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## PRACTICAL AND POPULAR ENTOMOLOGY—No. 10.

THE DRAGON-FLIES AND DAMSEL-FLIES (ORDER ODONATA).

BY FRANKLIN SHERMAN, JR., AGRIC. COLLEGE, GUELPH, ONTARIO.\*

In most parts of temperate North America the true Dragon-flies are among the most conspicuous members of the insect class in any community where water is at hand. Strong of flight, quick as a thought in their darting movements, wary in the highest degree, they are usually well-known to all by sight, yet not often captured by the amateur collector unless he takes the time to devote his special attention to them at some favourable place.

The Damsel-flies, on the other hand, are less wary and less active, and may often be caught in the hand or picked up in the fingers from their resting-place on grass-stems, etc. Their delicate wings and frail bodies are, however, easily broken, and they are not favourites with collectors, all the less so as they are quite difficult to classify even when in perfect condition.

Under the older system of classification, they were included in the order Neuroptera along with a number of other insects. By more recent workers they have been assigned an order to themselves—the Odonata. Some entomologists regard them as comprising but one family,—others as two families, but the tendency with the most modern workers who have devoted special attention to them is to group them into six and sometimes even seven families. It is therefore somewhat a matter of preference as to what system we shall adopt. For the purposes of this article we have divided them into six families, all of which are represented in Ontario, and all but one, quite commonly.

### CLASSIFICATION INTO FAMILIES.

The characters used in classifying the Odonata into families are based wholly upon the wings and the eyes, and are characters which are easily recognized if one first learns a little of the structure of these insects.

\*In this article as well as in any others which he may contribute under the head of "Popular or Practical Entomology," the writer lays no claim to originality in the matter presented, nor are references to literature commonly quoted. The object here is to present the subject in a manner easily understood by non-technical readers.

*The Eyes* are large and prominent, one on each side of the head. They may be widely separated, almost touching, barely touching at one point only, or meeting for some little distance. The size of the eyes and their prominent position on the head accounts in large degree for the wariness of these insects.

*The Wings* are long and narrow as compared with those of butterflies. In the active Dragon-flies the hind wings are quite broad at their base (next the body), while in the weaker Damsel-flies they are narrowed at the base.

In all Odonata there is a notch-like or joint-like structure on the front edge of the wings about mid-way its length; the *nodus*.

The *pterostigma* (which is absent in some Odonata) is a distinct, hardened or conspicuously coloured small patch on the front edge of the wing between the nodus and the tip of the wing, usually nearer the latter. Examine a specimen carefully and you will plainly see the framework of the wing:—hardened black lines called *veins*, which support the thin *membrane* of the wing. Note that in the front part of the wing there are several strong veins running lengthwise. The very front margin of the wing itself is a strong vein, which extends all the way around the wing. The next of these lengthwise veins usually only extends to the nodus, and between it and the vein which forms the margin of the wing are a number of small veins running perpendicularly between the two:—this is the *first series of antenodal veins*, so called because they come (starting at the base of the wing) *before* the nodus. Between this second lengthwise vein which stops at the nodus and the *third* lengthwise vein which runs right on past the nodus to the pterostigma, is the *second series of antenodal veins*. Now, sometimes these two series of antenodal veins correspond: that is, one of the second series is continuous with one of the first series, as if it were one continuous antenodal vein running from the margin of the wing to the third lengthwise vein. In other cases these two series of antenodal veins do not at all correspond, and only rarely will you find a vein which is continuous from the margin to the third lengthwise vein.

Now, upon the characters which we have just discussed—(1) the position and relation of the eyes; (2) the shape of the hind wings and (3) the correspondence (or lack of it) between the two series of antenodal veins—we may construct an easy table for separating our Odonata into their six families.

- A. Eyes wide apart, projecting from the head,—the hind wings narrow at base, and the wings held vertically over the back when not in use. . . . . (Damsel-flies.)

- B. Not more than 5 antenodal veins in either series.....Family *Agrionidae*.
- BB. More than 5 antenodal veins in either series.....Family *Calopterygidae*.
- AA. Eyes *usually* not far apart,—hind wings broad at base, and the wings are held extended horizontally by the insect when not flying.....(True Dragon-flies.)
  - C. The two series of antenodal veins not corresponding.
    - D. Eyes widely separated..... Family *Gomphidae*.
    - DD. Eyes touching only.... Family *Cordulegasteridae*.
    - DDD. Eyes meeting for some distance. Family *Aeschnidae*.
  - CC. The two series of antenodal veins corresponding..... Family *Libellulidae*.

Of the above six families the *Agrionidae* and the *Libellulidae* contain by far the greater number of species; the *Cordulegasteridae* have only a few species, all of which are rather uncommon.



Fig. 1.



Fig. 2.

FIG. 1.—One of the *Libellulidae*, or true Dragon-flies. Note that the hind wings are broad at base and the eyes meet on the head. In this figure the second series of antenodal veins is easily seen and they correspond with the first series. (See Key to Families).

FIG. 2.—One of the *Agrionidae* or Damselflies. Note that the hind wings are narrowed at base and that the antenodal veins are not numerous or close together. The eyes are widely separated. (See Key to Families).

FIG. 3.—A young or nymph of one of the Dragon-flies. Note the buds of wings or wing-pads, and that the general shape of the body is quite similar to that of the adults.



Fig. 3.

All of the Odonata deposit their eggs in water, and the young insects bear some resemblance to the adults in the shape of the head and size of the eyes, and in the avidity with which they prey upon other weaker insects. The young of the Damsel-flies are more slender than those of the true Dragon-flies and are further distinguished by having several flat leaf-like plates at the hind end of the abdomen, which aid in purifying the blood by acquiring fresh air from the very minute bubbles which are present in the water. In the young of the true Dragon-flies there are no such plates, but the air is drawn into and forced out of the hinder part of the body.

There is, among the ignorant, much needless fear of the Dragon-flies. In various sections they are known as Dragon-flies, Darning-needles, Snake-doctors, Mule-killers, Mosquito-hawks, etc. Of these names, the first and last give the truest idea of their habits. They are true dragons of the air, and undoubtedly do devour immense numbers of mosquitoes; for woe unto the gnat or small fly which is spied by a dragon-fly!—a swift swoop of the long, strong wings, a quick dart of the Dragon-fly, and the place which the gnat knows it no more. They are absolutely harmless to man and may be handled in the fingers with impunity: a slight pinching with their jaws is all that they can give,—but this, while nothing to us, means death to weaker creatures.

The appetite of an adult Dragon-fly is something remarkable. I have seen specimens held in the hand cease struggling to munch on a proffered fly, and the same thing may be observed even when the creature is impaled on a pin which is passed directly through the body between the wings. But most remarkable of all was the case in which a captured specimen, when its own body was bent under so that the tip was near its mouth, seized its own abdomen and ate off two of the segments!

The Odonata is a good example of a group of insects which for a long time were regarded as of no economic importance, but which suddenly acquired interest. When it had been clearly demonstrated that mosquitoes may transmit the germs of malaria and yellow fever to man, the question of natural enemies of mosquitoes became important. Mosquitoes lay their eggs in water and the young are known as "wrigglers" or "wiggle-tails." Coursing over the pool and marshes, the large, swift Dragon-flies surely destroy many an impregnated female mosquito, or more likely destroy them when they first emerge, before they are ready to lay eggs. In the pool, creeping about on the bottom in the shallow places, the young Dragon-fly doubtless makes many a happy meal on the luckless wrigglers which come within reach.

There should be between 100 and 130 species of Odonata found in Ontario. They have been but little studied here. Dr. E. M. Walker, of Toronto, has probably done more work upon this group than anyone else, and I am glad to know that he will likely soon publish in this journal a list of the species which he has observed. During the coming season, which will not be far distant when this article appears, let us hope that our Ontario collectors, at least, will give more attention to this interesting group.

#### WHAT EUCHCECA COMPTARIA, WALK., REALLY IS.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

My last paper, upholding Dr. Hulst's determination that *E. perlineata*, Pack., is the above species, was intended also to convey the idea that until we knew *positively* that he was wrong it was better to accept his decision. Nor was it my desire to belittle the judgment of Mr. Prout, as I expressly stated. Immediately after its publication I received two letters from Mr. Prout, explaining his views so clearly that I began to doubt the correctness of my opinion, as set forth in my paper upon "The Genus *Venusia* and Its Included Species."<sup>1</sup> It must be noted that up to that time none of us had seen Dr. Packard's types. In the paper last named I mentioned that *comptaria*, Walk. (= *perlineata*, Pack.) was taken plentifully by me in the Catskill Mts., and I proceeded therefore to describe another eastern form under the name of *salienta*, associating with it a larger Californian species, which my scant material did not warrant me in separating. Later,<sup>2</sup> with the receipt of a larger series, I had about determined that it was entitled to specific rank, and that opinion I now hold. Convinced that Mr. Prout would be able to judge correctly, I forwarded to him examples of what I called *comptaria*, Walk. (= *perlineata*, Pack.), from the Catskill Mts., co-types of *salienta*, Pears., and of *Nomenia 12-lineata*, Pack., as separated by me. He had advised me that he already had a good series of the western form of *salienta*; hence he would have before him both of our eastern and both of our western species for comparison with Walker's type of *comptaria*.

On Nov. 22nd I went to Cambridge, where, by the courtesy of Dr. Henshaw, I was permitted to examine freely the Packard types. The result was clarifying, if not altogether gratifying, for I found that in *salienta* I had been guilty of adding another synonym to the many. It is the *perlineata* of Packard without a shadow of doubt. The species I

<sup>1</sup> CAN. ENT., Vol. 37, p. 125.

<sup>2</sup> CAN. ENT., Vol. 37, p. 331.  
February, 1906.

have been calling *comptaria* (= *perlineata*) is not in the Packard collection at all, and is the one I should have described.

