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## POPULAR AND PRACTICAL ENTOMOLOGY.

### SOME WINTER INSECT LIFE.

BY RALPH HOPPING,

Vernon, B. C.

The cabin was a ranger station in the foothills of the Sierras, five miles from a small town called Dunlop, in Fresno County, California. In August the hillside close to the northern side of the cabin was dry, the grass was yellow, and even the brush a few rods away had a parched look. No insect life stirred in the dry, hot atmosphere. The winter rains, however, changed all this. By February everything was transformed. The hillside close to the cabin was green and numerous flowers were beginning to bloom everywhere. A great many insect holes appeared among the grass stems. These were of various shapes and sizes. The ranger, who was also an entomologist, was curious. So one Sunday, assisted by his deputy, an investigation began. Ant hills were common. The unknown possesses a lure much greater than the known. We merely noted that two species had homes on the hillside. Four other varieties of freshly-made holes invited our attention. Two were about three-eighths of an inch across with ant-like mounds around the entrance. The earth pellets, however, were of two kinds, one fine and granular, the other conglomerate, irregular masses composed of twelve to twenty grains of earth. The former proved to be a spider. Spiders are "common" to a coleopterist. We were not interested. The latter type of hole, however, produced a female *Bradycinetus horni*, Rivers. The next hole produced a male. Once we found the male and female in the same hole. In all we collected thirty-two specimens in holes of varying depths of from six to twelve inches. This is a rare species. We almost forgot the other holes, one of which was a horizontal slit in the hillside about three-eighths of an inch high and one and a fourth to one and a half inches in length. On the lower edge extended the "dump" of fine particles of earth, much like that at the mouth of a mining tunnel. These slits were not few. They existed in hundreds. Exploring the mountainside in all directions gave the same result. They were everywhere. The burrows extended horizontally an inch or two, and then perpendicularly for about eight inches. We explored half a dozen and each gave up a nice, fat blue-black scorpion. Thousands in our dooryard and we had lived there two years and had not seen them! We still had one other variety of hole. This was larger than any we had explored, about an inch across. One to one and a half inches below the surface the hole was plugged with earth. This plug was one to two inches thick. Below was an opening, a hole somewhat larger in diameter than the portion above the plug. We followed the hole down twenty-eight inches and found a round, fat, female *Pleocoma fimbriata*, Lec. She was reddish in colour, shiny, and lay on her back feebly waving her legs. That day we dug twenty-four from a varying

depth of eighteen to thirty inches. Always these holes were in the red soil. Suddenly I realized why I found so many holes in this red soil dug by foxes: "Mrs. Pleocomma" undoubtedly made a fine part of "Mr. Fox's" meal.

Many times I had caught the males of this species, a black, shiny beetle about one-half the size of the female, flying in the dusk during a slight drizzle. The females seldom if ever come out of the ground, the males only during the winter months or wet season. At such times the air was full of them, appearing like swarms of bees. But let the drizzle stop or let it actually begin to rain and, presto! they were gone. They only fly in the winter months after the first few soaking rains. This general habit of flying only in the winter and during a fine drizzle at dusk is common not only to *Pleocomma fimbriata* but to *Pleocomma behrensii*, Lec. and to *Pleocomma hoppingi* Fall, and probably to all the Pleocomas.

The underground life is all around us, but few of us know anything about it. We have eyes but we do not see.

#### ALBERTAN COLEOPTERA.

BY F. S. CARR,  
Edmonton, Alberta.

##### *Cicindela repanda edmontonensis*, new variety.

Type to be deposited in the National Collection at Ottawa, labeled Edmonton, Alta. 21-VIII-19; F. S. Carr, collector; female.

Length 12.75 mm. The colour is dark brown with narrow elytral markings; the humeral and apical lunules are widely separated from the side margin, the dot of the oblique line being broken off that line. The humeral angles of the thorax are cupreous and the sulci blue, the blue fading out where the sulci join the median line. The under surface of the thorax is bright cupreous and of the abdomen shining green, the under surface being covered with long white pubescence.

The head is much narrower than the thorax, coarsely strigose, and with the front sparsely hairy. The elytra are punctate, each puncture having a shining granule.

This variety is another in that complex centering about *repanda* Dej., a complex characterized by a development of colour pattern along two directions. In one the elytral markings become heavier and more crowded, producing *bucolica* Csy. and *unijuncta* Csy.; in the other the markings become fainter, producing *edmontonensis* Carr and *hudsonica* Csy. All five varieties have been taken on the banks of the Saskatchewan River at Edmonton, *bucolica* and *unijuncta* being the most abundant.

##### *Diplochila undulata*, new species.

Type to be deposited in the National Collection at Ottawa, labeled 10-V-19, Edmonton, Alta.; collected by F. S. Carr; male.

The head is black, the palpi and antennæ piceous, the palpi being testaceous at the ends. The thorax is much wider than long, wider at the base than at the apex, widest at the anterior third. The posterior angles are obtuse, the basal impressions single, deep, linear, the median impression defined medially but obsolete anteriorly and posteriorly. The thorax is smooth. The elytra

are the same width at the base as the thorax, then widen out to the anterior sixth, then run parallel to the posterior fourth, from which the sides curve to the suture, the apex being sinuate. The intervals are interrupted by shallow transverse wrinkles most deeply incised where the intervals dip to the striae; the striae possess traces of punctures at rare intervals; the seventh stria is almost obsolete.

