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REPORT ON A COLLECTION OF JAPANESE CRANE-FLIES (TIPULIDÆ), WITH A KEY TO THE SPECIES OF PTYCHOPTERA.

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An extensive collection of Japanese crane-flies, taken by Dr. S. I. Kuwana and assistant entomologists in the vicinity of Nishigahara, Tokio, Japan, during the season of 1912, was forwarded to me for examination. The material, alcoholic, is contained in 62 vials, very carefully prepared and with complete data. I express my sincere thanks to Dr. Kuwana and his assistants for this fine representation of Japanese Tipulidæ and Ptychopteridæ.

Family Ptychopteridæ

Genus Ptychoptera Meigen.

Key to the species of Ptychoptera.

1. Wings with a distinct brown cross-band along the cord 2
Wings hyaline or subhyaline without a distinct brown cross-band along the cord.
2. Radial sector more than twice as long as the radio-median cross-vein. (Europe) *contaminata* L.
Radial sector rarely longer than the radio-median cross-vein. . . 3
3. Posterior metatarsus conspicuously white.
(Europe) *albimana* Fabr.
Posterior metatarsus not white.
4. Pleuræ reddish yellow; a short brown cross-band near the middle of the radial cell. (East. U.S.) *rufocincta* O.S.
Pleuræ black; no brown cross-band near the middle of the radial cell. 5
5. All coxæ yellow or reddish-yellow; scape of antennæ brownish-yellow or yellow. 6

* Contribution from the Entomological Laboratory of Cornell University.

- Fore coxæ yellowish, other coxæ black; scape of antennæ black.
 (Japan)..... *japonica*, sp. n.
6. Scutellum yellow. (Europe)..... *lacustris* Meig.
 Scutellum black..... 7
7. Abdomen with the basal third of the second segment and the
 basal one-half of the third segment reddish orange.
 (India)..... *distincta* Brun.
 Abdomen entirely black. (Europe)..... *paludosa* Meig.
8. Femora and tibiæ bright orange-yellow, tarsi coal-black.
 (Abdomen orange-yellow, tergites with blackish borders to
 the segments; sternites orange-yellow.)
 (India)..... *atrirtarsis* Brun.
 Femora and tibiæ more or less black or brown; tarsi not coal-
 black..... 9
9. Pleuræ silvery-white..... 10
 Pleuræ not white. Thorax different in colour in the two sexes;
 femora bright yellow, hind pair black on the basal two-thirds
 except the extreme base. (India)..... *tibialis* Brun.
10. Hind coxæ black except at tip; femora brown at tip; scutellum
 reddish; hypopygium large, reddish; first segment of the
 antennæ reddish. (West. U.S.)..... *lenis* O. S.
 Coxæ and femora yellow, the latter black at the tip; scutellum
 yellow; hypopygium small, mostly blackish; antennal scape
 black. (Europe)..... *scutellaris* Meig.

Ptychoptera japonica, sp. n.

Wings banded; radial sector very short; antennæ of the male
 very long, about as long as the body; abdomen with little reddish
 or yellowish colour.

Male.—Length, 8.5 mm; wing, 8.9 mm; antennæ, 8.4 mm.;
 fore leg, femur, 5.4 mm.; tibia, 5.4 mm.; tarsus, 8 mm.; middle leg,
 femur, 5.4 mm.; tibia, 5.1 mm.; tarsus, 7 mm. Hind leg, femur, 6.1
 mm.; tibia, 6.8 mm.; tarsus, 6.3 mm.

Female.—Length, 11.5–13.5 mm.; wing, 10.7–10.8 mm.
 Fore leg, femur, 5.6–5.8 mm.; tibia, 5.1–5.4 mm.; tarsus, 7 mm.
 Middle leg, femur, 5.4 mm.; tibia, 5.4 mm.; tarsus, 6.8 mm. Hind
 leg, femur, 6.2 mm.; tibia, 6.8 mm.; tarsus, 6.2 mm.

Male.—Rostrum and palpi light brownish-yellow; front and vertex very dark coloured, occiput similar. Antennæ, segment one black, segment two black at base, brown apically, segment three yellowish on basal half, black apically, remainder of antennæ black; antennæ very long, as long as the body; segments one and two short, the third segment very long, segments 4 to 15 long, gradually shortening, terminal segment very short.

Thoracic pronotum deep bluish-black; mesonotum, including the pleuræ similar. Halteres rather pale dull whitish. Fore legs with yellow coxa, dark at base, yellow trochanter, yellow femur broadly tipped with blackish, yellow tibia narrowly tipped with blackish, metatarsus yellowish-brown—darkened into brownish-black at the tip, remaining tarsal segments brownish black; middle and hind legs similar, but their coxæ blackish and the black femoral tips narrower. Wings with cell C yellowish brown, Sc and R more yellowish, remainder of wing hyaline or nearly so, a brown mark at the base of the wing in the neighbourhood of cross-vein h, a cross-band at the cord, often irregular, often a rounded brown spot on vein Cu.₁ midway between cross-vein m-cu and the tip of the vein, brown marks at end of vein R₁, fork of R₄₊₅ and fork of M. Venation (see plate III., fig. 7); Rs very short, much shorter than cross-vein r-m, basal deflection of R₄₊₅ short but distinct, about one-half as long as Rs, cross-vein m-cu long, curved, longer than the basal deflection of Cu.₁, placed opposite or very slightly beyond cross-vein r-m.

Abdomen, 1st segment very short, 2nd a little longer than the 4th, 3rd very long, as long as the succeeding 4 segments combined, segments 4 - 8 successively shorter. Abdomen dark brownish black, basal half of segment 4 orange. Hypopygium, 8th tergite narrow, short, widely separated from the somewhat broader 8th sternite, 9th tergite viewed from above very deeply incised, this incision rectangular, the caudad projecting lateral lobes are somewhat swollen basally, narrowed behind, slightly enlarged at the tips, densely clothed with long black hairs, between the lateral arms is a small rounded lobe, directed caudad; the 9th pleurite reaches the 8th tergite, the 9th tergite and 9th sternite being more widely separated; the 9th tergite is triangular,

its apex rounded, bearing a long slender appendage at its tip on the inner side, this appendage long, slender and curved proximad so that each touches its mate of the opposite side, these appendages thickly clothed with long black hairs. The 9th sternite is very high at its base, extending up beyond the ventral level of the 8th tergite, its caudal ventral margin strongly chitinized, produced caudad and dorsad into a long slender arm, just dorsad of which is a shorter, strongly chitinized arm, with five or six blunt teeth on the ventral face. The guards of the penis are separated except at the base, divergent, chitinized, slender, rather blunt at the end, but the outer angle produced distad into a long slender arm. (See pl. IV., fig. 12-16).

Female.—Similar to the male, with the following exceptions: Antennæ short; black on tips of femora even more extensive, in fore femur covering almost one-half of the segment; tibiæ almost uniformly brown. Abdomen, tergites 1 to 6 dark brown; segment 7 brown, apical third white; 8th tergite mostly whitish; sternum lighter brown. 9th tergite, blade-like, pointed; 9th sternite short, produced into a short lobe on its dorsocaudal angle; ovipositor chestnut-brown. (See pl. IV.; fig. 11.)

Vial No. 29, Tokyo, Japan; May 7, 1912. 1 ♂, 5 ♀.

Holotype.—Male, Tokyo, Japan; May 7, 1912.

Allotype.—Female, with the type.

Paratypes.—Four females, with the type.

Types in the author's collection.

Paratypes in the U. S. National Museum and Cornell University collections.

Family Tipulidæ

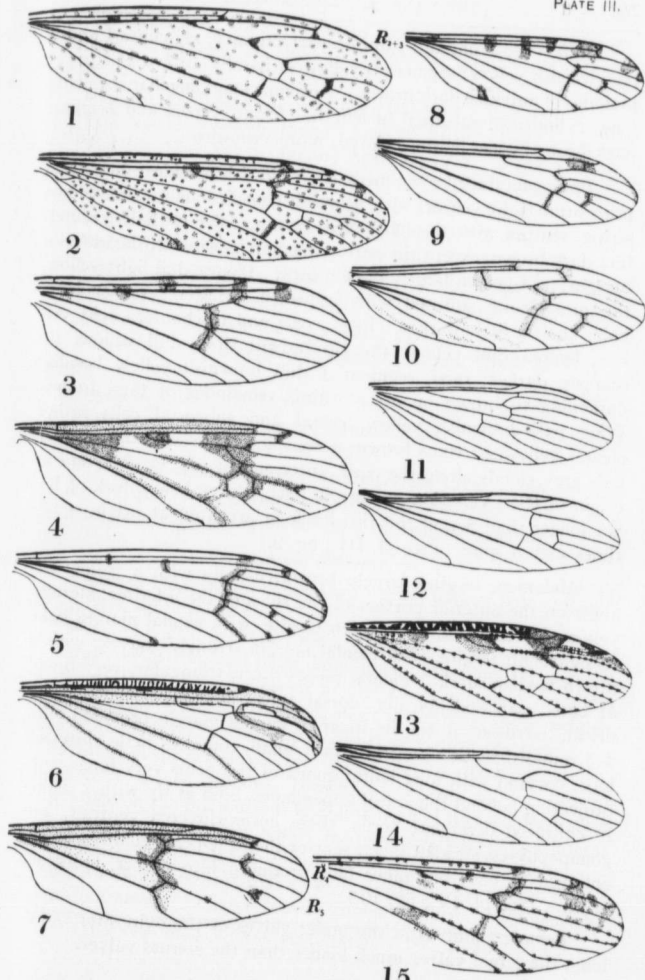
Tribe Limnobiini.

Genus Dicranomyia Stephens.

DICRANOMYIA JAPONICA, sp. n.

Subcosta long; wings with a distinct stigma and faint clouds along the cord; femora tipped with brown.

Male.—Length, 9-9.4 mm; wing, 9.4-10 mm; antennæ 3.2 mm. *Female*: Length, 10.2-11.4 mm; wing, 9.3-10.6 mm.



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JAPANESE CRANE-FLIES (ALEXANDER).

Male.—Rostrum and palpi brown; antennæ, segments 1 and 2 pale whitish yellow; segment 3 yellowish basally, brown at tip; remainder of antennæ dark brown. Antennæ long; flagellar segments long, cylindrical, subequal in length. Front, vertex and occiput, dark brown; genæ lighter colored, more yellowish.

Pronotum dark brown medially, yellowish on sides; mesonotal præscutum light yellow, with a broad, conspicuous median brown stripe; scutum with the lobes dark brown, paler medially; scutellum dark brown, except the narrow median incision on the anterior margin; post-notum largely dark brown. Pleuræ dull light yellow, the mesopleuræ suffused with brownish. Halteres rather long, pale, knob a little darker. Legs, coxæ and trochanters light yellow, femora dull yellow, the tip brown; tibiæ dull yellow, tip scarcely darker; tarsi, segment 1 dull brownish yellow basally, darkening to brown on apical third; remainder of tarsi brown. Wing pale brownish yellow, costal and subcostal cells rather clearer yellowish; veins brown; a conspicuous brown stigma; very pale grey clouds along the cord, outer end of cell 1st M_2 , and at origin of Rs. Venation see fig; Sc long, ending before fork of Rs, Sc_2 longer than Sc_1 , at the tip; Rs long arcuated at origin sometimes with a spur. (See pl. III.; fig. 9.)

Abdomen, tergites largely brown, usually with a yellow triangle on the anterior portion of the sides of the sclerites; sternite yellow; 8th and 9th, brown; 8th tergite, with caudal margin pale, straight; 9th tergite, with caudal margin strongly convex; with a brown median mark. Pleural pieces short, triangular, very broad at base, narrowed apically; dorsal apical appendage short, cylindrical, narrowed at tip, its inner or caudal margin provided with 4-5 rounded teeth. Ventral arm a small, rounded, little chitinized lobe, covered with long hairs; guard of the penis very long, pale, projecting beyond the apical appendages, bifid at tip with 2 slightly chitinized divergent horns, these horns directed ventrad; 2nd gonapophyses, slender, much shorter than the penis guard, scarcely enlarged at end, but inner face produced into a short, indistinct tooth. (See pl. IV.; fig. 10.)