In the Packard collection *perlineata* is represented by two males labelled "type" from "West Virginia, Mead. 4 9. 72," in good condition, and referred to in description, page 83, Mono. Geom. Moths, 1876. *12-lineata*.—Under this name are four males, labelled "type," all from California. Three of them belong to the genus *Nomenia*, bearing unipectinate antennæ. The fourth is a male without a vestige of antennæ, but is certainly the western form of *Euchœca*, referred by me to *salienta*. It was the custom of Dr. Packard to describe from a group of specimens, calling all of them types, and he so labelled them. In the Monograph Geo. Moths, 1876, *perlineata* was represented by five males and five females; of these, only two males are left. Of *12-lineata* he had three males and five females. Now there are four males left. Three are the males of *Nomenia*. Where did the other ♂ come from? Did he consider the other western species with its simple antennæ to be females of the first? It would appear so. Again, in taking description from a group of specimens involving two species, he makes reference to a certain characteristic which may belong to one species or the other, and where it becomes necessary to separate them, as in the case of *12-lineata*, the description may not wholly fit either of them. After many careful comparisons between my specimens and his description and plates (note its simple antennæ), I find them to agree so well that, as offering the best way out of a complex situation, it would be better to recognize the western *Euchœca* as entitled to the name of *12-lineata*, Pack., and raise it to specific rank. At the close of his remarks under this species he says: "It may be found to intergrade with *E. perlineata* of the Eastern States. It is a little larger, with more acute fore wings than that species or variety (?)" He might have added, by its colour also, which is white, as he describes it, while *perlineata* is decidedly bluish-ashen; nor did he refer to *Nomenia*, for that species is noticeably smaller than *perlineata*. By these points it is easily separable to my eye. This situation leaves *Nomenia* sp. undescribed.

To-day I received a letter from Mr. Prout, in which, after acknowledging receipt of my specimens, he says:

"*Comptaria*, Walk., is not = *perlineata* (that is my Catskill Mt species I had sent him labelled *perlineata*). This is certissime!

"IF it is not exactly = *salienta*, Pears. . . . it is at least so close to it that my eye fails to detect any difference **WHATEVER.**"

The capitals are his, not mine, and it follows that if *salienta* is *comptaria*, Walk., then *perlineata* of Packard, of which it is a synonym, must be also.

It will be seen by this statement of facts that Dr. Hulst was, after all, correct in his determination of *perlineata*, Pack., as a synonym of *comptaria*, Walk. So that if we accept the dictum of Dr. Taylor,<sup>3</sup> which he lays down so emphatically, that his listing should "replace Nos. 3330 and 3331 in Dyar's Catalogue," we will find ourselves very much in error. And here I will answer his question, "whether I will follow Hulst and accept the other synonyms placed with *perlineata* under *comptaria*, Walk.?" Certainly not. Because Dr. Hulst was right in one case does not make him right in all, nor do the errors he made discredit him entirely. It is necessary to note them, and I will continue to publish them, but comment I refuse to make, since he is not here to answer for himself. A description of the species involved follows:

*Nomenia unipecta*, n. sp.—Front seal-brown, above gray and clear white scales mixed. Palpi short, gray and white scaled, tip seal-brown. Antennæ gray, unipectinate, apex simple in ♂, in ♀ filiform simple. Collar, thorax above, patagia and abdomen above, dull white, mixed with dark gray or brown scales, these having a tendency to gather in spots on thorax and abdomen, but they do not form a fixed pattern; under parts lighter, the fore and middle tibiae washed with seal-brown, hind legs whitish. Fore wings with costa long, so that they appear sharp at apex, the outer margin receding almost straight. Colour grayish-ash, darker at base and along costal region, crossed by about ten waved dark gray lines, angled at costa, their general direction being straight across the wing. Preceding the discal space, which is narrow and paler, are four lines, the first slightly curved outward, the second nearly straight, some distance from it, the last two close together. Extra discal line sharper and darker than any other, starting at small angle from costa, it bends outward a little opposite cell, and from the lower end of the curve its course inclines toward hind angle. Two heavy shade lines follow this close to it and each other, and between them are scattered brown scales, not prominent, wanting entirely in many specimens, but forming as a whole a dark streak crossing the wing. Sub-terminal shade lines heavy and distinct, much waved; between this and border often occurs another less distinct shade line. An intervenular sharp black line borders both wings. Fringes

<sup>3</sup> CAN ENT., Vol. 37, p. 411.

dusky. The veins are marked where lines cross with fine black dashes, more generally beyond discal space. Hind wings well extended, rounded as in *Euchæa*, paler dusky-white, crossed beyond cell by four indistinct curved gray lines, much broken and waved, the inner crossing at end of cell and quite distant from the others. Discal dots wanting in most examples, sometimes discernible on fore wings. Beneath dusky. Extra discal and sub-terminal lines on fore wings are reproduced faintly, darker at costa, the latter crossing the wing, the former lost before reaching inner margin, intervenular black line on margin distinct. Hind wings with lines as above faintly reproduced, discal dots very small and faint.

Type ♂ and ♀; coll. R. F. Pearsall.

The specimens described were received through Mr. G. Franck, of Brooklyn, the male from Plumas Co., Cal.; the female from Pasadena, Cal. My examples from Pasadena are much more suffused and darker than those from other parts of California.

*Euchæa exhumata*, n. sp.—In form a miniature of *V. cambrica* about one-half its size. The texture of the wing is much heavier than any other species in the genus, as much so as in *cambrica*. Front broad, rounded, dark seal-brown above, mixed gray and white; palpi short. Antennæ compressed ciliate in ♂, simple in ♀. Colour chalky-white, not shining, with gray and black scales intermixed, these forming into about six diffuse waved lines, crossing both wings. Of these the basal and extra discal are mostly black and heavier. Basal line on fore wings forms a regular outward curve from costa to inner margin, without angle or waving. Within this are three or four wavy, paler gray lines, giving to this section quite a dark appearance. Beyond the basal line the wing is generally a clear gray, sometimes white. The extra discal line is black, with a large angle below costa to cell, then forms a complete semicircle opposite cell, from lower point of it running straight to inner margin. Outside of this, and parallel with it, and sometimes of the basal line as well, there is a line of yellow-brown scales, interrupted on the veins by heavy black dashes, the two opposite cell being large and diffuse. There follows a clear white space, like a waved line, crossing both wings, and conspicuous in all specimens. Subterminal line of darker scales, heavy at costa, sometimes entire, sometimes fading out opposite cell. Subterminal space clear light gray, darker in suffused examples. Fringes both dusky-white. An intervenular black line just within the margin of long wings. Hind wings with basal portion clear gray, the basal line of fore wings often continued with a slight curve to inner margin, as an indefinite



waved line. Extra discal line distinct, less so at costa, with a large angle to cell, then curved boldly outward, reaching in a straight or wavy line to inner margin, about two-thirds from base. Outside this and parallel is a gray shade line replacing the brown line of fore wings. Often a few brown scales appear in this line, visible under lens. A conspicuous white line-like space follows the extra discal line, beyond which the single subterminal is more or less distinct, but does not dissolve into points in any of my specimens. Discal dots round and black, usually distinct on fore wings, smaller and sometimes wanting on hind wings, in the latter never included in the basal line, as in *comptaria*, Walk. Beneath dusky, the extra discal and subterminal lines distinctly reproduced on both wings, the space between them being less dusky, often the basal line is faintly shown. Intervenular line at margin faint but apparent. Discal dots obvious. Legs dusky, fore tibia dark gray, tarsi ringed with yellowish. Abdomen in ♂ above dull white, each segment anteriorly ringed with dark gray, beneath dusky-yellowish. Anal tuft yellowish, in ♀ dull white, not ringed, dusky at base.

Type ♂ and ♀; coll. R. F. Pearsall.

I have before me 25 ♂'s, 10 ♀'s, taken in the Catskill Mts., from June 4 to July 15. As compared with *comptaria*, Walk., the wing texture is much heavier, the ground colour clear white, not bluish-ash, and the lines diffuse. One male is entirely suffused with dark gray and brown scales, the conspicuous white line beyond extra discal showing out vividly; indeed, the tendency to suffusion is a characteristic of the species, and makes intelligent description most difficult. The large round spot opposite cell, so marked a feature in *lucata*, is shown to a less degree in this species, but combined with a wide white discal space it has produced the form confounded with the latter, and easily distinguished from it by the marginal intervenular line not present in *lucata*.

The species concerned will, I trust, finally rest as I now place them.

*Nomenia unipecta*, Pearsall, n. sp.

*Euchoeca comptaria*, Walker.

= *perlineata*, Packard.

= *salienta*, Pearsall.

*Euchoeca 12-lineata*, Packard.

*Euchoeca exhumata*, Pearsall, n. sp.

During the preparation of this paper more material has come to me through the kindness of Dr. Wm. Barnes. He sends me examples of *comptaria* (= *perlineata*, Pack.) taken as far west as Quincy, Ill., the

farthest western point I know. Besides examples of *Nomenia unipecta*, Pears., from California, there are three specimens belonging to this interesting genus, taken by Dr. Barnes at Glenwood Springs, Colorado, which he suggested should constitute a new species. After a careful study I cannot accept this view, but have designated it :

*Nomenia unipecta*, var. *secunda*, Pears.—It differs from the type in these respects : About one-third larger, the body and fore wings of a dark, dusky-slate, without the sheen of California examples ; hind wings somewhat lighter. On both wings the lines are sharper, and on the fore wings the brown scales which follow the extra basal and discal lines are more evident. Beneath I can discover no difference from my dark specimens taken at Pasadena. Its darker opaque hue, sharper lines, and larger size distinguish it from typical *unipecta*.

The genus *Euchœca* contains other errors. For instance, *albovittata*, Guen., has nothing in common with this group, either in appearance or habits. It goes into the genus *Trichodezia*, Warren, of which it is the type. Dr. Hulst failed to observe the distinguishing marks of this genus, and therefore discarded it.<sup>4</sup> They are present as sexual characters in the male, and quite apparent in fresh specimens. The venation of hind wings is also quite distinct. With this may go *Californiata*, but I have no male of it for comparison. A later paper will be devoted to the genus as a whole.

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ASSOCIATION OF ECONOMIC ENTOMOLOGISTS. — The recent meeting in New Orleans was a very successful one, over thirty members being present. The next meeting will be held next winter in New York City, in conjunction with the A. A. A. S. The following officers were elected for the ensuing year :

President, A. H. Kirkland, Malden, Mass.; 1st Vice-President, W. E. Britton, New Haven, Conn.; 2nd Vice-President, H. A. Morgan, Knoxville, Tenn.; Secretary-Treasurer, A. F. Burgess, Columbus, Ohio. For Member Committee on Nomenclature, to serve three years : Herbert Osborn, Columbus, Ohio. For Members Council, A. A. A. S.: H. E. Summers, Ames, Iowa, and E. A. Schwartz, Washington, D. C.

