varies in different species. For example, in *Hæmagogus equinus*, Theob., the male palpi are long, while in several other members of the genus they are short like those of the female. To add to the confusion, Peryassú states that the male palpi of *Stegoconops* are long. He includes two species in this genus, but gives no description of the male of either. One of these species (*leucomelas*, Lutz) we have identified as a species of *Ædes* (as we understand that genus). We do not know the male, but suspect that it has long palpi. The other species included in *Stegoconops* (*capricorni*, Lutz) is the one upon which the genus was founded. We have identified this as a species of *Hæmagogus*, the female agreeing with the original description in every respect, but the male palpi are short, like those of the female. Finally, it generally happens that specimens received for identification are females, and such are entirely unplaceable on the "system." As admitted by Theobald himself when he says, "but unless both sexes are seen, it is quite impossible to place any *Culicid* in any of the sections into which the family is divided." (Mon. Culic. iv., 122, 1907.) We are aware of instances where the work of enthusiastic students has been completely arrested from their inability to make any headway in classifying their material, since they could never determine to what genera their specimens should be referred.

The practice has become prevalent of erecting genera not only on trivial characters, but hastily and without proper comparison of allied forms. For example, *Stethomyia*, Theobald, a genus of Anophelines, has been founded upon the so called mammillated prothoracic lobes. We have received authentic specimens of this species through the kindness of Dr. Oswaldo Cruz, and find that, firstly, Theobald's picture gives an altogether exaggerated idea of the structure, while, secondly, the same structure occurs in all the other species of *Anopheles* that we have examined.

The scales on the metanotum are another character which has given rise to error. The subfamily Trichoprosopina has been founded upon the presence of scales together with setæ on the metanotum. The genus *Sabethes* (*sensu Theobaldi*), however, which has the metanotum densely covered with scales in all the species which we have examined, is excluded. The presence or absence of scales is of no fundamental importance; their value is far less than that of the setæ. Practically their use is confusing, since in indifferent specimens they may be entirely rubbed off, leaving no trace, and causing the student to misidentify his material, if not to actually find a new genus.

We have elsewhere called attention to the fact that the so-called ciliate legs do not form a tangible character for generic separation. In the forms of *Janthinosoma* we find all degrees of intergradation between strongly "ciliate" hind legs and those with the vestiture smooth. A similar condition obtains in the species of *Psorophora*. Even more striking cases may be found in the group Sabethini; the genus *Lesticocampa* includes species with strongly "ciliate" legs, and with perfectly normal ones. The genus *Trichoprosopon*, Theob., was founded upon the species *nivipes*, Theob., in which the legs are not "ciliate"; Dr. Lutz has described a species from Brazil (*splendens*) with strongly "ciliate" legs, but has wisely refrained from proposing a new generic term.

Another character made use of by Theobald in his recent work proves to be untenable for generic separation. We refer to the so-called spiny front margin of the wings. This consists of a series of more or less spine-like scales inserted on the front margin of the wing. These may be more or less conspicuous, not only from differences in development, but according to the degree in which these scales are overlapped by the other

normally-shaped scales. At all events, it offers nothing tangible or definable, being present more or less in all species.

The incorrect use of the term metatarsus has been corrected by Mr. Theobald in his latest volume, but, unfortunately, not uniformly so, so that the reader is often at a loss to know to which joint a certain number refers, thus greatly increasing the difficulty of this already too much involved subject.

We regret to be obliged to call attention to an important error in the otherwise excellent work of Dr. Goeldi. That author figures the eggs of *Mansonia titillans* from photographs. This constitutes the only reference published to the life-history of this interesting species, and is the only contribution to the life-history of it or its allies. Dr. Goeldi's observations have been widely quoted, and it is generally supposed, in consequence, that *Mansonia* eggs are of fusiform shape and deposited singly. It is, however, clearly to be seen from the figures of the adult on Dr. Goeldi's plate, that the species he had under observation could not have been a *Mansonia*, owing to the long tapering extensile abdomen there clearly shown, characteristic of *Aedes* (*sensu nostrum*), while the abdomen of *Mansonia titillans* is blunt and non-extensile. This type of egg is also characteristic of *Aedes*, and leaves the early history of *Mansonia* entirely unknown. We have reason to suspect that the larvæ of this group, when known, will be found generally similar to those of *Teniorhynchus* (*sensu Theobaldi*), that is, they probably feed permanently in mud at the bottom of swamps, attached to air-bearing roots, and the eggs are probably laid in a boat-shaped mass.

Finally, we must notice *Anopheles perplexens*, Ludlow, recently described as from Pennsylvania. We decline to recognize this as an American species, since it is unreasonable to suppose such a form would have remained undiscovered, whereas the chance of its being of foreign origin is probable. The North American species of Anophelines are few and of generally wide distribution, whereas those of the Philippines are many, nor are the species there at all well known, nor their range of variation properly studied. Miss Ludlow receives frequent consignments of mosquitoes from the army surgeons, not only in the United States, but more frequently from the Philippines. Her method of keeping them in uniform pill-boxes, loose in cotton, with the data written upon the covers, lends itself easily to error, from the facility with which covers might be accidentally transposed without the change being suspected.

NOTES ON THE PTEROPHORIDÆ OR PLUME-MOTHS OF  
SOUTHERN CALIFORNIA, WITH DESCRIPTIONS  
OF NEW SPECIES.

BY FORDYCE GRINNELL, JR., PASADENA, CALIF.

Lord Walsingham's paper, "Pterophoridae of California and Oregon," published in London, England, in 1880, is the first to describe or record any Plume-moths from California. It is devoted to those collected by the author in a journey through California and Oregon in 1871 and 1872. This was, and is, a notable contribution to Californian lepidopterology, and will hold its place in the future as a classic in the study of this interesting group of moths. Its descriptions are excellent, and its three plates well executed. Zeller in 1874 published a paper called "Lepidoptera der Westküste Amerika's," in which he describes *Leioptilus Mathewianus* from Vancouver Island. Charles Fish was the next person to describe any Plume-moths from California; this he did in a paper published in the CANADIAN ENTOMOLOGIST, in 1881, the specimens being mostly collected by Baron in Mendocino County. Since this last paper nothing has been recorded or described concerning these moths from California, except one species in Dyar's "List of North American Lepidoptera," 1902; this last work is important, as giving the synonymy and range of each species. Fernald, in 1898, published his valuable "Pterophoridae of North America," reviewing the structure and literature, and describing all the species and genera with keys, and adding a few species from California without definite localities; this is the most important work on the Pterophoridae of North America, and in the matter of genera and arrangement I follow it closely in the present paper.

It is seen that no species of Plume-moths have been definitely reported from Southern California; but the present paper shows them to be not at all rare, and that we have a good fauna, as we have of everything else. Doubtless many more species will be discovered with search and study.

Most of the material for this paper was collected at the headwaters of the Santa Ana River, in the San Bernardino Mountains, Southern California, by Prof. Joseph Grinnell, during the summer of 1907; and it shows the number of species to be taken in a rather small circumscribed area. A few species have been taken at San Diego by Mr. Wm. S. Wright, to whom I am indebted for sending them to me. Mr. Francis X. Williams has collected two new species near San Francisco, and raised them from the larvæ. A few have been collected at Pasadena and Stanford University by the writer.

September, 1908

*Trichoptilus Wrightii*, n. sp.—Expanse of wings, 16 mm. Head and thorax cinnamon-rufous; antennæ brownish-black, barred with white hairs; palpi cinnamon, tipped with white, and with long hairs underneath. Eyes dark brown. Thorax and abdomen cinnamon-rufous, whitish underneath; legs of the prevailing colour, spurs white, brown at base and at tip. Fore wings: cinnamon-rufous, with a tinge of orange towards the base of wings. Wings long, slender and narrow, giving the insect a delicate appearance. A light brown band crosses the outer third of the first lobe, between this and apex there is a darker patch, and in the apex there is a long, narrow, white patch resting on the costa, below which is a black streak in the fringe of the inner margin; the second lobe has a small, white spot in the anal angle, within which the fringe of long hairs is black. The feathers of the hind wings are of the general colour, as noted above, with the fringes darker and with a few black hairs intermixed; the third feather has the usual cluster of black scales towards the outer half.

Habitat: San Diego, Calif., Oct. 13, 1907; collected by Mr. Wm. S. Wright, in honour of whom this interesting species is named. There are five specimens in my collection, collected on the above date, two of which are types.