Length 13 mm.

This species is described from a series of six specimens all taken at Edmonton. The writer had for comparison a series of *obtusa* Lec., one from Edmonton and three from Mr. Chagnon, Montreal. From *obtusa* it is easily distinguished by its size and the appearance of the elytra, which somewhat resemble those of *Amara interstitialis* Dej.

### *Chlaenius frostii*, new species.

The type is to be deposited in the National Collection at Ottawa, labeled 11-V-18, Edmonton, Alta.; collected by F. S. Carr; male.

Length 9 mm. The colour is black beneath, slightly violaceous above, darker on the head and thorax, polished and shining. The antennae are piceous with the first joint pale, the palpi are black with the tip almost white, the terminal joint being dilated and truncate. The labial palpi are more dilated than the maxillary palpi. The head is smooth. The thorax is widest at the base gradually becoming narrower towards the apex, the base of the thorax and the elytra being the same width. The anterior angles are broadly rounded, the posterior obtuse. The impressions are double, wide, shallow and punctured coarsely, the punctures being separated by their own diameter. The median impression is defined as a narrow impressed line fading out anteriorly and posteriorly and bordered on each side by a row of punctures. The remainder of the surface is sparsely punctured with the exception of the base, which is punctured like the impressions.

The basal line of the elytra meets the lateral line at an angle. The striae are clearly impressed and punctured and are wide apart, the intervals being flat and shining. The punctures of the intervals are coarse, being about  $3\frac{1}{2}$  punctures to the greatest width of any interval, and occurring in lines arranged more or less transversely. The punctures on the first interval are at most in two rows. The scutellar stria is short and deeply impressed. The abdomen is coarsely, shallowly and sparsely punctate and sparsely pubescent with short, yellow pubescence. The prosternum is coarsely and sparsely punctate; the mesosternal episternum and the metasternum are cribrate.

The describer has given this species the name *frostii* as an indication that he appreciates the great amount of assistance given him by Mr. C. A. Frost. In connection with this species Mr. Frost kindly loaned a specimen of *purpuricollis* Rand, that had been compared with the material in the Leconte and Harris collections.

This species is most closely related to *purpuricollis*. It is most readily distinguished by the following table:

<i>frostii</i>	<i>purpuricollis</i>
elytra shining	elytra opaque from small, transverse lines.
punctures coarse	punctures small

This species is described from a series of five, all taken in the Edmonton district.

**Elleschus borealis**, new species.

The type will be deposited in the National Collection at Ottawa. It is labeled 24-V-19; Edmonton, Alta.; collected by F. S. Carr.

Length 2.8 mm. The colour is red, the eyes alone being black, and is covered with white pubescence except for a denuded area behind the middle, stretching from the second interval to the margin and back to the top of the declivity. The beak is shining, shorter than the head and thorax, punctate, the punctures being coarse and well separated; the second joint of the antennæ is longer than the third, the median line on the thorax is raised in the middle only, the pubescence diverging from it to the sides, which are rounded. It is widest at the anterior third. The elytral striæ are finely impressed and punctate with coarse punctures closely placed.

This species seems to be closely allied to *bipunctatus* Linn., but is distinguished by its colour. It has been described from a large series taken on willow.

ADDENDUM.

Mr. F. A. Sherriff has kindly sent a specimen of *Chlaenius purpuricollis* Rand. This was received since the descriptions were prepared. It agrees with the specimen loaned by Mr. Frost. This specimen was also taken in Mass.

A BIBLIOGRAPHY OF THE LITERATURE ON THE DESCRIBED  
TRANSFORMATIONS AND FOOD PLANTS OF NORTH  
AMERICA SPECIES OF AGRILUS (COL.).

BY C. A. FROST AND H. B. WEISS.

New Brunswick, N. J.

(Continued from page 210.)

**A. politus** Say.

Blatchley, Col. Ind. p. 801, 1910.

Chittenden, Bul 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Childs, Mo. Bul. Cal. Hort. Comm., Vol III, pp. 150-155, 1914.

Felt, N. Y. St. Mus. Bul. 200, p. 37, 135, 1917.

Frost, Can. Ent., Nov., p. 386, 1916.

Hamilton, Tr. Am. Ent. Soc., Vol. XXII, p. 364, 1895.

Hopkins, Bul. 32, W. Va. Agric. Exp. Sta., p. 184.

Knull, Ent. News, Vol. XXXI, p. 10, 1920.

Lugger, Psyche, Vol. IV, p. 203, 1884.

Manee, Ent. News, Vol. XXIV, pp. 167-171, 1913.

Smith, Ins. N. J., p. 295, 1909.

This species is known as the oak twig-girdler. Spiral shaped burrows are made in the soft-growing tissues of the twig, and encircle it from four to seven times (Childs). Infests green bark on living willow trees (Hopkins). Common on *Salix obtusifolia* (Hamilton). On willow (Manee) (Blanchard). On hazel (Bruner). On *Salix* and *Corylus americana* and *C. rostrata* leaves (Frost). On oak and willow (Blatchley) (Smith). Breeds in living willow and striped maple (*Acer pennsylvanicum*) (Knull). Forms galls on twigs of white thorn (*Crataegus*) (Felt).