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<sup>4</sup> Trans. Am. Ent. Soc., vol. 23, p. 274.

## NEW BEES OF THE GENUS COLLETES.

BY MYRON H. SWENK, LINCOLN, NEBRASKA.

*Colletes clypeonitens*, n. sp.—♀. Length 11 mm. Clypeus prominent, polished, narrowly medially sulcate, its punctures coarse but scattered and not forming striæ, its apex slightly emarginate and preceded by a transverse rim. Malar space one and one-half times as long as broad, finely striate. Antennæ black, the flagellum brownish beneath, joint 3 decidedly longer than 4. Face dull, finely and feebly punctured, its pubescence dense and erect, dull soiled gray, becoming whitish about clypeus. Vertex shiny, minutely punctured. Cheeks dull, striate like malar space, with long white hair and short appressed pile about orbits. Prothorax without an apparent spine. Punctures of mesothorax small and widely separated, a very large polished disk subimpunctate. Scutellum finely separately punctured, these closest along posterior border. Post-scutellum finely densely punctured. Pits on superior face of metathorax very irregular and poorly defined, apparently very long and narrow, medially on a broadened area. Enclosure funnel-shaped, polished, smooth, the bowl convex. Pleura shining, with fine, well separated punctures. Pubescence of thoracic dorsum dull yellowish gray, whitish on pleura, metathorax, postscutellum and below. Tegulæ yellowish testaceous. Wings clear, nervures and stigma dark brown, the former becoming yellowish at base, with the costal nervure entirely yellow. Abdomen parallel-sided, first segment shining, finely, rather indistinctly, scatteringly punctured, following segments finely, closely, indistinctly punctured. Tergum with a fine, very dense, short and appressed pile practically concealing the surface between the contrasting, very dense, shaggy fasciæ, all of a dull gray colour, basal segment with long white hairs, segments 3-6 with white bristles, 6 bare of appressed pile. Venter shining, not banded. Legs black, with white pubescence, that on posterior femora and tibiæ very long and quite dense, carrying much pollen, outer tibial spur not pectinate, both spurs short and yellow, claws rufous, with the inner tooth submedian, front coxæ without spines.

Type.—Los Angeles, California (Dr. Davidson), 1 ♀ specimen.

There is no other species known to me, except the following, which shows close relationship to this one, which is very distinct in its sparsely punctured, non-striate clypeus, long malar space and densely pilose tergum. On the whole its nearest relative is probably *C. delodontus*, Viereck, or *C. albescens*, Cresson.

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*Colletes petalostemonis*, n. sp.—♀. Length 7–8 mm. Very like to *C. clypeonitens*, to which it is most closely related, but differs as follows: Clypeus not sulcate nor its apex emarginate. Malar space about as long as wide. Flagellum merely fuscous below, its first joint subequal to its second. Vertex with distinct punctures of two sizes. Punctures of face distinct. Mesothorax similarly, but more coarsely punctured, those on pleura coarse and close, scutellum coarsely and sparsely punctured posteriorly. Pits on superior metathoracic face even more irregular, and the median broadening much more pronounced. Bowl of enclosure very convex, bulging. Wings white, nervures yellow, becoming dark toward the apex, the stigma large, fuscous. Abdomen similarly shaped, but much more coarsely punctured, these very distinct and quite well separated on segment 1, fine and close on 2, indistinct on following segments. Tergum with similar appressed pile. Entire pubescence of a more silvery, less yellowish cast, tinged with the latter colour slightly on thoracic dorsum only.

♂. Length 7 mm. Clypeus concealed by long, dull white pubescence. Malar space slightly over twice as long as wide. Flagellum brown below, its first joint two-thirds as long as its second, both black, the brown joints over twice as long as wide. Abdomen very coarsely punctured, especially on segment 1, segments 1–6 with broad white apical fasciæ, the spaces between with thin pale pile not nearly concealing the surface, basal segment with long white hair, very erect, denser laterally. Otherwise essentially like the ♀.

Types.—Warbonnet Canon, Sioux County, Nebraska, July 20, 1901 (♀), July 13, 1901 (♂), on *Petalostemon candidus*. (M. Cary.)

Paratypes.—Glen, Sioux County, Nebraska, August 9, 1905, on *Petalostemon candidus*, 4 ♀; do. August 14, 1 ♀; 40 miles north of Lusk, Wyoming, July, 1895, (F. H. Snow) ♀, ♂. This species seems to be oligotropic on *Petalostemon candidus*, and is not common even where the plant is abundant.

*Colletes solidaginis*, n. sp.—♀. Length 9 mm. Head very short and broad, the eyes large. Vertex scarcely depressed, minutely punctured, its sides bare, the hairs between the ocelli long and erect. Clypeus somewhat shiny, uniformly slightly convex, roughened by close, coarse punctures which form irregular striæ, the apical rim prominent, intensified by a transverse depression immediately preceding it, covered with a sparse, short pale ochraceous pubescence. Front covered with a short, dense, pale ochraceous pubescence, concealing a dull, finely-roughened surface,

that below antennæ yellowish white, the cheeks with a pale whitish pubescence and the surface slightly shiny and finely punctured. Malar space so short as to be almost wanting. Antennæ black, with the flagellum below beyond the second joint dull brownish to ferruginous, its basal joint but a shade, if any, longer than the second.

Thorax above very densely covered with a short, erect, bright fulvo-ochraceous pubescence, wholly concealing the surface, not at all mixed with dark hairs, longer and denser on postscutellum, paling on the sides to grayish white below. Prothoracic spines apparently wanting, mesothorax evenly punctured on a shining surface, the punctures very close and distinct, slightly sparser on a discal space, the posterior margin very finely and densely punctured. Scutellum polished and impunctate at base, elsewhere with close, coarse, rounded punctures, the postscutellum dull and finely roughened. Superior face of metathorax separated from the posterior face by an irregular rim, and divided into a series of about a dozen shining pits, which are narrow, crowded and imperfect on the sides, but quite perfect and about square medially. Posterior face with the sides shiny, weakly and scatteringly punctured, with long, pale ochraceous hairs becoming very dense laterally, the enclosure funnel-shaped, highly polished and shining, the bowl more or less ridged at the sides and base, the neck perfectly smooth, much longer than wide at base. Pleura shiny, with fine crowded punctures concealed by a dense ochraceous pubescence. Tegulae pale testaceous. Wing short, hyaline, the nervures and stigma honey yellow. Legs slender, black, sometimes tinged with brownish on tarsi and ends of tibiae, the pubescence short, sparse, grayish white. Front coxae with long hairy spines. Outer tibial spurs distinctly pectinate, yellow. Claws dark, medially toothed. Abdomen with the sides subparallel, above densely covered with a very short and appressed and ochraceous pile which conceals the surface, the first segment with long dense ochraceous hairs at base and sides, its middle more sparsely pubescent and partially exposing a shining impunctate surface. The apical margins of the segments are not depressed, but have the pubescence much denser than elsewhere, forming noticeable fasciae concolorous with the rest of the pubescence, the venter with very narrow pale fasciae or fringes on the apical margins, apical segment bare, contrasting,

♂. Length 6-7 mm. Resembles the ♀ except in the following points: Pubescence whitish, strongly tinged with yellowish on sides and dorsum of thorax, in general much sparser than in ♀, the clypeus covered with a

long, dense, pale yellow pubescence, becoming whitish about base of antennæ; flagellum ferruginous beyond the first joint, which is less than half as long as second, the median ones twice as long as broad; mesothorax more finely and sparsely punctured, a large, shining, impunctate discal space with scattered punctures laterally; legs shining black except for the ferruginous tarsi and posterior knees; abdomen slender, its first segment very polished and shiny, practically impunctate, with long pale hairs, especially basally, following segments duller, indistinctly punctured, segments 1-6 with rather narrow and loose fasciæ of yellowish white pubescence continued very narrowly on venter, sparse, very short, pale hairs between, apex practically nude.

Types.—Lincoln, Nebraska, July, ♀, ♂.

This species flies at Lincoln in July and early August, visiting the flowers of *Solidago Missouriensis*. Its nearest ally seems to be *C. Wilmatte*, Ckll., which is an oligotropic visitor of *Petalostemon*, and which flies at the same time; it is readily distinguished from that species by smaller size, dark legs, normal thoracic pubescence, etc.

*Colletes ochraceus*, n. sp.—♀. Near to *C. solidaginis*, but easily distinguished from that species as follows: Larger, length 11 mm. Clypeus distinctly sulcate medially, especially towards the apex, and more coarsely punctured. Antennæ rather shorter and heavier, wholly black. Vertex with a few large punctures scattered on a minutely punctured surface. Pubescence of thoracic dorsum only slightly tinged with fulvous. Enclosure extremely small, its bowl shining but very small and irregularly roughened, the neck long and narrow. Sides of posterior face of metathorax strongly and rather closely punctured, the pubescence yellowish white. Nervures and stigma yellowish brown. Legs black, with silvery pubescence, the pectination of the hind spur very distinct, with about a dozen teeth.

Type.—Southern California (D. A. Saunders), one ♀ specimen.

*Colletes rufithorax*, n. sp.—♀. Length 14-15 mm. Differs from *C. thoracicus* as follows: Clypeus more coarsely and striately punctured, especially apically, vertex with punctures of two conspicuously distinct sizes; punctures on cheeks coarse and well separated on a finely striate surface; joint 3 of antennæ = 4; malar space slightly longer; wings heavily clouded, nervures fusco-ferruginous; pubescence of face above clypeus strongly tinged with orange, that on thorax above brighter, more rusty red;

outer surface of posterior tibiae with black hairs among the longer pale ones; abdominal fasciae thinner.

♂. Length 10-12 mm. Distinguishable from the ♂ of *thoracicus* by its larger size; much heavier and broader head; longer malar space, two-thirds as long as broad; shorter antennae, falling short of metathoracic truncation, and with joint 3 one-half as long as 4; legs much less polished; abdomen with basal segments less regularly and more coarsely punctured, the second segment only a little more finely punctured, the fasciae narrower, looser, more grayish.

One aberrant female from Clementon is only 12 mm. long, has rather clearer wings and a narrower, more polished abdomen. I do not, however, regard it as distinct.

