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## THE LIFE-HISTORY OF *EUPREPIA CAJA*, L., VAR. *AMERICANA*, HARR.

BY ARTHUR GIBSON, ASSISTANT, DIVISION OF ENTOMOLOGY, CENTRAL EXPERIMENTAL FARM, OTTAWA.

On the evening of the 31st July, 1899, while collecting moths at the electric light, close to the entrance to the Central Experimental Farm, I was fortunate enough to secure a female of *Euprepia Caja*, L., var. *Americana*, Harr. I enclosed her alive in a small box over night, and by the morning she had laid nine eggs. From these eggs five larvæ hatched, and as I have succeeded in bringing two of these through all their stages, my notes may be of interest to some of the readers of the CANADIAN ENTOMOLOGIST.

*Egg*.—Semi-ovoid, about .75 mm. in width, at widest part; pale yellowish, smooth, shiny.

On the 9th Aug. one egg hatched, on the 10th two more hatched, and by the morning of the 11th the last two had emerged. Before hatching, the black heads of the young larvæ are plainly noticeable, and the egg at this time is a thick milky colour.

*Stage I*.—Length at rest 2.25 mm., extended 3 mm. General colour creamy white. Head .4 mm. wide, jet black, shiny, rather depressed at apex. Face sparsely covered with minute hairs. On each segment is a transverse row of black tubercles bearing long hairs, those from tubercles on dorsum being black, while those from tubercles on sides are silvery. On 2nd segment in centre of dorsum is one conspicuous black double tubercle almost extending across the dorsum. Thoracic feet black, pro-

legs concolorous, rather translucent. Young larvæ are very active and spin a slight web.

On the 14th Aug. two larvæ passed the first moult, two more on the 15th, and the last one on the 17th Aug.

*Stage II.*—Length at rest 3 mm., extended 4 mm. General colour dirty whitish-yellow. Head .5 mm. wide, jet black, shiny, very slightly depressed at apex. Face sparsely covered with hairs, which are a little longer than in last moult. On each segment is a transverse row of shiny black tubercles bearing long black and silvery hairs. The large black double tubercle on 2nd segment in centre of dorsum appears as before. Thoracic feet blackish-gray, prolegs slightly darker than body and rather translucent.

On the 19th Aug. one larva passed the 2nd moult, two more on the 20th, and the 4th on the 21st, one larva having died on the 18th Aug.

*Stage III.*—Length at rest 5.75 mm., extended 6.5 mm. General colour blackish-gray, with a whitish stripe on dorsum, within which is a central ruddy yellowish-red line. Head .7 to .8 mm. wide, jet black, shiny, slightly depressed at apex. A transverse row of irregular shiny jet black tubercles appear on each segment as before, bearing long blackish and silvery hairs. Large double tubercle on 2nd segment in centre of dorsum also as before. On sides of body a stigmatal band occurs, yellowish-white in colour, with a reddish reflection. Thoracic feet shiny, jet black, prolegs concolorous.

On the 24th Aug. three larvæ passed the 3rd moult, and the remaining one on the 25th Aug.

*Stage IV.*—Length at rest 9 mm., extended 10.5 mm. General colour black, with the front segments rusty. Head 1.0 to 1.1 mm. wide, jet black, shiny, slightly depressed at apex. Transverse row of shiny jet black tubercles on all segments but head; on the 2nd, 3rd, 4th and 5th segments reddish hairs from all tubercles, and also some rather long blackish and silvery hairs. The hairs on the other segments are all blackish and silvery, some much longer than others. Dorsal band, and yellowish-red line centering dorsal band, have entirely disappeared. Stigmatal band interrupted, whitish, tinted with yellow, very faint. Thoracic feet shiny jet black, prolegs black, tipped with dull red.

On the 29th Aug. three larvæ passed the 4th moult, and the remaining one on the 30th Aug.

*Stage V.*—Length at rest 15.5 mm., extended 18 mm. General

colour black, with front segments rusty, slightly brighter than in last moult. Head 1.5 to 1.6 mm. wide, jet black, shiny, slight furrow on vertex. Transverse row of shiny black tubercles on all segments but head. On the 2nd, 3rd, 4th and 5th segments, as in last moult, reddish hairs from all tubercles, also some black and long silvery hairs. The hairs from tubercles on the other segments are all blackish and silvery, the silvery ones being long and slender; all the tubercles on dorsal area, including a series of which there is one tubercle posterior to each spiracle, have a pearly white patch at summit. This is most conspicuous on the lateral series—*i.e.*, the third from the dorsum. Thoracic feet jet black, prolegs black, tipped with rusty red.

On the 3rd Sept. two larvæ were swollen, and by the morning of the 4th had passed the 5th moult. The remaining two moulted, one on the 5th, and the other on the 6th Sept.

*Stage VI.*—Length at rest 24 mm., extended 26.5 mm. General appearance a black hairy caterpillar, reddish rust colour on 2nd, 3rd and 4th segments. Head 1.9 to 2.1 mm. wide, jet black, shiny, slight furrow on vertex. Long sweeping silvery white hairs from all tubercles, particularly numerous on segments 5 to 13, inclusive. These segments also bear short white bristles. On segments 2, 3 and 4 the bristles are a rusty red, with only one (or two) long sweeping whitish hair from each tubercle (these rusty red bristles giving the front part of larvæ the reddish appearance). On segment 5 the lateral tubercles also bear a few rusty bristles. All bristles below stigmata on each side fawn coloured (in some specimens almost white). Dorsal series of tubercles black, on segments 5 to 13, inclusive, lateral and stigmatal tubercles whitish. Stigmata white and very small. On segments 2, 3 and 4 the dorsal tubercles are whitish. Thoracic feet and prolegs concolorous, prolegs tipped with a faint rusty tinge.

On the 18th Sept. two had passed the 6th moult, one having died after the 5th moult. The remaining one moulted on the morning of the 20th, but died the same day.

*Stage VII.*—Length at rest 32 mm., extended 39 mm. General appearance a black caterpillar with rusty red sides, and covered with long sweeping silvery hairs. Head 3.2 to 3.4 mm. wide, jet black, shiny, bilobed. Face sparsely covered with bristles, those about the mouth-parts short and rusty in colour, those from upper part of face fewer and twice as long, and black in colour. On each side of face, on either side

of apex of frontal triangle, there is a small shallow depression. The prominent rusty bristles from dorsal tubercles on segments 2, 3 and 4 have disappeared, with the exception of a transverse patch from tubercles on 2nd segment, which turn down abruptly over the face, and very few on 3rd segment, all the remaining bristles being black. All tubercles whitish. Black bristles and long sweeping silvery white hairs from all tubercles above spiracles. On 2nd and 3rd segments very few silvery hairs; on remaining tubercles of dorsal area on segments 4 to 12, inclusive, about 20, or more, long sweeping silvery hairs. The row of tubercles posterior to spiracles bear long, bright, rusty red bristles from each tubercle, together with a few black bristles from upper half of tubercle, and also a very few long silvery hairs. All bristles below spiracles bright rusty red. Spiracles white. On the 5th and 6th and 11th, 12th and 13th segments are two small blackish medio-ventral tubercles and two sub-ventral tubercles sparsely covered with rusty bristles, the sub-ventral tubercles having more bristles, which are also longer. The medio-ventral tubercles are close together, almost touching each other. Thoracic feet shiny, black, tipped with brownish, prolegs blackish, reddish at ends.

On the 9th Oct. the two remaining larvæ had spun a slight cocoon, and by the 16th Oct. had changed to pupæ.

The cocoon is very thin, made of white, almost cobweb-like silk, with all the long white and some of the other hairs from larva interwoven. Pupa is plainly distinguishable through the cocoon.

*Pupa*.—Length 27 mm., width at widest part 8.5 mm.; black. Abdomen minutely pitted; thorax and wing-cases wrinkly. Reddish on abdominal folds between segments. Cremaster rough, short but broad, hollowed below, terminating with a bunch of about a dozen and a half short, capitate, rust-red bristles.