**A. burkei** Fisher.

Fisher, Can. Ent., Vol. 49, p. 287, 1917.

Larva mines inner bark and wood of normal, injured and dying white alder (*Alnus rhombifolia*) and paper-leaf alder (*A. tenuifolia*) (Fisher).

**A. viridis** L. var. **fagi** Ratz.

Weiss, Jour. Econ. Ent., Vol. VII, p. 438, 1914.

Weiss, Ent. News, Vol. XXVII, p. 426.

The larva of this species works in the stems of roses, making a spiral band of channels and causing a swelling or gall over the infested part. Theobald states that *viridis* attacks beech, alder, birch, aspen, oak.

**A. sinuatus** Oliv.

Banks, U. S. D. A., Div. Ent., Bul. 34, n. s., 1902.

Beach, Lowe, Stewart, Bull. 170, N. Y. Agric. Exp. Sta., pp. 381-445, 1899.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Felt, Proc. 24th An. Meet. Soc. Prom. Agric. Sci., pp. 39-48, 1903.

" 31st Ann. Rept. St. Ent. N. Y., p. 78, 1915.

" Bul. 200, N. Y. St. Mus., p. 134, 1917.

Howard, Ins. Life, Vol. VII, pp. 258-260, 1894.

Lugger, Bull. 66, Minn. Agric. Exp. Sta., pp. 85-331, 1899.

Parrott & Glasgow, N. Y. Sta. Circ. 44, 1915.

Slingerland & Crosby, Man. Fr. Ins., p. 230, 1914.

Smith, Ins. Life, Vol. VII, p. 189.

" Ins. Life, Vol. VII, pp. 258-260.

" Garden & Forest, pp. 373-374, 1894.

" Garden & Forest, p. 448, 1894.

" 15th Ann. Rept. N. J. Agric. Exp. Sta., pp. 423-600, 1894.

" Amer. Agric. 26, Jan., p. 85, 1895.

" Bul. 109 N. J. Agric. Exp. Sta., 1895.

" An. Rept. N. J. Agric. Exp. Sta., pp. 365-526, 1895.

" N. J. Ent. Rept., 1900.

" N. J. Exp. Sta. Bul. 155, 1902.

" N. J. Ent. Rept., 1901.

" Ins. N. J., p. 295, 1909.

" N. J. Ent. Circ., 28.

" N. J. Bd. Agr. Rept. 37, p. 188, 1910.

Webster, Bul. 77, Ohio Agric. Exp. Sta., pp. 33-52, 1897.

Weiss, Jour. Econ. Ent., Vol. VII, p. 251, 1914.

" N. J. Dept. Agr. Circ. 24, p. 5, 1918.

This species is the sinuate pear borer. Eggs are deposited in crevices and under flakes of bark, and the resulting slender, whitish larvæ construct narrow winding burrows in the sap wood, the courses of these channels being indicated exteriorly by the discoloured and abnormal bark over them. On young trees this discoloured bark splits or raises into a welt.

**A. fallax** Say.

Blatchley, Col. Ind., p. 802, 1910.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.

Hopkins, Bul. 32, W. Va. Agric. Exp. Sta., p. 184.

Knull, Ent. News, Vol. XXXI, p. 10, 1920.

Stromberg, Can. Ent., Vol. XXVI, p. 36.

Occurs on locust and oak (Blatchley). Adults reared from dead branches of honey locust (*G. triacanthos*) (Kirk). Beaten from oak (Stromberg). Habits similar to those of *egenus* (Chittenden). Infests bark and wood of dying branches of hackberry (*Celtis occidentalis*) (Hopkins). Reared from honey locust (Fisher).

**A. crataegi** Frost.

Frost, Can. Ent., Vol. XLIV, p. 247, 1912.

Bred from dead, fallen, trunk of *Crataegus* (Fisher & Kirk). Beaten from *Crataegus* (Liljeblad).

**A. obsoletogettatus** Gory.

Blanchard, Ent. Amer., Vol. IV, p. 32 (*interruptus*).

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900 (*interruptus*).

Harrington, 27th Rept. Ent. Soc. Ont., p. 71, 1896 (*interruptus*).

Knull, Ent. News, Vol. XXXI, p. 10, 1920.

Stromberg, Can. Ent., Vol. XXVI, p. 36.

Reared from dead branches of beech (*Fagus americana*), blue beech (*Carpinus caroliniana*), ironwood (*Ostrya virginiana*), red oak (*Quercus rubra*), and hickory (Knull). Probably breeds in oak (Blanchard). On oak (Chittenden). Found on beech, birch and hickory (Harrington). On red and laurel oaks (Stromberg). On red oak leaves (Frost). On dead beech (Morris).

**A. scitulus** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Reared from huisache (Schwarz).

**A. ornatulus** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Breeds in huisache (*Acacia farnesiana*) (Schwarz).

**A. subcinctus** Gory.

Knull, Ent. News, Vol. XXXI, p. 11, 1920.

On poison ivy (*Rhus toxicodendron*) (Wenzel).