Female about as in the male; valves of the ovipositor rather long, the tergal valves much longer than the sternal valves.

Variations: In some specimens the basal 4 or 5 segments are pale; yellow triangles on sides of abdominal tergites vary in distinctness.

Vial No. 4.—Tokyo, Japan; April 25, 1912. 1 ♂.

Vial No. 14.—Tokyo, Japan; April 25, 1912. 1 ♀.

Vial No. 15.—Tokyo, Japan; April 25, 1912. 4 ♂s, 2 ♀s.

Vial No. 24.—Tokyo, Japan; April 27, 1912. 7 ♂s, 6 ♀s.

Vial No. 32.—Tokyo, Japan; May 7, 1912. 3 ♀s.

Vial No. 33.—Tokyo, Japan; May 7, 1912. 2 ♂s.

Vial No. 37.—Tokyo, Japan; May 7, 1912. 1 ♂.

Vial No. 38.—Tokyo, Japan; May 7, 1912. 1 ♀.

Holotype.—♂, Tokyo; Japan; April 27, 1912. (Vial 24).

Allotype.—♀, with the type (Vial 24).

Paratypes.—14 ♂s; 12 ♀s; Tokyo, Japan; April 25–May 7, 1912.

Types in author's collection.

Paratypes in U.S. National Museum and Cornell University collections.

D. japonica resembles *umbrata* Meij. from Java (1) but the legs are much paler, wing-pattern and venation different, and it is a much larger species (wing, 9–10 mm.; in *umbrata*, 5 mm.).

Dicranomyia nebulosa, sp. n.

Subcosta long; wings clouded with grey; femora pale apically, with a dark subterminal ring.

Male.—Length, 5.4 mm.; wing, 5.8 mm.

Male.—Rostrum and palpi dark brown; antennæ, 1st segment brown at base, more yellowish at the tip, succeeding segments brown; flagellar segments rounded, short-pedicellate, these pedicels being whitish; front, vertex and occiput, very dark blackish.

Pronotum brownish-yellow, darker brown medially above. Mesonotum rather gibbous, brown, a narrow, darker brown, median line on the præscutum; lateral margin of this sclerite with a rounded dark brown spot which is connected with short lateral stripes nearer to the median vitta; scutum light brown, lobes margined with dark brown; scutellum with a dark brown median mark; postnotum brown. Pleuræ brown, almost uniform, paler near the

(1) (Tijd voor Entomol.; Vol. 44; p. 25; pl. 1, f. 7.; 1911.)

sternum. Halteres pale. Legs, coxæ and trochanters light yellow; femora light brown, becoming light yellow on the apical sixth and with a conspicuous, dark-brown, subapical ring; tibiæ dark brown; tarsi broken. Wings, whitish or subhyaline; costal cell slightly more yellowish; grey clouds as follows: At origin of Rs (largest), at stigma, at tip of Sc, along cord, along outer end of cell 1st M₂ and in the center of most of the cells. Venation, (see pl. III.; fig. 10); Sc long, extending far beyond the origin of Rs, Sc₂ at the tip of Sc₁, Rs almost square at its origin and spurred (in the types), cell R₂ almost as far proximad as cell 1st M₂ (as in *F. stulta* O.S.), cell 1st M₂ long, longer than the veins issuing from it, basal deflection of Cu₁ at the fork of M.

Abdomen, tergum dark brown; caudal margins of the 7th, 8th and 9th segments more yellowish; sternum dull yellow. Hypopygium (see figs. 8, 9; pl. IV.); 9th tergite short, its cephalic and caudal margin convex its caudal half provided with a number of long hairs. Pleuræ very long, cylindrical, the tips produced into a slender lobe on the ventral side; two apical appendages, which are very short and inconspicuous, being scarcely one-third as long as the plura; dorsal appendage simple, short, slender and subchitinized, not exceeding the ventral appendage; ventral appendage double, its dorsal arm being small, triangular and with the caudal or outer face bearing a chitinized tooth, its tip produced entad and cephalad into a blunt lobe; the ventral arm is produced entad into a small lobe, with the tip evenly rounded. Viewed from the side, the pleura is broad, its ventral margin rounded at the base, at the middle of its length produced into a spatulate fleshy lobe which is directed caudad. The guard of the penis is long (extending about to the extreme tip of the pleura), and slender, broad at the base, narrowed toward the tip, the end little, if any, enlarged; the apex is very slightly notched; viewed from the side, it is seen that the extreme tip is bent ventrad; viewed from above, the guard seems to be concave, its lateral margins being more strongly chitinized. The second gonapophyses are rather long, dark brown, subrounded or scarcely pointed at the apex; at their base they are about as broad as the base of the penis guard; the lateral margin of the apophyse is produced dorsad into an incurved, chitinized flap or

margin, which, on the sides, protects the short, slightly emarginate anal tube.

Vial No. H.—Tokyo, Japan; Aug. 1912. 1 ♂.

Holotype, ♂.—Tokyo, Japan; Aug. 1912.

Type in the author's collection.

D. nebulosa resembles *unibrata* Meij. (Java), but the leg-pattern and venation are quite different.

Genus *Geranomyia* Haliday.

Geranomyia avocetta, sp. n.

Wings spotted; thoracic dorsum brown, the humeral portions of the præscutum yellow; tibial apices not blackened.

Male.—Length, excluding the proboscis, 7.5–7.7 mm.; proboscis, 3–3.6 mm.; wing, 7.8–7.9 mm.

Male.—Proboscis and palpi dark brown, the former more yellowish basally; antennæ, basal segments dark brown, flagellar segments somewhat lighter brown, segments rounded-oval; front, vertex and occiput dark-colored, almost black.

Pronotum dark brown; in the paratypical specimen, the caudal margin of the scutum and the scutellum, yellowish. Mesonotal præscutum with a broad, dark brown, median line, widened behind; humeral angles conspicuously light yellow, behind darkening into brown of a lighter shade than the broad median vitta; scutum with the lobes dark brown, median line paler; scutellum and postnotum brown. Pleuræ dull brownish-yellow, clearer below. Halteres pale, knob a little browner. Legs: Coxæ and trochanters light yellow, the latter margined with black at the tip; femora and tibiæ light brown, scarcely darkened at their tips; terminal tarsal segments darker brown. Wings, hyaline or nearly so, the costal cells and veins more tawny; veins light brown, darker brown where traversed by dark markings; seven brown marks along the costal margin, the third at the origin of Rs extending down almost to vein M; the fourth at the tip of Sc extending down into cell 1st R₁; the 5th (stigmal) spot, largest, rectangular; the sixth and seventh spots at ends of veins R₃₊₄ and R₄₊₅; cord and outer end of cell 1st M₂ seamed with brown; a brown spot at ends of most of the veins, most distinct and largest at the 2nd anal vein. Venation (see pl. III.; fig. 8): Sc long, ending nearer to the fork of Rs than to

its origin; Sc_2 at tip of Sc_1 ; R_s long, nearly three times as long as the basal deflection of R_{4+5} ; basal deflection of $Cu_{1.1}$ at fork of M .

Abdominal tergum brown, anterior margins of the basal segments somewhat more yellowish; sternum pale whitish-yellow. Hypopygium (see figs. 5-7; pl. IV.): 8th tergite short, consisting only of a narrow ring, almost straight on its cephalic margin, concave on the caudal margin; 9th tergite convex anteriorly, concave on caudal margin. Pleural pieces very short, cylindrical, not more than twice as long as wide, bearing two apical appendages. The dorsal appendage is a short, slender, strongly curved hook, sharp pointed and more chitinized at its tip; it is directed entad, cephalad and dorsad. The ventral lobes are long, fleshy, between two and three times as long as the pleura and much thicker; at their base, on the inner side, is a short, fleshy tooth, more chitinized at its tip, directed cephalad and dorsad and meeting its mate of the opposite side on the median line; near the tip, on the outer or caudal face, are two, long, slender, subequal bristles, directed caudad. The ventral side of the pleura is produced into a lobe, enlarged apically and directed entad and slightly caudad. The guard of the penis is short, extending slightly beyond the most caudad-projecting portion of the pleura; it is swollen at the base, less so in the middle of its length, its tip small, chitinized, bifid at apex, the tip directed slightly ventrad. The second gonapophyses are very short, and, viewed from above, barely project beyond the fleshy lobe lying between them.

Vial No. 8.—Tokyo, Japan; April 25, 1912. 1 ♂.

Vial No. 49.—Tokyo, Japan; August, 1912. 1 ♂.

Holotype, ♂.—Vial No. 8.

Paratype, ♂.—Vial No. 49.

Types in the author's collection.

G. avocetta, compared with the four Javan species described by de Meijere, agrees most closely with *G. montana*, which, however, has the wing-pattern much less distinct. From the North American *G. rostrata* Say, it differs conspicuously in its unicolorous tibiae.

Genus Rhipidia Meigen.

Rhipidia pulchra septentrionis, subsp. n.

This subspecies differs from typical *pulchra* Meij.* (Java) in

*Neue und bekannte sudasiatische Dipteren; p. 92, fig. 7. Bijdragen tot de Dierkunde, vol. 17, 1904.

antennal coloration, the flagellar segments being alternately dark and light-coloured; segments, 4, 6, 8, 10 and 12 are whitish, the remainder of the antennæ brown. The wings have a large spot at the base of Cu and the venation is not as figured by de Meijere. (Compare fig. 1; pl. III.)

Female.—Length, 7.6–8.6 mm.; wing, 7.4 mm.

Vial No. 10.—Tokyo, Japan; April 25, 1912. 2 ♀s.

Holotype and Paratype in author's collection.

In *Tijd Voor Entomol.*, Vol. 44, p. 27, figs. 14–16, de Meijere refers this to *Dicranomyia*. However, I believe his original reference of the species to be the correct one—this belief based on venational hypopygial characters.

Tribe Antochini

Genus Rhamphidia Meigen.

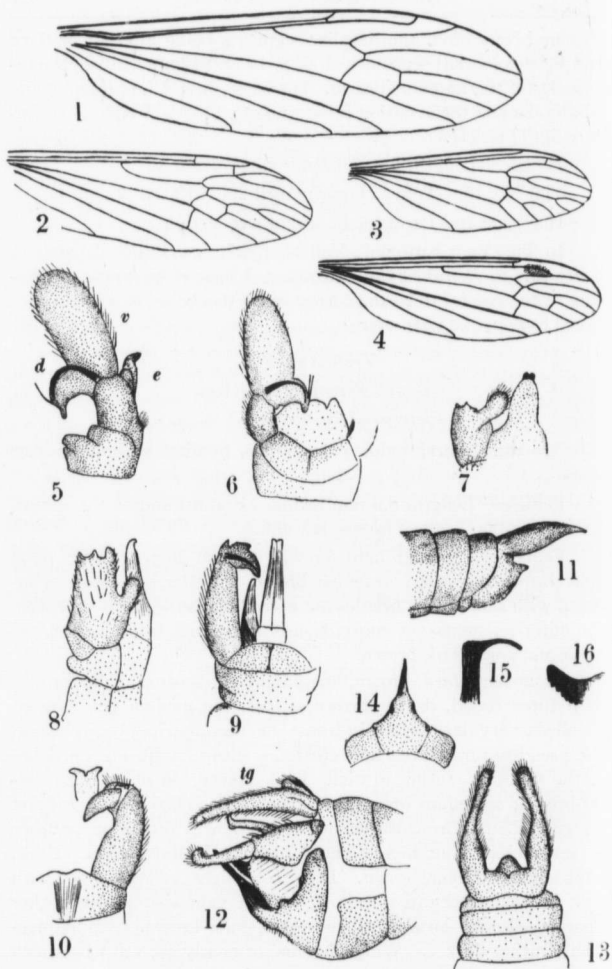
Rhamphidia nipponensis, sp. n.