On the 16th June, 1900, a single specimen of the mature larva was found at Cumberland, Ont., to which place an excursion of the Ottawa Field-Naturalists' Club was held. The following description was taken: Length 42 mm., extended 50 mm. General appearance, black caterpillar with rust-red sides, rust-red colour on 2nd, 3rd and 4th segments, and covered with long sweeping silvery hairs. Head, width 3.4 mm., jet black, shiny, bilobed. Face sparsely covered with bristles, those about the mouth-parts short and rusty in colour, those from upper part of face fewer and twice as long, and black in colour. On each side

of face on either side of apex of frontal triangle there is a small shallow depression. The skin of body is a beautiful deep black velvety colour. Dorsal tubercles are grayish, with the exception of those on 2nd, 3rd and 4th segments, which are whitish—all other tubercles are whitish. All tubercles above spiracles on segments 5 to 13 bear long silvery hairs from one-half to three-quarters of an inch in length—some tubercles bear as many as twenty silvery hairs. Besides the silvery hairs, these tubercles also bear many black bristles about a quarter of an inch in length. On segment No. 2 the bristles are all reddish, and many hang down over the head. On segment No. 3 the bristles are rust-red, with a very few black ones, and a very few long silvery hairs. On segment No. 4 the tubercles bear hairs and bristles the same as those on the other segments, with the exception that they also bear rust-red bristles in numbers sufficient to give the anterior portion over which these bristles extend a reddish appearance. The row of tubercles posterior to spiracles bear mostly rust-red bristles, but there are also a few black bristles and a few long sweeping silvery hairs. All bristles below spiracles are bright rust-red. Spiracles white. On the 5th and 6th segments and 11th, 12th and 13th segments are two small blackish medio-ventral tubercles and two sub-ventral tubercles bearing sparse rusty bristles, the sub-ventral tubercles having more bristles, which are also longer. The medio-ventral tubercles are close together, almost touching each other. Thoracic feet black, shiny, tipped with brownish, and bearing sparse, short rusty bristles. Abdominal feet and prolegs black, shiny, reddish at ends, and also bearing short rusty bristles.

On the 20th June this larva spun a cocoon and in due course pupated, the moth emerging on the 29th July—length of pupal stage being about 39 days. In the case of this specimen, the cocoon was much darker than in those bred in 1899; this cause being largely due to the additional number of reddish hairs from dorsal tubercles on segments 2, 3 and 4, being interwoven.

The above two descriptions of the mature larva differ slightly in some respects, but this in all probability is due to variations which doubtless occur in the species.

*Food Plant.*—The larvae bred in 1899 were fed on lamb's-quarters (*Chenopodium album*). The one taken this year fed on this plant, as also on dandelion and plantain.

## NEW SPECIES OF ANAPHORINÆ.

BY HARRISON G. DYAR, WASHINGTON, D. C.

The following apparently new species of Anaphorinæ have been received since the paper published in CAN. ENT., XXXII., 307, was prepared :

Genus *ATOPOCERA*, Walsingham.

Wals., Proc. Zool. Soc., London, 1897, p. 169.

Lord Walsingham would probably not have proposed this name if he had been aware of the previous use of the masculine form of the same term (*Atopocerus*, Kraatz, Dent. ent. Zeit., XXXII., 360, 1888. However, the different endings will probably sufficiently distinguish the two genera.

*Atopocera Barnesii*, n. sp.

Palpi recurved to near end of thorax, with head and thorax dark blackish brown ; legs and abdomen dark gray. Antennæ simple, somewhat compressed. Fore wings with costa convex, inner margin slightly excavate before anal angle ; dark brownish gray, violaceous, tinted, mottled, subreticulate with darker brown, and showing faintly a dark rounded discal dot and irregular quadrate patch on the centre of inner margin, extending toward base along median vein. Hind wing uniform dark brown, the base of fringe narrowly lighter. Expanse 20 mm. Male genitalia with uncus double, two well-separated sharp spines, roundedly and but slightly curved toward tip, the opposing lower piece short ; harpes slender, obliquely ascending, curved, uniform, the tip rounded.

One ♂, Kerrville, Texas (Dr. W. Barnes); U. S. Nat. Mus., type No. 5347.

Genus *ANAPHORA*, Clemens.

In CAN. ENT., XXXII., 309, I placed *Acrolophus violaceellus*, Beut., as a distinct species, but on further comparison I cannot distinguish it from *Anaphora tenuis*, Wals.

Lord Walsingham separates *tenuis* by the presence of short supplementary processes in the ♂ genitalia, but this character is so obscure that I prefer to give the synoptic table in the following form :

Uncus abruptly angulated.

- Points of uncus distinctly separated... .. *popcanella*.  
 Points of uncus closely approximate... .. *Morrisoni*.  
 Uncus curved over.  
 Points of uncus distinctly separate.  
   Harpes rounded at tip... .. *tenuis*.  
   Harpes oblique below at tip... .. *macrogaster*.  
 Points of uncus closely approximate... .. *propinqua*.

## GENUS NEOLOPHUS, Walsingham.

Wals., Trans. Ent. Soc., Lond., 1887, p. 141.

*Neolophus persimplex*, n. sp.

Palpi short, erect, reaching to vertex of head, and closely appressed, densely hairy, slightly tufted on the joints, the third joint smoother. Body robust, in size and appearance resembling *Pseudanaphora davisellus*, Beut., but veins 8 and 9 of fore wings stalked. Antennæ subserrate, especially towards tips. Head and thorax dark gray. Fore wing pale cinerous gray, mottled with black, heaviest in the centre of the wing, the dark area forming a quadrate or pointed patch on the centre of the inner margin, and a diffuse discal patch, becoming merged in the mottlings along costal edge of wing; area along inner margin lighter gray. Hind wings dark gray. Expanse 22 to 24 mm. Male genitalia with the uncus a single long spine tapering from a broad base, obliquely bent downward; harpes broad, concave, strongly widened at tips, rounded, with a slight projection on the terminal margin.

Nine examples; Huachuca Mts., Arizona; July 16 to Aug. 23 (Dr. W. Barnes); U. S. Nat Mus., type No. 5343.

## GENUS ORTHOLOPHUS, Walsingham.

. *Synopsis of Species.*

Uncus single.

Harpes slender, uniform in width, constricted near tip... .. *variabilis*.

Harpes broad, spoon-shaped, narrow at base... .. *piger*.

*Ortholophus piger*, n sp.

Palpi erect, reaching above vertex, free from front, rather smoothly scaled. Fore wings light cinerous, slightly violaceous; an ochreous shade over centre of wing, limited inwardly by a black, mottled line from basal third of costa to above centre of inner margin, and outwardly by a similar line from below outer fourth of costa to opposite centre of outer margin,



not reaching either margin. Between these lines the ochreous shade does not reach the costa, and is incised opposite the outer third of inner margin. Wing sparsely irrorate with black, distinctly along costa and in the ochreous shade. A group of dark scales on centre of outer margin. Hind wing blackish, pale along costal edge and extreme base. Expanse 17 mm. Male genitalia with uncus simple, gently curved, broadening toward base; harpes broadly rounded, spoon-shaped, strongly contracted at base, tips evenly rounded.

Three specimens; San Diego, Texas; May 24 to 26 (E. A. Schwarz); U. S. Nat. Mus., type No. 5348.

Genus FELDERIA, Walsingham.

*Felderia dorsimacula*, n. sp.

Palpi strongly recurved to base of thorax, pale gray before, black outwardly; head and thorax dark gray. Fore wing gray, dark on the costal half, more cinereous along internal margin, mottled with dark brown. A triangular black patch with point on centre of inner margin and the broadest side on the median vein, joined outwardly to a triangular discal patch, that is extended in a curved band nearly to apex, where it becomes obsolete. Hind wings rather light gray, a little darker toward the margin. Expanse 24 to 26 mm. Male genitalia with uncus single, a broad triangular plate, tapering rapidly to a point; harpes slender, rather flat, long, well curved at base, the tips oblique above.

Nine specimens; Huachuca Mts., Arizona; July 24 to Aug. 15 (Dr. W. Barnes); U. S. Nat. Mus., type No. 5346.

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#### THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the first meeting of the autumn, held on the evening of October 15, sixteen persons present, Mr. Wm. H. Roever, of Washington University, presented an elaborate paper discussing in detail the subject of the establishment of the method of least squares. Professor F. E. Nipher presented two papers, entitled respectively Positive Photography, with special reference to eclipse work, and The Frictional Effects of Railway Trains upon the Air; and Mr. C. F. Baker exhibited an interesting collection representing nearly all of the species of fleas thus far known, which he had prepared for the United States National Museum.

Four persons were elected to active membership.

WILLIAM TRELEASE, Recording Secretary.

## NEW OR LITTLE KNOWN CALIFORNIAN ORTHOPTERA.

BY SAMUEL H. SCUDDER, CAMBRIDGE, MASS.

The species here brought together were most of them collected by Mr. A. P. Morse, in the summer of 1897, and as they belong to miscellaneous genera, none of which require special revision, the descriptions are here collected for publication.

*Loboptera americana* Scudd.