*Oxyptilus Bernardinus*, n. sp.—Expanse of wings, 18–22 mm. General colour of head, thorax, abdomen, legs and wings light mummy-brown (Ridgway's Nomenclature of Colours); antennæ narrowly-ringed with white throughout, the enlarged first joint conspicuously so; palpi largely white, with long fringes of white hairs on the segments.

Fore wings fissured to the middle; general colour mummy-brown, white as follows: Two oblique stripes on the outer end of the first lobe, the outer stripe narrow, the inner one at least twice as broad; a narrow white bar at end of fissure, reaching half way towards costa; the second lobe of a general, uniform colour, the anal angle very pronounced, white, producing the effect of an excavation, a few white scales along inner margin; under side much the same as upper, with white fringe of second lobe more pronounced. Hind wings general colour of fore wings, slightly darker; third lobe with a large cluster of black scales towards the apex, the fringe between the cluster and base whitish; hairs of fringes slightly blackish. The legs are mummy-brown, conspicuously barred with white. The spurs are brown on the under side, white above, long. Thorax and abdomen mummy-brown, sprinkled lightly with white hairs; base of thorax conspicuously white; abdomen with narrow white stripes between the segments.

Habitat: South Fork, Santa Ana River, San Bernardino Mts., Calif., 6,200 ft. altitude, June 27 and 28, 1907; described from five specimens, two of which are types in the author's collection.

This species is related to *O. ningoris*, Wlsm., from Northern California and Southern Oregon.

There is a single specimen from the Santa Ana River, 5,500 ft. altitude, Aug. 8, 1907. Expanse, 20 mm. General colour russet, thus being very much lighter than *Bernardinus*; the white stripes on the first lobe of the fore wings are very indistinct, the outermost almost obliterated; the white bar at the fissure scarcely perceptible. A few black hairs on the fringe of the second lobe. The feathers of the hind wing are as dark, or nearly so, as *Bernardinus*. The thorax and abdomen russet; the white patch at base of thorax very conspicuous. I consider this specimen to be either a seasonal or altitudinal form, or probably both (note the date and altitude above). I propose to call this form *finitimus*, n. form.

*Platyptilia Williamsii*, n. sp.—Expanse of wings, 20.5 mm. Antennæ, palpi and head, wood-brown; thorax and abdomen wood-brown, conspicuously marked with hoary scales or hairs, especially dorsally, where it is quite white. Legs white, with conspicuous black bars; spurs white and of equal length.

Fore wings are generally fawn-colour, with traces of wood-brown and russet. Fringes light brown. First lobe: The outer third consists of a cinereous band, within this a wood-brown band, broader than the first band; within this is a dark mummy-brown triangular patch, the point resting on the end of the fissure, the costal side and side parallel with the outer margin, longest. A costal light mummy-brown streak extending half way to base. The outer cinereous band (marginal) continuous with that on first lobe; a line of black dots within the fringe of the inner side, the outermost small and isolated, the second longer. Rest of lobe of general uniform colour. The whole wing covered with glistening whitish scales. Hind wings of an even, pale fawn colour. The black scales along the fringe of third feather to more than half the distance from base to apex, numerous and crowded. Under side with a black outer margin; a white line on the outer side of the cinereous band, which is much paler above, more cinereous; a white dash on the costa above the fissure; a black spot at end of fissure.

Habitat: Lake Merced, San Mateo Co., Calif., May 31, 1907, F. X. Williams. Raised from larva found in head of a composite flower. Named in honour of my friend and fellow-collector, Mr. Francis Xavier Williams, of San Francisco.

This species is related to *albidorsella*, *grandis* and *Cooleyi*, from which it can be separated by its darker colour and smaller size.

Type: 1 ♂, in the author's collection.

*Platyptilia monticola*, n. sp.—Expands, 18–21 mm. Head and thorax fawn-colour; antennæ of an even colour, somewhat darker; abdomen a dark fawn-colour, with patches of hoary scales on the sides and dorsum and on the caudal end of the thorax. Legs light fawn-colour, spurs and adjacent parts of legs brownish, tips of spurs lighter.

Fore wings: Fawn-colour and salmon-buff. A dark triangular patch at end of fissure, resting on costa and apex reaching into second lobe, beyond the end of fissure; the outer side of triangle concave; between the triangle and the outer side is a dark patch extending between the two margins, repeated on the second lobe; on the outer side of this patch is a distinct, white line. The rest of the fore wing is fawn-colour, more or less mixed with black and hoary scales, except for a very conspicuous patch of black scales on the inner margin of second lobe, three-fourths of the distance from the base, and more or less triangular in outline. Fringes white. Feathers of hind wings very dark fawn-colour, scattered over with many darker scales and a few hoary ones. A few black scales towards the base of hind margin of the third feather, reaching in some specimens to a little beyond the middle of the feather.

Habitat: South Fork, Santa Ana River, 6,200 ft. altitude, June 26 and July 1, 1907, J. Grinnell.

Types: Four examples in the collection of the author.

*Platyptilia hesperis*, n. sp.—Expanse of wings, 26 mm. Head and thorax ochraceous to ochraceous-buff; eyes dark brown; antennæ light ochraceous-buff or buff, with a few lighter coloured hairs along the upper side; the abdomen, cephalad, is the same colour as adjacent parts of body, caudad it is mummy-brown to Prout's-brown, slightly lighter beneath and at the tip.

Fore wings: General colour varying from ochraceous-buff to ochraceous, and tawny-ochraceous in some lights, and clay-colour including the hind wings. A large, triangular patch of mummy- or Prout's-brown resting on the costa, one-third of the way from the base, the tip reaching to beyond the end of the fissure, not quite touching, a short distance, nearly half way into the second lobe; basally, the wing is ochraceous-buff; the part beyond the triangle has a central patch of ochraceous, edged with buff bands; next to the inner buff band, which is narrower, is a band of

ochraceous, followed by a marginal band of mummy-brown; the markings of the first continued on the second lobe; fringes white; the fringe of the inner margin of the second lobe has two patches of black scales, the basal one largest; anal angle of the second lobe is mummy-brown, less so on the first lobe; the apex of the first lobe is produced, pointed. Hind wings are entirely clay-colour, fringes slightly lighter; third feather with black scales along the fringe, especially towards the base, the largest patch in the centre and somewhat triangular. Legs barred with mummy-brown and white, the basal part white; spurs white.

Habitat: South Fork, Santa Ana River, 6,200 ft. altitude, June 26, 28, and July 1, and Santa Ana River, 5,500 ft. altitude, Aug. 3, 1907; San Bernardino Mountains, Calif., J. Grinnell. Described from five specimens, two of which are types in the author's collection.

*Platyptilia Pasadenensis*, n. sp.—Expanse of wings, 18 mm. Head and thorax light brown; antennæ darker, spotted on the upper side with a lighter colour; abdomen hair-brown, lighter beneath, and with patches of white scales, two large patches of white scales just below and slightly behind the wings; on sides of the thorax slightly spotted with white; legs dark brown, barred with white; spurs pale, outer two-thirds dark brown.

Fore wings: General colour hair-brown to olive and seal-brown; the darkest is a triangular patch, resting on the costa, above the fissure, not quite reaching the fissure; the space between the triangular patch and outer margin is more or less hoary, but much streaked and spotted with black; a narrow, fimbriate, obscure black line extends from the outer end of the triangle along the costa to within the fringes, thence to fissure, fading out on the second lobe. The wing within the triangular patch to base is darker than the outer half, and spotted with darker scales; another blackish triangular patch rests on the costa at end of fissure, the longest side within; a black quadrangular patch on second lobe, below the fissure; the space between the two patches is light brown. Hind wings are the same colour as fore wings, with the usual black scales along the fringe of the third feather.

Habitat: Pasadena, Los Angeles Co., Calif.; collected by the author, July 16, 1906.

Type: 1 ♂ in the author's collection.

*Pterophorus baccharides*, n. sp.—Expanse of wings, 30–36 mm. Antennæ and palpi whitish or clay-colour; rest of head ochraceous; thorax and abdomen buff; legs buff.

Fore wings an even ochraceous-buff, inclining to light ochraceous along the costa, especially basally. Fringes darker than the adjoining parts of the wing. Colour glistening under a lens; the fissure occupies about one-third of the wing. Lobes of hind wing very light buff, with a silky lustre; fringes darker. The under side of all wings decidedly lighter than upper side, with a less silky appearance, a duller lustre, but bright.