Rostrum short; palpi pale; wings hyaline without darker marks.

Female.—Length, 8.9 mm.; wing, 7.8 mm.; middle leg, femur, 6.6 mm.; tibia, 7 mm.; tarsus, 6.7 mm.

Female.—Rostrum light brown; labrum light yellow; palpi light brownish-yellow; antennæ brown, flagellar segments cylindrical with short black bristles not exceeding the segment in length, the outer segments not conspicuously narrowed; front, vertex, occiput and genæ dark brown.

Pronotum dark brown, mesonotal præscutum light brown, with three broad, darker brown stripes, the median one longest, broadest, very dark brown in front; the lateral stripes begin behind the pseudosutural fovea and cross the suture, suffusing the lobes of the scutum; scutum medially light brown, on margins yellowish-brown; scutellum brown, margined with yellowish; postnotum brown. Pleuræ brownish-yellow, suffused with brown on portions of the mesopleuræ; mesosternum brown. Halteres light yellow, knob slightly darker, brown. Legs: coxæ light yellow, tipped with pale brown; trochanters yellow; femora yellowish-brown, rather clearer yellowish basally; tibiæ brown, tarsi brown, terminal segments rather darker. Wings, hyaline or nearly so; veins brownish



JAPANESE CRANE-FLIES (ALEXANDER).

yellow, stigma not indicated. Venation (see fig. 1; plate IV.); cross-vein r-m distinct; basal deflection of Cu beyond the fork of M.

Abdomen, tergum and sternum dark brown; ovipositor light yellow.

Vial No. 28.—Tokyo, Japan; April 26, 1912. 1 ♀.

Holotype, ♀.—Vial No. 28, in author's collection.

This species differs from the European *R. longirostris* by its shorter rostrum, cylindrical flagellar segments with short bristles; pale maxillary palpi and other colorational differences, which may, of course, vary in series.

EXPLANATION OF THE PLATES.

PLATE III.

- Fig. 1. Wing of *Rhipidia pulchra septentrionis*, sub sp. n.
 Fig. 2. Wing of *Limnophila japonica*, sp. n..
 Fig. 3. Wing of *Erioptera elegantula*, sp. n.
 Fig. 4. Wing of *Limnophila satsuma* Westwood.
 Fig. 5. Wing of *Tricyphona vetusta*, sp. n.
 Fig. 6. Wing of *T. kuwanai*, sp. n.
 Fig. 7. Wing of *Ptychoptera japonica*, sp. n.
 Fig. 8. Wing of *Geranomyia avocetta*, sp. n.
 Fig. 9. Wing of *Dicranomyia japonica*, sp. n.
 Fig. 10. Wing of *D. nebulosa*, sp. n.
 Fig. 11. Wing of *Molophilus pegasus*, sp. n.
 Fig. 12. Wing of *Gonomyia insulensis*, sp. n.
 Fig. 13. Wing of *Conosia irrorata* Wiedemann.
 Fig. 14. Wing of *Gonomyia superba*, sp. n.
 Fig. 15. Wing of *Erioptera asymmetrica*, sp. n.

PLATE IV.

- Fig. 1. Wing of *Rhamphidia nipponensis*, sp. n.
 Fig. 2. Wing of *Limnophila inconcussa*, sp. n.
 Fig. 3. Wing of *Tricyphona insulana*, sp. n.
 Fig. 4. *Liogma kuwanai*, sp. n.
 Fig. 5. Hypopygium of *Geranomyia avocetta*; lateral aspect.
 e—penis guard; d—dorsal apical appendage; v—ventral apical appendage.

- Fig. 6. Hypopygium of *Geranomyia avocetta*; dorsal aspect.
Fig. 7. Hypopygium of *Geranomyia avocetta*; ventral aspect, showing a portion of the hypopygium.
Fig. 8. Hypopygium of *Dicranomyia nebulosa*; lateral aspect. The apical appendages are not included.
Fig. 9. Hypopygium of *Dicranomyia nebulosa*; dorsal aspect.
Fig. 10. Hypopygium of *Dicranomyia japonica*; dorsal aspect.
Fig. 11. Ovipositor of *Ptychoptera japonica*; lateral aspect.
Fig. 12. Hypopygium of *Ptychoptera japonica*; lateral aspect. tg—9th tergite.
Fig. 13. Hypopygium of *Ptychoptera japonica*; 9th tergite, dorsal aspect.
Fig. 14. Hypopygium of *Ptychoptera japonica*; 9th sternite, ventral aspect.
Fig. 15. Hypopygium of *Ptychoptera japonica*; guard of the penis (?).
Fig. 16. Hypopygium of *Ptychoptera japonica*; ventral appendage.

(TO BE CONTINUED.)

DONACIA EMARGINATA KIRBY (COLEOPTERA.)

A BIOGRAPHIC NOTE.

BY L. B. WOODRUFF, NEW YORK CITY.

Donacia emarginata Kirby may gain its sustenance from various water-loving plants, but that which it seems to find superlatively to its taste near New York City is the Marsh-marigold, *Calltha palustris*. In a certain wooded swamp just outside the city limits, always wet under foot and in April excessively "soft," grow and bloom great masses of these glorious golden flowers; and when they reach the zenith of their splendor, in almost every clump, half buried under their stamens, are from one to several of these graceful metallic beetles. The sturdy crowfoot cup gives them secure support, and in them throughout the flowering period they are to be found in breeding pairs. On the stems just above the roots the pupal cocoons are attached, sometimes several in a row; but when the swollen buds expand the beetles emerge, leave their lowly dwellings, and, climbing up the stems, attain the scene of

July, 1913

their ensuing revels. When not too much engrossed, they display the instinct shared with so many other strongly flying members of their order, and, on the approach of danger, clamber to the petal's edge and seek safety by dropping to the cover that lies below.

The *Caltha* seems to be an unrecorded food-plant for the genus, though hardly a surprising one in view of its evident adaptability and its environmental association with the skunk cabbage, the resort of certain others of its component species.

So far as they have come under the writer's observation, the males of *D. emarginata* in this neighborhood are uniformly purplish or bluish-black, while the females are never like them in colour, but vary through shining olivaceous green, the shade most commonly occurring, to brassy and rich bronze. If these colour distinctions hold constant with the beetles from other localities, we have here secondary sexual characters which are worthy of note.

A NEW BRACONID OF THE GENUS MICRODUS FROM CANADA.

BY C. H. RICHARDSON, JR., FOREST HILLS, MASS.

Among a number of parasitic hymenoptera reared from the Bud Moth (*Tmetocera ocellana* Schiff.), at the Dominion Entomological Laboratory, Bridgetown, Nova Scotia, by Mr. G. E. Sanders, there is a Braconid belonging to the genus *Microdus* which appears to be new. Since it is desired to refer to this species in the near future, Dr. Hewitt, Dominion Entomologist has asked me to describe it at the present time.

Microdus ocellanae, sp. nov.

Description of the type (female): Length 5 mm. Wing 4 mm. Ovipositor about 5 mm. Head, thorax and abdomen black, refulgent; palpi pale fulvous; fore and middle legs pale fulvous, with the apical joints black; hind legs pale fulvous except for the black coxæ, the black apical annuli on the tibiæ, the darkened distal ends of the first tarsal joints and the complete darkening of the succeeding joints. A large fulvous spot covering the first and second abdominal segments ventrally. Pubescence light. Wings slightly infuscated, iridescent; stigma black. Head slightly wider than thorax, less than three times as wide as thick; clypeus slightly produced; clypeal foveæ large, each equaling an ocellus in size; face

punctuate, pubescent; vertex, occiput and genæ sparsely punctulate and pubescent. Antennæ 42-jointed, stape and pedicel longer than the first joint of the flagellum; joints of flagellum subequal. Mesonotum punctulate, with deep punctate parapsidal grooves which meet posteriorly. Scutellum punctulate flatly convex; anterior depression of scutellum with four deep umbilicate punctures. Metanotum rugose-punctate; metathoracic spiracles oval, slightly longer than wide. Mesopleuræ sparsely punctulate and pubescent with a curved punctured line just below the tegulæ; a single post-median fovea and a longitudinal row of umbilicate punctures below this. Metapleuræ more densely punctulate and pubescent. First segment of the abdomen deeply striated longitudinally; the second segment weakly and irregularly aciculated with a median transverse depression; remaining segments smooth, shining.

Type ♀ No. 4001d, July 28, 1912; in Coll. Div. Ent., Ottawa.

Type locality.—*Kentville, Nova Scotia, Canada.*

Paratype (♀) agrees essentially with the type.

This species is related to *Microdus earinoides* Cresson resembling it in size and colour, but differing in the sculpture of the abdomen, the possession of black hind coxæ and the extent of the black on the hind tibiæ as well as the quite distinctly infuscated wings. It is also very similar to *Microdus nigricoxis* Provancher, but only the hind coxæ are black and the basal segment of the abdomen is striated, not rugose. Acknowledgments are due Mr. C. T. Brues for aid in looking up the literature.

A SUCCESSFUL MOVE

Recently I had occasion to move my entire collection of over 200 well-filled boxes of Hemiptera from Buffalo, N. Y., to San Diego, Calif., and on unpacking them here was surprised to find that not a single specimen had been damaged. The boxes were packed in straw in two large willow pottery crates and were shipped by freight through one of the household shipping agencies. However, they had to go through two storage warehouses and be twice re-shipped before starting on their long ride which speaks well for the packing. I received my instructions for packing from Dr. E. D. Ball and will gladly pass it on to any one contemplating a similar move.—E. P. VAN DUZEE, 4020 Ivy St., San Diego, Calif.

DESCRIPTION OF TWO NEW SPECIES OF OCHTERUS
LATR. (HEMIPTERA) WITH AN ARRANGEMENT
OF THE NORTH AMERICAN SPECIES.

BY H. G. BARBER, ROSELLE PARK, N. J.

The genus *Ochterus* Latr. (*Pelogonus* Latr.) is represented in North America by five species—four from Mexico, Central America or the Antilles, and only one has been described from the United States—*O. americanus* Uhl. (Bull. U.S. Geol. and Geogr. Surv. I, 335, 1876). The Mexican and Central American species are well characterized and figured by Champion, in Biol. Cent. Amer. Hem.-Het. II., 344-346, 1901.

I herewith add two more species to the list—one from the collection of Mr. Nathan Banks, who collected several specimens at Glencarlyn, Va., in June, and the other represented by a single specimen from Mrs. Slosson's collection, taken by her at Ormond, Florida, in the spring. The former of these must be closely related to the Palearctic *O. marginatus* Latr., the latter is more closely allied to *O. americanus* Uhl.

The following synopsis of the North American species of *Ochterus* is adapted from Champion's key:

- Anterior angles of the pronotum acute; humeri rounded; face not at all or obsoletely carinate between the eyes *perbosci* Guér. (Mex., Antilles.)
- Anterior angles of the pronotum obtuse or rounded.
- Humeri rounded.
- Face not carinate between the eyes *anifrons* Champ. (Mex., Cent. Am., Antilles)
- Face distinctly carinate between the eyes.
- Clavus entirely yellow *flaviclavus*, n. sp. (Florida).
- Clavus concolorous.
- Entire lateral pronotal margins broadly pale *banksi*, n. sp. (Virginia)
- Lateral pronotal margins, with only a pale spot anteriorly *americanus* Uhl. (U.S.)

- Humeri subacute. Face carinate and closely rugulose between the eyes.....*viridifrons* Champ. (Cent.Amer.)
- Humeri acute. Face carinate, but almost smooth between the eyes.....*acutangulus* Champ. (Cent. Amer.)

Ochterus banksi, n. sp.