Types.—6 ♀ ♀, 7 ♂ ♂, all taken by Mr. H. L. Viereck in New Jersey, as follows: Ocean City, June 19, 1901, 1 ♀ on wild cherry and 2 ♂ ♂ on poison ivy; Avalon, June 9th, 3 ♀ ♀; Westville, June 15th, 1 ♀; Clementon, May 9, 1899, 1 ♂, June 2, 1901, on sand myrtle, 1 ♀, May 14, 1901, on sand myrtle, 1 ♂, May 17, 1901, 2 ♂ ♂; Mamuskin, May, 10, 1903, 1 ♂. I have also two ♂ ♂, taken by Rev. Birkmann at Fedor, Texas, April 19, 1902, and March 21, 1904, and a ♂ from Anglesea, N. J., May 28, 1905. (E. Daecke.) Probably a species characteristic of the Austroriparian life zone.

*Colletes pulcher*, n. sp.—♂. Length 14 mm. With a general resemblance to *C. thoracicus* ♂, but very much larger; clypeus coarsely striatopunctate, covered with a dense beard of silky, yellowish white hair, that above clypeus dense, erect and strongly tinged with orange; vertex with sides depressed, finely, densely punctured, except on a narrow subimpunctate spot contiguous to lateral ocelli; face coarsely punctured; cheeks with coarse, close, rather indistinct punctures; malar space striate, two-thirds as long as broad; antennae heavy, reaching well beyond tegulae; joint 3 one-half as long as four; thorax sculptured essentially as in *thoracicus*; pubescence of thorax above bright rusty red, that down sides of metathorax pale orange, that on pleura, legs and below grayish-white; wings hyaline, well clouded apically, nervures reddish-brown; spurs yellowish, the outer one finely but very distinctly pectinate; abdomen polished, elongate oval, first segment with small, distinct, well-separated punctures and sparse long grayish pubescence, denser laterally, second and third segments punctured

much like first, but more closely and less distinctly so, following segments indistinctly punctured; apical margins of segments 1-3 slightly depressed laterally, of segments 1-5 with narrow grayish-white fasciæ, interrupted medially on 1, and continued as fringes on venter; segments 4-7 with elongated white bristles on margins.

Type.—One ♂, Fedor, Texas, March 19, 1904 (Birkmann). A very distinct and exceedingly handsome species.

*Colletes brachycerus*, new name.

*Colletes brevicornis*, Perez (Actes. Soc. Linn. Bordeaux, Vol. 58, p. ccxxvi, 1903), is preoccupied by a North American species, *C. brevicornis*, Robertson (Trans. Acad. Sci., St. Louis, Vol. VII., p. 315-316, 1897). The above name is, therefore, proposed for the European species.

#### GUESTS OF SPITTLE-INSECTS.

Insects of the family Cercopidae, genus Clastoptera or one closely allied, were very common in this region last summer, and the masses of froth in which the clumsy larvæ splash their way to maturity and activity were everywhere in evidence on the twigs and leaves of the wild hazel, especially where this bush fringed the timber.

One hot July day, while annoying some of these semi-amphibious infants by poking into their unpleasant habitations, I noticed some small dipterous larvæ that were apparently enjoying life under the same conditions as the hemipter that built the foam. These flies were evidently able to go through the life-cycle among the bubbles, for their little brown pupæ were there, glued fast to the leaves by the drying of the froth. When taken home and reared they proved to be of the species *Drosophila sigmoides*, Loew, mentioned in Aldrich's Catalogue of the Diptera as occurring in Texas, and collected here in Minnesota possibly for the first time.

The froth mass seemed to afford ample room for the owner and its uninvited guests, and possibly neither knew that the other was there. Even if a predatory wasp should carry off the Cercopid there would probably be enough dampness remaining to enable the flies to reach maturity among the exuvæ of the host, with the possible aid of the dew and rain to keep them moist.

C. N. AINSLIE, Rochester, Minn.



## PRELIMINARY LIST OF THE MACROLEPIDOPTERA OF ALBERTA, N.-W. T.

BY F. H. WOLLEY DOD, MILLARVILLE, ALBERTA.

(Continued from Vol. XXXVII, page 252.)

408. *Autographa Sackeni*, Grt.—Rare. A ♂ and two ♀♀ are labelled July 12th to 25th, taken in different years. At light, and flying in sunshine. The ♂ bears Dr. Ottolengui's label. As a matter of fact, this and the preceding species were returned to me bearing the wrong labels. The error was quite obvious from the figs. in Dr. Ottolengui's paper, so I reversed them. His letter to me at the same time convinced me as to the lapsus. A ♂ which hatched out on July 23rd, 1902, from a larva found feeding on *Potentilla fruticosa* a few weeks previously, has a broader black border on secondaries, and differs slightly in the sign, but otherwise looks the same.

409. *A. Snowi*, Hy. Edw.—I have three specimens dated July 1st to 12th, from the "Billing's Mill" locality, where it seems to fly in company with *Syngrapha ignea*, but in fewer numbers. I never took the species until 1903. Dr. Dyar gave me the name. Closely allied to the preceding species, and similar in pattern. Comparing them, Dr. Ottolengui says in his paper concerning *Snowi*: "It is smaller, the apex of the wing is much less produced than in *Sackeni* and the colour is different. As words do not adequately describe colour, let me resort to comparisons: The colour scheme of *Snowi* is the same as in *simplex*, the browns and reds being identical in shade. The coloration of *Sackeni* is nearer to, but not exactly the same as *ampla*. . . . . A spot at the base of the costa is orange in *Snowi*; it is more sagittate in shape and very pale yellowish in *Sackeni*." In my specimens *Snowi* has a dark apical shade, which *Sackeni* lacks. Both are figured in Dr. Ottolengui's paper.

410. *Syngrapha devergens*, Hbn.—A splendid specimen from Mr. Bean, taken at the station level at Laggan about twelve years ago, was so named for me by Dr. Ottolengui, but is not now in my collection. Mr. Bean gave me to understand that it was common at Laggan. I have a badly-rubbed specimen of the same species taken close to the station there on July 17th, 1904, by Mrs. Nicholl. It bears some resemblance to a miniature *ignea*, but though the differences are obvious enough between good specimens, it is no use my trying to locate them with only one very bad specimen of *devergens* at hand. It is not in the least like Dr. Holland's figure of the species, which bears a suspicious resemblance to Dr.

Ottolengui's fig. of *parilis*. In his paper Dr. Ottolengui mentions *alticola* as occurring in the Northwest Territories and suggests that it may ultimately prove distinct from *devergens* of Labrador. In *alticola* I fancy he refers to the species he labeled *devergens* for me.

411. *S. ignea*, Grt.—Rather rare as a rule here on Pine Creek, but comparatively common in 1903. It seems more common westward, and I have it from well into the foothills. A day-flier, but also comes to light. Dr. Ottolengui has several specimens from here, and gives me the name. I quite fail to distinguish Dr. Holland's fig. of *Hochenwarthii* from this species, except that it is a little smaller than any of my specimens. End June and July.

412. *Reabotis immaculalis*, Hulst.—A single ♂ from Lethbridge, on July 11th, 1904, by Mr. Willing. It is a most appropriate name, as the specimen is of a quite uniform dirty cream colour on all wings, and bears not the least trace of maculation whatsoever.

413. *Erastria panatela*, Smith.—(Psyche, June, 1904, p. 60). Described from three ♂♂ and one ♀, one male being a co-type in my own collection, taken here at light on June 23rd, 1901, and the rest from Winnipeg. The type is with Prof. Smith. He remarks under the description: "This is one of the broad winged species, like *musculosa* or *includens*, and resembles the latter, somewhat, in type of maculation."

414. *Therasea angustipennis*, Grt.—Fairly common at light. June and July. One specimen has a distinctly yellowish shading on the costa, and otherwise differing slightly from the rest of my very short series, may really be *flavicosta*, Smith. It certainly resembles Dr. Holland's figure of that species, but I dare not separate on the one specimen.

415. *Fruva fasciatella*, Grt.—Rare. I have four specimens dated from June 7th to Aug. 5th. It varies from dull smoky to creamy-white. A smoky specimen is labelled "June 7th, sunshine," and a white one "Aug. 5th, light."

416. *Spragueia tortricina*, Zell.—A single specimen dated June 18th, 1903, has been so named by Prof. Smith. The primaries are ochre yellow, and it is almost certainly distinct from the preceding, notwithstanding the names are referred to one species in Dyar's list.

417. *Drasteria erectea*, Cram.—Not common. Some years very scarce. Middle July and August. Treacle and light. Does not habitually fly in daytime.

418. *D. crassiuscula*, Haw.—A ♀, in fair condition, taken flying in daytime near the Red Deer River, 50 miles north-east of Gleichen, on July 5th, 1904, is without much doubt this species. A ♂, taken at the same time and place, is probably the same. I certainly have no females from nearer to Calgary, but cannot be quite so positive about males.