The single original specimen of this species was taken in Arizona, and was apparently collected in alcohol, as two fresh specimens taken by Mr. Morse at Cahon Pass, Cal., July 18, differ in colour and in the shape of the pronotum, requiring its partial re-description. The pronotum is fusco-castaneous, only less obscure than the abdomen, very faintly and delicately mottled with luteo-castaneous; it has no mesial constriction (due in the original specimen to contraction in drying), but a regular parabolic curve, and is feebly margined laterally. The tegmina are castaneous, either with the inner half fuscous or with a fuscous median streak. The antennæ are of the length of the body, fusco-luteous, gradually becoming paler distally, very sparsely and delicately verticillate. The legs are uniform luteo-castaneous, the spines concolorous. The form of the whole body is not so oval as indicated in the original figure, but nearly parallel-sided, the abdomen with an independent fullness, and both extremities, but especially the posterior, broadly rounded. The figure also represents the legs as stouter and shorter than they are.

MICROTES, Gen. nov. (*μικρότης*).

Allied to *Spharagemon* and *Tomonotus*. Moderately robust, but of small size. Head normal, the summit without carination; fastigium of vertex oval, rather deeply impressed, completely margined with elevated walls; lateral foveolæ triangular, a little elongate, but not reaching the tip of the vertical fastigium; frontal costa not very broad, deeply sulcate, subequal but enlarging below; eyes rather small and prominent; antennæ rather coarse, not tapering, blunt-tipped, in the male only a little longer than the head and pronotum together. Pronotum moderately stout, mesially compressed, the median carina moderately high, cut only by the principal sulcus, the lateral canthi distinct, distinctly cut by the principal sulcus and fading in advance of it, the process of the metazona subrectangulate; interpace between both mesosternal and metasternal lobes distinctly transverse in both sexes.

Tegmina moderately broad, the intercalary vein straight, approximate to the median vein; wings crossed by an extramesial fuscous band, cloudy below the humeral field and in that field sending a tænia nearly to the base. Hind femora rather broad, the inferior carina less elevated than the superior, not very arcuate.

The following single species is known to me :

*Microtes nubila*, sp. nov.

Fuscous or cinereo-fuscous. Head ferrugineo-fuscous blotched with cinereous, the summit more or less rugulose behind the deep and smooth fastigium; frontal costa deeply sulcate throughout, not or but faintly expanded at the ocellus; antennæ fusco-ferruginous, punctate, considerably less than half as long as the tegmina. Pronotum fuscous or ferrugineo-fuscous blotched with cinereous, the lateral lobes with a small central bright quadrate spot, the disc rugulose or granulate, with no defined direction to the independent rugæ, the median carina moderately high and subequal on the prozona, though somewhat sinuate on a lateral view, gradually lowering on the metazona. Tegmina cinereous, crossed by rather broad, often broken, fuscous bands, a broad basal one, a mesial and a generally shattered extramesial one, the cinereous clouds on either side the median fuscous band hardly crossing the wing, but clear and distinct on the costal border, the whole anal area uniform fusco-cinereous; wings hyaline, weakly tinged with citron basally, the humeral field with a longitudinal fusco-fuliginous stripe occupying the basal half and a similar costal stigma, the anal field feebly infumate beyond the middle, especially in a rather narrow transverse extramesial band, which attains but does not follow the hind margin. Hind femora cinereo-testaceous, four times narrowly and obliquely banded with fuscous; hind tibiæ glaucous, with the base black and a postbasal luteous annulus.

Length of body, ♂, 14.5 mm., ♀, 21 mm.; antennæ, ♂, 6 mm.; tegmina, ♂, 15 mm., ♀, 19.5 mm.; hind femora, ♂, 10 mm., ♀, 13 mm.

4 ♂, 1 ♀. Monterey, Cal., July 16. R. W. Doane (Mus. Leland Stanford Jr. University).

*Trimerotropis gratiosa*, sp. nov.

Allied to *T. pacifica*. Robust, cinereo-testaceous, rather feebly marked with fuscous. Head as in *T. pacifica*, with rather more pronounced margins of the fastigium of the vertex and more sulcate frontal costa; antennæ testaceous at base, beyond fusco-testaceous,

annulate with fuscous. Pronotum robust, generally uniformly testaceous or cinereo-testaceous, rarely longitudinally striped with fuscous, and then the lower part of the head and lateral lobes are pallid; median carina distinct, percurrent, though the prozona, especially in the female, has a prominent median tuberculous swelling; lateral carinæ sharp and pronounced, even distinct on the prozona; disk of metazona generally plane, sometimes feebly rounded, densely punctate, the process obtus-angulate in both sexes; lateral lobes terminating behind in an inferior pointed process, as in *T. pacifica*, but placed more completely at posterior margin. Tegmina, as in *T. pacifica*, but with the markings less pronounced, sometimes almost wholly wanting; hind wings feebly washed with citron in basal half, beyond hyaline, but with the apical veins and cross-veins fuscous (more deeply than in *T. pacifica*) and generally with feeble remains of a transverse mesial fuscous band like that of *T. pacifica*, but never continuous and generally altogether confined to the infuscation of some but not all of the veins and cross-veins of that region, and rarely shows the added infuscation of some of the cells. Hind femora and tibiæ as in *T. pacifica*, the former quite as heavily marked.

Length of body, ♂, 28 mm., ♀, 35 mm.; antennæ, ♂, 15 mm., ♀, 13.5 mm.; tegmina, ♂, 26.75 mm., ♀, 31.5 mm.; hind femora, ♂, 15.5 mm., ♀, 18.5 mm.

6 ♂, 6 ♀. Ceres, Cal., Aug. 17. A. P. Morse.

This species differs from *T. pacifica* by its more widely angled pronotal process, robuster and more angulate pronotum, the protuberance of the prozonal disk, and the almost complete, sometimes complete, absence of a band on the hind wings.

*Dichopetala brevicauda*, sp. nov.

Pale testaceous, the upper surface of head and pronotum tinged with flavous, which terminates on the posterior part of the pronotum at a rectangular bent line of reddish points, its angle at the posterior margin; lateral lobes obscurely marked with fuscous. Pronotum constricted just behind the front margin, emarginate posteriorly next the lower margin of the tegmina; these are testaceous, overlapping, about as long as broad, not truncate, but angulate. All the legs, but especially the hind pair, very long uniform testaceous. Ovipositor no longer than the pronotum, both margins serrate on distal half, besides which the sides of both valves of the same portion bristle with raised rufous serrations, arranged linearly and gradually fading baseward.

Length of body, 15 mm.; antennæ, 43 mm.; pronotum, 4 mm.; fore femora, 9 mm.; hind femora, 22 mm.; ovipositor, 4 mm.

1 ♀. Cahon Pass, Cal., July 18. A. P. Morse.

This species differs distinctly from the species heretofore known in the brevity of the ovipositor, and the overlapping of the female tegmina.

*Arethusa consuetipes*, sp. nov.

Green, the pronotum sometimes testaceous, the basal half of the male tympanum testaceous, but without other markings. Tegmina just surpassing the hind femora, the radial vein sending five or six branches to the posterior margin; tympanum of male tegmina produced, lanceolate, as long behind the transverse vein as in front of it, rounded at tip; legs shorter than common in the genus, the fore and middle femora rectangularly produced at tip.

Length of body, 16 mm.; pronotum, 4.75 mm.; tegmina, 25 mm.; wings, 29.5 mm.; hind femora, 21 mm.

2 ♂. Indio, Cal., July 9. A. P. Morse.

This species differs markedly from the others in the relative brevity of the hind legs. The pronotum lacks the selliform aspect found in the other species, and this species should perhaps be generically distinguished from them.

*Clinopleura flavomarginata*, sp. nov.

Testaceous or fusco-testaceous, marked and sculptured quite as in *C. melanopleura*, but with the infuscation of the lateral lobes of the pronotum either wanting or much less pronounced, and the lateral carinæ of the pronotum, if anything, less distant. The legs, and especially the hind legs, are longer (the hind femora longer than the body), and the anal appendages of the male differ in that the cerci have a much shorter incurved apical hook, much shorter than the body of the cerci themselves, and the infragenital plate is apically truncate and not emarginate.

Length of body, ♂, 23 mm., ♀, 25.5 mm.; pronotum, ♂ ♀, 6.75 mm.; hind femora, ♂, 25.5 mm., ♀, 26.5 mm.; ovipositor, 19 mm.

5 ♂, 6 ♀. Ahwanee, Aug. 15; Ceres, Aug. 17; and Raymond, Cal., Aug. 16; A. P. Morse. Calaveras, Cal.; Riley. Other specimens of this species are in the U. S. National Museum.