Broad ovate, brownish black. The head, behind the vertex, opaque, from there anteriorly, shining and obliquely, finely rugulose and tricarinate; one carina next each eye and a median one, continuous from vertex to apex; transversely sulcate midway between ocelli and base of head. Pronotum with anterior margin almost truncated, with the anterior angles next the eyes rounded and not projecting forwards or outwardly beyond the exterior margin of the eyes; entire lateral margins gently rounding posteriorly; humeral angle rounded, not very prominent; lateral margins broadly expanded, pale; this mark broadest about the middle, more abruptly rounded anteriorly and tapering posteriorly to occupy the entire margin; the remainder of the surface brownish black, elevated and transversely, but not very deeply, sulcate a very little behind the middle; posterior lobe, middle and anterior part of first lobe more coarsely punctate, the latter with two or three transverse weak furrows. Scutellum almost equilateral, rather coarsely punctate and transversely furrowed; anteriorly with a transverse elevated ridge, behind which it is depressed. Corium not demarked from membrane, broadest across the middle, with lateral margin gently rounded to just beyond middle, where it more abruptly rounds

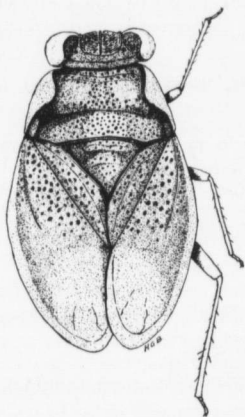


FIG. 9.
Ochterus banksi, n. sp.

off to the rather narrow apical part of membrane; the external margins either broadly pale throughout or in part suffused with fuscous and reflexed, without the usual series of pale marginal spots

which occur in *O. americanus*. Clavus and corium, anteriorly, with coarse scattered punctures. Nervures of the membrane indistinct. General surface with indications of the customary bluish grey markings, unless denuded, when the whole upper surface is smooth and shining. Beneath on sternum and venter paler, with rostrum, acetabulae, coxae, legs and external angle of metathorax pale yellow. Prosternum rather coarsely punctate.

Length, 4 mm. Width of pronotum, 2 mm.

Described from three males and one female collected by Mr. Nathan Banks at Glencarlyn, Virginia, in June. Judging from the meagre descriptions and indifferent illustrations at hand, I am led to the opinion that this species is most nearly related to *O. marginatus* Latr., of Europe. But having no specimens of that species for comparison, I am, at this time, unable to settle the point. *O. banksi* can readily be separated from *americanus* by its difference in color markings, and the character of the pronotum. Apex of membrane is more narrow than in *americanus*.

Ochterus flaviclavus, n. sp.

Brownish-black. Very much the appearance of *O. americanus*, to which it is closely related, having the usual carinate and rugulose face. However, somewhat smaller than that species with the clavus entirely yellow. The pronotum with the lateral margins gently rounded, more converging anteriorly, the anterior margin being narrower than the width across the eyes; the anterior angle of the pronotum sharply rounded and not projecting anteriorly as in *americanus*; the expanded part of lateral margins narrower, with a small yellowish spot just posterior to the anterior angle; the humeral angle almost rectangular, projecting but a trifle beyond margin of corium. Extreme edge of corium very narrowly pale, but the usual pale marginal spots are lacking. Surface with the usual pearl grey spots. Beneath, with the sternum slate grey; the acetabula, posterior and lateral flange of the prosternum, elytral flange anteriorly, posterior margin of metasternum, legs and venter, pale; legs lightly infuscated. Prosternum, mesosternum externally and metasternum before the posterior angle distinctly punctate.

Length, $3\frac{1}{2}$ mm.; width of pronotum, about 2 mm.

Described from a single male in the collection of Mrs. Annie Trumbull Slosson, taken by her at Ormond, Florida.

A SECOND ADDITION TO THE AUSTRALIAN
HYMENOPTERA MYMARIDÆ.

BY A. A. GIRAULT, BRISBANE, AUSTRALIA.

The following species have recently been captured by Mr. Alan P. Dodd and very kindly given to me. They are the eighteenth and nineteenth species of *Gonatocerus* and the sixth, seventh and eighth of *Polynema*. All in normal position.

1. *Gonatocerus bicolor*, new species.

Female.—Length 1.65 mm. Large for the genus.

Black, the abdomen contrasting orange reddish, dorsad with faint duskiness, the scape and pedicel lemon yellow, as are also the legs and coxæ; tibiæ fuscous. Ovipositor not exerted. Fore wings of the narrower type, yet moderately broad, bearing about thirty longitudinal lines of very fine discal cilia, lightly fumated throughout, the marginal cilia short, the longest not more than a fifth of the greatest wing width. Proximal tarsal joints very long. First funicle joint longer than either the pedicel or the second joint of the funicle, subequal to funicle joint 3, joints 4 and 5 each somewhat shorter than 3, joint 5 shorter than 4, 6 still shorter than 5, while 7 lengthens slightly, subequal to 2; distal funicle joint shortest, subequal in length to the pedicel. Of the general habitus and structure of *spinozai* Girault and belonging to the group of species with graceful fore wings and usually golden bodies (e.g., *complei*, *cingulatus*). Marginal vein very long. Caudal wings with an incomplete, more or less variable, paired line of midlongitudinal discal ciliation. Club long.

(From one specimen, 2-3-inch objective, 1-inch optic, Bausch and Lomb).

Male.—Not known.

Described from a single female captured by sweeping jungle growths along forest streamlet, near Nelson, North Queensland, December 6, 1912 (A. P. Dodd).

Habitat: Australia—Nelson (Cairns), Queensland.

Type: No. Hy 1293, Queensland Museum, Brisbane; the above specimen on a slide of xylol-balsam.

This beautifully coloured species may be distinguished with ease by the great contrast between the black of the thorax and the

orange of the abdomen, by the clouded wings and long venation and by the long first joint of the antennal funicle. It is allied to *spinozai*, but could not be confused with that characteristic species.

2. *Gonatocerus spinozai* Girault.

At the same time that the above new species was captured Mr. Dodd obtained a pair of this species. The male was unknown and, since it differs considerably in coloration from the female, I briefly point out its characteristics. In structure, similar to the female, but the antennæ are 13-jointed and filiform, the pedicel very small and sublobate, funicle joints 2-4 and 9-10 subequal, longest, about thrice longer than wide; joints 1 and 5 subequal, somewhat shorter than the others; joints 13, 6 and 7 subequal, still somewhat shorter; joint 8 shortest, a third shorter than joint 2. Abdomen subpetiolate, declivous from above at base, ovate, striped dorsad with black, transversely (6 stripes counting the broadest at extreme base). Propodeum purplish black, its spiracle very minute, round, the surface finely reticulated, a median carina present (its exact shape not seen, probably paired). Tip of dorsal abdomen black. Otherwise coloured as in female. When mounted in balsam, the tip or apex of the declivous part of the base of the abdomen closed up to the thorax, partially concealing the real nature of the segmentation; this apex is projected or heeled, stopper-shaped and appearing as if it was intended to fit against the thorax.

3. *Gonatocerus fasciiventris*, new species.

Male.—Length 1.15 mm.

Black, the abdomen golden yellow, conspicuously striped transversely with black above and below, the intervening yellow stripes much narrower, the lateral line yellow (about six black stripes). Legs yellowish brown, the coxæ black. Wings hyaline, the fore wings of the less graceful type, the marginal vein moderately long; fore wing with about twenty-five lines of discal cilia; posterior wings narrow. Scape, pedicel and first funicle joint more or less suffused with yellowish. Antennæ strongly longitudinally striated, the funicle joints short and subequal, each about one and a half times longer than broad. Allied with *coethei*, but, besides the differences in coloration, the fore wings are broader. Pedicel only half the length of the first funicle joint.

(From one specimen, similarly magnified).

Female.—Not known.

Described from a single male captured with the preceding two species.

Habitat: Australia—Nelson (Cairns), N. Q.

Type: Hy 1294, Queensland Museum, Brisbane, the above specimen (mounted with the types of *G. brunoi lyelli* and *Polynema devriesi* both described beyond).

4. *Gonatocerus brunoi lyelli*, new variety.

Male: Like the typical forms, but the abdomen at its distal half dorsad distinctly banded by narrow golden yellowish stripes (two or three), the wings very dark.

(From one specimen, enlarged as with preceding species).

Respectfully dedicated to the late Sir Charles Lyell, the author of the "Principles of Geology."

Described from a male captured with the preceding species.

Habitat: Australia—Nelson (Cairns), Queensland.

Type: No. Hy 1295, Queensland Museum, Brisbane, the above specimen (mounted with the type of *Gonatocerus fasciativentris* Girault and a *Polynema*).

Genus *Polynema* Haliday.

1. *Polynema devriesi*, new species.

Male: Length, 1.2 mm.

Somewhat similar to both *draperi* and *romanesi* Girault, but differing from the former in having the discal cilia of the fore wing much coarser, from the latter in the same point, from both in general coloration being ferruginous, the distal third of the abdomen black. Scape and pedicel concolorous, the flagellum black, its joints very long, as are also the proximal tarsal joints. About nine lines of rather coarse discal cilia, the marginal cilia longer than the wing's greatest width. Distal tarsal joints black. Wings obscurely fumated, the posterior ones very narrow, the fore wings narrowing proximad before venation.

(From one specimen, similarly magnified).

Female: Not known.

Described from a single male captured with the species of *Gonatocerus* noted above. Respectfully dedicated to Hugo De Vries, the author of the mutation theory in biology.

Habitat: Australia—Nelson (Cairns), N. Q.

Type: No. Hy 1296, Queensland Museum, Brisbane, the above specimen in balsam (mounted with the types of *Gonatocerus fasciiventris* Girault).

2. *Polynema mendeli*, new species.

Male: Length 1.20 mm.

Like *devriesi*, but the discal cilia of the fore wing is finer, the marginal cilia shorter, not quite as long as the greatest width of the blade, subfuscous, not as slender proximad before venation; in this species the proximal funicle joint is much shorter than the next joint, not half its length, while also joints 5 distad of the flagellum are all short, more or less subequal to 1, flagellar joint 2 longest, 3 and 4 next in succession. This antennal structure easily separates this species from *draperi* and *romanesi*. Ferruginous, the abdomen (exclusive of pedicel) black, as are also the distal tarsal joints and the flagellum; proximal funicle joint yellowish, head blackish. Fore wings with about 10 lines of fine but rather long discal cilia.

(From one specimen, enlarged as in previous descriptions.)

Female: Not known.

Described from one male, captured with the preceding species. Dedicated to Abbé Gregor Mendel, who established the Mendelian principle of inheritance.

Habitat: Australia—Nelson (Cairns), Queensland.

Type: No. Hy 1297, Queensland Museum, Brisbane, the above specimen in balsam (mounted with specimens of *Gonatocerus spinozai* and the type of *Polynema nordaui*, described beyond).

3. *Polynema nordaui*, new species.

Female: Length 0.60 mm. Small for the genus.

Black, the first three antennal joints, abdominal pedicel, legs except distal half of posterior femur and distal tarsal joints, orange yellow. Like the North American *longipes* Ashmead, being about the same size and habitus, but differing in that the wings of *longipes* are much narrower and slender and the antennal segmentation entirely different, since in this Australian species the second

and third funicle joints are long and subequal. Very much like *draperi* in wing structure, but the legs are brighter and orange. Funicle joint 1 longer than the pedicel, joints 2 and 3 longest, subequal, elongate, one and a half times longer than 1, joint 4 a fourth shorter, 5 shorter, somewhat enlarged, somewhat longer than 1. Scape moderate in length.

(From one specimen, enlarged as in preceding.)

Male: Not known.

Described from one female, captured with the preceding species.

Habitat: Australia—Nelson (Cairns), Queensland.

Type: No. *Hy 1298*, Queensland Museum, Brisbane, the above female in balsam (mounted with *Gonatocerus spinozai* and the type of *Polynema mendeli*).

Respectfully dedicated to Max Nordau.

This species may be the female of *draperi*, which it resembles closely, but there are differences which make me doubt it, especially in the shape of the fore wings, the relative length of the cephalic marginal cilia of those wings and the differences in colour.