419. *D. distincta*, Neum.—Very common. Middle May and June. Good specimens of both sexes from the above-mentioned Red Deer River locality, dated July 6th and 8th, 1904, do not seem separable from the Calgary form. A day-flier, rarely coming to light, and still more rarely to treacle. Both sexes are figured from Calgary specimens in CAN. ENT., XXXII, pl. 5, Aug., 1900, but, unfortunately, the figures are not very clear. So far as my own local material is concerned, I am strongly inclined to let the three names given above stand for these species. I formerly had ♂ and ♀ of *erechtea* standing respectively as *erichto* (*crassiuscula*) and *erechtea*, but becoming suspicious from the fact that I only took males of one and females of the other, submitted a series of both sexes to Prof Smith, which resulted in my placing all my material from south and west of Calgary under *erechtea*. The receipt, at different times, of various specimens labelled *crassiuscula* and *erechtea* from eastern correspondents puzzled me considerably to know how the two were to be distinguished, the more so since, as I now find, the labels were about as often wrong as right. I had never seen Mr. Slingerland's paper on *Drasteria* in Insect Life, V, 87 and 88, 1892, of which Dr. Bethune has kindly sent me an extract. The author of that article, it appears, after critically examining a large number of specimens from various localities, became convinced that *erechtea* and *crassiuscula* were distinct species, about equally common, and that *oehrea* and *distincta* were varieties of the latter. He found an exceptionally striking difference in the ♂ genitalia, and another in the form of ♀ abdomen. In ♀ *erechtea* the ventral portion of the seventh abdominal segment is as long as broad, with caudal margin broadly rounded. In ♀ *crassiuscula* it is broader than long, with caudal margin broadly emarginate. In colour and maculation he differentiates them thus. *Erechtea*—fore wings above dark or light drab gray (in many females brown or olivaceous) shade, with the two large dark bands always separate, distinct and well defined towards inner margin in ♂; in ♀, markings always much less distinct, the subapical dentate spots never as distinct as in the ♂, or as in the ♀ of *crassiuscula*. The males are very constant. *Crassiuscula*—fore wings above either distinct violaceous, brown, or red shade, with the two large dark bands very variable, often

shading into ground colour on outer edge, or coalescing near inner margin; all markings, especially subapical dentate spots, equally distinct in both sexes. It is slightly smaller than *erechtea*, more variable, and marked alike in both sexes. After reading the above I have been able to make what I believe to be a fairly satisfactory separation of my eastern material upon this basis, and certainly find the form of ♀ abdomen a rather striking character, combined with the practical absence of subapical black spots in ♀ *erechtea*. The males are certainly darker, but those of *crassiuscula* seem to be less gray than in the other species, and in specimens where the two bands are well joined on inner margin so as to form a rude U, the reference to *crassiuscula* is probably safe. Mr. Slingerland states, however, that "specimens occur which it is almost impossible to separate by markings alone, and the structural characters must then be resorted to." In Ent. News, XV, 221, Mr. E. J. Smith states that Dr. Holland's pl. XXX, fig. 15, is not *crassiuscula* ♂, but *erechtea*. From Mr. Slingerland's papers I should judge that it might be either, with the probabilities rather in favour of the latter. Fig. 14 is certainly an excellent representation of Calgary ♀ *erechtea*.

I have so far received nothing from the east under the name of *distincta*, but have males so closely resembling the Calgary form as to make their specific difference very doubtful, and have sent out numbers of local specimens at different times without having the name questioned. But, despite this fact, and that Mr. Slingerland says that *crassiuscula* is "marked alike in both sexes," I find more tendency to a sexual colour difference in my eastern series under that name than exists in Calgary *distincta*, of which the primaries may be best described as ashen-gray. Though the form of ♀ abdomen resembles that of *crassiuscula*, the males much more nearly approximate those of *erechtea*. The bands on primaries scarcely seem to show more tendency to join, and with males alone to deal with, and knowing nothing about the different habits of the two in life, I should be almost inclined to look upon them as one seasonally dimorphic species. *Distincta* averages decidedly smaller, and is usually much grayer, but single specimens are sometimes rather hard to place without the aid of the date label. But the strong colour difference between the sexes of *erechtea* prevents any real confusion with *distincta*. The capture of the above-listed typical ♀ *crassiuscula* on the Red Deer River, in company with the smaller and quite dissimilar Calgary form of *distincta*, makes it hard for me to accept them as one species.

420. *D. conspicua*, Smith. (? = *Euclidia annexa*, Hy. Edw.) Described from here, and both sexes are figured with the description. The type is at Washington. Not common. Middle May to middle June. Exclusively a day-flier. Prof. Smith states, "The species is so well marked that it cannot be mistaken. The maculation of primaries is a reduced copy of *erecta*, much more distinct, but in the banded secondaries generic habit is abandoned, and the form is unique." He well describes the colour of primaries as "smoky, overlaid by bluish-white or gray scales, . . . . the markings smoky-brown or blackish, contrasting." There is little difference between the sexes. Dr. Holland's figure gives an excellent idea of the species. In build it certainly looks like a *Drasteria*, with ♀ abdomen somewhat of the *crassiuscula* form, but the banding of the secondaries, including a conspicuous discal lunule, is almost as much like that of a *Syneda*. Sir George Hampson has the species from here, and tells me it is identical with the type of *Euclidia annexa*, Hy. Edw.

421. *Euclidia cuspidata*, Hbn.—Two specimens. One on Bow River, near mouth of Fish Creek, June 24th, 1894; the other on Red Deer River, about 50 miles north-east of Gleichen, June 20th, 1901. The last mentioned specimen is in my collection. Both were flying in sunshine. It is probably a prairie species, and hardly extends this far west.

422. *Melipotis limbolaris*, Geyer.—Have seen it common on the prairie, near the mouth of Fish Creek, on Bow River. I have never seen it in the hills. My specimens from there, two pairs, are dated June 25th to Aug. 4th, 1893 and 1894. Prof. Smith saw a pair of these recently, and returned them to me as this species, which name he had given me for it some years previously. Two pairs from the Red Deer River locality on July 5th and 8th, 1904, are probably the same species. The sexual dimorphism is strong, the females having a dull, washed-out appearance. Were the secondaries orange instead of creamy-white, the resemblance of the ♂ would be nearer to *divergens* or *Hudsonica* than to *limbolaris* of Dr. Holland's figures. A day-flier. Mr. Gregson records the species from the Lacombe district on the authority of Dr. Fletcher.

423. *Syneda Athabasca*, Neum.—Fairly common some years. June to middle July. A day flier. The form, of which I have also both sexes from the Red Deer River locality, is like Dr. Holland's figure, but one Red Deer ♂ and two Laggan (station level) females have orange-tinted secondaries, but do not seem to differ in maculation. These three

specimens are almost as much like Dr. Holland's fig. of *Alleni*, but are darker throughout.

424. *S. Hudsonica*, G. and R.?—A worn ♂ from Pipestone Creek, Laggan, July 16th, 1904, looked to me like a dark suffused variety of what I have listed as *Meipotis limbolaris*, and I placed it in that series. I have received, however, from Dr. Dyar as *Hudsonica*, a very closely similar ♀ from Kaslo, but, unfortunately, also rather worn. In both specimens the primaries are blacker, and secondaries much less orange than in Dr. Holland's figure.

425. *Catocala unijuga*, Walk.—Very rare at treacle, and occasionally at rest in daytime, or in houses. My only two specimens are dated Aug. 27th and 29th.

Var. *Fletcheri*, Beut.—Named after Dr. James Fletcher. Dr. Fletcher says in Rep. Ent. Soc., Ont., No. 19, p. 94, 1903, "A new variety, which was collected by Mr. T. N. Willing, of Regina, when living at Olds, Alta., about 60 miles north of Calgary. It is like the typical form in markings, but the bands on secondaries, instead of being red, are of a dark yellowish sooty-drab." I am not sure where the type of this variety is at present.

426. *C. briseis*, Edw.—Rare. Treacle, in Aug and Sept., and occasionally at rest in daytime. I have a specimen in which the basal half of both primaries and secondaries is almost entirely black.

427. *C. relicta*, Walk.—I never met with the species until 1904, when three or four fine specimens, including both sexes, turned up at treacle and light on Sept. 3rd and 5th, which agree with a ♀ sent, named by Dr. Fletcher, from Ottawa. Mr. Gregson took two specimens at Blackfalds on Sept. 15th and 17th, 1901, which I have seen.

428. *Erebus odora*, Linn.—One ♀. Identified by Dr. Fletcher from a coloured drawing made by Miss Moodie, of Calgary, in whose possession I have seen the specimen, and who tells me that it was taken in the town of Calgary in May, 1897. The specimen is badly worn, and is, of course, a migrant.

429. *Epizeuxis Americanalis*, Gn.—Common. Light and treacle. End June and July.

430. *Philometra goasalis*, Walk.—Common at light. Also flies in daytime. July.

431. *Hypena humuli*, Harr.—Very rare. Apparently double brooded. A worn specimen at treacle on Red Deer River, about 55 miles

north-east of Gleichen, June 21st. Two specimens here on Pine Creek, June 24th and Sept. 18th, 1899, the latter in fine condition.

Var. *albopunctata*, Tep.—A ♀ in fine condition, Sept. 25th, 1899.

## THYATIRIDÆ.

432. *Habrosyne scripta*, Gosse.—Very rare. Three specimens only, in different years, at treacle. Middle June to middle July.

433. *Pseudothyatira cymatophoroides*, Gn., var. *expultrix*, Grt.—A ♂, in fair condition, at treacle, on July 5th, 1904, is exactly like Dr. Holland's figure.

434. *Bombycia Tearlii*, Hy. Edw.—Rare. Middle Aug. to middle Sept. Treacle. The species here is of a smooth ashen gray, almost immaculate except for the double brown t.a. and t.p. lines, and looks quite different from the green and brown *improvisa* sent me by Mr. Hanham from Victoria, B.C., which also seems to be a more heavily built insect.

## NOTODONTIDÆ.

435. *Melalopha apicalis*, Walker.—Rare. I have only taken three specimens, all at rest in daytime in the town of Calgary. June 2nd to 19th. I have specimens from Cartwright, Man., and from Chicago, which are rather smaller and darker, but otherwise look the same.

436. *M. albosigma*, Fitch.—Very rare. May 21st to 31st. Light.

437. *M. Brucei*, Hy. Edw.—Rare. May 21st to June 5th. Light. Rather like *apicalis*, but differs not only by its darker colour, but also in having the second and third lines entire, and not meeting centrally. In *apicalis*, the third line springs from the second on the median vein, and is not visible as a separate line above that point.

438. *Hyperæschra stragula*, Grt.—Very rare. June 6th, 1894, June 12th and 24th, 1903. Light.

439. *Notodonta simplaria*, Graef.—One fine ♂, at light, June 18th, 1900.

440. *Pheosia dimidiata*, H.-S.—A ♀ taken at Olds, Alta., on July 7th, 1898, by Mr. T. N. Willing. Named by Dr. Fletcher.

441. *Harpyia scolopendrina*, Bdn.—A ♂ on May 31st, 1902, and a ♀ May 11th, 1901. Both at light, and perfect specimens. A ♀, crippled, bred in early June, 1905, from a pupa found on a fence in Calgary.