Specimens of *C. melanopleura* were taken by Mr. Morse at Tehachapi, Cal., Aug. 3.

## NOTES ON SOME SPECIES OF ACRONYCTA IN THE BRITISH MUSEUM.

BY JOHN B. SMITH, SC. D., RUTGERS COLLEGE, N. J.

Nothing is more aggravating than to be compelled, soon after completing a monographic work, to make changes in the nomenclature and synonymy; yet this is the purpose of this paper concerning the genus *Acronycta*, which was monographed by Dr. H. G. Dyar and myself in Proc. U. S. Nat. Mus., XXI., pp. 1-194, 1898.

It was explained in the introduction to this paper that, because of its interesting early stages, the late Dr. C. V. Riley had been, for years, accumulating material for a thorough study of *Acronycta*; therefore I had made no effort to become closely familiar with the species. Some time before, Dr. A. G. Butler, of the British Museum, attracted in the same way by the larval difference, had divided the species among several genera, referred to several families; allowing superficial and secondary characters to mislead him, as he has since admitted. In 1886, while arranging the Grote material, Dr. Butler made comparisons with other types in the Museum, the results of which were published in 1887 in "Entomologica Americana."

When, in 1891, I examined the British Museum collections, the species of *Acronycta* were still scattered among several families, and, 1st, because Dr. Butler had already made comparisons and published results; 2nd, because Dr. Riley had made comparisons, the results of which were not yet published, I decided to make no original notes myself. I called attention to this point in my Catalogue, Bull. 44, U. S. N. M., p. 35, where I accepted nearly all of Mr. Butler's synonymical references.

In 1900 I had another opportunity to examine the British Museum collections, and the results are here given.

*Acronycta felina*, Grt. Type and one other specimen so labelled. Three examples from Vancouver are different. There are "types" also in the Edwards and Tepper collections, which are much darker than the B. M. type. The latter is quite a light gray, basal streak to place of t. a. line; not furcate at tip. T. p. line distinct. Reniform a dusky lunule. In my revision I have described as the typical form the examples represented in the American collections.

*Acronycta lepusculina*, Gn. The type of this species is not in the collection. Three distinct forms are grouped under this specific name.

*Acronycta insita*, Walk. The type is a female, and very much

resembles at first sight the male type of *dactylina*. My identification of this species is correct.

It may not be quite out of place to say that additional material received in 1899 makes it quite certain that the form named, tentatively, *Canadensis*, on p. 57 of the Revision, is really a good species.

*Acronycta innotata*, Gn. The type is a male.

*Acronycta dactylina*, Grt. The type is a somewhat crippled male.

*Acronycta contacta*, Wlk. The type is a female, and Mr. Grote rightly refers it to *Polia*. The reference of *diffusilis* as a synonym is just a little doubtful; a point to which I will recur in a later paper.

*Acronycta sperata*, Grt. Types male and female are here. There is also an example marked "type" in the Coll. Am. Ent. Soc.

*Acronycta tota*, Grt. The type is a male.

*Acronycta pallidicoma*, Grt. The type is a small female.

*Acronycta impressa*, Wlk., type; *Acronycta fasciata*, Wlk., type; and *Acronycta Verrillii*, Grt., type: these are all the same species, and are what Mr. Grote called *brumosa*. There is also a "type" of *Verrillii* in the collection of the American Entomological Society.

*Acronycta distans*, Grt. The type is a male.

*Acronycta superans*, Gn. The type is a poor female.

*Acronycta brumosa*, Gn., type, is the same as *A. persuasa*, Harv., type, and the same as a male example of *A. longa*, Gn., which is *not* the type. There is nothing to warrant the belief that *longa* was named by Guenée himself, and, as I have shown, the description fits closely to *xyliniformis*. On the other hand, Mr. Butler was correct in uniting *brumosa* and *superans*, and I was wrong in connecting *brumosa* with *subochrea*. It seems likely that there was a mix-up among the larvæ described by Guenée, and that in this case an erroneous adult was placed with a *subochrea* larva.

*Acronycta perdita*, Grt. The type is a male.

*Acronycta extricata*, Grt. The type is a male.

*Acronycta subochrea*, Grt., type. A good species, and not *impleta*, Wlk.

*Acronycta impleta*, Wlk., type. *Subochrea*, Grt., is not to be associated with this species; but, on the other hand, *luteicoma*, G. & R., is, without question, the same species.

As a result of these notes, *Acronycta brumosa* in the Revision, p. 117, should read *subochrea*, and corresponding corrections should be made whenever the species there described under that name is referred to.

*Luticoma*, G. & R., on p. 152, should read *impleta*, Wlk., and further corrections to be made as in preceding instance

*Persuasa*, Harv., must be replaced by *brumosa*, Gn., and corrections made as before.

*Acronycta hamamelis*, Gn., type, is a very dark, powdery form, and is the form named *afflicta* by Grote; not at all the species heretofore so named in our collections.

*Acronycta afflicta*, Grt., not the type; but so named by Mr. Grote, and like the species so recognized in American collections. This is the same as *A. hamamelis*, Gn., which is also the same as *brumosa*, var. *b* of Gn. This will explain why Guenée describes the larva of *brumosa* for *hamamelis*. He had evidently mixed up three species; a very dark form of what we call *hamamelis* being easily confused with *afflicta*. At all events, I cannot find any difference between type specimens of *hamamelis*, Gn.; *brumosa*, var. *b*, Gn., and *afflicta*, Grt. The latter name on p. 127 of the Revision must be replaced by *hamamelis* wherever the species there described is referred to; while *hamamelis*, Gn., on p. 141, is really unnamed, and may be called *inclara*.

*Acronycta haesitata*, Grt., type. A good species, and not *clarescens*, Gn.

*Acronycta clarescens*, Gn., type. This is the species which was so named in American collections by Mr. Grote, and Mr. Butler was altogether in error in associating it with *hamamelis* (*haesitata*). I was the more ready to accept Mr. Butler's determination because the description does really apply to *haesitata* more nearly than to the species for which it is actually intended. At all events, *haesitata*, Grt., must be restored, and *clarescens*, Gn., must be again transferred to the species so long known as such, and now listed as *pruni*.

*Acronycta dentata*, Grt., type.

*Acronycta increta*, Morr. A specimen marked "type" in Mr. Grote's handwriting is in the collection. Associated with it are three examples of *inclara*—i.e., *hamamelis*, Auct., nec. Guenée.

*Acronycta dissecta*, Grt., type. There is also a type specimen in the collection of the American Entomological Society. The type of *retardata*, Wlk., which has priority, is in the collection of Entomological Society of Ontario.

*Acronycta exilis*, Grt., type; *A. modica*, Wlk., type. These seem to be alike; but there is perhaps a question. The type of *exilis* is the small, light form, with much yellow in the cell and over the ordinary spots; the type of *modica* is as large as *ovata*, but not so sharply



marked, the secondaries dusky. Four other examples of *modica* are broader winged than *exilis*. Based upon these specimens only, the two names would seem to refer to distinct species; but, in the series before me when I wrote, I failed to find a reliable character to separate them.

*Acronycta spinigera*, Gn., type; *A. Harveyana*, Grt., type. These are identical. There seems to be no reason for doubting the authenticity of the type label on Guenée's species and, as pointed out in the Revision, the description is thoroughly applicable.

*Acronycta ovata*, Grt., type. Another type specimen is in the collection of the American Entomological Society.

*Acronycta albarufa*, Grt., type. The type of *Walkerii*, Andrews, is, I believe, in the possession of Mr. John Akhurst, of Brooklyn.

*Acronycta grisea*, Wlk., type. The type of *pidorata*, Morr., is in the Tepper collection, now in the possession of the Michigan Agricultural College.

*Acronycta lobelia*, Gn. The type is a small and not very characteristic specimen without fringes.

*Acronycta thoracica*, Grt. The type is a female, placed in the collection under the *lobelia* label as identical with it; but the species are distinct.

*Acronycta paupercula*, Grt. The specimen is of the larger form of the species.

*Acronycta falcata*, Grt., type. Two examples of *grisea* are erroneously associated with this.

*Acronycta parallela*, Grt., type.

*Acronycta quadrata*, Grt. The type is a female.

*Acronycta connecta*, Grt. The type a male.

*Acronycta Radcliffei*, Harv. Marked "type" in Mr. Grote's handwriting.

*Merolonche spinea*, Grt. The type is a female. Another example, also labelled "type," is in the Hy. Edwards collection.