SOME NEW AUSTRALIAN GENERA IN THE HYMENOPTEROUS FAMILIES EURYTOMIDÆ, PERILAMPIDÆ, EUCHARIDÆ AND CLEONYMIDÆ.

BY A. A. GIRAULT, NELSON (CAIRNS) N. QUEENSLAND.

Family Eurytomidæ,

Eurytomini.

Xanthosomoides, new genus.

Female.—Non-metallic, yellow, body not umbilicately punctate, fore wing with a stigate spot at the stigmal vein. Head normal, the antenna inserted in the middle of the face, 11-jointed, the club solid, the funicle 7-jointed, cylindrical, its joints not much longer than wide, the single ring-joint rather stout, the pedicel nearly as long as the first funicle joint, the scape rather long, simple. Wings large, the marginal vein long and slender, at least two-thirds the length of the long submarginal vein, thrice or more the length of the rather short stigmal vein, the postmarginal vein also very long, nearly as long as the marginal or quite equal to it

(or slightly longer than it), tapering distad. Wings normally ciliate, the marginal fringes short. Abdomen as long as the thorax, the ovipositor and its valves exerted, curved upward, fully as long as the rest of the body. Abdomen sessile but narrowed at base, triangular from lateral aspect. Propodeum slightly shorter than the scutellum or the prothorax and simple, without carinae. Parapsidal furrows complete. Eyes ovate, the ocelli in a triangle in the centre of the vertex, the lateral ones distant from the eye margins. Propodeal spiracle elliptical. Face subquadrate, wide.

Male.—Not known.

A genus related to *Xanthosoma* Ashmead, from which it differs in bearing the much longer marginal and postmarginal veins and non-moniliform funicle joints.

Type.—The following species:

1. *Xanthosomoides maculatipennis*, new species.

Female.—Length, variable, 2.50 mm. exclusive of ovipositor, the exerted portion of the latter about the same length.

Pale cadmium yellow, the head, pronotum, legs and a transverse spot laterad of the mesopostscutellum (the spot cephalad of the propodeal spiracle) contrasting yellow, lighter, lemon yellow; also more or less, the produced part of the ventral abdomen. Lateral suture of scutellum, the visible (dorsal, lateral) portions of the occiput and the cephalic margin of the propodeum, black. Dorsal aspect of abdomen suffused irregularly with brown. Venation black. Fore wings hyaline, but with a conspicuous, rather large, black globe-like stigmal spot, regularly oval in shape, obscuring the curved stigmal vein and appearing as if suspended by a short pedicel from the end of the marginal vein. Ciliation normal and dense, the marginal fringes very short. Antennae yellow suffused with much black. Ovipositor brown, the valves black. Thorax delicately, transversely wrinkled. Club solid, first funicle joint widening distad, nearly twice longer than broad at apex. Scape yellow, black above.

(From three specimens, the same magnification.)

Male.—Not known.

Described from three females on cards from the collections of the Queensland Museum, labelled "Bred out of Gall 5 A. Brisbane. H. Hacker."

Habitat: Australia—Queensland (Brisbane).

Type: No. Hy 1192, Queensland Museum, Brisbane, one female on a card.

2. *Xanthosomoides fulvipes*, new species.

Female.—Length, 4.2 mm. excluding the ovipositor, the latter exerted for a length nearly equal to that of the body. The same as *maculatipennis*, but much more robust; also the pronotum is nearly as dark as the scutum, its caudal margin contrasting lemon yellow followed by a narrow black stripe running across the cephalic margin of the scutum; the propodeum is wholly black or very dark, the ovipositor fuscous, the meson of the thoracic venter is black and in the venter of the prothorax there is a distinct triangular black marking like the Greek letter Delta of the capital case. The postmarginal vein is slightly longer than in the first species, the apparent petiole of the stigmal spot in the fore wing also longer. Vertex dark ochreous, the face lemon yellow. The wings are large. First funicle joint longer, cylindrical, more than twice longer than broad at apex.

(From a single specimen, the same magnification.)

Male.—Not known.

Described from a single female specimen from the collections of the Queensland Museum, labelled "Brisbane, H. Hacker. 3-7-1911."

Habitat: Australia—Brisbane, Queensland.

Type in the Queensland Museum, Brisbane, the foregoing specimen on a card.

Melanosomellini, new tribe.

Antennæ 12-jointed, with one ring-joint, the club 3-jointed, the male antennæ different and bearing long ramii; otherwise as in the Eurytomini and Rileyini as limited by Ashmead. The marginal vein two and a half times its own width, but shorter than either the stigmal or postmarginal veins. Probably differing totally in habits from the Rileyini, since the latter appear to be egg parasites of the Orthoptera. The following genus:

Melanosomella, new genus.

Female.—Head (cephalic aspect) slightly wider than long, the antennæ inserted slightly below the middle of the face, the scrobes

short and not deep, the lateral ocelli far distant from the eyes; pronotum not long, the parapsidal furrows complete, the head and thorax smooth. Antennæ 12-jointed, the ring-joint large, nearly as long as wide, the funicle apparently compressed, the joints all transverse and lamellate or produced toward one side, the distal joint much less so and largest of the funicle; pedicel subquadrate, much longer than the proximal funicle joints; club long-ovate, longer than the cylindrical, simple scape, its joints obliquely truncate, the distal joint short and conic. Fore wings normal, the marginal cilia sparse and short. Propodeum with a bright median carina, its spiracle large and nearly round. Abdomen short and stout, no longer than the thorax, its second segment occupying half of the surface. Scutellum longer than the propodeum. Parapsidal furrows complete. Posterior tibiæ apparently with but one apical spur.

Male.—The same, the abdomen more depressed and cylindrical; antennæ entirely different, the scape much shorter, dilated ventrally, the antennæ 12-jointed, the pedicel not much longer than thick, the ring-joint like a ring, the first funicle joint very transverse and lamellate; following five funicle joints very transverse and increasing in length, each bearing a long, curved, cylindrical ramus from its disto-lateral margin, joint 2 no longer than the diameter of its ramus and practically forming a continuation of it; joint 3 slightly larger than wide; joint 6 much longer than wide; the ramii longer proximad, the shortest and distal one distinctly longer than any single joint of the antenna. Proximal joint of club elongate, obconic, forming half of the club and longer than the distal funicle joint; the other two club joints subequal. Funicle and ramii with sparse, long fine hairs.

Type.—The following species (flavipes).

Female.—Length, 3 mm.

Black and shining, the face, genæ, legs (except coxæ, the tarsi more brownish), scape (except at tip, where it is blackish) the margin of the eyes dorsad and caudad more or less obscurely, lemon yellow; the black of the vertex at the meson projects obtusely into the yellow of the face, some distance directly cephalo-ventrad of the

cephalic ocellus. Tegula brownish. Fore wing with a distinct brownish band nearly across it from the apex of the submarginal vein; this stripe is interrupted. Venation black. Antennal flagellum brownish, subfuscous. Face with thimble punctures; remainder of body apparently simple and shining more or less.

(From one specimen, the same magnification.)

Male.—The same, but the fuscous stripe on the wing subobsolete.

(From one specimen, the same magnification.)

Described from a single pair received for study from the Acting Government Entomologist of Victoria, cardmounted and labelled "From unknown galls on Eucalyptus, N.S.W."

Habitat.—Australia—New South Wales.

Types: No. Hy 1193, Queensland Museum, Brisbane, the above specimens (2 pins) plus a slide bearing male and female antennæ.

Family Perilampidæ.

Epiperilampus, new genus.

Female.—The same as *Perilampus* Latreille, but the thorax not coarsely punctate but only with scattered thimble-punctures and transversely wrinkled, the antennæ with two large ring-joints and a well-defined, 3-jointed club, the joints of the flagellum distad transverse, the pedicel larger than the first funicle joint. Marginal, stigmal and postmarginal veins shortened but still moderately long, yet the postmarginal is somewhat shorter than the other two, which are subequal; the stigmal vein with a slender neck. Fore wings with a fuscous blotch under the end of the submarginal vein. Antennæ inserted in the middle of the face, the head more or less lenticular from cephalic aspect. With an encyrtine habitus. Scutellum simple. Axillæ separated. Discal ciliation of the fore wing not quite normal. Second segment of abdomen nearly half the latter's length, the third short.

Male.—Not known.

A genus resembling *Perilampus*.

Type: The following species:

1. *Epiperilampus xanthocephalus*, new species.

Female.—Length, 2.5 mm.

Orange yellow, the parapsides cephalo-mesad marked with metallic bluish, the propodeum and abdomen shining blackish or dark metallic bluish, but the latter in the dorsal aspect of the base of its distal half with a conspicuous yellow marking, incised medially from behind (caudad). Legs nearly all dark metallic bluish, but with brownish markings at the knees and tarsi, the cephalic tibiae nearly all brown. Venation brownish, the marginal, stigmal and postmarginal veins lemon yellow; the fore wings lightly embrowned throughout and with a distinct, smoky brown cloud under the apex of the submarginal vein, extending across the wing, but interrupted caudad of its middle by a clear longitudinal streak; its proximo-cephalic margin is accented and another shorter clear streak enters it from proximad nearer the caudal wing margin. Marginal fringes extremely short, as is also the discal ciliation, which is speckled over the wing surface like minute pin-points, quite irregular but not dense. Scape yellow, dark above and at tip, the remainder of the antenna brownish yellow, sometimes bluish, proximal joint of club subequal to distal funicle joint, both wider than long; funicle joints 2 and 3 subquadrate, subequal. Thorax finely polygonally sculptured, the scutum with obscure punctures.

(From many specimens, the same magnification.)

Male.—Not known.

Described from a number of specimens in the Queensland Museum, mounted on cards labelled respectively: "Gall, No. 6 Brisbane. H. Hacker. 19-7-11." 4 ♀'s. Types: "Gall No. 6; 3 ♀'s": "Gall No. 6," three cards 5 ♀'s, 5 ♀'s and 6 ♀'s; and "Gall No. 6. Brisbane. H. Hacker. 19-7-11." 3 ♀'s. Evidently reared from galls.

Habitat: Australia—Brisbane, Queensland.

Types: No. *Hy 1194*, Queensland Museum, Brisbane, the four females on a single card as above noted, plus a slide of xylol-balsam bearing an antenna and a pair of wings.

Family Eucharidæ.

Epimetegea, new genus.

Female.—The same as *Metagea* Kirby, but the antennæ not moniliform and only 10-jointed. Also agreeing somewhat with *Pseudochalcura* Ashmead, but differing again in lacking one antennal

joint. Head thin, triangular, the antennæ inserted slightly below the middle of the face, 10-jointed, the club solid and ovate, longer than any of the funicle joints, but slightly shorter than the simple, cylindrical scape; pedicel obconic, short, subequal to joint 4 of the funicle, bearing from one side of its apical margin a single, very long, slender but stiff bristle-like seta, which reaches distad nearly to the apex of joint 3 of the funicle. Proximal funicle joint longest, nearly twice the length of the pedicel, all the funicle joints obconic, widening distinctly distad, all more or less prolonged obtusely from one apical corner, the distal joints more so. None of the joints petiolate or subpetiolate; no ring-joint. Mandibles long and falcate, acute at apex, the right with two large triangular teeth within, the left one which is larger than either of those of the right; also exteriorly at base each with a large tooth. From beneath the clypeus there projects a flat, palmate (9-digitate) brownish plate, above and between the mandibles; clypeus convex along the distal margin, the latter with two teeth on each side of its end, the first very obtuse, the second more tooth-like, but not large. Ocelli nearly in a straight line across the vertex, the cephalic one within and at the apex of the short scrobicular cavity. Parapsidal furrows complete, with deep punctures. Scutellum normal, terminating in a short plate whose distal margin is entire though convex. Thorax elevated convexly in places, but the convexities obtuse. A rather large, tooth-like plate from the lateral aspect of the thorax some distance beneath the axilla. Thorax with large, irregular reticulations or narrow carinate lines, but not punctate excepting the large punctures in sutures. Abdomen with a distinct petiole, which is moderate in length, depressed, diamond-shaped from dorsal aspect, opaque. Proximal tarsal joints of all the legs long and slender. Venation obscure, the stigmal and postmarginal veins short, much shorter than the marginal, the stigmal the longer of the two, curved or bent like a boomerang. Wings hyaline, all ciliation nearly absent; a trace of marginal cilia disto-caudad. From lateral aspect, scutellum appearing as if terminating in a short, acute tooth.