442. *H.* (? var.) *modesta*, Huds.—Two ♂♂ and a ♀. One ♂ labelled June 21st, and probably taken at light, the other marked "bred, 1894," without day or month. The ♀ is somewhat crippled and comes from Mr. Gregson, bearing label "June 9th, 1902, Blackfalds, Alta., bred." The names are as quite recently given me by Dr. Dyar. He had some

years ago called the same ♂ *scolopendrina* which he now calls *modesta* and Dr. Ottolengui had called a ♂ of the same species *scolopendrina*, whilst the same ♂ which Dr. Dyar now calls *scolopendrina*, Dr. Ottolengui, then named *modesta*, so I presume that the two forms are not well known. Whatever their correct names may be, I feel certain that my two forms are two species, and told Dr. Dyar so when I sent them. He wrote: "They certainly look like distinct species as you have them contrasted." Briefly described, my *scolopendrina* has the ground colour white; has patches of fulvous scales on patagiae, on borders to median band, and anterior to apical patch. The discal spot is narrowly linear, and there are three distinct transverse crenulate lines beyond the cell, the inner one sharply toothed. Expanse, ♂ 42 mm., ♀ 46 mm. My *modesta* have the ground colour distinctly tinged with ochreous and lack the patches of fulvous scales. The discal spot is ovate rather than linear, the three transverse lines beyond the cell are much less distinct, and the inner one is not toothed. Expanse, ♂ 38 mm., ♀ 40 mm. Dr. Holland's figure of *scolopendrina* bears a closer resemblance to this form than my No. 441.

442a. *H.* (? var.) *albicoma*, Strk.—A ♀ in fine condition taken at Lethbridge on July 11th, 1904, by Mr. Willing, which I have seen and closely examined. Whilst it is almost exactly like Dr. Holland's figure of *albicoma*, I have carefully compared it with my specimens of *scolopendrina* and *modesta*, and cannot help thinking that it must be distinct from either, though certainly nearest to *scolopendrina*. It is whiter than that form, has no fulvous scales, and the black on thorax and abdomen is more confined to the dorsal area. The central band is very narrow, and the line before it is almost entire, instead of composed of mere spots, and the two inner lines of the three beyond the cell are obsolete. With the exception of a transverse shade on the secondaries, the specimen is altogether less smoky.

443. *Gluphisia septentrionalis*, Walk.—A ♂ at light, July 5th, 1896.

444. *G. Lintneri*, Grt.—A ♀ at light, May 5th, 1900.

#### LIPARIDÆ.

445. *Gynaphora Rossii*, Curt.—Three specimens were bred by Mr. Gregson in 1902 from larvæ found feeding on "cottonwood" (*Populus deltoidea*, or *P. balsamifera*) in the Blackfalds district. They all emerged on the same day, June 10th, but, unfortunately, two were destroyed. The remaining specimen I have seen, and it was named by Dr. Fletcher. There can be little doubt as to its identity. Mr. Gregson



tells me that the larvæ were very dark brown, with rather short hairs, and that they pupated in the spring after hibernation. He reports the larvæ as having been almost abundant during 1903, but says that he failed in an attempt to hibernate some of them.

446. *Notolophus antiqua*, Lin.—Very rarely met with, indeed. I have only two records, both males. One was taken by myself near the mouth of Fish Creek in 1893, and the other by Mr. Hudson, head of Pine Creek, at rest on a binder, Sept. 3rd, 1903. I have not infrequently found empty cocoons, sometimes with hatched ova on them, on trunks of *Populus tremuloides*, which I believe to have been those of this species.

447. *Olene plagiata*, Walk.—Two fine males. One taken by Mr. Hudson in 1903, labelled (? July 27th), probably at light; the other July 9th, 1904, at light.

448. *Malacosoma Americana*, Harr.—A single ♀, bred on Aug. 6th, 1905, from a larva taken on the Red Deer River, north-east of gleichen. A large number of larvæ were collected there during the first week in July by Mr. Hudson and myself, as they appeared obviously to differ from those we were so used to seeing in the Pine Creek district. Owing to an accident only one was brought to maturity. They were found commonly feeding on rose, saskatoon and wolf-willow, but I cannot recollect that we found them on true willow (*Salix*). They differed from the larva of the following species in the predominance of pale gray markings, especially in the lateral area, at the expense of black and yellow. I refer the species here, though with some doubt, owing to the resemblance of the specimen bred to a series kindly sent me under the name from Toronto by Mr. Gibson.

449. *M. fragilis*, Stretch.—The name was first given me by Prof. Smith, and Dr. Barnes has seen my series and not questioned its correctness. I cannot state positively that I have not more than one species in the series, but can draw no line. The males are normally darker than the females, and vary from pale luteous (? var. *constrictina*, Neum. and Dyar) to dark red-brown, with luteous transverse lines. The central band is nearly always darker, especially in luteous specimens, and the edges of the band usually darker than the centre. Thus, in luteous specimens the dark edges show up as lines when the luteous lines are dissolved in the pale ground. The lines are generally even. I must admit that I have specimens which I can hardly separate from some of my Ontario series of *Americana*, which seem to differ mainly in being browner, with less of the reddish tinge. The females show similar variation to the males, but run

more to luteous and less to red, and the outer line is occasionally crenulate, suggesting *Californica*, of which, however, I have not seen authentic specimens. In two females no dark colours are on primaries, except the edges of the otherwise concolorous central band, and dark marks on fringes (? var. *perlutea*, Neum. and Dyar). In some seasons the larvæ are very abundant, their nests being especially conspicuous on dwarf species of *Salix*. They also appear to favour wild gooseberry and rose, but are very rarely found on aspen. The imago comes to light from about the middle of July to the middle of August, though in nothing like the numbers that might be expected from the abundance of the larvæ. I cannot see that the form differs, in the imago at any rate, from *pluvialis*, recorded by Dr. Dyar in the Kootenai list. I have exchanged specimens with Dr. Dyar, and he says of the Calgary form: "More nearly resembles *pluvialis* than *fragilis*. Perhaps you are where the two forms run together." Some of the species of this genus seem very obscure, and I believe are more distinct in the larval stage. This I regret that I have not yet closely studied.

450. *M. disstria*, Hbn.—Mr. Hudson found a brood feeding on aspen poplar (*P. tremuloides*) in 1902, from which seven males and five females were bred, all emerging between July 31st and Aug. 2nd. I came across another brood, also upon aspen, during June of the past year (1905). Beyond these we have never met with the species. Mr. Gregson takes it in the Blackfalds district. Dr. Fletcher, in his report to the Director of Experimental Farms for 1904, states that on July 21st of that year he found two destructive colonies of what he believed to be this species on aspens, near St. Albert, ten or twelve miles north-west of Edmonton. In one case a patch of many acres was infested, and "the moths were in thousands, and were just emerging from their cocoons."

451. *Epicnaptera Americana*, Harr.—Rather rare. Middle May to middle June. Light. My only ♀ was bred from a larva found full-grown. I did not discover the food plant, but believe it to have been *Amelanchier alnifolia*, here known as Saskatoon. Rev. G. W. Taylor, of Wellington, B. C., tells me that he has often reared it on alder, but here that is far more local than the moth.

Var. *ferruginea*, Pack. One ♂ at light, April 26th, 1894, nearly three weeks earlier than my next earliest record for the species. The specimen is almost unicolorous rusty-red, with no gray shades or powdering at all.

(To be continued.)

## RECORDS IN ORTHOPTERA FROM THE CANADIAN NORTHWEST.

BY E. M. WALKER, B.A., M.B., TORONTO.

The following list of Orthoptera chiefly comprises the species taken by the writer during a month's trip to the Canadian Pacific Coast in 1897. But few stops were made, most of the specimens being taken at the various stations along the line of the Canadian Pacific Railway. As a rule, but a few minutes to half an hour were spent at each stopping place, but in Manitoba and British Columbia longer periods were spent, and better opportunities were to be had for collecting.

The list also contains the names of a few specimens taken by Dr. Fletcher in British Columbia and Manitoba during 1901.

Very few specimens other than Acridiidae were taken, as the writer was at that time inexperienced in collecting the Gryllidae and Locustidae. The species taken in Ontario are omitted, as they have already been recorded elsewhere.

1. *Blattella germania*, Steph.—One female, Agassiz, B. C., Sept. 9, 1897.
2. *Tetrix granulatus*, Kirby.—Agassiz, B. C., Sept. 9, 1897, 2 males, 1 female; Winnipeg, Man., Sept. 20, 1897, 1 female.
3. *Tettix Hancocki*, Morse.—Sidney, Man., Aug. 29, 1897, 1 female.
4. *Amphitornus bicolor*, Thom.—Vernon, B. C., Sept. 10, 1897, 2 females.
5. *Chloealtis abdominalis*, Thom.—Banff, Alta., Aug. 31, Sept. 1, 1897, 2 males, 2 females; between Carberry and Neepawa, Man., Sept. 22, 3 females.
6. *Stenobothrus curtispennis*, Harr.—Brandon, Man., Aug. 29, 1897; Swift Current, Assa., Sept. 20; Banff, Alta., Sept. 1; Sandon, B. C., Sept. 16; Vernon, B. C., Sept. 10.
7. *Gomphocerus clavatus*, Thom.—Near Waldeck, Assa., Aug. 30, 1897, 1 male; Pasqua, Assa., Aug. 30, 1 male, 1 female.
8. *Mecostethus gracilis*, Scudd.—Winnipeg, Man., Sept. 20, 1897, 2 males.
9. *Arphia pseudomitana*, Thom.—Brandon, Man., Sept. 23, 1897; between Souris and Boissevain, Man., Sept. 24; between Carberry and Neepawa, Sept. 22; Maple Creek, Assa., Sept. 20; Herbert, Assa., Aug. 30; Moose Jaw, Assa., Aug. 30; near Gull Lake, Assa., Aug. 30; Vernon, B. C., Sept. 10; Victoria, B. C., Sept. 8.