*Acronycta lanceolaria*, Grt., type; *Acronycta insolita*, Grt., type. The former is a good example, the latter a very poor male: *lanccolaria* I had seen at the time of writing the Revision; but *insolita* was then unknown to me. During the winter of 1899-1900, Dr. Dimmock sent me a few specimens from Massachusetts for determination; among them was *insolita*, and, much to my surprise, examples indicating that it was a very dark form of *lanccolaria*. The two extremes are totally unlike—very pale ashen or whitish gray on the one hand, almost black on the other, yet when the black overlay of *insolita* is removed, *lanccolaria* appears and, of an example now in my collection, it is almost impossible to say where it should be placed.

The material is too scant to make the reference positively; but it is a little problem for our New England friends to solve by breeding. The larva has been found by Mr. Kirkland and is described on p. 172 of the Revision. It feeds on Willow, *Comptonia* and *Gaillardia*.

## ADDITIONS TO THE WESTERN JASSID FAUNA.

BY E. D. BALL, FORT COLLINS, COLO.

*Thamnotettix chiragrica*, n. sp.—Form and size of *T. parallela* nearly, superficially resembling *Cicadula punctifrons*, var. *Americana*. Length, 6 mm.; width, very nearly 2 mm.

Vertex twice wider than long, half longer on middle than against eye, disc convex slightly sloping, rounded to the face, front very broad and short, width at base and length about equal, the disc convex. Pronotum a third longer than the vertex, over twice wider than long; elytra long, almost parallel margined to the apex, venation distinct, apical cells short, their bases truncate, the anteapicals long.

Colour: vertex pale greenish yellow, a pair of round black spots on the posterior margin, slightly nearer the eyes than to each other, a pair of larger, quadrate spots between the ocelli and the eyes, face pale yellow, a few dark arcs on upper part of front, the upper bounding pair crescentiform uniting on the tip of the vertex, a pair of black spots above the antennal sockets and a black band margining the eyes below. Pronotum olive, shading to yellowish in front, a pair of approximate median spots on the anterior submargin, a larger pair against the eyes and a pair of dots just inside the latter, on either side, black. Scutellum pale yellow, a pair of round spots on the disc and a larger, triangular pair just within the basal angles, black. Elytra dark fuscous, the veins and margins milk-white in sharp contrast. Below pale yellow; ovipositor and spot on the last segment black.

Genitalia: ultimate ventral segment of the female three times the length of the penultimate, the lateral margin roundly narrowing, the posterior margin roundly emarginate, the disc posteriorly striated, the middle half angularly elevated.

Described from a single female from Phoenix, Ariz. This is so distinct and easily-recognized a species that there can be no danger in describing it from the single specimen.

*Thamnotettix Osborni*, n. sp.—Form and general appearance of *Kennicottii*, but smaller and lighter coloured. Length, 5 mm.; width, 1.25 mm.

Vertex longer and narrower than in *Kennicottii*, less than twice as wide as its middle length, disc convex, evenly rounding to the front; front long and narrow, scarcely narrowing until just at the clypeus, genæ scarcely angled, extending below the loræ.

Colour very similar to *Coquilletti*, vertex and face pale creamy washed with orange, ocelli and an irregular spot on either side the vertex at the base, fulvous. Pronotum pale orange fulvous, a narrow transverse band on the middle. Scutellum yellow, brownish or fuscous triangular spots within the basal angles. Elytra fulvous, the anterior half of the corium subhyaline, veins on clavus and the sutural margin narrowly white, claval suture broadly white, with the band on pronotum forming a long triangle.

Genitalia: ultimate ventral segment of female half longer than penultimate, posterior margin broadly rounding, sharply notched either side of a strap-shaped, produced, median tooth; male valve small, almost concealed beneath the large ultimate segment; plates narrow, triangular, the sides convex at base, nearly straight beyond.

Described from a number of specimens taken at Fort Collins and Wray, Colo., and Kimball, Neb. This species is the western representative of *Kennicottii*, with which it has formerly been confused. It may be distinguished by its smaller size and lighter colour as well as by the distinct genitalia.

*Thamnotettix Heidemanni*, n. sp.—Form of *Cockerelli* nearly, but smaller, the head broader and blunter. Grayish green sprinkled with blood red dots. Length, 4 mm.; width, 1-1.25 mm.

Vertex very slightly angled in front, twice wider at base than its middle length, transversely depressed posteriorly, passage to the front rounded, ocelli rather distant from the eyes, front parallel margined until below the middle, then regularly narrowing to the clypeus, pronotum scarcely twice the length of the vertex, elytra together wedge-shaped.

Colour: vertex and face pale yellow, sutures and about five short arcs on the front fuscous, pronotum pale olive, the anterior margin lighter, scutellum yellow, and orange spot inside each basal angle. Elytra milky subhyaline with a greenish cast, the black tergum showing through. Whole upper surface and face minutely dotted with blood red.

Genitalia: ultimate ventral segment of the female two and one half times as long as the penultimate, the posterior margin broadly rounding or slightly produced on the middle third; male valve small, rounding, about half the length of the ultimate segment, plates broad at base, almost circularly rounding and then extending as a pair of style-like points, pygofer long, tubular, oblique, equalling or exceeding the plates.

Described from eighteen specimens from Cerro Summit and Alder, Colo., both high mountain points.

*Thamnotettix Cockerelli*, n. sp.—Form and general appearance of *Kennicottii* nearly, with indistinct red mottlings. Length, 5-6 mm.; width, 1.5 mm.

Vertex more than twice wider than long, very little produced in the middle, bluntly angled, with the front transversely depressed behind the middle; face parallel margined to below the antennæ, then narrowing to the nearly parallel-margined clypeus; elytra rather long and strongly appressed behind.

Colour: vertex, face, anterior margin of pronotum and scutellum pale yellow, disc of pronotum and elytra grayish brown with a strong coppery reflection, the whole insect mottled with blood red, veins on elytra light, sutures of front black-lined.

Genitalia: ultimate ventral segment of the female very long, nearly as long as the pygofers, posterior margin broadly and evenly rounding; male valve short, rounding, plates broad at base, evenly rounding to beyond the middle, then produced as acute style-like points, the lateral margin, especially of the points, heavily fringed with stout hairs; a dark line just inside the margin at the base.

Described from numerous specimens from Ward, Rist Canon, Marshall Pass, and Palmer Lake, Colo. Taken from well back in the foothills up to 9,500 ft.

*Thamnotettix perexigua*, n. sp.—Resembling *Chlorotettix lusoria* and *necopina*, but without the fulvous colour. Length, 8 mm.; width, 2 mm.

Vertex but little longer on middle than at the sides, roundly angled, transversely depressed across the disc; front broad, only slightly convex in either diameter; clypeus long, slightly constricted in the middle; pronotum with the lateral margins long, humeral margins short; elytra long, strong, scarcely narrowing behind.

Colour: Vertex and face slightly greenish-orange, a spot above and another below each ocellus, a waved line along the anterior margin of the vertex, broken in the middle, fuscous; pronotum with a little more of the green than the vertex; elytra a bright greenish-yellow, subhyaline, showing the dark tergum; below bright yellow.

Genitalia: Male valve very short, one-third the length of the ultimate segment, a blunt tooth in the centre; plates long, compressed, a furrow running obliquely through each one, the part outside the furrow curving up and forming a somewhat boat-shaped organ; at the apex of

each plate is a long filament-like appendage resembling that commonly met in *Scaphoides*.

Described from a single male specimen from Cuernavaca, Mex. (O. W. B.)

*Chlorotettix tunicata*, n. sp.—Form and general appearance of *Balli*, vertex as in *galbanata*. Length, 7 mm.; width, 1.25 mm.

Vertex half longer on middle than against eye, twice wider than long, disc convex, front and vertex evenly rounded except at apex, which is slightly conical.

Colour pale green, elytra subhyaline, greenish.

Genitalia: ultimate ventral segment of female half longer than penultimate, lateral angles rounding, posterior margin roundly emarginate, one-third the depth of the segment, sometimes slightly notched in the middle, either side of which there is a brown cloud; male valve broad, slightly longer than the ultimate segment, obtusely angulate, plates broad at base, roundly narrowing to a very obtuse, almost truncate, apex, together the shape of a blunt-pointed spoon, convex below with a marginal fringe of coarse spines.

Described from three females and three males from Onaga, Kan. (Crevecoeur). This species may be readily separated from any other described by the male plates.

*Chlorotettix nudata*, n. sp.—Resembling *stolata* in form and colour; the vertex is more angled and the fulvous reflection less prominent. Length, 7.5 mm.; width, nearly 2 mm.