Male.—Not known.

Type: The following species (*purpurea*).

1. *Epimetagea purpurea*, new species.

Female.—Length, 3.5 mm.

Metallic purple, the abdomen with metallic green reflections; knees, tibiae, tarsi (except distal dark part of distal joint) and the antennae, brown, the latter suffused with purplish distad. Venation nearly invisible, but the stigmal vein brownish. Head impunctate, but with very fine circular striae; lateral ocelli very distant from the eye margins; scrobicular cavity with its lateral margins noncarinate; a tubercle at latero-cephalic aspect of pronotum. Scutellum between and behind the axillae (at the meson) sunken. Abdominal petiole longitudinally striate. Cephalic part of thorax dorsad (cephalad of the middle of the scutum) coarsely reticulate, as is also much of the scutellum. Base of propodeum with deep, transverse foveae.

(From three specimens, the same magnification.)

Male.—Not known.

Described from three female specimens kindly given to me by Mr. F. P. Dodd, mounted together on a card labelled "From ant pupae. Townsville, July 1902."

Habitat: Australia—Townsville, Queensland.

Types: No. *Hy 1195*, Queensland Museum, the above specimens (two more or less mutilated) on a single card, plus a slide of xylol-balsam bearing female head and antennae.

Family Cleonymidae.

Chalcedectinae.

Calosetroides, new genus.

Female.—Allied to *Amotura* Cameron, but the front femora are swollen, compressed and excised beneath at apex, the posterior femora unarmed beneath. Legs unarmed otherwise; cephalic tibiae somewhat compressed; caudal coxa compressed, flat interiorly, the caudal femur enlarged but unarmed; caudal tibiae with two unequal spurs, both rather large. Tarsi five-jointed. Antennae inserted distinctly below the ventral ends of the eyes; very near the clypeus, the scape obclavate and long, the flagellum 9-jointed, no ring-joint. Scrobicular cavity long, but not including the cephalic ocellus, the lateral ocelli separated from the eye margin, the three

in a small triangle in the center of the vertex; eyes somewhat convergent above, long-ovate, naked. Bulbs separated by a long, acutely triangular raised area in the scrobicular cavity. Genæ long, genal suture distinct. Pronotum incised at meson. Parapsidal furrows complete, the axillæ rather widely separated. Scutellum simple, its caudal margin carinate and preceded by a line of deep punctures separated by narrow, short carinæ. Propodeum with a short, solid acutely margined median carina, which is V-shaped and margined on each side by a broad sulcus; the spiracle cephalad, large, elliptical. Abdomen sessile, the ovipositor not exerted, the abdomen not any longer than the head and thorax combined, flat above, acutely conic-ovate, its second segment smooth, forming nearly half of the surface. Wings infuscated; marginal vein long, only slightly shorter than the submarginal, the stigmal and postmarginal veins also long, the former curved, only half the length of the postmarginal, which is three-fourths the length of the marginal. Metallic, large.

Male.—Not known.

Type: The species *australica*, described forthwith.

1. *Caloseteroides australica*, new species.

Female.—Length, 5.65 mm.

Metallic purplish with aeneous tinges, the face metallic green; legs reddish brown, the coxæ, the posterior femora (exteriorly only) concolorous, the intermediate tibiæ promixad and exteriorly and the cephalic tibiæ exteriorly or along the outer margin, black. Wings with a distinct, large embrowned subsagittate cloud in its middle, longitudinally, the area appearing as if hung by one of the lateral angles from the apex of the stigmal vein; also there is an elliptical spot suspended from the apex of the submarginal vein. Antennæ black, the scape concolorous. Head and thorax granularly punctate.

Male.—Not known.

Described from a pinned female received from the Acting Government Entomologist of Victoria, labelled "Millbrook, Victoria."

Habitat: Australia—Victoria (Millbrook).

Type: No. *Hy 1196*, Queensland Museum, Brisbane, the above specimen, plus a slide, bearing fore wing, the legs and antenna.

SOME FOSSIL INSECTS FROM FLORISSANT, COLORADO.

BY T. D. A. COCKERELL, UNIVERSITY OF COLORADO, BOULDER, COL.

The insects now described have a very modern aspect. The anal cell of *Venallites*, taken by itself, may be thought of as primitive, but the fly is otherwise a specialized type. Certainly there has been little advance in insect evolution since the Miocene, but many genera have become extinct.

HOMOPTERA

Echinaphis new genus (Aphididæ)

Stout, with long antennæ; the two basal joints short as usual; the first somewhat gibbous at apex on inner side; front broad; abdomen with six longitudinal rows (the outer was lateral) of about six very strong black spines; the apex of abdomen, which is broad, with a transverse (marginal) row of six still larger and stronger spines; cornicles not evident, probably small; hind wing of rather coriaceous texture, the venation essentially as in *Chaitophorus*. Anterior wings not preserved in type.

Echinaphis rohweri, n. sp.

Length, 3 mm.; width of abdomen, 1.75 mm.; length of hind wing a little over 2 mm.; dark colored, with the anterior legs clear ferruginous; wings reddish; front and sides of thorax without hairs. The following measurements are in microns: Width of front between eyes 320; length of first antennal joint 128; of second 80; antenna, from base of third joint to apex, 1665; length of a dorsal spine about 160; of a caudal one about 270; distance between the wing-veins (Cu and M.) at base (separation from Rs) about 112. The veins are nearer together at base, and less parallel than in *Chaitophorus populicola*.



FIG. 9
Echinaphis rohweri. Ckll.

Miocene shales of Florissant, Station 13 (*S. A. Rohwer*).

This singular species is quite unlike any of the fossil Aphids previously described from Florissant. In the development of spines, it has a certain resemblance to the living *Chaitophorus spinosus* Oestl., found on oak in Minnesota. *Sipha glyceriæ* (Koch), which is also spiny, has much shorter antennæ. Close to

the type of *Echinaphis rohweri* is an elongated, minutely reticulated object 690 microns long, shaped like the egg of *Aedes grossbecki*, but broader, with the reticulations considerably more minute and rather transverse than longitudinal, in the manner of *Aedes colopus*. It is, I think, a mosquito egg, and is the first fossil from Florissant I have been able to refer to the Culicidæ.

DIPTERA.

Asilus peritulus Cockerell.

Two wings from Station 14 (Geo. N. Rohwer).

Verrallites, new genus (Bombyliidæ).

A genus of slender-bodied Bombyliidæ, with clavate but not much elongated abdomen, characterized especially by the anal cell being very widely open, its width on margin in the typical species 720 microns, which is a slight fraction more than the width of the third position cell on the margin. Head and thorax apparently bare; abdomen sparsely minutely hairy; costa minutely bristly; auxiliary vein longitudinal, reaching costa near (apparently a little before) middle of wing (practically as in *Lordotus*); marginal cell long and narrow, its lower side gently concave, its apex broadly rounded, the second vein turned basad before reaching the costa (the cell practically as in *Lomatia lateralis*, except that the outer angle with costa is more acute in the fossil); two submarginal cells the second elongate, widened apically (about as in *Phthiria pulicaria* except that the upper nervure curves upwards apically, more as in *Geron*); four posterior cells, the first nearly parallel-sided throughout (in the manner of *Phthiria*), the others widely open, the third very broadly open (much as in *Ploas virescens*, only much longer); fourth posterior narrowed basally and extremely widely open apically (*Phthiria*-style, only more elongated); anterior cross-vein far beyond middle of discal cell, beyond the beginning of its last third.

Verrallites cladurus, n. sp.

Length, about 7 mm., with the abdomen gently curved; abdomen with a depth of 2 mm. near apex; wings 5.75 mm. long. Head and thorax probably black in life; abdomen apparently brown, the sutures broadly colourless; wings clear hyaline.

Miocene shales of Florissant, Colorado, Station 13 B (Univ. of Colorado Exped.)

This remarkable genus is dedicated to G. H. Verrall, whose writings are invaluable to students of fossil Diptera, although he studied only living forms. In Williston's table (N. Am. Diptera, 3rd. Edit.) it runs to 29, and the wings, except for the anal cell, show a rather close general resemblance to those of *Lepidophora*. In *Legnotomyia* the anal cell is as widely open on the wing margin as the third posterior, but these cells are not nearly as wide as in *Verrallites*; the discal cell in *Legnotomyia* is also much shorter than in the fossil, and there are other important differences. From all the genera of fossil Bombyliidæ from Florissant, *Venallites* is easily known by the form of the anal cell.

We are still without a single Tachinid or Muscid s. str. from the Florissant shales. *Glossina* alone (two species) represents the whole series of Calyptrate Muscoids. In Coleoptera, we are still without a Histerid or Cicindelid. A *Cypris* is, so far, the sole representative of the Crustacea. The total number of species described is now so great that these blanks become significant. In the Neuropteroid series we have plenty of Ephemeroidea and Termitidae; numerous Raphidiids, Chrysopids and Hemerobiids; a Nemopterid and an Embiid; but as yet not a single Perlid. The Panorpids are represented by three species. We have no less than five species of the Dipterous family Nemeletridæ, now so rare in this country. The quite numerous Bombyliidæ, as well as the very numerous Aphididæ, all belong to extinct genera; but the Phoridae, Syrphidæ, Therevidæ, Leptidæ, etc., are referable to genera still living.

HYMENOPTERA.

Alysia ruskii, n. sp.

♀—Robust, length almost 5 mm.; anterior wings broad, broadly rounded at apex, nearly 4 mm. long; expanse about 9 mm.; head and thorax black; base of abdomen (apparently two segments) clear ferruginous, the rest black or dark brown; antennæ nearly 3 mm. long, dark, thick, the joints just before the end about as broad as long, with a diameter of about 110 microns; legs ferruginous, the hind femora incrassate, suffused with dark brown, the base broadly and apex more narrowly pallid; hind tibial spur long and sharp; head and thorax apparently closely but shallowly punctured;

parapsidal grooves of mesothorax distinct, entire; width of abdomen nearly $1\frac{1}{2}$ mm.; wings hyaline, slightly dusky because minutely hairy all over, the hairs dark; nervures ferruginous, very distinct; costa not bristly; stigma large, about 720 microns long and 320 deep; a linear, hardly noticeable, costal cell; basal nervure leaving costa very obliquely near base of stigma, its lower part very strongly arched, its lower end only about 320 microns in a straight line from subcosta; marginal cell subtriangular, sharply pointed, about 930 microns long, its lower side beyond the submarginal cells faintly concave (bulging inward); first s.m. diamond-shaped except for the large part cut off by the stigma, its basal end only a short distance down nasal nervure; first section of radial or marginal nervure having stigma beyond middle, nearly at right angles; second section nearly obsolete, but marked by the bend in the nervure; second t.c. wholly obsolete, but marked at each end by an angle in the nervure where it should arise; recurrent nervure exactly meeting first t.c.; lower end of b.n. basad of t.m. a distance equal to rather more than half of latter; t.m. very oblique; second discoidal complete.

Florissant, in the Miocene shales (*Willard Rusk*). Type U. of Colorado Museum, 4903. Easily known from the two species described by Brues from the Florissant shales by the obsolete second t.c. Except for this the venation is nearly as in *A. petrina* Brues, except that the first section of radius is about as long as second, the marginal cell is narrower apically, the b.n. is strongly bent (straight in *petrina*), and the second s.m. has its apical corner more produced. The linear costal cell is not different from that seen in other forms in which this cell is described as "absent," because it is not readily seen without a microscope. According to Ashmead's tables, the absence of the second t.c. would throw it in *Dacnusinae*; but, as Marshall observes, in true *Dacnusinae* the radius beyond the first section presents an unbroken curve, without any angle where the second t.c. should be inserted. In the meeting of the a.n. and first t.c., *A. ruskii* resembles *Alysia* (*Goniarcha*) *atra* Hal., but that species has the first s.m. with a broad side on b.n. In the shape of the first discoidal cell, the fossil is suggestive of *Dacnusa* (*Phænolexis*) *petiolata* Nees.