Habitat: San Francisco, Calif., Sept. 7, 1907, Francis X. Williams. Raised from larvæ living in *Baccharis pilularis*, D. C.

Types: 1 ♂, 1 ♀ in the author's collection.

*Pterophorus Gorgoniensis*, n. sp.—Expanse of wings, 23–26 mm. Head and palpi grayish-white; antennæ grayish, distinctly annulated with black. Eyes blackish. Thorax and abdomen grayish-white; legs entirely grayish-white, spurs tipped with black.

General colour of wings buff to pinkish-buff, mixed with considerable grayish and black scales; a delicate, brownish-metallic lustre underlies the general colour of fore wings; there is a black dash on the costa above the end of the fissure, and two black dots between this and apex, indistinct; a black dot in the anal angle of the first lobe; fringes white, intermixed with a few black hairs; a small black, triangular spot at the end of the fissure. Hind wings even, shining, brownish, with a slight silky lustre; fringes concolorous.

Habitat: Santa Ana River, 5,500 ft. altitude, San Bernardino Mts., Calif. (J. Grinnell), Aug. 4, 8, 1907. There is a single specimen from the same locality, July 29, 1907, which differs in being much more brown over the whole surface, the black markings more conspicuous, and the triangular patch at the end of the fissure much larger.

*Pterophorus subochraceus australis*, n. subsp.—Expanse of wings, 28–30 mm. Resembles *subochraceus*, Wlsm., except that the general colour is cream-buff, even, with no other markings, except the abdomen, which is brownish above and below. There is no ferruginous shade on the fore wings, nor the cilia brownish, as described for *subochraceus* by Walsingham.

Habitat: Santa Ana River, San Bernardino Mts., 5,500 ft. altitude, July 25, 26, 29, and Aug. 13, 1907, J. Grinnell. Six specimens.

My six specimens are all constant, and I think the differences warrant giving it a distinct name. These little moths are very restricted in time and place of appearance, and their limited powers of flight render them

restricted to certain localities. We should thus study them closely to observe the differences, and so arrive at a conclusion in regard to their origin and distribution.

*Pterophorus Behrii*, n. sp.—Expanse of wings, 26–30 mm. Antennæ grayish or whitish, conspicuously barred with black rings the whole length; eyes brownish; head and palpi grayish, tip of palpi black; thorax and abdomen grayish; legs gray, conspicuously barred with black at the joints; spurs white.

Fore wings: General colour grayish, but much streaked and blotched with black and white or grayish. Three black blotches on the costa of the outer half of the first lobe; a white, orbicular blotch at end of fissure, followed inwardly by a black dash, which is somewhat long-triangular in outline; a black dash on the outer third of the first lobe, next to the fissure; on the second lobe there is a black dash in the apex and one in the inner margin; the rest of the wing is grayish, conspicuously dotted with black; there is a round, white, black spot on the inner side, one-third the distance from base, and a white dash on the costa of the first lobe. Fringes fuscous, marked or streaked with white. Hind wings fawn-colour, shining, fringes concolorous, long.

Habitat: Santa Ana River, 5,500 ft. altitude, July 26, Aug. 3, 1907, San Bernardino Mts., Calif., J. Grinnell. Six specimens, two of which are types, in the author's collection.

A very pretty species allied to *griseus*, Wism., and *aretidactylus*, Fitch. Dedicated to the memory of Hans Herman Behr.

*Pterophorus Catalinae*, n. sp.—Expanse of wings, 28 mm. Head and thorax and palpi cream-buff; antennæ cream-buff, darker at the tip; eyes dark brown or black; abdomen cream-buff, brownish dorsally; legs and spurs white.

General colour of wings cream-buff to olive-buff; first lobe of fore wings entirely clear olive-buff, except the fringes, which are lighter and comparatively long; the second lobe is cream-buff, slightly tinged with olive at the base; fringes very long, somewhat lighter, especially on the outer half of the wing at anal angle. Hind wings pale ecru-drab, shining, fringes concolorous; fringe very long, especially along the inner side of the third feather.

Habitat: Avalon, Santa Catalina Id., Calif., Sept. 6, 1907, collected by Mr. Victor L. Clémence. Described from one specimen in the author's collection.

This is a very distinct and peculiar-looking species, the pronounced curve to the first lobe of the fore wings, and the general slender aspect, render it easily recognizable and distinct. It is interesting as coming from an island.

*Pterophorus Hilda*, n. sp.—Expanse of wings, 23 mm. Head and antennæ pinkish-buff; antennæ annulated with black; eyes black; thorax and abdomen pinkish-buff or cream-buff.

General colour of wings varying from pinkish-buff, cream-buff to olive-buff; there is a black dash at end of fissure, but not touching it, somewhat crescent-shaped; a delicate shade (white) extends from here to the costa, slightly diagonally, where there is another dark brownish dash resting on the costa lengthwise; there are indications of two or three more spots between this and apex, obscure; there is a delicate white shade along the costa of the first lobe, and in the apex is a larger one, with a white line extending from this to the anal angle; the second lobe is of the same general shade of colour, but is more largely intermixed with a white shade, which in the outer half (in one specimen) is resolved into three bands. Fringes white, mixed with black hairs. Hind wings of an even, shining pinkish-buff; fringes long, concolorous; legs white.

Habitat: Santa Ana River, 5,500 ft. altitude, July 27 and 31, 1907, J. Grinnell. San Bernardino Mountains, Calif., July 13, 14, and Aug. 3. Five specimens, of which two are types in the author's collection.

Named after Hilda Wood Grinnell, who took so much interest in the Lepidoptera of the San Bernardino Mountains.

*Pterophorus pictipennis*, n. sp.—Expanse of wings, 26 mm. Head and antennæ cream-buff; eyes black; rear of head, thorax and abdomen ochraceous-buff; legs whitish, barred with ochraceous-buff.

General colour of fore wings ochraceous-buff, with an admixture of salmon-buff; a black dash at base of fissure; four or five small black dots in angle of second lobe, and several along the inner margin, not reaching the base; fringes darker than the rest of the wing. Hind wings salmon-buff, with shining scales and silky lustre; fringes of all the feathers very long, opaque, concolorous. Legs salmon-buff and ochraceous-buff, spurs white on the basal half, the upper part white.

Habitat: South Fork of the Santa Ana River, 6,200 ft. altitude, San Bernardino Mts., Calif., June 29, 1907; J. Grinnell.

Type in the author's collection.

Another specimen which is not quite typical is placed here provisionally; it is from the Santa Ana River, 5,500 ft. altitude, July 26, 1907.

It is less bright in its coloration, the first lobe being a grayish-brown to the base of the wing.

*Stenoptilia Coloradensis*, Fernald.—Fernald, Pterophoridae of North America, p. 61, 1898. (Four examples from Colorado.)

I have seventeen specimens in my collection from Santa Ana River, 5,500 ft. altitude, July and August, 1907, and South Fork, 6,200 ft. alt., June 19, 25, 1907, in the San Bernardino Mts., Calif.; J. Grinnell. Not previously reported from any locality, except the type locality.

*Stenoptilia Californica*, n. sp.—Expanse of wings, 28 mm. General colour buff to ochraceous-buff. Head, palpi and antennæ of an even buff.

Fore wing with a heavy, comparatively large, tawny dash at the base of fissure, barely touching the fissure, extending to the costa in a broad, diagonal, somewhat lighter shade; this band directed costo-apically; the costal end of the band is a very heavy tawny dash. The rest of the wing an even general colour, buff-ochraceous, except the apex of the first lobe, which is somewhat darker. The hind wings are an even colour, but lighter than the fore wings, of a silky lustre; fringes concolorous. Under side similar to the upper, but lacking the dash and streak on the first lobe of fore wings. Thorax and abdomen the same colour as adjacent parts of the wings.

Habitat: Santa Ana River, 5,500 ft. altitude, Aug. 2, 18, 29; South Fork, 6,200 ft. altitude, July 10, 1907, San Bernardino Mts., by J. Grinnell, and Pasadena, Los Angeles Co., Calif., Aug. 24, 1907, collected by the author. A very beautiful species.

*Stenoptilia Gorgoniensis*, n. sp.—Expanse of wings, 24–26 mm. Head and palpi light salmon-buff; antennæ darker, inclining to cinnamon-rufous.