10. *Encoptolophus parvus*, Scudd.—Near Waldeck, Assa., Aug. 30, 1897, 1 male, 1 female; Swift Current, Assa., Sept. 20, 1 male; Pasqua, Assa., Aug. 30, 1 male.
11. *Camnula pellucida*, Scudd.—Portage la Prairie, Man., Aug. 29, 1897; Plum Coulee, Man., July 3, 1901 (Fletcher); Brandon, Man., Aug. 29; Indian Head, Assa., Aug. 30; Canmore, Alta., Aug. 31; Kananaskis, Alta., Aug. 31; Discovery Bay, Vancouver Id., B. C., Sept. 6.
12. *Hippiscus Californicus*, Scudd.—Vernon, B. C., Sept. 10, 2 males, 4 females. These specimens vary considerably in markings. One of the males and one of the females lack the yellowish stripe along the dorsal surface of the tegmina.
13. *Hippiscus zapoterus*, Sauss.—I have 1 female labelled Man., 1880, from Dr. Brodie's collection. Dr. Scudder writes that he has a specimen from Mill Valley, Man., Aug. 10, 1900.
14. *Dissosteira Carolina*, L.—Vernon, Sept. 10, 1 male, 1 female. The female is an extremely larger example, much larger than any I have seen from the east. Ordinary examples were common elsewhere in B. C.
15. *Spharagemon collare*, Scudd.—Between Souris and Boissevain, Man., Sept. 24, 1897; near Brandon, Man., Sept. 23; Rush Lake, Assa., Aug. 30; Moose Jaw, Assa., Aug. 30; Morse, Assa., Sept. 20; Chaplin, Assa., Sept. 20; Parkbeg, Assa., Aug. 30, Sept. 20. This is a very common species on the prairies, especially on the semi-arid parts. It shows great variation in colour and markings, and in the height of the median carinae of the pronotum, but all the specimens seem to belong to the typical race *collare*. Most of the Assiniboia specimens are collared, but many of the Manitoba ones lack this feature and are more uniform in coloration. The median carina is generally lower. The Manitoba specimens were taken, as a rule, on sandy prairies; those from Assiniboia everywhere in the semi-arid country.
16. *Metator pardalinum*, Sauss.(?)—Near Waldeck, Assa., Aug. 30, 1897, 1 male. This is a yellow-winged specimen, and is probably the same as *Mestobregma maculosum*, Sauss., which is reported from Alberta.
17. *Mestobregma Kiowa*, Thom.—Between Souris and Boissevain, Man., Sept. 24, 1897; 10 miles north of Brandon, Man., Sept. 23; Morse, Assa., Sept. 20; Moose Jaw, Assa., Aug. 30; Indian Head, Assa., Aug. 29.
18. *Conozoa Wallula*, Scudl.—Vernon, B. C., Sept. 10, 2 males, 1 female.

19. *Trimerotropis caeruleipes*, Bruner?—Nanaimo, B. C., Sept. 7, 1897; Duncan's, Vancouver Id., B. C., Sept. 7; Discovery Id., near Victoria, B. C., Sept. 6.

This is a very common insect on Vancouver Id., but I did not meet with it elsewhere.

20. *Trimerotropis monticola*, Sauss.—Near Waldeck, Assa., Aug. 30, 1897; Moose Jaw, Assa., Aug. 30; Morse, Assa., Sept. 20; near Gull Lake, Assa., Aug. 30; Vernon, B. C., Sept. 10.

Very common on the semi-arid parts of the Great Plains, associated with and closely resembling the collared variety of *Spharagemon collare*.

21. *Trimerotropis Bruneri*, McNeill.—Swift Current, Assa., Sept. 20, 1897, 1 male.

22. *Trimerotropis longicornis*, Walk.—Vernon, B. C., Sept. 10, 1897, 2 males.

23. *Trimerotropis vinculata*, Scudd.—Revelstoke, B. C., Sept. 17, 1897; Vernon, B. C., Sept. 10; Agassiz, B. C., Sept. 9.

24. *Trimerotropis sordida*, Walk.—Moose Jaw, Assa., Aug. 30, 1897; near Waldeck, Assa., Aug. 30; Morse, Assa., Sept. 20.

25. *Circotettix suffusus*, Scudd.—Donald, B. C., Sept. 3, 18, 1897; Revelstoke, B. C., Sept. 11; Rosslund, B. C., Sept. 12; Robson, B. C., Sept. 12; Vernon, B. C., Sept. 10; Agassiz, B. C., Sept. 8; Discovery Id., near Victoria, B. C., Sept. 5.

Very common on rocky and sandy places in B. C.; quite similar in habitat, flight and stridulation to *C. verruculatus*, Kirby.

26. *Circotettix lobatus*, Sauss.—Vernon, B. C., Sept. 10, 1897, 3 males, 1 female. A rare species, not known before from Canada. It makes a very loud but less harsh sound than *C. suffusus* and *verruculatus*. They were taken in company with a number of other Oedipodinae from the low, barren, semi-arid hills of the Okanagan district.

27. *Circotettix carlinianus*, Thom.—Pasqua, Assa., Aug. 30, 1897, 1 female.

28. *Podisma Dodgei*, Thom.?—Laggan, Alta., 7,000 ft., Sept. 19, 1897, 1 female.

This specimen is considerably smaller than typical *Dodgei*, and is somewhat differently marked. It is quite likely a new species.

29. *Melanoptus Alaskanus*, Scudd.?—Vernon, B. C., Sept. 10, 1897, 1 male. This specimen was sent to Dr. Scudder, who wrote me that it was either *Alaskanus* or a new species near it. The subgenital

plate is very long—longer than that of the specimen of *Alaskanus* figured in Scudder's Revision of the Melanopli.

30. *Melanoplus affinis*, Scudd.—Vernon, B. C., Aug. 23, 1901, 1 female (Fletcher); Nicola Valley, B. C., Aug. 20, 1901, 2 males, 2 females (Fletcher).

31. *Melanoplus bilituratus*, Walk.—Donald, B. C., Sept. 3, 1897; Vernon, B. C., Sept. 10; Discovery Id., near Victoria, B. C., Sept. 6; Duncan's, Nanaimo and Riddell, Vancouver Id., B. C., Sept. 7; Kelowna, B. C., Aug. 23, 1901 (Fletcher).

Extremely common on the Pacific Slope, where it seems to be the most abundant grasshopper.

32. *Melanoplus atlantis*, Riley.—Near Rosebank, Man., July 4, 1901 (Fletcher); Moose Jaw, Assa., Aug. 30, 1897; Parkbeg, Assa., Aug. 30; Kananaskis, Alta., Aug. 31; Banff, Alta., Sept. 1; Agassiz, B. C., Sept. 9; Vernon, Aug. 23, 1901, 1 male, very large (Fletcher); Sept. 10, two females, very large.

The large specimens from Vernon may possibly belong to another species, but I can find no structural differences from *atlantis*.

33. *Melanoplus spretus*, Uhler.—Between Brandon and Souris, Man., Sept. 23, 1897, 2 males; near Rosebank, Man., July 4, 1901, numerous mature specimens and a few nymphs (Fletcher).

34. *Melanoplus Dawsoni*, Scudd.—Between Souris and Boissevain, Man., Sept. 24, 1897; between Carberry and Neepawa, Man., Sept. 22; Brandon, Man., Aug. 29; Carberry, Man., Aug. 29; Portage la Prairie, Man., Aug. 29; Bergin, Man., Aug. 29; between Chaplin and Parkbeg, Assa., Sept. 20, 1897.

One of the common grasshoppers of the prairies.

35. *Melanoplus fasciatus*, Walk.—Banff, Alta., Sept. 1, 2, 1897. Rather common in open woods.

36. *Melanoplus femur-rubrum*, DeG.—Portage la Prairie, Man., Aug. 29, one male; Brandon, Man., Aug. 29, one male, one female; Moose Jaw, Assa., Aug. 30, one male; near Waldeck, Assa., Aug. 30, one male; Agassiz, B. C., Sept. 8.

All the specimens from the Plains, i.e., all but the one from Agassiz, are of small size.

37. *Melanoplus extremus*, Walk.—Plum Coulee, Man., July 3, 1901, one male, short-winged (J. Fletcher).

38. *Melanoplus compactus*, Scudd.—Between Carberry and Neepawa, Man., Sept. 22, 1897, two males, three females.

39. *Melanoplus Packardii*, Scudd.—Nicola Valley, B.C., Aug. 20, 1901, one male (Fletcher).
40. *Melanoplus infantilis*, Scudd.—Between Souris and Boissevain, Man., Sept. 24, 1897; near Brandon, Man., Sept. 23; between Chaplin and Parkbeg, Assa., Sept. 20, 1897; Moose Jaw, Assa., Aug. 30; Indian Head, Assa., Aug. 29; near Waldeck, Assa., Aug. 30.  
Very common on the semi-arid plains of Assiniboia.
41. *Melanoplus luridus*, Dodge.—Near Rosebank, Man., July 4, 1901, one female (Fletcher). Between Brandon and Souris, Man., Sept. 23, 1897, one female; 10 miles north of Brandon, Sept. 23, one female.
42. *Melanoplus bivittatus*, Say.—Near Rosebank, Man., July 4, 1901, one male (Fletcher); Rush Lake, Assa., Aug. 30, 1897, one female; Vernon, B.C., Sept. 10, one female. These all have glaucous hind tibiæ.
43. *Asemoplus montanus*, Bruner.—Vernon, B.C., Sept. 10, 1897, one female; probably this species, according to Dr. Scudder. It was taken in a small low wood of poplar, Douglas fir, etc., surrounded by dry barren hills.
44. *Asemoplus nudus*, Walk.—Sandon, B.C., Sept. 16, 1897, two males, one female; Laggan, Alta., Sept. 19, one male, four females.
45. *Scudderia furcata*, Brunn.—Agassiz, B.C., Sept. 9, 1897, common.
46. *Xiphidium fasciatum*, DeG.—Boissevain, Man., Sept. 24, 1897; Agassiz, B.C., Sept. 9.
47. *Cyphoderris monstrosa*, Scudd.—Banff, Alta., Sept. 2, 1897, two males (one immature). The mature male was found dead, but fresh, lying in a pool of water from a hot sulphur spring on the side of Sulphur Mountain. The other was found under a stone close to the same pool.
48. *Nemobius fasciatus*, Scudd.—Var. *abortivus*, Cand.—Common everywhere on the prairies—Man., Assa., Alta.
49. *Gryllus abbreviatus*, Serv.—Near Victoria, B.C., Sept. 6, 1897, three males. These appear to be typical *abbreviatus*, although this species is not recorded from the Pacific coast. Unfortunately no females were taken.

At a meeting of the Mount Royal Entomological Club, held on the 16th Dec. last, Mr. G. R. Southee reported the capture of *Sphinx luscitiosa*, Clemens, at Montreal, on July 3rd and 17th last. This moth has always been very rare in that locality and its capture was a surprise to several of the Montreal collectors.—G. CHAGNON.

## FIVE NEW CULICIDÆ FROM THE WEST INDIES.

BY D. W. COQUILLET, WASHINGTON, D. C.