**A. abstersus** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.

Reared from twigs of *Acacia greggii* (Hubbard & Schwarz).

**A. lecontei** Saund.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Knull, Ent. News, Vol. XXXI, p. 11, 1920.

Lugger, Psyche, Vol. IV, p. 203, 1884.

Stromberg, Can. Ent., Vol. XXVI, p. 36.

Breeds in dead wood of hackberry (*Celtis occidentalis*) (Knull). On hackberry (Chittenden), (Schwarz), (Stromberg).

**A. abductus** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.

On *Quercus arizonica* (Hubbard & Schwarz).

**A. palmacollis** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Reared from twigs and branches of mesquite (*Prosopis juliflora*) and huisache (*Acacia farnesiana*) (Schwarz).

**A. felix** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.  
Reared from *Parkinsonia microphylla* (Hubbard & Schwarz).

**A. impexus** Horn.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.  
Stromberg, Can. Ent., Vol. XXVI, p. 36.  
Occurs on the two locusts *Gleditsia triacanthos* and *Robinia pseudacacia* (Stromberg).

**A. floridanus** Crotch.

Blatchley, Can. Ent., Vol. LI, p. 29, 1919.  
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.  
On *Quercus* (Schwarz). Swept from huckleberry and other low shrubs (Blatchley).

**A. addendus** Crotch.

Blatchley, Col. Ind., p. 804, 1910.  
Taken from peach trees in blossom (Blatchley).

**A. lacustris** Lec.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900 (*cuneus*).  
Bred from *Croton capitatum*; also occurs on *Croton eleagnifolium* (Schwarz).

**A. imbellis** Crotch.

Blanchard, Ent. Amer., V, p. 32, 1889.  
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.  
Occurs on *Helianthemum canadense* (Blanchard).

**A. egenus** Gory.

Blatchley, Col. Ind., p. 804, 1910.  
Chittenden, Ent. Amer., Vol. V, pp. 217-220, 1889.  
" Bull. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.  
Garman, Bien. Rept. St. For. Ky. 2, pp. 32-63, 1915.  
" Bull. 200, Ky. Agric. Exp. Sta., p. 124, 1916.  
Glover, Rept. U. S. Comm. Agric., pp. 65-91, 1870, 1871.  
Hamilton, Trans. Am. Ent. Soc., Vol. XXII, p. 364, 1895.  
Knull, Ent. News, Vol. XXXI, p. 11, 1920.  
Packard, 5th Rept. U. S. Ent. Comm., p. 291, 1890.  
" 5th Rept. U. S. Ent. Comm., p. 372, 1890.  
Smith, Ins. N. J., p. 295, 1909.

This species infests locust mining under bark and twigs of smaller branches, the beetles eating the leaves. Reared from hickory (*Ilicoria alba*) (Chittenden). Reared from *Robinia neomexicana* (Hubbard & Schwarz). On willow (Smith). Bred from Virginia creeper (Kirk). Garman states that the beetles have a singular way of chewing the edges of locust leaflets so as to give them a rough appearance, which however is so slight as to be easily overlooked. Knull states that *egenus* has been confused with *celti* in collections so that in view of this, some of the above records may apply to *celti*.

**A. celti** Knull.

Knull, Ent. News, Vol. XXXI, p. 11, 1920.  
Reared from dead branches of hackberry (*Celtis occidentalis*) (Kirk & Knull).

## NEW NEARCTIC CRANE-FLIES (TIPULIDÆ, DIPTERA). PART X.

BY CHARLES P. ALEXANDER,

State Laboratory of Natural History, Urbana, Illinois.

***Ormosia friscni*, sp. n.**

Closest to *O. meigenii* (O. S.); inner pleural appendage of the male hypopygium with a conspicuous lateral spine; all four gonapophyses of approximately equal size and shape.

*Male*.—Length 3–3.5 mm.; wing 4–4.5 mm.

*Female*.—Length 3.8–4 mm.; wing 4–4.8 mm.

Rostrum and palpi dark brown. Antennæ brownish black; flagellar segments oval, provided with a dense white pubescence and rather elongate verticils. Head yellowish grey.

Pronotum brown, the scutellum pale whitish yellow. Mesonotum uniformly brownish gray with a sparse yellowish bloom; pseudosutural foveæ conspicuously oval, black; tuberculate pits conspicuous, separated from one another by a distance a little greater than the diameter of one. Pleura light plumbeous. Halteres whitish. Legs with the coxæ plumbeous; trochanters light brown; femora brownish yellow, the tips broadly darkened; tibiae and tarsi dark brown. Wings with a strong brownish gray tinge; stigma darker brown; conspicuous whitish areas before and beyond the stigma; basal cells largely whitish; veins dark brown. Venation: cell  $M_2$  open by the atrophy of the outer deflection of  $M_1$ ; anal veins convergent.

Abdomen dark brown, including the hypopygium. Male hypopygium with the inner pleural appendage smaller than the outer, before the tip with an acute black spine set at a right angle to the appendage; outer appendage strongly curved, the tip acute. Gonapophyses four in number, black, of approximately equal size and shape, the inner pair a little more slender than the outer pair; outer apophyses with a tiny tooth at about two-thirds the length on the inner face; inner apophyses with the basal half flattened, the distal half strongly narrowed; penis-guard slender, pale in colour. Ninth sternite with a spatulate lobe as in the group.