General colour of wings salmon-buff, darkest toward the costa; this colour is fairly even over the fore wings, except that the costal region, especially basally, is very much darker; the fringes are lighter, and there is a darker, fimbriate, marginal line, inconspicuous; a conspicuous, dark brown dash, basad of the fissure, and somewhat below it; there is a small, black dot in the anal angle of the second lobe. The hind wings are practically of the same even colour as the fore wings, and also the fringes, with a silky lustre. The under side is somewhat lighter, slightly suffused with grayish scales, and lacks the black dash on the fore wings. Thorax and abdomen light salmon-buff; legs and spurs grayish-white.

Habitat: South Fork, Santa Ana River, 6,200 ft. altitude, San Bernardino Mts., Calif., J. Grinnell, July 4, 1907. Described from two examples, taken within the San Gorgonio quadrangle (U. S. Geological Survey). Types in the author's collection.

## NEW PHILANTHID WASPS.

BY S. A. ROHWER, BOULDER, COLO.

*Cerceris calochorti*, n. sp.—♀. Length, about 10 mm.; length of anterior wing 7 mm. Head with rather large, separated punctures; closest anteriorly, where they are somewhat confluent; ocelli in a low triangle, the distance between the two lateral ocelli less than the distance to the nearest eye margin; between the antennæ is a low, broad carina, which goes to base of the clypeus; first joint of flagellum about equal to 2 + 3; flagellum somewhat thickened from base to apex; clypeus distinctly convex in middle, convex part truncate, without any teeth; pronotum rounded, without ridge anteriorly, and not broken in middle, with a few well-separated punctures; propleura with irregular striæ; dorsulum with distinct punctures, some well separated, others touching each other, a broad, shallow furrow down middle; scutellum similarly punctured; mesopleura punctured similarly, but the punctures more shallow; mesopectus in middle without punctures; metathorax more shining than dorsulum, and the punctures are larger; enclosure dull, at anterior angles with four or five oblique striæ, rest very finely, longitudinally striated, middle furrow distinct but not strong; apical angles of fore tarsi rather strongly produced; posterior coxæ distinctly, strongly excavated on outer margin; posterior tibiæ serrate on outer margin; first abdominal segment small; all the abdominal segments somewhat constricted at base above, punctures of dorsal segments large (larger on first three segments), well separated; punctures of the ventral segments are not as strong as those of the dorsal; pygidium distinctly margined, about twice as long as width at base, obtusely rounded, densely punctured (punctures confluent). Colour black, subopaque basal part of mandibles, clypeus, except narrow line on apical middle and thin black line separating sides and raised part at base, lower two-thirds of inner orbits broadly (this is separated from the clypeus by a thin dark line), carina between antennæ to clypeus, scape in front, spot back of eyes near vertex, *yellowish white*; two large spots on pronotum, tegulæ, small spot below tegulæ, line on scutellum, postscutellum, two large oval spots on metathorax, large spots on first abdominal segment nearly meeting in middle, broad band on second to sixth (this band is narrowed in the middle on the second, third, fourth segments), spots on second, third, fourth and fifth ventral segments (those on second and third uniting in middle), *lemon-yellow*; legs, coxæ, trochanters, basal half of four anterior femora above, apex of posterior femora (deeper above), apex

of posterior tibiæ, *black*; tarsi somewhat ferruginous, rest of legs *lemon-yellow*; wings dusky hyaline, darker at anterior apical margin; nervures brown, costa and stigma reddish-yellow; flagellum bright ferruginous beneath, dark brown above; a few white hairs on head and thorax.

*Habitat*.—Boulder, Colorado, June 27, 1905 (W. P. Cockerell), fls. of mariposa lily (*Calochortus Gunnisonii*).

This could hardly be the female of *sexta*, Say, as it is much smaller. It differs as follows from Cresson's description (*Philanthidæ* of N. Am.): flagellum ferruginous beneath for entire length; enclosure dull, not shining; nervures brown, not ferruginous. It is near *vicinoides*, Vier. & Ckll., but may be separated by not having the mesopleura reticulated, the enclosure striated at sides, posterior femora mostly yellow, and other characters.

Two ♂'s from Boulder, Colo. (W. P. Cockerell), are probably males of this species. In one the markings are whitish-yellow, not lemon-yellow. In both the metathoracic enclosure is finely striated with broken striæ, and the face has more yellow, as is usual for the males of *Philanthidæ*.

*Cerceris solidaginis*, n. sp.—♂. Length, 10 mm. Head nearly as wide as the thorax, closely punctured with large punctures; width of the front below the antennæ less than the length of the eyes; ocelli in a low triangle, distance between the lateral ocelli less than the distance to the nearest eye margin; high sharp carina between the antennæ; third joint of antennæ a little longer than fourth; clypeus punctured as front, produced into a large triangular tooth anteriorly; dorsulum with large punctures, punctures closest at the sides; scutellum punctured like dorsulum; mesopleura and pectus closely punctured with large punctures; metathorax with large, close punctures, punctures running into the enclosure, so it is almost wanting; posterior tibiæ with teeth on the outer margin; first joint of hind tarsi equal to 2 + 3 + 4; dorsulum of abdomen with close, large punctures; apical segment longer than wide, margined at the side, at the apex with two short spines; venter of abdomen shining, with a few sparse punctures, a comb of long blackish hairs between apex and middle of each segment. Colour black; antennæ brown, paler at base; mandibles (apex piceous), clypeus, except narrow black border, face to a little above the level of the antennæ except around the antennæ, two elongate spots on pronotum; tegulæ, two spots on scutellum, postscutellum, four anterior legs below femora, dorsal segments 2-7 except at base (wider in the middle of three, four, five and six), *lemon-yellow*; four anterior trochanters and femora, posterior legs below coxæ ferruginous, or *reddish-yellow*; wings

subhyaline, marginal cell and surrounding area somewhat fuscous; venation pale brown, stigma and costa reddish-yellow; anterior margin of clypeus with a fringe of silvery hairs; thorax and abdomen above with few scattered hairs.

*Habitat*.—Las Cruces, N. M., Aug. 3 (C. T. H. Townsend), fls. of *Solidago Canadensis*.

This species is near *femur-vibrum*, Vier. and Ckll., but the enclosure of the metathorax is punctured with large punctures, not smooth in the middle; the metathorax is without spots, etc.

*Cerceris argyrotricha*, n. sp.—♀. Length, 11 mm. Head as wide as thorax, rather closely punctured with large punctures; facial quadrangle broader than long; distance between the eyes at antennæ greater than the length of the eyes; ocelli in a low triangle, distance between the lateral ones about equal to the distance of the nearest eye margin; carina between the antennæ prominent; third joint of antennæ about equal in length to fourth; clypeus punctured like front, anterior margin with two very small teeth; thorax, except enclosure, with large rather close punctures; enclosure closely, finely punctured, middle furrow distinct, four anterior femora rather robust; anterior tarsi on outside with long bristles, on inside with a comb of short hairs; posterior tibiæ on outer margin strongly serrate; first joint of posterior tarsi a little longer than 2 + 3 + 4; dorsal segments of abdomen coarsely, closely punctured, punctures on first two segments larger; ventral segment with very few punctures; pygidium about three times as long as the width at base, at apex truncate, closely, finely punctured. Colour ferruginous; apex of mandibles, apical half of antennæ, front above antennæ (except two ferruginous spots on superior orbits), a basal, triangular spot on dorsal abdominal segments three and four (this spot is dark brown), *black*; clypeus, face to a little above the level of antennæ, elongate spots, pronotum, postscutellum, broad band on second dorsal segment, and following dorsal segment, except spots above mentioned, tegulæ in part, *yellow*; wings subhyaline, darker along margin; venation brown, stigma yellowish; face in front, thorax beneath, legs, especially tarsi, and more especially the hind tarsi, with silvery pubescence.

*Habitat*.—Las Cruces, N. M., Aug. 11 (C. T. H. Townsend).

This is quite a distinct species. In Viereck's and Cockerell's table of New Mexico *Cerceris* (Jn. N. Y. Ent. Soc., Sept., 1904), it runs out at 7 because of the yellow clypeus and truncate pygidium.