Alysia ruskaa should perhaps form a new genus near *Alysia*, but it seems better to leave it in *Alysia* sens. latiss.

Heriades saxosus, n. sp.

♂—Length about $7\frac{1}{4}$ mm., in a rather contracted state, the abdomen strongly convex dorsally in profile; head and thorax dark brown, probably black in life; abdomen lighter and redder; wings hyaline, very faintly dusky; anterior wings 4 mm. long; venation as in *H. sauteri* from Formosa, except that lower section of basal nervure is more arched, the marginal cell is considerably longer and more pointed, and the bend in the second t.c. is less distinct. As in *H. sauteri*, the second a.n. squarely meets the second t.c. The following measurements are in microns: Length of marginal cell 1152; depth of marginal cell 304; greatest (diagonal) length of first s.m. 768; second s.m. on marginal, 240; lower side of second s.m. 544; second s.m. on first discoidal 80; greatest (diagonal) length of first discoidal about 976. The basal nervure practically meets the transversomedial, which, as usual in Heriadines, is oblique, the lower end most basad.

Florissant, Colorado, in the Miocene shales; Station 14 (*W. P. Cockerell*.)

Among the fossil bees hitherto found at Florissant, this comes nearest to *Heriades laminarum* Ckll., but is smaller, with the second r.n. meeting second t.c., and the b.n. hardly falling short of the t.m. The apex of the marginal cell is pointed, if rather obtusely, not rounded. The first r.n. joins the second s.m. at a distance from its base equal to a little over a third of the length of the first t.c., the latter being about 224 microns long. The stigma is well developed.

CONCERNING THE REPUTED DISASTROUS OCCURRENCE OF *VANESSA CALIFORNICA* IN OREGON AND CALIFORNIA

BY J. MCDUNNOUGH, DECATUR, ILL.

In the April number of the CANADIAN ENTOMOLOGIST, Prof. F. M. Webster of the Bureau of Entomology, Washington, D. C., recounts several instances of devastation of crops and foliage which he attributes to the larvæ of *Vanessa californica*. A careful study of the various letters quoted convinces us that in all but the last

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instance the author is in error in determining the larvæ as belonging to this species.

In the Proceedings of the California Academy of Science, June 7th, 1875, Hy. Edwards gave a detailed account of the larva of *Californica*, citing the food plant as *Ceanothus*; according to this account the larva is jet black, *strongly spined* (a characteristic of all *Vanessa* larvæ) with five branched spines on each segment, the middle spine being bright-yellow at the base; at the bases of the spines are bright, steel-blue tubercles and between them numerous circular, whitish-yellow dots, giving the appearance of a yellow dorsal line. It is a well-known fact that the larvæ of the various *Vanessa* species are restricted to one or two food plants and it would be a most extraordinary proceeding if a Vanessid larva, normally restricted to *Ceanothus* as a food plant, should suddenly be found devastating alfalfa and garden truck.

Taking the various reports in order, we note from that of Mr. T. V. Hall of Lakeview, Oregon, that the "worm" which had destroyed the alfalfa crop was brownish colour, with *sleek* appearing surface. This description could hardly, even by the most ignorant, be drawn up from the jet black, heavily spined Vanessid larva; it could, however, easily apply to any one of the "cut-worm" species.

The next letter, from Mr. A. J. Swift of the the same locality, reports the occurrence of vast swarms of *californica* a month after the crops had been ravaged by a "worm" varying from bright green to nearly black, according to its food supply. There is nothing, except the imagination of the writer and the appearance of the butterfly at a later date than the larvæ, to connect the two. The swarms of the butterfly, which doubtless was *californica*, may be accounted for either as due to imaginary instincts or to the fact that the larvæ had actually bred in numbers on *Ceanothus* in the high valleys, a feature which would naturally not be observed by farmers, who are principally interested in their crops.

In the report from Mr. J. J. Monroe of Willow Ranch, California, we note one feature that would absolutely preclude the determination of the destructive larvæ as *californica*, i. e., the fact that they burrowed in the ground during the day, feeding by night. This is characteristic of "cut-worms" but unknown in Vanessid

larvæ, which remain on their food plants continually, usually feeding gregariously by day.

Mr. Webb's report from Waldo, Oregon, actually does deal with *californica*. He cites the larvæ as completely stripping the foliage off grease-wood and mountain lilac. We do not know just what is meant by this latter plant, but believe that *Ceanothus* is often locally called grease-wood. From this report it would seem that there is some danger, when vast numbers of the larvæ are present, of fruit trees being attacked, but it is apparent that only when the natural food supply is exhausted would this occur. We note that it is distinctly stated that "they seemed to care for nothing to speak of but grease-wood and lilac", and the fact that "tons" of them perished on water and land in their vain search for a further food supply only goes to support our previous statement that *californica* is very restricted in its choice for food plants and the idea of its being held responsible for damage to alfalfa and other crops may be banished as so improbable as to be almost ridiculous.

ANNUAL MEETING OF MONTREAL BRANCH

The fortieth annual meeting of the Montreal Branch of the Entomological Society of Ontario was held at the residence of Mr. Henry H. Lyman on Saturday evening, May 17th. Mr. G. A. Southee, President, occupied the chair, seven members being present.

After the reading of the minutes and election of Mr. G. M. Henderson as a member the reports of the council and of the treasurer were read and adopted. The president delivered his annual address dealing with the good work accomplished by members of the branch in spite of the exceptionally unfavourable weather conditions, several new species and varieties of moths having been discovered as well as some rare captures, notably *Hepialus auratus*, the second Canadian specimen.

The election of officers resulted as follows: President, A. F. Winn; Vice-President and Librarian, G. Chagnon; Secretary, Geo. A. Moore; Treasurer and Curator, Henry H. Lyman; Members of Council, G. A. Southee, E. C. Barwick, G. H. Clayson.

GEO. A. MOORE, SEC., 850 St. Hubert Street.

FURTHER NOTES ON ALBERTA LEPIDOPTERA.

BY F. H. WOLLEY DOD, MIDNAPORE, ALTA.

(Continued from page 192.)

403. *A. excelsa* Ottol.—I have no local captures in my collection, but several from Banff, July 30th–August 19th (Sanson). Under the description Dr. Ottolengui mentions having three specimens from Laggan, and claims to have seen many more from there. I have one from Field, B.C., and a few from Kaslo. My series are all much alike, and one or two agree concisely with Ottolengui's figure. I have *angulidens* from Colorado, and, though closely allied, I believe they are distinct. The difference was pointed out by Ottolengui. I would say, in addition, that whilst in *angulidens* the outer stroke of the U portion of the sign is evenly out-curved, the outer stroke of the V in *excelsa* is either direct or in-curved for the lower two-thirds of its length. In both it has generally a slight inward hook at the tip. *Vaccinii* appears to be another very close ally. There was a series of that in the Washington collection from the White Mountains, N.H., in which the sign seemed to me very variable. Also associated with them, justly as far as I could judge, was an unset Kaslo specimen, recorded by the name in the Kaslo list. I have suspicions that this specimen was really *excelsa*.

I have what I feel sure is another slightly larger closely allied species from Kaslo and Nelson, B.C., which was recorded in the Kaslo list as "*u-aureum* Guen." but which was sent me subsequently by Mr. Cockle as "*u-aureum* of the Kaslo list, but *excelsa* by Dr. Barnes, compared with Ottolengui's naming." I feel sure that *excelsa* is wrong for this form, and I am by no means satisfied that it is *u-aureum*. Compared with both *excelsa* and *angulidens*, it has a wider open sign; in fact, more rectangular than V or U-shaped. I may call it a more *octoscripta*-like sign, more resembling that of *arctica* than of any other of Ottolengui's figures. The outer spot is in every specimen larger than in *excelsa*, and sometimes hollow—that is to say, dark filled centrally, and more often touches the outer line of the larger sign at varying points. It is a slightly larger species, but as regards the rest of the maculation and color of the primaries, there is really very little difference. The secondaries differ, however. In *excelsa* the secondaries may be described as dull fuscous, with a broad but ill-defined yellowish

white median band. The outer fuscous border is rather narrow, and the pale median band is fuscous suffused. My specimens of *excelsa* all agree exactly with Ottolengui's figure in this respect. In the other species the secondaries are better described as yellowish white, slightly fuscous at the base, and with a broad fuscous outer band, occupying the outer third of the wing. The central portion of the wing is thus much dirtier in *excelsa*, but the outer border narrower. On the underside *excelsa* is more suffused with gray and fuscous than the unknown species. The discal spot on secondaries beneath in *excelsa* is scarcely more than a point. In the unknown species it is obviously V-shaped. In both species spines are usually, but apparently not always, present on the hind tibiae.

If the Kaslo specimens formerly recorded as *u-aureum* were subsequently named *excelsa* after a comparison with a co-type of that from Jefferson, New Hampshire, which my notes tell me I saw in the Washington collection, then it is possible that the co-type in question is not *excelsa*. Of course, Dr. Ottolengui may have mixed these two species in his description, but I am taking it for granted that his figure represents the type.

The Kaslo and Nelson specimens in question have a most remarkable resemblance to Mr South's most excellent photo-lithograph figures of *interrogationis* Lin., Pl. 26, figs. 4,5, of his "Moths of the British Isles," Series ii., though I appear to have overlooked the resemblance in the British Museum, if, indeed, I noticed the Linnean species at all. I had a Nelson specimen with me, and it did not satisfy me as agreeing with the *u-aureum* of that collection. I noticed several similar B.C. specimens there however, standing under more than one name. It differs most obviously from what I have listed as *octoscripta*, which it sometimes nearly resembles in the sign, by a totally different arrangement of color, the less crenate t.p. line, and the absence of blackish dashes both before and after the s.t. line.

I have seen specimens of it standing under *celsa*, described, I believe, from Oregon, and have two from Duncans, Vancouver Island, which appear to be the same species, though slightly larger and with sharper contrasts, one of which agrees with Ottolengui's figure of *celsa* in every detail except the sign. In this

one specimen, as in the figure, the inner part of the sign is V-shaped. Mine has, instead of a tail, a large round outer dot touching the lower angle of the V. The fact that one of my eight specimens has an almost V-shaped sign, and the rest have it nearer rectangular, does not indicate greater variation than exists in *californica* and other species in my collection. On the strength of this Duncans specimen, which I may remark bears some resemblance to a small *viridisignata*, it seems not unlikely that *celsa* may turn out to be at least one of the correct names for my Kaslo and Nelson species. I quite expect ultimately to find at least a close relationship to *interrogationis*.

As regards the great variation known to exist in the signs of some species of this genus, the late Mr. Tutt's remarks concerning *interrogationis* in the British Isles are interesting. "The great character in this species is the endless variation which the central silvery marks or characters undergo. Truly no two are alike, and to look down a long series at this mark, is something like looking at a series of Chinese characters. Some are like the normal mark in *iota* and *pulchrina*, composed of a V and a dot; others have them united as in *gamma*; others again are like the Greek ϵ ; one forms a tiny solid blotch as in *bractea*, and so on." (British Noctuae and their Varieties, IV. 36, 1892.)