*Habitat*.—Illinois.

*Holotype*.—♂, Muncie, May 15, 1920, (Alexander).

*Allotopotype*.—♀, (Frison).

*Paratopotypes*.—1 ♂, May 8, 1920, (Frison); 32 ♂ ♀'s, May 15, 1920, (Alexander & Frison).

Type in the collection of the Illinois State Natural History Survey.

*Ormosia frisoni* bears a considerable resemblance to *O. meigenii* (O. S.) but is readily told by the smaller size, differently coloured wings and, especially, by the structure of the male hypopygium. In *O. meigenii* the inner pleural appendage has the tip narrowed into a chitinized point that is in a straight line with the axis of the appendage; of the four gonapophyses, the inner pair are approximately one-half longer than the outer pair. This interesting new species is dedicated to the collector, my friend, Mr. Theodore H. Frison.

This species occurred near the margin of a prairie cat-tail swamp where it was associated with *Pseudolimnophila luteipennis* (O. S.) and *Tipula dejecta*

October, 1920



Walker. The flies were generally observed in small swarms among a dense growth of *Equisetum hiemale* that covered the embankment.

***Ormosia notmani*, sp. n.**

General coloration dark brown, the praescutum without stripes; wings grayish subhyaline, the stigma slightly darker brown; cell *1st M*<sub>2</sub> open by the atrophy of the outer deflection of *M*<sub>3</sub>; basal deflection of *Cu*<sub>1</sub> very oblique in position, inserted beyond the fork of *M*; *2nd Anal* vein bent toward the *1st Anal* on its outer end only; male hypopygium complicated; outer pleural appendage a black, three-spined structure; inner pleural appendage slender, deeply bifid; gonapophyses slender, the distal end slightly widened, each apophysis with a long, powerful spine at the base.

*Male*.—Length about 3.8 mm.; 4.4 mm.

Rostrum and palpi dark brown. Antennae slightly elongated, dark brown. the scapal segments a little paler; flagellar segments long-oval, provided with a dense, erect, white pubescence. Head brownish gray, provided with long, yellow bristles.

Pronotum brown, the scutellum obscure yellow. Mesonotum dark brown, sparsely dusted with a grayish yellow pollen; pseudosutural foveae conspicuous, oval, black. Pleura brown, sparsely dusted with gray. Halteres light yellow. Legs with the coxae and trochanters light yellow; femora light brown, brighter basally; remainder of the legs darker brown. Wings grayish subhyaline; stigma slightly darker, brown; wing-base a little brighter; veins dark brown. Venation: *r* less than its own length beyond the fork of *R*<sub>2+3</sub> on *R*<sub>2</sub>; cell *1st M*<sub>2</sub> open by the atrophy of the outer deflection of *M*<sub>3</sub>; basal deflection of *Cu*<sub>1</sub> a short distance beyond the fork of *M*, very oblique in position, the branches of *Cu* forming an angle of about 100°; *2nd Anal* vein with the extreme outer end bent toward the *1st Anal*.

Abdomen dark brown, the hypopygium a little brighter. Male hypopygium somewhat as in *O. bilineata* Dietz and *O. subcornuta* Alexander but very distinct in the details of structure. Outer pleural appendage a short, squat, chitinized structure that terminates in three acute blackened points, the two outer ones short and sub-equal, the inner spine much longer, acute; inner pleural appendage long and slender, almost straight, profoundly bifid, the two arms lying generally parallel, the one arm appearing as a long, blackened spine with the proximal face microscopically serrulate, the other, more dorsal, arm slightly paler, sparsely setigerous. Gonapophyses shaped as slender blades, the outer ends a little flattened and expanded, at the base of each with a powerful, semi-erect spine that is about one-third the length of the apophysis. Ninth sternite with a conspicuous fleshy spatulate lobe as in the *meigenii* group of species.

*Habitat*.—New York.

*Holotype*.—♂, Keene Valley, Essex Co., May 26, 1920, (Notman).

Type in the collection of the author.

This remarkably distinct species is dedicated to the collector, Mr. Howard Notman, whose conscientious and capable efforts have added numerous species, in many orders, to the list of New York insects.

***Limnophila (Eulimnophila) imbecilla illinoiensis*, subsp. n.**

*Male*.—Length 6 mm.; wing 6–6.5 mm.

Very similar to typical *imbecilla* Osten Sacken but very much smaller (in *imbecilla*, the wing of the male measures 8.2–8.5 mm.). Head yellowish with scarcely any gray pruinosity. Wings grayish yellow.

*Habitat*.—Illinois.

*Holotype*.—♂, Homer Park, June 13, 1920 (Frison).

*Paratopotypes*.—Two ♂'s.

Type in the collection of the Illinois State Natural History Survey.

Paratypes in the collection of Mr. Frison and the writer.

***Tipula tennessa*, sp. n.**

Allied to *T. ultima* Alexander; wings brownish yellow, the dusky spot at the end of the vein 2nd *A* small; abdominal tergites with a narrow, dark brown median line; male hypopygium with the ninth tergite small, the caudal margin with a broad, U-shaped median notch, the lateral lobes obtusely rounded with the margins smooth, on the ventral face with a sharp chitinized spine.