*Cerceris rhois*, n. sp.—♂. Length, 12 mm.; length of anterior wing, 10 mm. Head closely punctured with large punctures; ocelli in a triangle, distance between the lateral ocelli less than that to the nearest eye margin; carina between the antennæ short, high, sharp; third antennal joint longer than fourth, first and third joint of about equal length; clypeus punctured as front, produced in the middle into a short, broad tooth, which at the apex is dentate; thorax, except enclosure, punctured like head, mesonotum in middle with a shallow longitudinal furrow in anterior middle; enclosure strongly, slightly obliquely striated, middle furrow distinct, on the lower part the striæ start from this furrow; posterior tibiæ on outer margin with six short teeth, from each tooth is a rather long bristle; abdomen above with large, rather close punctures; venter shining, not strongly punctured, first ventral segment rather finely striato-punctate; seventh dorsal segment parallel-sided, not quite twice as long as width at apex, rather sparsely covered with large punctures, at apex truncate, a small tooth at each apical corner. Colour black; clypeus, mandibles (apex piceous), face to a little above the antennæ, two spots on pronotum, postscutellum, broad band on second dorsal segment, a narrower one on following dorsal ones narrowed in middle, narrow band on ventral segments two, three and four, anterior trochanters and femora beneath, middle and posterior coxæ beneath, entire middle and posterior trochanters, middle femora beneath, posterior femora for basal half, four anterior tibiæ and tarsi, *yellow*; four basal joints of antennæ, apical half of middle femora above (the basal half above black), apical half of posterior femora, posterior tibiæ and tarsi, tegulæ, *reddish-yellow*; wings subhyaline, apex clouded; venation reddish-yellow; entire insect clothed with brown or golden pubescence.

*Habitat*.—Rio Ruidoso, White Mts., about 6,500 ft., N. M., July 21, on flowers of *Rhus glabra* (C. T. H. Townsend).

In the striation of the enclosure this species is like *C. compacta*, Cress., but the clypeus is different, also the pubescence. There are also other differences. It has some resemblance to *mimica*, Cress, but is of a different colour, the venter is maculated, etc.

*Cerceris cleoma*, n. sp.—♂. Length, about 5 mm. Head with large close punctures; distance between the lateral ocelli about equal to the distance to the nearest eye margin; carina between the antennæ rather strong; first antennal joint longer than third, third and fourth equal; clypeus punctured like front, rather pointed in middle of rounded anterior

margin; entire thorax punctured with large close punctures; enclosure with large punctures, middle furrow more or less distinctly indicated by a row of punctures; four anterior femora robust, swollen; anterior trochanters triangular in outline, long, as long as half their femora; abdomen above punctured as thorax; venter not strongly punctured; seventh dorsal segment parallel-sided, about twice as long as the width at base, truncate at apex, each apical corner with a small tooth, punctured with large punctures. Colour black; antennæ, except basal joints above, fulvous, dusky above; face to level of antennæ, inner orbits to a little above antennæ, middle of clypeus, outer half of tegulæ, postscutellum, *yellow*; bands on dorsal abdominal segments two to seven (one on sixth very small), *yellowish-white*; legs below knees (posterior tibiæ at apex brownish) yellow or reddish-yellow; posterior trochanters and base of femora rufous; posterior femora dark brown; wings dark, darker along anterior margin; venation black.

*Habitat*.—Denver, Colo., July 20, 1907, on *Cleome*, 1109 (Dunning).

The coarsely-punctured enclosure separates this species from most American ones. From its allies the dark wings, small size and shape of the clypeus will serve to separate it. The general appearance is much like that of *C. finitima*, Cresson.

The types of the species described above are in the author's collection. The following species of *Eucerceris* has been described by Mr. Cockerell, after we had studied and discussed it together:

*Eucerceris pimarum*, n. sp., Cockerell & Rohwer.—♀. Length, about or nearly 10 mm.; red, blackish and pale yellow. Head broad and thick, bright ferruginous, darker on face; mandibles thick, black at apex; face flattened, closely and finely punctured; clypeus very short, but very broad, divided into three lobes, the middle one with a pair of rather widely separated black teeth or tubercles on the lower margin, and between them a small bituberculate prominence, and all three fringed with rather short pale hairs; front with a very prominent obtuse ridge between the antennæ, broadening and inclining to divide above, so as to form a sort of V; front, vertex and cheeks with strong, close punctures; vertex broad; interocellar area black; cheeks exceedingly broad, rounded behind; antennæ ferruginous, the apical two-thirds of the flagellum more dusky; third antennal joint little shorter than 4+5; mesothorax very shiny, with large, well-separated punctures, tending to run in rows; scutellum and postscutellum sparsely punctured; mesopleura roughened;

region beneath hind wings obliquely striate; metathorax closely punctured, the area triangular, strongly, transversely grooved, and with a longitudinal median groove; thorax ferruginous, the mesothorax blackish, suffused with red behind, the area of metathorax black or almost; prothorax above, scutellum anteriorly (narrowest in the middle), postscutellum, a patch on upper part of pleura, and an elongated mark on each side of metathorax, all pale yellow; tegulae ferruginous; wings hyaline, with a slight cloud near upper end of basal nervure, and a very large dark brown cloud occupying the marginal cell, the apex of the first submarginal, the small second submarginal, the third submarginal except below, and the apical area beyond these; stigma clear orange-ferruginous, nervures fuscous; recurrent nervures received near beginning of second and third submarginal cells; legs bright ferruginous; hind tibiae with strong but short spines on outer edge; abdomen constricted at the bases of the segments, shining, punctures strong and well separated, but segments 2 to 4 with a band of small dense punctures across the middle; first segment small; first four segments reddish-fuscous or reddish-black above, the others and the venter ferruginous; first five segments each with a broad apical pale yellow band, that on second very broad laterally, but widely emarginate in the middle; pygidial area broad, dull, subrugose.

In Cresson's table of *Eucerceris* this runs nearest to *E. fulvipes*, Cress., to which it is allied, but *fulvipes* has conspicuous light markings on the face, and honey-yellow nervures.

*Hab.*—Phoenix, Arizona, 1897, November. Collector unknown; received from Mr. S. N. Dunning.

### A JULY BLIZZARD.

BY WM. H. BROADWELL, NEWARK, N. J.

My duties as a letter carrier necessitate my being out each night till 1 a.m., so I have a fine chance to observe the things that go on in the entomological world after sundown. As I pass several hundred electric lights in the suburbs, I see and get a large quantity of insects that I would not otherwise come across.

On the evening of July 17th the "blizzard" occurred. From about 8 p.m. until 2 a.m., by actual observation—and no doubt until daylight—there were around each electric light thousands, yes, millions, of a small white moth—*Ennomos subsignarius*.

In New York they were in evidence on the 15th, on the 16th in Paterson, and in Newark on the 17th. At all these places they were present in about the same abundance.

At an electric light two doors away from my house they covered a branch of a tree extending out over the street so thickly that, when standing at my door, the branch had the appearance it would have after a heavy fall of wet, clinging snow. On the front of the two houses nearest to this light, from the top of the first-floor windows to the roof—both three-story houses—you could not have placed your hand on the boards without disturbing four or five moths. There is an eight-foot alley between these houses, and the sides adjoining this alley were covered in the same manner.

When going along the streets and passing a light, one's clothing became coated as effectually as with real particles of snow. They would fly in one's face, in one's eyes, and into one's mouth if it were not kept tightly shut.

Early the following morning (the 18th), under the lamps the wings were on the ground as thick as apple blossoms after a storm, showing that the sparrows had not forgotten why they were brought over to this country some forty years ago. In New York they extended from Herald Square to Harlem. At Paterson and Newark they extended to all parts of the cities.

Although this moth was so abundant, it is as harmless as it is beautiful.

*E. subsignarius* feeds on only five or six varieties of trees, and except under the most unusual conditions could it do much harm. We may consider ourselves fortunate that the invasion was not of the Brown-tail or Gypsy moths. It would be a hard matter to say where this army of invaders came from, but no doubt conditions somewhere were favourable to their breeding to such an enormous extent.

In July, 1897 or 1898, I saw a similar phenomenon at Boonton, N. J., but in this case the invaders were *Nepytia semiclusaria*.

On the 4th of July I was in a large woods, and suddenly came to a tree completely covered from base to the lower limbs with *semiclusaria*, and upon going a little further I saw other trees covered as thickly. As in this latest instance the invasion was for only one day, the next day only a dozen or so could be found. Whence came they? Whither do they go? It is easy to answer the last, but who can explain the first?

## NEW SESIID MOTHS.

BY T. D. A. COCKERELL, BOULDER, COLORADO.

*Sesia fragariæ* (Hy. Edw.), var. *semipræstans*, v. nov.