Vertex twice longer on middle than against eye, slightly conically pointed, front shaped as in *lusoria*, loræ long and narrow. Elytra long, slightly flaring in the middle, appressed behind.

Colour: pale green, an orange cast on face and vertex, a slightly brownish or fulvous cast on pronotum and elytra, elytra subhyaline, the nervures indistinct.

Genitalia: ultimate ventral segment of the female very short, scarcely as long as the penultimate segment; posterior margin divided into four lobes by a narrow slit in the middle and a pair of broad, shallow notches a little more than half way towards the sides, the margin thin, the plates visible at the base of the pygofer; male valve narrow, obtusely angular, as long as the ultimate segment, plates broad at base, three times the length of the valve, gradually narrowing to the acute slightly produced tips.

Described from one female and one male from Ames, Iowa. Readily separated from any of the species with angled vertices by the genitalia.

*Cholorotettix stolata*, n. sp.—Form and general appearance of *Iusoria* slightly narrower and without the mark on the vertex. Length 7-8 mm.; width 1.5 mm. Male slightly smaller.

Vertex nearly flat on disc, rounding anteriorly, one-third longer on middle than against eye, twice wider than long, front convex line between vertex and front distinct, ocelli prominent, transparent, distant from eyes; elytra long and very narrow, venation as in *Iusoria*, indistinct.

Colour: vertex pale yellow, sometimes with a greenish cast, pronotum olive, the disc with a fulvous cast; elytra hyaline green, with an iridescent fulvous tinge.

Genitalia: ultimate ventral segment of the female very long, truncate posteriorly or very slightly emarginate, the centre with a brown mark; male valve as long as the last ventral segment, the apex rounding, the margin notched at the middle, plates rather narrow at base, rapidly roundly narrowing to before the middle, then extending as long attenuate finger-like points.

Described from three females and one male from Cimmaron, Col. Taken in a mountain valley. The genitalia of both male and female are very much like those of *unicolor*, while in shape of head and general appearance it is closely allied to *Iusoria* and *nudata*.

*Lonatura nebulosa*, n. sp.—Form and size of *salsura* nearly, resembles *noctivaga*, but with shorter ovipositor and longer elytra. Length, ♀ 3.5 mm., ♂ 3 mm.; width 1.25 mm.

Brachypterous form: vertex slightly convex, one-fourth wider than long, nearly twice longer on middle than against eye, not quite so long as the pronotum; front longer and narrower than in *noctivaga*, resembling *megalopa*; elytra covering all but two segments of abdomen, evenly rounding behind; venation rather weak, not reticulate.

Colour: vertex dirty straw, a pair of large angular black spots back of the point of the vertex, connected outwardly with a pair of slightly smaller round ones just inside the ocelli; back of these is an interrupted transverse brown band, a brownish fuscous spot against each eye, inside of which is an oblique, olive dash; pronotum pale olive and straw, with a pair of brown spots on the anterior margin equidistant from the median line and the eye, elytra subhyaline, the veins on the inner half milky-

white; abdomen straw colour, with a transverse row of fuscous dots on the middle of each segment, pygofer with a black mark above.

Genitalia: ultimate ventral segment of the female as long as the penultimate, the posterior margin slightly rounding, the disc strongly elevated; male valve very small, rounding, plates triangularly narrowing half their length, then produced into bluntly-tipped points, the margin fringed with long hairs.

Described from a single pair taken at Fort Collins, Colo. The four large black spots in a row on the margin of the vertex will readily distinguish it from any but *noctivaga*, from which the smaller size, narrower face and longer elytra will at once separate it.

*Lonatura noctivaga*, n. sp.—Form of *salsura*, but larger. Pale straw colour, with four black spots on the vertex and two on the elytra. Length, ♀ 5.5 mm., ♂ 4 mm.; width 1.5 mm.

Brachypterous form: vertex slightly obtusely angled, one-fourth wider than long, two-thirds as long against the eye as on middle; face broad, slightly convex, front almost as broad as long, parallel-margined to the antennæ, then rapidly narrowing, to the long parallel-margined clypeus. Pronotum transverse, scarcely as long as the vertex. Elytra short, obliquely truncate, covering only the first two abdominal segments. Venation obscure, reticulate, especially along the clavus and apical margins of corium.

Colour: vertex creamy white; a pair of black spots just back of the apex, and a large pair between these and the ocelli, the median line, an oblique dash on either side of the disc, and some irregular marks against the eyes, olive. Pronotum creamy, with four olive stripes. Elytra creamy, or olive, with light veins; a black spot on the posterior margin, and sometimes another between this and the scutellum. Abdomen creamy, with olive stripes, or dark olive with creamy stripes.

Genitalia: ultimate ventral segment of the female half longer than the penultimate; lateral margin roundly narrowing; posterior margin truncate or slightly emarginate, with a slight, triangular, median tooth; ovipositor very long, extending beyond the pygofer; male valve short, rounding; plates long, acutely triangular, the lateral margins slightly concave, fringed with a single row of stout hairs.

Described from numerous specimens from Stratton, Neb.; Lamar, and Fort Collins, Colo.

*Deltocephalus caperatus*, n. sp.—Resembling *Wecdi*, but with less flaring elytra; anterior half of vertex black, with a white cross upon it. Length 3 mm; width 1.25 mm.

Vertex slightly obtusely angled, slightly wider than its median length, one-third longer on middle than against eye, rounding to the front with a slightly produced apex; front convex, rather narrow, lateral margins rounding to the broad clypeus, suture between clypeus and front indistinct; elytra rather broad and stout, broadly rounding behind; venation strong, the central anteapical cell divided, outer sector of clavus tied before the middle of the claval suture.

Colour: vertex, posterior half pale yellow, with a fuscous dot against eye, anterior half shining black, with a strong white cross in the middle, the tip of the cross in a round white spot on the apex of the vertex, the lateral arms also ending in round spots; ocelli in white spots, a yellow line against each eye connecting them with the yellow posterior half of the vertex. Pronotum and scutellum olive, with slightly fuscous markings. Elytra olive subhyaline, the veins broadly white, distinct, narrowly fuscous margined. Face black above, with light arcs, lighter below, a dark band along the apex of front, a stripe on the clypeus, which widens apically; sometimes fuscous margins on loræ and genæ.

Genitalia: ultimate ventral segment of the female twice longer than penultimate, the lateral margins strongly emarginate from the base, the lateral angles rounding, posterior margin twice incised, forming three rounding lobes; beneath the ultimate segment, and visible as a triangular lobe at each lateral angle, is a second membrane as in *compactus*.

Described from three females; one each from: Ray, Colo.; Stratton, Neb., and Ames, Iowa. Readily recognized by the white cross in a black field.

*Deltocephalus comatus*, n. sp.—Form and general appearance of *colonus*, Uhl. Pale green, with dark spots on vertex, pronotum and scutellum. Length 3 mm., width 1 mm.

Vertex slightly wider than long, obtusely angulate before, but little longer on middle than at eye; eyes long and narrow, pronotum longer than vertex; over half its length within the anterior curve; face rather narrow, rounding; genæ narrow, straight beneath the eyes. Elytra slightly longer than abdomen; venation of the weak *nigrifrons* type.

Colour: vertex pale yellow, a pair of large round spots on the anterior margin near the eyes, a small approximate pair at tip, another pair of small



ones against the eyes, just within the posterior angles, and an oblique dash on either side the disc, black. Pronotum olive, becoming yellowish anteriorly, a pair of elongate spots on the anterior margin just within the eyes; an approximate pair of round ones just back of these, and an oblique dash on either side of the disc, before the middle, in line with the inner margin of the eyes, black. Scutellum pale yellow, a large black triangle well within the lateral angles. Elytra pale green, nervures slightly lighter. Front olive fuscous, a few short arcs and a median stripe, which includes the clypeus, light.

Genitalia : ultimate ventral segment of female about half longer than penultimate; lateral angles slightly rounding, the posterior margin elevated in the middle, and sometimes slightly obtusely toothed; male valve large, very obtusely angulate, plates stout, convexly rounding to a blunt tip, fringed with stout spines.

Described from numerous specimens from Orizaba, Yautepec, and other Mexican points. This species and the following are closely related to *colonus* of Uhler, and belong to the *nigrifrons* group. This species may be readily distinguished from any of the others by the heavy black markings on the pronotum.

*Deltocephalus sonorus*, n. sp.—Form and general appearance of *nigrifrons* nearly, longer and narrower than *comatus*, olive and fuscous, with milky nervures and reflections. Length 3.25 mm., width less than 1 mm.