*Male*.—Length about 16.5 mm.; wing 18.5 mm.

Generally similar to *Tipula ultima*, differing as follows:

Antennæ with the basal flagellar segments distinctly bicolorous, the basal enlargement of each segment dark brown, the remainder of each segment paler yellowish brown, the distal flagellar segments more uniformly brown.

Coloration of the thorax identical in the two species. Wings with a deep, brownish yellow suffusion, as in *ultima*, the dusky spot at the tip of vein 2nd *A* very restricted but evident. Venation: cell *R*<sub>2</sub> more acutely pointed at base; cell 1st *M*<sub>2</sub> long and narrow; petiole of cell *M*<sub>1</sub> shorter than *m*.

Abdominal tergites dull yellow with a distinct but narrow median vitta of dark brown; lateral margins of the tergites less distinctly darkened; sternites yellow. Male hypopygium with the sclerites fused into a continuous ring as in *ultima*. Ninth tergite small, the caudal margin with a broad, U-shaped median notch, the lateral lobes thus formed broadly and obtusely rounded, their margins unarmed; on the ventral face of each of these lobes a conspicuous, chitinized spine directed ventrad and slightly caudad and proximad; on the middle line beneath a narrow chitinized ridge that is slightly bifid at the cephalic end. Inner pleural appendage small, flattened, the distal end curved into a spoon-shaped structure. Ninth sternite profoundly notched, at the base of the incision with a flattened, recurved lobe that is sparsely provided with short hairs; on either side of this rectangular lobe, a somewhat similar lobe whose inner or proximal margin is provided with numerous, long, yellow bristles that become more elongated near the distal end; from the base of each of these subtending lobes, a flattened digitiform lobe extends dorsad; from the region of the pleurite a similar lobe is found, lying parallel to the last, the notch between them very narrow.

*Habitat*.—Tennessee.

*Holotype*.—♂, Knoxville, May 17, 1915, (G. M. Bentley).

Type in the collection of the Department of Entomology, University of Tennessee.

It will be seen from the above characterization that the hypopygium is very

distinct from that of *Tipula ultima*, where the ninth tergite is deeply notched, the lateral lobes very large, flattened, directed proximad and with the margins provided with numerous tiny chitinized denticles; all the other lobes and appendages of the hypopygium are much smaller and less complicated than in *T. ultima*. It should be noted that the present species is on the wing during May whereas *T. ultima* is a characteristic autumnal species.

***Tipula lygropis*, sp. n.**

Allied to *T. occidentalis* Doane; general coloration dark yellowish gray, the mesonotal praescutum with four brownish gray stripes; wings with a very strong brown suffusion, the obliterative streak unusually broad and conspicuous; a bomen obscure brown; male hypopygium with the ninth tergite with a deep, V-shaped notch; eighth sternite with two submedian pencils of long yellow hairs.

*Male*.—Length about 20 mm.; wing 21 mm.

Frontal prolongation of head dark brown, still darker laterally; no evident nasus, only a tuft of long hairs at this point; palpi brown, the basal two segments lighter in colour. Antennae dark brown, the scapal segments slightly paler brown. Head brownish gray, the occiput darker; the vertex with indistinct lines that are concentric from the occiput.

Mesonotal praescutum yellowish gray with four brownish gray stripes, the intermediate pair narrowly separated for most of their length by a line of the ground colour, the ends contiguous; scutum light gray, the lobes largely dark gray; scutellum pale yellowish gray with a capillary brown median line, the lateral portions dark; postnotum yellowish gray, the posterior margins darker. Pleura dull gray, more yellowish gray before the base of the halteres. Halteres dark brown, the base of the stem brighter. Legs with the coxae dull gray, the outer face sparsely yellow pollinose; femora and tibiae reddish brown, narrowly tipped with dark brown; tarsi brown. Wings with a very strong brownish tinge; cells *C* and *Sc* more yellowish brown; cells *M* and *Cu* adjoining vein *Cu* more yellowish; a conspicuous brown spot at the end of *Sc* and another including the stigma; a paler brown seam at the origin of *Rs*, along the cord and at the tip of vein *Cu*<sub>2</sub>; a very conspicuous white obliterative streak extending from cell *C* across cells *1st R*<sub>1</sub>, the end of *R*, the basal two-fifths of cell *1st M*<sub>2</sub>, into the base of cell *M*<sub>3</sub>. Venation: *R*<sub>2+1</sub> shorter than the distal section of *R*<sub>2</sub>; petiole of cell *M*<sub>2</sub> a little more than one-half of *m*.

Abdomen obscure brownish, the tergites very indistinctly trivittate with still darker brown, the distal segments more uniformly darkened; sternites brownish gray. Male hypopygium moderately large. Ninth tergite with a very deep V-shaped median notch that extends almost back to the eighth segment; the lateral lobes have the ventral edge produced into a flattened, chitinized blade, the tips running out into small, chitinized points. Ninth pleurite rather conspicuous, conical, the apex obtusely rounded but flattened; outer pleural appendage conspicuous, rather stout, dark brown, clothed with long, dark hairs. Ninth sternite with a profound notch that is narrowly margined with pale, from its dorsal proximal angle hang two long, pendulous lobes. Eighth sternite with a broad, U-shaped notch, on either side of the median line of the base of the notch, a pencil of very long yellow bristles; lateral lobes produced

proximad into very broad-based triangular lobes that are directed proximad, the proximal margin sparsely provided with bristles, the tip narrowed.