♀.—Length almost 12 mm.; anterior wing,  $10\frac{1}{3}$ ; antennæ simple, dark steel blue, with a dusky apical tuft; occiput, cheeks and palpi covered with orange-vermilion scales; last two joints of palpi with a few black scales; tongue long; vertex with black scales, and a little tuft of red on each side; a little red beneath each antennal socket; face convex, shining purple; thorax at sides orange, tinged with purplish-pink, above dark, with very strong peacock colours, green and purple, and rudimentary sublateral red stripes; patagia tipped with orange; legs metallic dark blue and green, with the tibiæ orange-vermilion, except at apex and base, and the tarsi also with many light orange scales; anterior wings metallic peacock-green, irrorated with pale reddish scales, but the lower margin, greatly widening basally, is a splendid orange, suffused with purple and crimson, while near the apical margin the dark scales are blackish; the discal red stripe is evident, but small; hind wings covered with orange scales, with only small transparent patches, these, perhaps, due to abrasion, veins  $M_2$ ,  $Cu_1$  and  $Cu_2$  black-scaled; fringes very long, shining yellowish-plumbeous; abdomen dark peacock-green, with the fourth segment, and the hind margins of the two following, vermilion; caudal tuft vermilion, with a few dark hairs laterally; beneath, the abdomen is red laterally, and mainly dark in the middle.

*Hab.*—Florissant, Colorado, prox. 8,000 ft., June 21, 1908, flying rapidly over very dry and barren ground (Cockerell).

Beutenmüller (Bull. Am. Mus. Nat. Hist., VIII, 144) remarks that *S. præstans* (from Washington State) is much like *fragariæ*, but "is larger, and is marked with orange in the cell and streaked with this colour in the area beyond the discal mark." In the orange streaking our insect is like *præstans*, but in the colour of the legs and the size it is like *fragariæ*. The colour of the abdomen is more like that of *præstans* than *fragariæ*. Henry Edwards, in his original description of *fragariæ*, omits all mention of the red fourth abdominal segment—a most conspicuous feature of *fragariæ*, as understood by Beutenmüller, who examined Edwards's type. Beutenmüller, however, says the type is "one female from Colorado," whereas Edwards describes the species primarily from a male.

It may be that *semipræstans* is a distinct species, but it seems better at present to treat it as a form of *fragariæ*.

In 1894 and 1896 Mr. Beutenmüller treated *Pyrrhotenia helianthi* as a synonym of *fragariæ*, but in his Monograph of the Sesiidæ, he makes it a synonym of *S. Behrensii* (Hy. Edw.). The name *helianthi*, however, has priority over *Behrensii*, and the species must be known as *Sesia helianthi* (Hy. Edw.).

*Sesia florissantella*, n. sp.

♂.—Length, 8 mm.; anterior wing about  $5\frac{1}{2}$ ; no red or yellow about the insect; antennæ black, with a small apical tuft; the basal half of the antennæ beneath is finely denticulate, and also furnished with numerous curving hairs; occiput with long, coarse, faintly yellowish hair; vertex with black hair or scales; cheeks with white hair, and face with white scales; palpi long and very bristly, the clothing black on the outside, white above and within; tongue slender; thorax above black, with strong greenish-metallic tints, the collar strongly brassy; sides of thorax with large black and white scales, a conspicuous patch of white just beneath the wings; legs black and white, the long hair on femora beneath white, spurs white, hind basitarsus nearly all white, as also second joint within and at apex, hind tibiæ with much white about the middle; anterior wings purple-black, with scattered white scales, a small white mark (peppered with black) in the cell, and conspicuous white streaks in the apical field; hind wings transparent pearly-white, except for the black costa and scales on the veins; fringes of both wings long and black; abdomen purple-black; some white scales on second segment; a narrow pure white band on fourth, and an apical white band on the penultimate one; caudal tuft black.

*Hab.*—Florissant, Colorado, June 25, 1908, in a very dry place (*Cockerell*). A distinct little species, in colour resembling *S. arctica*, Beutenm., as much as anything. It appears to be related most closely to *S. nigra*, Beutenm., known only in the female. It is barely possible that it is the undescribed male of *nigra*, but the differences in the colour of the wings are so great that this cannot be assumed.

*Egeria tibialis* (Harris), var. *Dyari*, n. var.

♀.—Thorax purple-black; lateral bands in front very broad, but the longitudinal lines very narrow; posterior dorsal yellow spots very large; abdomen with first segment black; second black, narrowly yellow at base;

third yellow, narrowly black at apex; fourth black, narrowly yellow at base; fifth and sixth yellow, narrowly black at apex; apex of abdomen cinnamon-brown.

*Hab.*—Las Vegas, New Mexico, July 3, 1900 (*Cockerell*). The same variety is figured in Beutenmüller's Monograph of the Sesiidæ, pl. xxxiii, fig. 13. The specimen figured, as I learn from Mr. Beutenmüller, is from Colorado. This variety was described many years ago, but not published; my type is in the U. S. Nat. Museum.

MOSQUITO NOTES.—NO. 6. (Continued.)

BY C. S. LUDLOW, PH. D.

Laboratory of the Office of the Surgeon-General U. S. Army, Washington, D. C.

From the Philippines comes a well-marked mosquito, apparently belonging to Theobald's *Pseudo-uranotenia*, but having very broad ungues not mentioned in the description of the type.

*Pseudo-uranotenia triangulata*, n. sp.—♂. Head dark, densely covered with white flat scales, having a bluish tinge and a few brown bristles; antennæ light and apparently lacking pubescence, verticils brown, basal joint testaceous; palpi brown, proboscis brown, some outstanding scales near the tip on one specimen, labellæ light, eyes brown and gold, clypeus dark brown.

Thorax: prothoracic lobes brown, with white, flat, broadly round-ended scales, a few brown bristles; mesonotum brown, covered for the most part with slender brown curved scales, but with a band of flat, white, broadly "round-ended" scales running cephalad from the wing joints, and meeting at the nape, making a continuous line of bluish-white around the latero-cephalic edge of the mesonotum, many long brown bristles near the scutellum; scutellum brown, markedly lobed, with flat brown scales and very long brown bristles; pleura brown, with brown flat scales, shaped like those on the mesonotum, and a line of flat white scales running diagonally across; metanotum brown.

Abdomen covered with black scales except a triangular apical spot (apex toward the base of the segment) of brilliant white scales, the spot sometimes extending to the base of the segment; venter black, except a few white scales forming a median line.

Legs: coxæ and trochanters light, with brown scales. The remainder of the legs covered with brown scales except in the hind legs, which have

the fourth and fifth and the distal half of the third joint pure white, mid femora markedly swollen. Ungues missing on all but the hind legs, where they are white, simple and very broad, rather leaf-like.

Wings clear, almost white, partly denuded, but with broad scales, some of them as symmetrical as in *Mansonia*, others suggesting the "heart-shaped" scales of *Etorleptomyia*, mostly brown, but some white scales, an irregular white spot just exterior to the root of the third long. vein, and extending on the second long. and subcosta, but not on the costa, costal scales as in *Uranotenia*. The cells very short, first submarginal at least one-third shorter than, and not so wide as the second posterior cell; supernumerary and mid cross-vein about the same length, meeting at an angle, and the posterior cross-vein about one-half the length of, and three times its length distant, anteriorly, from the mid.

Length, 3.5-4 mm. Habitat: Reine Regente, Mindanao, P. I. Taken Feb.

The markings are distinctive, the triangular spots on the abdomen being very noticeable.

It seems probable that in *Pseudoskusea mediolineata*, mihi, I have inadvertently described Theobald's *Skusea mediofasciata*, the distinction between the two genera being not the toothed unguis, but the long palpi.

#### ACKNOWLEDGMENT.

The Curator begs to acknowledge with grateful thanks the receipt of a box containing 87 specimens of Cuban Lepidoptera, Rhopalocera and Sphingidæ, sent by Mr. Charles T. Ramsden, Guantanamo, Cuba; they form a very welcome addition to the collections of the Entomological Society of Ontario.

NOTE.—The *Rhachidorus Semni*, Krauss, Orth. Austr. and Malayischen Archip., p. 765, pl. LXVII, figs. 13, 13a-b (1902), from Queensland, was inadvertently omitted from my fascicula on the Decticinae in Wytzman's Genera Insectorum, which has just appeared.

Too late for recording in the above-mentioned work, I find my *Platyclus Fletcheri*, described from a ♀ from Canada, belongs to the genus *Idionotus*, and is the same as my *I. brevipes*, described from an alcoholic ♂ from Arctic America. The discovery of this synonymy is due to Dr. E. M. Walker, of Ontario, who has taken both sexes of this insect.