Vertex and pronotum similar to those of *comatus*, the eyes long and narrow, enclosing over half of the pronotum. Elytra very long and narrow, with a large appendix; venation strong, two cross nervures, the central antepical cell very long, dumb-bell shaped but not divided, the apical cell beyond this, small, curved, less than half of the size of the third one.

Colour : vertex a pale dirty yellow; four black spots on the anterior margin, the outer pair often larger than the others, farther from eyes than from inner pair; sometimes a fuscous dot against the eye and irregular brownish markings on disc. Pronotum pale olive and yellowish, with five luteous stripes; scutellum with orange spots along the base. Elytra subhyaline, the veins light, sometimes margined with fuscous. Face brownish fuscous, with light arcs on the front, sometimes the lower part of the face light, with the sutures and a stripe on the clypeus fuscous.

Genitalia : ultimate ventral segment of the female half longer than

penultimate, posterior margin slightly waved; male valve angulate, plates concavely, acutely pointed.

Described from sixteen examples from Tucson, Ariz. (Dr. Kunze.)

*Deltocephalus elimatus*, n. sp.—Form of *sonorus*, but still longer and narrower. Golden green, with black spots on the vertex. Length 4 mm.

Vertex short but decidedly angulate, one-fourth wider than long, two-thirds the length of the pronotum, disc sloping, rounding to the front; front rather narrow above, almost straight margined to the broad clypeus. Elytra very long and narrow, Dicraneura-like; venation similar to *sonorus*, but weak, and lacking the second cross nervure.

Colour: vertex pale yellow, a fuscous spot at apex, a pair of round black spots on the margin nearer the eyes than the apex, and a pair of orange marks on the disc. Pronotum golden or greenish, with five luteous lines. Elytra subhyaline greenish, with a golden reflection. Face yellow, a spot below each ocellus and the antennal pits black.

Genitalia: ultimate ventral segment of female rather narrow at the base, then produced into a remarkably long, blunt-tipped, spatulate process, which is curved up along the margin and at tip; male valve rather long, rounding; plates wide at base, enormously elongated, narrowing to a blunt tip, five times the length of the valve.

Described from three specimens from Sante Fe, Mex. (Barrett.)

The remarkable genitalia of both sexes will readily distinguish this species.

*Deltocephalus gnarus*, n. sp.—Form and general appearance of *minutus*, V. D., nearly, with a longer vertex and front. Black, with a few markings, and the elytra milky white in female. Male darker. Length, ♀ 2.5 mm., ♂ 2.25 mm.; width 8 mm.

Vertex slightly obtusely angled, the margins straight, one-fourth wider at base than long, one-third longer on middle than against eye, as long as pronotum; front rather narrow, one third longer than wide, the margins gently curved. Pronotum strongly transversely wrinkled; elytra a little longer than body; venation weak; two cross nervures present; the outer antepical cell very small, acuminate anteriorly.

Colour: vertex shining black, circles around the ocelli, a slender line connecting them with the apex, a cross back of the apex, the margin against the eye, and a pair of oblique dashes on posterior disc, approxi-

mate on the margin, light. Pronotum shining black, a row of submarginal spots, sometimes a median line, and the posterior margin narrowly light. Scutellum black, the lateral margin interruptedly light. Elytra subhyaline white, veins milky. Sometimes in the male the disc of the elytra is darkened up, omitting the cross nervures and the apices of the claval veins. Face black, with margins and arcs on the front light.

Genitalia: ultimate ventral segment of the female twice longer than penultimate; lateral margin roundly narrowing; posterior margin truncate, curved around pygofer; male valve rather large, obtusely angulate; plates as wide as the valve, roundly narrowing to the slightly produced, acuminate, points.

Described from eight specimens from Ames, Iowa; taken by the writer on a patch of "dog-hair" *Juncus* growing on the margin of a pond.

*Cicadula potoria*, n, sp.—Form and general appearance of *D. gnarus*. Smaller and darker than any other described *Cicadula*. Length, ♀ 2.5 mm., ♂ 2.25 mm.

Vertex nearly right-angled, twice as long on middle as at eye, half wider than long, margin rounding, apex conical, front narrow, wedge-shaped, the margins straight. Pronotum slightly longer than vertex. Elytra considerably longer than the body, obtusely rounding behind. Venation strong, apical cells long, curved, outer branch of first sector obsolete, two anteapical cells.

Colour: female—vertex dark fuscous, the margins, a median line and two dashes on either side, yellow, the posterior dash almost enclosing a round black spot; front brownish, with fuscous arcs; lower part of face yellow, with sutures and a stripe on clypeus fuscous. Pronotum and scutellum yellow on margins and fuscous on discs, omitting a yellow longitudinal stripe. Elytra milky subhyaline, sometimes mottled with fuscous on disc. Male—often the same colour and marking as female; sometimes darkened up until all the light markings are gone except a triangle across face above antennæ.

Genitalia: ultimate ventral segment of female short and straight, or slightly waved posteriorly; pygofer very short and thick; male valve short, oval; plates triangular, their apices produced into long, divergent, style-like, upturned processes.

Described from ten specimens taken from *Juncus*, along with *D. gnarus*, at Ames, Iowa.

*Phlepsius joesa*, n. sp. Form of *humidus*, but much smaller. Colour red. Length 5.25 mm., width 1.5 mm.

Vertex flat, very slightly depressed posteriorly; half wider than long, nearly twice longer on middle than against eye; anterior margin thick but foliaceous; front narrow, wedge-shaped; clypeus small, linear. Pronotum little longer than the vertex. Elytra moderately stout, compressed behind.

Colour: ground colour pale yellowish olive, but so thickly sprinkled with irregular spots and blotches of blood-red as to give a red appearance to the whole insect, both above and below. The vertex and scutellum have a more decided yellowish cast. The eyes slaty brown. In the light specimens, the red spots are gathered on the nervures of the wings, but in the darker ones the nervures are indistinct.

Genitalia: ultimate ventral segment of the female half longer than the penultimate; the posterior margin roundly truncate, with the lateral angles rounded off; male valve very small, rounding, almost concealed under the long, ultimate segment; plates broad at base, semicircularly rounding, then produced into long, style-like, attingent points.

Described from two males and one female, from the mountains of Colorado. One specimen each from Alder, North Park, and Dutch George's, on the Poudre.

#### CHANGE OF PREOCCUPIED NAMES.

(1) *Parasa prasina*, Dyar, Psyche VIII., p. 273, 1898 (Central America), is preoccupied by *Parasa prasina*, Alph., Deut. ent. Zeit., 1895, p. 186 (Western China). The Central American species may be called *Parasa wellesca*.

(2) The genus *Callarectia*, Leech, Trans. Ent. Soc., Lond., 1899, p. 168 (West China), is preoccupied by *Callarectia*, Packard, Proc. Ent. Soc., Phil., III., p. 114, 1864 (North America). The Chinese genus may be called *Eulecchia*.

HARRISON G. DYAR.

A GENERAL INDEX to the thirty volumes of the Annual Reports of the Entomological Society of Ontario, extending from 1870 to 1899, has been prepared by the Editor of this magazine, and is now in course of publication by the Ontario Department of Agriculture. It will be ready for distribution before the end of the year, and will, no doubt, be of great value to all who have occasion to consult these Reports.

## VARIATIONS IN SOME COMMON SPECIES OF BUTTERFLIES.

BY GEO. A. EHRMANN, PITTSBURG, PA.

*Papilio asterias*, Fabr. Var. *semi alba*, ♂, nov. var.

On July 31st, 1890, I captured a very interesting form which is out of the ordinary run of the variation which prevails in this species. The size and markings are the same as the normal form, but all the maculations on the primaries are pure white, while the markings on the secondaries are of a deep golden yellow. The under side is the same, but not so conspicuous. Two males in my collection.

*Hab.*—S. W. Penn'a.*Papilio philenor*, Linn. Var. *obsoleta*, ♂, nov. var.

This form has no submarginal spots either on the fore or hind wings on the upper side; the under side of all the wings is the same as the normal form. Two males in my collection.

*Hab.*—S. W. Penn'a.*Papilio troilus*, Linn. Var. *Texasus*, ♂, nov. var.

In this form the light suffusion on the hind wings between the submarginal lunules and the discoidal cell is replaced by a well-decided band of ashen gray; the band is half an inch wide throughout; the submarginal spots, both on the fore and hind wings, are much larger than the general form. Expands  $4\frac{1}{2}$  inches. Male in my collection.

*Hab.*—Houston, Texas.*Limenitis ursula*, Fabr. Var. *cerulea*, ♀, nov. var.