*Habitat*.—California.

*Holotype*.—♂, Santa Cruz Island, May 16, 1919, (E. P. Van Duzee).

Type in the collection of the California Academy of Sciences

***Tipula pseudotruncorum*, sp. n.**

General coloration light gray; antennae short, dark brown; head with a linear brown mark; mesonotal praescutum with five more or less distinct brown lines; a capillary brown median line extending from the suture to the base of the abdomen; wings pale brown, variegated with dark brown and subhyaline blotches; abdomen buffy brown, the tergum with three conspicuous dark brown longitudinal stripes.

*Male*.—Length 15 mm.; wing 16 mm.

*Female*.—Length 20 mm.; wing 17.5 mm.

Frontal prolongation of the head long and slender, light gray; palpi dark brown. Antennae short, the first segment elongate, dusted with gray; second scapal segment brownish; flagellum black, the segments short with the basal swelling indistinct. Head light gray with a conspicuous elongate brown mark.

Mesonotal praescutum light gray, conspicuously marked with dark brown; median stripe light gray, split by a capillary brown line, the lateral margins of the stripe more broadly dark brown; all three of these lines are confluent before the suture; lateral praescutal stripes dark, the area between them and the median stripe infuscated; scutum light gray with two isolated grayish brown marks on each lobe; remainder of the mesonotum light gray, a capillary brown line extending from the suture to the base of the abdomen. Pleura light gray. Halteres brownish yellow, the knobs dark brown. Legs with the coxae light gray; trochanters grayish brown; femora black, more reddish basally; remainder of the legs black. Wings brown; stigma dark brown; a small, dark brown spot at the origin of *Rs*; membrane conspicuously variegated with subhyaline areas, the more conspicuous situated before and beyond the stigma, immediately before the origin of *Rs*; a conspicuous white blotch at the base of cell *M* and another at about two-thirds the length of the cell; indistinct whitish areas in cells *Cu* and *1st A*. Venation: *Rs* long; cell *1st M*<sub>2</sub> long and narrow; petiole of cell *M*<sub>1</sub> shorter than *m*.

Abdomen with the first tergite light gray; remaining tergites buffy brown, with three broad dark brown stripes that are narrowly interrupted at the base and apex of each segment; lateral margins of the tergites broadly light gray; sternites dusted with gray. Male hypopygium rather large. Ninth tergite with a broad, U-shaped notch, the lateral lobes indistinct, obtusely rounded; deep median incision that extends back to beyond mid-length of the tergite, the margins being practically contiguous. Ninth pleurite complete; outer pleural appendage tumid, gradually narrowed to the apex. Ninth sternite with a deep V-shaped notch, the lateral angles produced proximad into fleshy lobes that are contiguous on the median line, at the tip with conspicuous long yellow hairs that largely fill the notch of the sternite. Eighth sternite with the lateral angles produced into slight tumid lobes, each tipped with a pencil of long, reddish bristles, decussate across the median line.

The allotype female is much paler throughout but presumably belongs to this species; the markings on the body as well as the wings are very pale but indicated.

*Habitat*.—Northwestern United States.

*Holotype*.—♂, Longmire Springs, Mt. Rainier, Washington, altitude 2,500 feet, July 18, 1919, (Dr. C. L. Fox.).

*Allotype*.—♀, Paradise Valley, Mt. Rainier, altitude 6,000–8,000 feet, August 5, 1919, (Dr. C. L. Fox.).

*Paratypes*.—Two ♂'s, Moscow, Idaho.

Type in the collection of the California Academy of Sciences.

*Tipula pseudotruncorum* bears a resemblance to the European *T. truncorum* Meigen, and was distributed under this name by Prof. Doane. What is apparently this same species has been recorded by Snodgrass (Trans. Am. Ent. Soc., Vol. 30, pp. 211, 212; 1904) as *T. truncorum*. A comparison with authentic specimens of *truncorum* received from my friend, Herr M. P. Riedel, shows that the two species are abundantly distinct.

#### NOTES ON THE COLEOPTERA WITH DESCRIPTIONS OF NEW SPECIES.

BY C. A. FROST,  
Framingham, Mass.

***Cicindela spreta*** Lec. Several years ago I prepared a note on the capture of this form in Maine, but after some correspondence with the late Mr. Edward D. Harris it was laid aside. Further interesting facts regarding this much misunderstood insect were noted in his letters which should correct the impression given by several authors that it is closely related to *purpurea* Oliv. His father, T. W. Harris, some time prior to 1848, sent Dr. LeConte a specimen taken at Eastport, Maine, and which, according to Mr. Harris, is the unique type now in the LeConte collection at Cambridge, Mass., and bears his father's label.