—A. N. CAUDELL, U. S. Nat. Museum, Washington, D. C.

## ACTIAS LUNA.

I have been raising several broods of *Actias luna* this year. The prevailing type has very yellow-tinted males, a sort of golden-green, sometimes almost approaching sulphur-yellow, and some of them have the dark lines across the wings very pronounced and strongly undulated. The females are always clear green. I am trying to intensify these peculiarities by selecting the most marked examples to breed from, and as a complete generation requires only about seven to eight weeks during our long summers, results should be quickly attainable.

The species is easily raised in quantity, but is exceedingly rare out of doors. This seems to be due chiefly to the unremitting search for the caterpillars by the large paper-wasps (*Polistes*). Nothing can exceed the tiger-like ferocity with which these wasps leap upon and rip up and devour one of these great caterpillars—sometimes they bite holes in my cheese-cloth bags on the trees, and a veritable massacre of the innocents follows the entry of one of these murderous creatures. I have seen them tearing furiously with fore feet and jaws at the webs of the tent-caterpillars. They seem to track their prey by scent rather than sight.

A large *Cecropia* caterpillar put on a branch in the open escaped them for a day or two—*Cecropia* is not a native here—but very soon I came upon a wasp licking her chops over the last of it, while two examples of a smaller species of *Polistes* were chewing at the offal like jackals at a tiger's feast. The big wasp ignored them, but snapped viciously at a fly that came for a taste.

Last winter I sent to the CAN. ENT. a modest little advertisement of surplus *Luna* cocoons for sale. The outcome proves that this journal furnishes to its advertisers, besides sordid lucre, pretty nearly "everything that is requisite and necessary, as well for the body as for the soul," for I sold all my cocoons, and have had a most interesting correspondence and exchange of treasures. One boy in far-off Nova Scotia says I am to be his adopted "Uncle Teddy" henceforward as long as I live, and that he is coming some time to visit me in Florida!

Now, no one can ask more in this world than to have plenty of love and plenty of money (or its equivalent) and an agreeable avocation—the three together are surely "wealth beyond the dreams of avarice"—and all in return for a paltry half-inch of advertising space, at a money-cost too insignificant for consideration!—THEODORE L. MEAD, Oviedo, Fla.

## BOOK NOTICES.

## KIRKALDY'S CATALOGUE OF THE HEMIPTERA: A PRELIMINARY NOTE.

BY J. R. DE LA TORRE BUENO, WHITE PLAINS, N. Y.

I desire to bring to the notice of American entomologists, more especially to that of our hemipterists, Kirkaldy's Catalogue of the Hemiptera, which will shortly be published by F. L. Dames, of Berlin.

It has been my privilege to read some of the proof-sheets, and I am bound to say that in spite of all the discussion to which it will surely give rise, the work will be indispensable to all systematic zoologists, on account of the phylogenetic matter that enriches it. I reserve to myself the pleasure of going fully into the contents of each volume on its appearance. The first volume is promised to us shortly. But in the meantime I may say that it is far more than a mere list of names, since it gives much biological data and brings all synonymies down to date, clearing up many obscure points. I believe that since Stal's *Enumeratio Hemipterorum* no work of a similar nature has covered the field so completely, excepting, perhaps, Wytzman's "Genera Insectorum," which, however, is different in scope and plan.

THE GENERA OF THE TORTRICIDÆ AND THEIR TYPES. By C. H. Fernald, A. M., Ph. D., published by the author, Amherst, Mass. Signatures issued as dated February 21st to May 29th, 1908; issued complete June 4th, 1908; 68 pages.

The fathers of entomology who did such conspicuous work in the last quarter of the eighteenth and the first half of the nineteenth century, usually omitted to designate any certain species as the type of or typical of their genera. Their conception of a genus was also based upon superficial characters, such as the pattern and ornamentation of the wings, and it was naturally found, when the present systematic structural scheme was adopted, based upon venation and other fixed characters, that in many cases under one genus were many different structures.

This has been the cause of endless confusion and changing of generic names, especially during the past twenty-five years, when the systematists in different groups have endeavoured to live up to the severe letter of the law of priority. The confusion has been only increased by the

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different interpretations and different methods pursued by investigators as to the manner of fixation of types. Professor Fernald in this work states that he has followed the latest rules as prescribed by the highest International Authorities, and adopted at the last meeting of the Zoological Congress.

This work is the first of its kind that has ever been published in the Microlepidoptera. As its title implies, it takes up one by one every Tortricid genus known to the author, from the tenth edition of Linnæus down to the present day, and fixes and names the type species in each genus. The fact that about three hundred and twenty generic names are reviewed, indicates the magnitude of the task. Other authors have made desultory attempts from time to time to fix types in the particular genera in which they happened to be working, but it remains for the present author to treat the entire family of Tortricidæ as a comprehensive whole.

As the author states, there will naturally be a difference of opinion as to the flexibility or limitations of structure which constitute a genus. For this reason the synonymy of genera which concludes the work will be subject to change. This remark is emphasized by the fact that with two exceptions the synonymy is exactly the same as the list of species under the different generic headings in Staudinger & Rebel's 1901 Catalogue. Very little work in the European Tortricidæ has shown that the groups in this catalogue are not well assorted, and are subject to very considerable revision.

The North American and European genera appear to have been most conscientiously worked out, but it is apparent that little or no work has been done in the Indian and Australasian genera, as all of these latter are simply listed without criticism or indication that any attempt has been made to associate them with the older genera. As many of the Eastern genera have been erected on more or less unsubstantial secondary sexual characters, some of them will certainly fall into the synonymy when their structure is better known.

These criticisms do not affect the value of the work, as it only purports to fix the type of the genera, and in doing this it confers a vast benefit on all workers in this group.

The next step must be the publication of a work, containing plates showing the venation and other structure of every type species named in Professor Fernald's monograph, together with the synopsis of the characters

of each genus. Of course, this must be followed with an examination of every known species of the world's Tortricidæ and a reassemblage of them under their proper generic headings.

As it necessarily must be some years before such a work can be completed, the status of generic names in our present list is of interest. The most important changes are shown in the following table, the first column of which gives the names to be substituted for the supplanted names of the American lists in column two, and the European list in column three. It may be added that this table but briefly shows the changes made necessary in the European lists. About half of their present generic names will go into the synonymy and be replaced by older names.

		{ <i>Dyar Cat.</i> , 1902.	
<i>Fernald's Revision.</i>		{ <i>Smith List</i> , 1903.	<i>S. &amp; R. Catalogue</i> , 1901.
Rhyacionia, Hb.	Evetria, Hb.	Evetria, Hb.	Evetria, Hb.
Cymolomia, Led.	Exartema, Clem.	Cymolomia, Led.	Cymolomia, Led.
Olethreutes, Hb. }	Olethreutes, Hb.	Olethreutes, Hb.	Olethreutes, Hb.
Argyroploce, Hb. }			
Cydia, Hb.	{ Thiodia, Hb. (Dyar) }	Semasia, Hb.	
	{ Cydia, Hb. (Smith) }		
Enarmonia, Hb.	Epinotia, Hb.	Steganoptycha, Stph.	
Spilonota, Stph.	Tmetocera, Led.	Tmetocera, Led.	
Ancylis, Hb. }	Ancylis, Hb.	Ancylis, Hb.	
Anchylopera, Stph. }			
Laspeyresia, Hb. }	Enarmonia, Hb.	Grapholitha, Tr.	
Eucelis, Hb. }			
Carpocapsa, Tr.	{ Cydia, Hb. (Dyar) }	Carpocapsa, Tr.	
	{ Carpodapsa, Tr. (Sm.) }		
Peronea, Curt.	Acleris, Hb.	Acalla, Hb.	
Æthes, Billbg.	Phalonia, Hb.	Conchylis, Sodoff.	

As the author remarks in the Preface, his work is incomplete. This refers particularly to certain of Walker's names of exotic genera, which have not been systematically investigated, and likewise to the names in the Billberg Enumeratio. In both of these works genera were included under the heading of Tortricidæ, which belong to other families. Most of these have been treated by the author, but it is only reasonable to suppose that likewise in other families may be found genera based upon Tortricids, which may supplant some of the names re-established in this paper.

W. D. K.

## SOME RECENT PAPERS ON HEMIPTERA.

BY J. R. DE LA TORRE BUENO, NEW YORK.