As to *u-aureum*, which Ottolengui claimed was not a North American species at all, and further remarked that the description associated it with *interrogationis* (Journ. N.Y. Ent. Soc. X. 69, June 1902), it may be observed that the only localities given for it in Staudinger's Catalogue are Greenland, Labrador, and North America. He also places "*Interrogationis* var. *grænlandica* Staud." as a synonym. The types of *u-aureum* are probably in Mr. Oberthur's collection at Rennes, which by an unfortunate chance I just missed seeing in March 1912. Under the name in the British Museum were three specimens supposed to be North American. One had label "United States" at side. Sir George Hampson wrote me concerning the species: "Our specimens are from the Grote collection without exact locality. It is considered that the types really came from Labrador, and not from Dalecarlia, Sweden, as described." Concerning the Grote collection specimens, during my first visit to the British Museum early in 1909, I wrote,

"I can't distinguish them from *vaccinii*," of which there was a ♀ from Mt. Washington. About this specimen I wrote: "Darker than the *u-aureum* series, but seems to me exactly like it." My sketch of the sign of the three specimens shows that it was exactly like some in my unknown species, which I call "*u-aureum* of the Koc-tenai list." But in February, 1912, I compared a Nelson, B.C., specimen with them and do not seem to have found that they matched it. This time my notes read: "The *u-aureum* of this collection is not improbably *zeta* Ottol., judging by the figure of the type of that, though the t.a. (in *u-aureum*) seems less even, and in none does the outer spot join top of sign. Secondaries are alike exactly, but basal area of primaries seems paler in *zeta*." The description of the latter was made from a single ♀ from "North West Territory" and came from Mr. Jacob Doll's collection. I have nothing to match it exactly, but it appears to be of this group.

406. *A. falcifera* Kirby—Dr. Ottolengui's remarks on this species appear correct. Kirby described the grey form from Nova Scotia, and *simplex*, of which the type is a female in the British Museum, from Trenton Falls, N.Y., is a very dark brown specimen. I have tried hard to recognize two species in these forms, noticing that most *falcifera* seemed to have a smaller and more slender sign. This difference is not constant, however, and I must admit that I can discover no other means whatsoever of separating them except by color, in which they grade easily through.

It seems hard to believe that *simplicima* Ottol., described from a single female from the State of Washington, is anything more than an unusually small *simplex*, with a sharp-pointed sign. His remark that the sign is "always knobbed in *falcifera* and *simplex*" is not correct. I have a Calgary *falcifera* in which it is sharp, though not quite as sharp as in the right wing of his figure of *simplicima*.

407. *A. orophila* Hamps.—Sir George Hampson, in CAN. ENT. XL. 105, March 1908, thus named the Rocky Mountain form previously passing as *diasema*. The description was made from six males and a female from Brobokton Creek, Alberta Rockies, and one male from Early Winter Creek, Washington Forest Reserve, all taken by Mr. Nicholl. The type is a male from the former locality, and is marked as taken at 5,500 feet, on July 10th, 1907.

Its describer remarks: "*Diasema* Bdv., which is found in N. Europe and Asia, and in America from Greenland to Labrador, has the head, thorax and fore wing much more strongly tinged with red-brown, the last with the antemedial line excurved below the cell, the stigma more V-shaped, with a slight tail or point beyond its lower extremity; the hind wing with the terminal area, reddish-brown."

On my first visit to the British Museum, in January 1909, I found two Hudson Bay specimens and three others—one marked Lapland, standing under *diasema*. From notes I took on them I concluded on my return home that the Banff specimen I had recorded under the name was correct. Three years later I actually compared this specimen with the *diasema* series, and concluded that it fitted *orophila* better, and that, moreover, I had never seen true *diasema* from the Canadian Rockies at all. My series at present consists of a male and four females from Brobokton Creek, August 13th, 1907 (Mrs. Nicholl), Banff, August 13th, 1900, and August 1st, 1910 (Mr. N. B. Sanson and the author), and a pair from Kaslo, B.C. (Cockle), the female dated September 10th, 1907. I have also seen a Banff male from Mr. Sanson, dated September 1st, 1909, as well as more Kootenai specimens in Mr. Cockle's collection. The course of the t.a. line varies somewhat, and so does the size and shape of the sign. Both strokes of the latter vary considerably in their course, as well as in the amount of grey space which they define. The lower stroke may be almost direct, or slightly curved, or even almost obtusely angled at about its middle. The inner one may bend outwardly or inwardly, or both ways, and may so connect with the outer as to form either an even curve, an obtuse or a right angle, or a decided tail or point. Any specimens, however, which may have been named *diasema* by me have been so named erroneously.

409. The species referred to under this heading is not *snowi* nor does it bear any close resemblance thereto. It is *microgramma* Hbn., a European species not previously recorded from North America. I have compared a local specimen with a series in the British Museum. I referred to this in 40th Rep. Ent. Soc. Ont.,

p. 118, 1909. I have only two poor specimens left in my collection. On several occasions I have made special trips to the locality at about the time for its appearance, but have not been fortunate enough to meet with the species again. It is the size of *alticola* and *devergens*, in color and maculation not unlike *orophila*, except as to the sign, which much resembles that of *californica*. It is very distinct from anything else North American.

410. *Syngrapha alticola* Walk.—Walker's type from the Canadian Rockies (Lord Derby) is in the British Museum, and my specimens agree with it. They are labelled Laggan, July 17th, 1904, and Wilcox Pass, Rockies, Alta., July 26th to Aug. 13th, 1907, Mrs. Nicholl. It flies at low altitudes (5,000 ft.), but I do not know how high it goes. Sir George Hampson, in CAN. ENT. XL. 106, March, 1908, records more of Mrs. Nicholl's captures on Mt. Assiniboine, Brobokton and Brazeau Creeks, Alta., and Kicking Horse Pass, B.C., and states that the species is quite distinct from European *devergens* Hbn. I have two specimens of the latter from the Swiss Alps, and have examined others, and believe his statement to be correct, though they are very close allies. *Devergens* has been recorded from Labrador, but I have not the literature by which to investigate either the record or the correct spelling of the name. Holland's figure of *devergens* is *parilis*.

411. *S. ignea* Grt.—I have seen neither description nor type of this species. Smith's Catalogue states that the type should be at Philadelphia, and Grote makes the same assertion in his 1895 list. Smith's reference of *ignea* to *alticola* is after Grote, who admitted that he had never seen Walker's type, and many have mistaken his species. My *ignea* is the same as that of the British Museum from the Grote collection, and the same as Holland's figure of *hohenwarthi*, misspelt, as elsewhere, *hochenwarthi*. The latter stands as distinct in all our lists. I have specimens from Alberta, Colorado, Utah, and several European localities, and am unable to recognize two species. *Divergens* Fabr. is given as a synonym by Smith and Grote, but the name is attributed to Hübner by Staudinger. I am unable to discover whether the latter name has any connection with *devergens*.

414. *Theresea angustipennis* Grt.—I have not seen the description of this species, but Hampson figures the type, a female from Bosque County, Texas. That has fewer whitish areas than any of my series, which are nearly all from Alberta, but is evidently the same species. In common with most species in this and allied genera, the males have usually much more white than the females. Some of my females have the olive brown shading on the costa from the base to the t.a. line, and in one it continues with scarcely a break to the t.p. In some the costa is almost clear except for three or four patches, some or all of which usually join the extensive brown region below the median vein. In males, the costa is on the average much cleaner, and the patches are much reduced, sometimes almost entirely lacking. Their position is sometimes indicated by distinct yellowish shades, which may extend faintly all along the costal area. Specimens with the yellow shades are var. *flavicosta* Smith, which was described as a species from five males and two females from Hot Springs, New Mexico; Colorado, and Montana. I have compared one of my specimens with all, or nearly all, the type material. A male type from Colorado in the Washington collection has the costa clear nearly to the apex, with very little yellow, indeed. The variation appears to be more common in the male sex. The species is by no means rare on the Alberta Prairies.

415-416. The specimens formerly referred to by me under these two headings appear to be all one species, *tortricina* Zeller, by the British Museum collection, which Hampson places in his genus *Tarachidia*. The typical form appears to be ochre yellow, which is my No. 416. Hampson mentions three varieties as aberrations. "Ab. 1., with the markings almost obsolete," is *obsoleta* Grt., though Grote's type, from Illinois, happens to be itself obsolete, all except the left hind wing. "Ab. 2, *modesta*, grey brown, slightly suffused with yellowish white." This form occurs here, and is one described by Henry Edwards. "Ab. 3, *deleta*, dark brown, suffused with olive yellow scales, leaving the termen and cilia dark, almost without markings." I seem to have this form from here also, and it was likewise described by Henry Edwards. *Inorata* Grt. stands as a synonym. I have a series of eight specimens, taken on Pine Creek and on the Red Deer River prairie.

One is creamy whitish, as mentioned in my former notes. The series shows a gradation through.

Fasciatella Grt. is entirely distinct, and I have no authentic Canadian record. Hampson places it by itself in *Fruva* Grt. I have an Arizona specimen compared with the type in the British Museum, from Texas.

417. *Drasteria erectea* Cram.—The species I have listed under this name is apparently that of which Holland figures both sexes on Pl. XXX., figs. 14 and 15, the latter figure as *crassiuscula*. Of local captures I have at present twenty-five males and three females.

418. *D. crassiuscula* Haw.—I have taken no more females than the one I previously referred to. Males, of course, I am uncertain about.

419. *D. distincta* Neum.—Under this heading in my previous notes, Vol. XXXVIII., p. 47, line 8 of the note, instead of "for these species," read "for three species." It was a printer's error, and the correction is an important one, as the point I wished to emphasize was not that I had gone to the trouble of verifying the names, as far as that was possible, but that I was under the impression that I had taken three allied species in Alberta. I have recently spent some hours studying the group again with the aid of material from other localities, and have found no reason to alter my opinion. Separation into three species in Alberta is quite easy, excepting, of course, with males of *erectea* and *crassiuscula*, but I have much difficulty in coming to a decision about some outside material. For instance, I have males from the eastern coast which are superficially inseparable from my local males of *distincta*, but no females at all like mine, which differ very little from the males. From Vancouver Island I have females of *crassiuscula* and *erectea* and a series of thirteen good males, which probably includes both. Another species from there is about the size of Alberta *distincta*, but shows very much stronger sexual dimorphism. The males are like dark and ochreous *distincta*, but the females are not unlike very small *crassiuscula*, though the subapical black marks are usually lacking. It seems not unlikely that we have a fourth

species in this group excluding *cærulea* and *conspicua*. Slingerland gives us to understand that there are some very marked differences in the male genitalia. Careful examination of numbers of these might give enlightenment, and, in addition to breeding, the forms require to be studied almost by the hundreds from various localities.

420. *D. annexa* Hy. Edw., syn *conspicua* Smith.—Edwards' type is a male in the British Museum, labelled "West U.S.A., Walsingham," and is the *conspicua* of Smith. It appears to agree structurally with *distincta*, and has all the tibiæ spined. It differs in several points of structure from *cuspidata*. My series has been reduced to two pairs, and I have no recent captures, though I occasionally notice it in the spring. I have seen it from Similkameen River in the collection of Mr. E. M. Skinner, of Duncans, B.C., and there is a specimen in the British Museum, taken by Mrs Nicholl in the Upper Kere-meos. Both of these localities are in Southern British Columbia, near the border of Washington. It occurs at Banff.

421. *Euclidia cuspidata* Hbn.—I have a specimen from Edmonton, taken by Mr. F. S. Carr.

422. *Syneda hudsonica* G. & R.—The species is not *limbolaris*, which is correctly figured by Holland. No. 422 stands correctly named in the Neumægen and Henry Edwards collections. It was described from the Hudson Bay Territory. I have not seen any type, but both sexes are figured with the description, and appear to be this species. This is not the form figured by Holland as *hudsonica*, which is referred to under No. 424. The female is quite unlike the male, having the primaries much more evenly grey, sometimes quite a blue-grey, with the maculation blurred, indistinct. In this respect it differs strikingly from No. 424, formerly listed as *hudsonica*, and in which the sexes are superficially alike. It is not uncommon on the prairie, and occurs in Manitoba, but I do not seem to have met with it here in the hills. A day flier.

(To be continued.)

Mailed July 8th, 1913.