The upper side is normal. Under side, on both the fore and hind wings there is a subdiscal band of large bluish spots, very similar to the white bands in both *L. arthemis* and *L. Weidemeyerii*; otherwise it is the same as the regular form. Female in my collection.

*Hab.*—Charleroi, Penn'a.*Vanessa antiopa*, Linn. Var. *grandis*, ♀, nov. var.

The whole space of the upper side, "except the yellow border and the submarginal black bar," is of a rich chocolate brown; the submarginal row of blue spots is wanting and the yellow border is greatly suffused with brown; under side normal. Female, ex. larva, in my collection.

*Hab.*—S. W. Penn'a.

## DESCRIPTION OF A NEW GENUS IN THE APHELININÆ.

BY WILLIAM H. ASHMEAD.

*Myiocnema*, new genus.

This new genus falls in a table of the genera of the Aphelininæ next to *Encarsia*, Förster, the antennæ being 8 jointed and the club in the female being 2 jointed.

The head is transverse thin antero-posteriorly, the occiput concave, the vertex impressed; the thorax has several long bristly hairs, and the parapsidal furrows are distinct but very delicate, almost invisible; the front wings have a large discoidal cloud beneath the marginal vein as in *Coccophagus orientalis*, Howard, the stigmal vein is distinct, not very short, but still shorter than the marginal vein and a little shorter than the post-marginal, the marginal vein being a little longer than half the length of the submarginal vein. The hind femora are somewhat thickened, subcompressed, their tibiae armed behind with stiff bristles; all tarsi 5-jointed, the anterior and middle tarsi being longer than their tibiae; middle tibiae with one well-developed apical spur, the hind tibiae with two short apical spurs. The abdomen seen from above is subovate, flat, beneath subconvex, the ovipositor hidden.

The only male specimen has lost its antennæ, but otherwise, except in having a much smaller, shorter, oval, depressed abdomen, agrees well with the female.

The genus is readily recognized by the hind tibiae, in both sexes, being armed with stiff black bristles.

*Myiocnema Comperi*, new species.

♀ length 1.2 mm. Head and thorax above aeneous black; sides of thorax, coxæ and femora blue-black; antennæ and tegulæ brown; knees of middle legs, anterior tibiae and all tarsi, except terminal joints, yellowish; tibial spurs white; middle and hind tibiae fuscous; hind tibiae in both sexes armed with stiff black bristles. Wings hyaline, with a broad fuscous discoidal band below the marginal vein.

*Habitat*.—Brisbane, Queensland.

*Types*.—Cat. No. 5442, U. S. N. M.

Described from 1 ♂ and 7 ♀ specimens, received by Dr. L. O. Howard from Mr. Alex. Craw, and bred in July, 1900, from *Lecanium oleæ*, Bernard; collected by Mr. George Compere, the travelling agent of the California State Board of Horticulture at Brisbane, Queensland.

## CORRESPONDENCE.

SIR,—I am glad to note that Mr. H. H. Lyman, in his review of my paper on the Argynnis of North America, sums up the matter so well in his last paragraph, wherein he states that "The whole paper shows that much more knowledge is needed before a satisfactory revision of the very difficult North American forms can be made." That is just what the author thought, and why the paper was not called, or thought to be, a *Revision of the genus Argynnis*.

When first written, it was to be read before the Chicago Entomological Society, to my especial friends who knew of my interest in the genus, and the paper was called "A Contribution to the Better Knowledge of the genus Argynnis." The author does not want his friends to think that he has yet attempted to completely solve the Argynnis puzzle, and takes this opportunity to say that any satisfactory revision must be accompanied by plates in natural colours, showing both the upper and under side of each species, a work which can only be accomplished successfully at great expense of time and money.

The author is not a believer in the infallibility of those who name species. His collection contains specimens which have been given three different names by three men supposed to know the species of the genus Argynnis, and specimens taken "in coitu" have been called different species by well-versed students of the genus. What was stated as the polygamous habits of the members of the genus was given as partial proof of what the author believes to be a fact, that many so-called species are varieties or hybrids. He did not, however, feel justified, without further proof, in "relegating a number of names to the synonymy."

Reference was made to the polygamous habits simply to make plain the fact that some of the so-called species are freaks, the result of hybridism. Naturalists, especially closet naturalists, who do not consider it worth their time to study specimens alive, may reach dogmatic conclusions which are entirely satisfactory to themselves, yet which are based on study of a few poor specimens, or even a single individual. The past summer has added to the evidence for hybridism. A correspondent in the field wrote me: "Collecting yesterday where Eurynome was rather abundant, in two instances I found a male Eurynome paying court to females of a dark species double its size, or about same size as Aphrodite. If it is usual for Eurynome to form attachments outside of the species, it may account for several allied forms." This writer is a live naturalist,

and as the Irishman said, "Hit the nail right where a great many have missed it before." Better to "give a counsel of perfection" and hit a few facts than to make a collection of Argynnids with only one or two of each species, and imagine one knows all about the genus.

Permit me to repeat, that each collector interested in the final disentangling of this genus should do all in his power to build up "large series of species from every locality," for the very reason that "every few miles in every direction is a separate locality," and we must know the fauna of many more of these localities before completing the knowledge of the Argynnids.

As to the dimorphic males, there may be more to say some day, or the author's views may prove incorrect. Stranger things than to name varieties of well-known males as new species have been done by those who hasten to place their names (be they bishops, doctors or laymen) after the names of supposed new species.

What I have written is not with any thought of opening up a controversy, or in any sense to express my objection to the reviewer's remarks; but to make more clear my views upon the subject, and prevent possible wrong conceptions concerning the paper reviewed, both as to its aims and contents.

ARTHUR J. SNYDER.

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#### BOOK NOTICE.

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A NATURAL HISTORY OF THE BRITISH LEPIDOPTERA, ETC.—By J. W. Tutt, F. E. S. Vol. II. London and Berlin: May, 1900, pp. vi.—584, plates i.—vii.

The second volume of Mr. Tutt's exhaustive work has now appeared, and this continuation merits all the good words which were so freely spent upon the appearance of the first volume. We have first 100 pages devoted to general subjects, such as Metamorphosis in Lepidoptera, and the External Morphology of the Lepidopterous Pupa. And then (pp. 102-434) there is such a full account of the Psychides as has not yet been published. This is the chief characteristic of Mr. Tutt's work, that everything which has been written on a species has been consulted; the original description is given, the synonym is exhaustive, all known and many new biological facts are carefully added. The number of pages devoted to a single species is thus far in excess and the work has so much more value for consultation. With regard to the Psychides, it



seems extraordinary that there should still be so much new and still to be learned about the European members of this difficult group. The author has been careful to give the gist of what has been published in France and Germany, and concludes his study of the British species by a catalogue of the palæarctic Psychides. Thus there is a broad basis to Mr. Tutt's work, which relieves it from all charge of insularity and should commend it at the same time to continental students no less than to those everywhere interested in the subject.

Pages 434 to the close of the volume are given to the commencement of the Lachneides, and this group is very carefully treated, particular attention being given to Dr. Dyar's studies; while on plate vii. a phyletic tree is reproduced from the pen of our American authority. In the Psychides the views of German writers have been chiefly adopted, in the Lachneides the studies of American authors receive very full attention.

It is not possible, within the limits of this notice, to enter into questions of detail. Mr. Tutt has generally quoted all opinions upon the intricate question of generic synonymy. Where these have differed, in any one case, then the matter has been originally enquired into and a conclusion reached. So far as the reviewer is concerned, these conclusions appear generally acceptable. An exception may perhaps be noted in the case of *Eriogaster*, from which *populi* is excluded as a possible type on the ground that it does not agree with the generic diagnosis. But by its inclusion, Germar evidently thought it did. With questions like this, the historical sifting of types should have nothing to do. If we are to argue upon the verbal interpretation and applicability of the earlier generic diagnoses, there will be no end to the discussion. On the other hand, the reviewer is glad to adopt Mr. Tutt's opinion as to the type of *Gastropacha*, which term may be retained for our *Americana*, etc.

To conclude: No general faunal study is known to the reviewer which can compare with Mr. Tutt's in scope and execution. It is greatly to be hoped that the volumes we now have will be followed by others to the completion of the entire work.—A. R. G.

The Annual Meeting of the Entomological Society of Ontario will be held in the rooms of the Society, 429 Wellington Street, London, on Wednesday and Thursday, Nov. 14th and 15th. All members are cordially invited to attend, and are requested to bring with them any rare or interesting specimens that they may have obtained. Donations to the Society's collections will be very welcome.