*Stegomyia mediovittata*, n. sp.—Proboscis black, unmarked, palpi black scaled, in the male the bases of the joints white scaled, in the female only the apices of the joints are white; inner side of first antennal joint white scaled, scales of occiput black, a median line of white ones, those on the sides yellow and white. Thorax brown scaled, a median line of white ones, which is divided into two branches on the posterior fifth of the mesonotum; on either side of this line is a stripe of dark brown scales, followed by a line of light yellow scales, which become whitish on the posterior portion of the mesonotum; a broadly interrupted line of white scales midway between this line and the insertion of the wing, and a similar line just above this insertion, a spot of white scales on the humerus, and several similar spots on the pleura; scutellum with a spot of white scales on each of its three lobes. Abdomen black scaled, with a bluish reflection, a spot of white ones near base of sides of the last four segments, and a few white scales at apex of the last segment. Legs black scaled, a line of white ones on anterior and posterior sides of each femur, a spot above middle of anterior side of each tibia, the base of the first two joints of the front and middle tarsi and the base of each joint of the hind ones white scaled; tarsal claws of the female simple, those of the front and middle tarsi of the male with one tooth under one of the claws, none under the other, claws of the hind tarsi simple. Wings hyaline, the scales black. Length about 3 mm.

San Domingo, West Indies. Thirty-four specimens, collected by Mr. August Busck. Type No. 9138, U. S. National Museum.

*Stegomyia Busckii*, n. sp.—Proboscis and palpi wholly black, no white scales on the first antennal joints, scales of occiput brown, a median stripe of yellow ones, changing to white anteriorly, the sides of occiput bordered with white ones, the lower half largely yellow scaled. Thorax brown scaled, a median pair of widely-separated yellow scaled lines on the anterior three-fourths of the mesonotum, and between each of these and the adjacent wing is a line of similar scales on the posterior half, an interrupted line of white scales toward the sides of the mesonotum, and several spots on the pleura; scutellum brown scaled, and with a median stripe of white ones. Abdomen black scaled, with a tinge of bronze; venter yellow scaled, and with a lateral spot of white scales on the last three segments. Legs black scaled, those on under side of femora pale



yellow, a dot of white scales at apex of each femur and tibia, bases of first three joints of the hind tarsi white scaled; tarsal claws in both sexes as in *mediovittata*. Length about 3 mm.

San Domingo, West Indies. A female and two males, collected by Mr. August Busck, after whom this handsome species is named. Type No. 9139, U. S. National Museum.

*Teniorhynchus palliatus*, n. sp.—Proboscis wholly black scaled, palpi mixed black and yellow, occiput and mesonotum golden-yellow scaled, a large spot on posterior half of mesonotum almost devoid of scales (rubbed?), pleura with several spots of whitish ones. Abdomen black scaled, with a strong tinge of purple, a spot of yellow scales at bases of the third and fourth segments, and of white ones at base of each of the following three segments, a patch of white scales in the outer front angles of each segment; venter black scaled, and with a median stripe of yellow ones on the first four segments. Legs black scaled, those on the under side of each femur yellow; a spot of white scales at apex of each femur; base of first joint of each tarsus white scaled; tarsal claws simple. Wings hyaline, scales brown, narrow-lanceolate and linear intermixed. Length about 3 mm.

Trinidad, West Indies. A female collected by Mr. F. W. Urich. Type No. 9140, U. S. National Museum.

*Melanoconion Urichii*, n. sp.—Proboscis and palpi black scaled, occiput yellow scaled. Thorax thinly black scaled, the median part of the posterior half chiefly yellow scaled, the bristles on this part and on the scutellum yellow. Abdomen black scaled, the venter with a row of large violet spots on either side of segments from two to six, the middle of the venter golden-yellow scaled except on the narrow hind margins of the last four segments. Legs black scaled, with a purplish tinge, the under side of the femora, at least basally, yellow scaled, a large patch of violet scales before the apex of the front side of each femur, fourth joint of hind tarsi white scaled (the fifth is wanting); tarsal claws simple. Wings hyaline, somewhat smoky along the costa, the scales black, with a purplish tinge, those in outer half of wings rather broad, oblanceolate. Length about 4 mm.

Trinidad, West Indies. A female specimen collected by Mr. F. W. Urich, after whom this fine species is named. Type No. 9141, U. S. National Museum.

*Verrallina insolita*, n. sp.—Proboscis and palpi black scaled, occiput white scaled around the edge, yellow scaled in the centre, and with a pair of black scaled spots on the upper half. Thorax black scaled in the middle, the sides in front of the wings broadly, and spots on the pleura, white scaled. Abdomen black scaled, with a tinge of purple, middle of venter, except on the broad apices of the last four segments, white scaled, extending outwardly considerably on these segments. Legs black scaled, the under side of the front and middle femora towards the base, and the whole of the hind femora except the base and a broad band beyond the middle, white scaled; narrow bases of first three joints of the front and middle tarsi, both ends of the first joint and base of the second joint of the hind tarsi white scaled; claws of the front and middle tarsi toothed, those of the hind ones simple. Wings hyaline, the scales brown. Length nearly 4 mm.

Trinidad, West Indies. A female collected by Mr. F. W. Ulrich. Type No. 9142, U. S. National Museum.

#### A NEW LASIOCAMPID FROM ARIZONA.

BY WILLIAM BARNES, S. B., M. D., DECATUR, ILL.

*Eutricha Oweni*, n. sp., ♂.—Expanse, 70 mm. Thorax, abdomen and fore wings reddish-brown, more or less lightened from an admixture of pale gray or whitish scales or hairs. Fore wings crossed by four lines, one at inner fourth dark reddish-brown, accompanied by a pale inner line, almost transverse, only slightly incurved at costa and inner margin. The dark portion of the line is well marked, the paler portion not so distinct. The course of the line is slightly irregular, not perfectly smooth and even. The second line is just beyond the middle of the wing, it is similar to the first, only the pale shade is on the outer side. It is slightly exerted beyond cell, somewhat drawn in at the inner margin and a little wavy at costal end. The space between these two lines is somewhat darker than the rest of the wing. The third line is much fainter than the others, but is rendered more prominent by the contrast between the paler shade of the wing following and the slightly darker shade preceding it, which latter is, however, a trifle paler than the median space. The fourth or sub-terminal line is irregular and broken into short intravenular dots and bars,

February, 1906.

which are of a darker colour than any of the other markings. The wing following this line is somewhat darker than the portion preceding it. The veins of about the outer half of the wings are paler than the interspaces. Outer margin slightly scalloped, fringe concolorous. Hind wings of uniform reddish-brown, darker than fore wings. Fringe whitish at extreme edge. Outer margin quite distinctly scalloped.

Beneath the fore wings are of about the same shade as the hind wings above, while the hind wings beneath almost match the fore wings above in colour. The fore wings are somewhat washed with gray towards apex and outer margin. A double outer line more or less in evidence, the inner of the two, on hind wings, being well marked, the outer one much fainter. On fore wings both lines are quite faint, though easily traceable. Antennæ brown, quite broadly bipectinate to tip.

♀. Expanse, 92 mm. Compared with the ♂, the wings are much more distinctly scalloped, the colour of head, thorax and fore wings, while still somewhat lighter than the hind wings, is not so much mixed with gray, and the pale band preceding the subterminal broken line is much more contrasting, being quite a little paler than the rest of the wing, while the median space is only a shade darker.

The relation of colours of the under side to the upper is the same as in the ♂, the hind wings, however, being only a trifle lighter than the fore. The transverse lines are less well marked, being scarcely traceable, except toward costa of fore wing.

Types ♂ and ♀. Southern Arizona, August 21st, Chiricahua Mts.

I take pleasure in naming this beautiful species after Mr. V. W. Owen, of Los Angeles, California, who kindly sent the specimens to me for description. It is congeneric with my *Coronada*, and from the evident resemblance to figures of various species of *Entricha*, given in the Biol. Cent. Amer., there is no question but that they belong to that genus.

*HALICTUS PECOSENSIS*.—The type of this new species came from Pecos Canon, N. M., not from Pecos, as stated on page 6.

Mr. W. R. Dewar, a graduate of the Ontario Agricultural College, Guelph, has been appointed Entomologist of the Agricultural Department of Cape Colony, South Africa.

## BOOK NOTICE.

THE BUTTERFLIES OF THE WEST COAST OF THE UNITED STATES.—By William Greenwood Wright. Price, postpaid, \$4.35. Published by the author, 445 F. St., San Bernardino, California.

For a score of years Mr. Wright has been known to North American Lepidopterists as a keen and enthusiastic collector of butterflies, and now he has given to the world the results of his labours in the form of this large and handsome volume. It is profusely illustrated with 32 plates in colour photography, containing over 900 examples, and depicting all the species of butterflies, except the very commonest, that are found on the Pacific Coast. There is also a portrait of the author as a frontispiece, which forms a welcome addition to the book. One is struck at the first glance with the wealth of species that are unknown to us here, as for example in *Parnassius*, *Anthocharis*, *Synchlœ* and *Chionobas*, and the abundance and variety in *Pieris*, *Colias*, *Melitæa*, *Chrysophanus* and other genera. For these plates and descriptions alone the book is well worth having, and anyone who exchanges with western collectors will find it most useful as well as delightful; to our friends in British Columbia it is surely indispensable.

The first part of the volume, some thirty pages, is taken up with "General features of Butterfly life," and contains the author's views on many points of interest, respecting some of which there is much diversity of opinion. There are also some good hints on collecting and preserving specimens. This is followed by a complete list of the butterflies of the United States, with localities, which will be found of much value. The body of the work consists of notes upon each species and variety taken in the "West Coast" region, giving the points of difference between varieties and disputed species, and descriptions of a number of new species. As a rule the figures on the plates are considered to be sufficient for identification without description, especially as the upper and under surfaces of both sexes are generally depicted. There are no doubt some instances where the author's conclusions will not be accepted by others, but we are not competent to offer any opinion upon them. A satisfactory decision can only be arrived at by those who have studied these butterflies in their native haunts and who have reared the varieties for more than one generation. We hope that the book will be in demand all over the Continent, and that the author may not suffer pecuniarily in his enterprise; certainly anyone who procures it cannot fail to be pleased, and it will form an admirable complement to Dr. Holland's "Butterfly Book."