(Continued from page 302.)

Another paper of interest is by Mr. G. W. Kirkaldy, "A List of the Described Hemiptera (excluding Aleyrodidæ and Coccidæ) of the Hawaiian Islands."<sup>1</sup>

This paper is in its nature a supplement and an addendum to his former work on the same group in the "Fauna Hawaiiensis." The arrangement and nomenclature very naturally agree with the author's views on phylogeny and nomenclature, which, I understand, will be carried out in his forthcoming catalogue of the Hemiptera, to be issued shortly. But aside from these matters open to disagreement, *with which in the main I am in accord*, there is much that is useful and of interest in the paper.

He begins by noting that the endemic families of the Heteroptera number only 8 out of the 26 recognized at the present day; and only 4 out of 12 Homopterous families; and further, that of these 12 families 6 only are represented by more than 10 species, namely: the Myodochidæ (Lygeidæ auctt), Nabidæ, Miridæ, and the first three Homopterous families. The absence of other dominant families in the Pacific "show more plainly than words the real condition of the Fauna."

"The leading characteristic of the Hawaiian Hemiptera is their tendency and almost complete adaptation to an arboreal life. All, or practically all, the Hawaiian Asiracidæ—one of the most important families numerically—are arboreal, a phenomenon otherwise known, so far, only in one peculiar Australian genus, *Proterosydne*, Kirkaldy. *Acanthia*, usually a riparian genus, has one species representing, no doubt, the ancestral form, inhabiting dry heaths in Europe; nowhere but in these Islands, to my knowledge, are there arboreal species."

One hundred and seventy-four species are recorded, of which 138 are considered endemic and 36 immigrant. The endemic genera reach 31. Coccidæ and Aleyrodidæ are not considered, and including these, described as well as manuscript species, he estimates the total Hemipterous

1. Proc. Haw. Ent. Soc., I, pt. 5, pp. 186-208, text figs. 1 to 3, pl. 4, April, 1908.

fauna, endemic and immigrant, at not less than 500 species, of which 360 are endemic.

In this paper several new genera are established, a number of new species described, some synonymy cleared up, and, which makes it of more importance to students of the Pacific fauna, a large number of rectifications are made in the "Fauna Hawaiiensis." To enhance its value, Kirkaldy gives us a table of the Asiracid genera. There are three text figures of wing venation, and a plate of Homopterous genitalia, which add greatly to the usefulness of the paper.

Putting aside the debatable points, this is a really valuable contribution to Hemipterology, a fragment though it be.

The third paper<sup>2</sup> appeared in the *Ohio Naturalist* for June of this year, under my name, but it is in reality a careful study of certain of the fresh-water forms of the Gerrid subfamily Halobatinae, and includes what is practically a monograph of Rheumatobates, by Dr. E. Bergroth. This paper is of so finished a character that any comment on its quality becomes superfluous. I wish, however, to call attention to it very especially, and now note a few of its salient points.

Dr. Bergroth begins by restricting and defining the subfamily *Halobatinae*, which is characterized by having the inner margin of the eyes convexly rounded. A discussion of *Trepobates*, Uhl., follows, in which this genus and its allies, *Callistometra*, Kuh.; *Rheumatometra*, Kirk.; *Metrobates*, Uhl.; *Telmatometra*, Bergr. (gen. nov.), and *Halobatopsis*, Bianchi, are considered. The new genus *Telmatometra* is here characterized, and is at once distinguished from its ally *Trepobates* by the structure of the head, antennae, corium and genital segments. One species, *Telmatometra Whitei*, Bergr., is described in the genus. Next in order, *Rheumatobates præposterus*, Bergr., is described. This can readily be separated from its described allied species by having the middle pair of legs curiously malformed in the ♂ instead of the third pair, as in other forms of the genus. This, of course, is apart from the excellent character afforded by the peculiar ♂ antennae. Dr. Bergroth gives a table for separating the known species, and figures their antennae. Taking it altogether, this is a most valuable contribution to Hemipterology, and indispensable to students of the semi-aquatic Trochalopoda.

2. On the Aquatic Hemiptera collected by Prof. H. S. Hine in Guatemala: *Ohio Naturalist*, viii, 370.

In contrast with these works is one entitled "Deutschlands Wasserwanzen," by Th. Heuber.<sup>3</sup> While "errare est humanum," it appears to me only reasonable for an author attempting such a subject to inform himself of the most recent work on the matter. If this entailed an enormous amount of bibliographical work, there might be some excuse, but where all that is necessary is to consult, for instance, the "Zoological Record," it seems to me that such negligence merits condemnation.

The work in question consists of an account of the Waterbugs, based on Fieber (1865) and Puton (1883). Necessarily, it is anything but accurate as regards classification, forms, etc. Tables are given for genera and species, with long descriptions, synonymy and localities. In anatomy of Nepa, for example, he refers to Dufour (1833), Burmeister (1835), and Flor (1860). All later (and really important) work is ignored. Korschelt and Heider he knows not, and Heymons is but a name. It is really regrettable that such work as this should be given to the public, especially since by its appearance of usefulness, due to its dichotomies, it will certainly enjoy some measure of repute.

In this connection I wish to point out that while much that is to-day written on the Aquatic Hemiptera is published in Hungary or in Roumania, or even in America, there are authors who have written on this subject in Europe, and what has not appeared in current English entomological publications has appeared in the "Wiener Entomologischer Zeitung," the "Annales" of the French and Belgian societies and other high-class continental mediums. Moreover, in book form there is Miall's "Natural History of Aquatic Insects," in which there is something regarding Hemiptera. And finally, I wish to call attention to what is at the moment the fullest account of European Waterbugs, and their habits, namely, Kirkaldy's "Guide to the Study of British Waterbugs," which appeared serially in "The Entomologist" at intervals from 1899 up to last year (1907). There are several plates of structural details, and the work as a whole summarizes the results of many investigators supplemented by the author's original researches. While later study controverts some few of his statements, nevertheless as a whole the work is remarkably free from errors. As to what it purports to be, "A Guide," it can be heartily recommended as a foundation for work on Waterbugs, but it must be borne in mind that there is much later research work now available in certain of the groups treated.

3. Jahresheft, Ver. Vaterl. Naturk. Wurttemb., 61, 1905, pp. 91-175.

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**BUREAU OF ENTOMOLOGY, WASHINGTON.**

We learn from *Science* that in the Bureau of Entomology the salary of the Entomologist has been increased from \$3,250 to \$4,000. The total appropriation is increased by \$48,950, making it \$184,960; this includes the Cotton Boll-weevil investigations, which have heretofore been carried in an emergency appropriation. In addition, the Bureau has charge of the Gypsy and Brown-tail Moth campaign, for which an emergency appropriation of \$250,000, an increase of \$100,000, was made, the entire amount being immediately available. The silk investigations in progress for several years are to be brought to a close.

MR. H. GROH, B. S. A., Ontario Agricultural College, Guelph, has recently been appointed an assistant in the Division of Entomology and Botany, over which Dr. James Fletcher presides, of the Experimental Farms of the Dominion.

His many friends will learn with deep regret that MR. J. A. GUIGNARD, for many years Dr. Fletcher's chief assistant, has felt compelled to resign, owing to advanced age and infirmity, the position which he so usefully filled. He has returned to his native Switzerland, where, it is to be hoped, he may have a prolonged period of rest and quiet happiness.

THE BRITISH MUSEUM has lately published "The History of the Collections contained in the Natural History Departments" (2 vols., 1905-7). Under "Insecta" there are lists of the accessions for each year, and the number of species and specimens in each order. The entire number of insects in 1904 was over 1,018,000 specimens, including 153,000 named species. The Coleoptera head the list with 398,000 specimens and 67,300 species; Lepidoptera 355,700 specimens, 41,000 species; Hymenoptera 132,000 specimens, 20,000 species; Hemiptera 57,650 specimens, 11,700 species; Diptera 47,000 specimens, 7,400 species; Orthoptera, 18,800 specimens, 3,900 species; other orders 9,200 specimens, 1,900 species. (These round numbers are the approximate figures to those given.) The largest single collection ever received was the great Bowring collection of 230,000 Coleoptera; the Stephens collection contained 90,000 specimens of various orders; the Leech collection over 50,000 Lepidoptera; the Pascoe collection 45,000 Coleoptera, including over 3,000 types. These are the most extensive contributions recorded, and formed very notable additions to the possessions of the Museum.

Mailed September 3rd, 1908.