The original description in the "Catalogue of the Geodephagous Coleoptera" (Ann. Lyc. Nat. Hist., 1848, p. 177) begins, "*Obscure nigro-aenea subviridescens*,—" and was probably made from the specimen in the LeConte collection, as it is a green insect of about the shade of those green forms of *purpurea* which sometimes pass for *spreti*, but having the complete *limbalis* markings. The figured *spreti* on the coloured plate XIII of the above work is a black insect, and it is referred to in the LeConte Revision of the Cicindelae of 1856 (Trans. Am. Phil. Soc. XI., p. 37) under *limbalis* (as a variety of *splendida*) as, "*Nigra. C. spreta* Lec. Ann. Lyc., 4, 177; tab. 13, fig. 7", and in a few lines below, "Eastport, Maine, Dr. Harris." In the Harris collection, Boston Museum of Natural History, is one specimen bearing an "Eastport, Me.," label and the manuscript number 1502, which is referred to in the Harris manuscript catalogue as, "*Cicindela Raiana* H. ms. *spreti* Lec. Ann. Lyc. N.Y. IV. 177. Eastport, Me., Dr. J. Ray, 1836." This is the specimen referred to by Mr. E. D. Harris in a letter to me as the "companion specimen" to the one in the LeConte collection. I examined this (Harris collection) specimen, which still bears the

old Harris label, and found it much darker than the type at Cambridge. It is an almost black insect with the faintest traces of green. It is marked like the type, and is almost exactly as the figure on Plate XIII of the work of 1848. Does it not seem probable that Dr. LeConte made the description from his green specimen, and in some way the figure was made from the black specimen of the Harris collection? This supposition will at least account for the dual colour rôle of *spretæ*.

In correspondence with Dr. LeConte, T. W. Harris expressed the opinion that *spretæ* was much nearer *limbalis* Klug. than *purpurea*, and that Dr. LeConte was in accord with him is shown by the Revision of 1856.

In 1900, Mr. E. D. Harris took a large series (about 100 specimens) of *limbalis* at Mt. Desert, Me., and, discovering several dark green ones among them, took one to Cambridge and placed it beside the type, and then to the Harris collection where he made a comparison with the "companion specimen." His conclusion was, "It is, to all intents, exactly the same thing. It is *limbalis*."

On June 24, 1909, I took a specimen of *spretæ* at Monmouth, Me., in a sparsely wooded pasture on the west shore of Lake Cobbosseecontee. It has been placed beside the type and found to be the same in every respect. Another specimen from Wales, Me., June 15, 1909, is very much like Mt. Desert *limbalis*, with reddish-cupreous shading and silky lustre. A specimen from Monmouth, June 25, 1905, is nearly intermediate between the other two, being a more clear green at the base of elytra and becoming gradually cupreous towards the apex, but without definite silky lustre.

From the above we have sufficient proof that *spretæ* Lec., a rather dark green insect (of about the shade of the green forms of *purpurea*) with *limbalis* markings, (humeral, post-humeral and ante-apical dots, sinuate median fasciæ, and apical lunules) is but a colour variation of *limbalis* Klug. as represented by the Mt. Desert specimens. Therefore, Dr. Walther Horn is in error in the Genera Insectorum in placing "*spretæ* Lec., 1848" as a "senile form" and *spretæ* Lec., 1856, as a "black form" of *purpurea* Oliv.

***Cicindela hentzi* Dej., var. *niveihamata*, n. var.** This interesting variation was taken at the Middlesex Fells Reservation in a road near the shore of Spot Pond in the town of Stoneham, Mass., July 26, 1903. It was found somewhat remote from the usual haunts of the species, although they frequently scatter from the ledges to the neighboring roads. The markings of this unique are formed by the extension of the apical lunules along the margin, including the ante-apical marginal spots, to and joining with the obliquely transverse median fasciæ; the result is a broad marginal band with sinuate inner edge terminating in a hook at the middle of each elytron. The median ante-apical dot has almost vanished and the humeral lunule is represented by a small humeral dot and a very faint sub-humeral one. The markings resemble those of the posterior half of the elytra of *C. schauppi* with the transverse fasciæ more oblique. In order to stimulate ambition and anticipation among those collectors who delight in aberrant forms this handsome little insect is duly christened as above.

***Pterostichus coruscus* Lec.** This species, which has hitherto been taken rarely along a railroad embankment through a swamp, was found in large numbers (over 100) under stones, logs and in debris along the shores of

the Charles River in Medfield, Mass., April 19, 1919. There had been a heavy rain which flooded the meadows where these little insects evidently abound, and drove them to shelter along the river bank.

**Elaphrus olivaceus** Lec. Two specimens of this pretty swamp-loving species were taken at Monterey, Mass., July 9, 1919, in a dark, forbidding wood through which ran a small brook between low and muddy banks at the spot where they occurred. *E. cicatricosus* was also present at this place which was partly covered with dead branches; these did not improve the conditions under which they were taken by the usual method of treading about in the mud and keeping a close watch of the surface for any moving object.

**Coccidula occidentalis** Horn. A specimen was given me by Mr. H. M. Parshley, who took it at Orono, Maine, May 31, 1914, by sweeping in a meadow. It is almost exactly like several specimens from Edmonton, Alberta, taken by Mr. F. S. Carr, who, as usual, generously shared his catch with me. These were taken June 14 and 26, 1917. One of the characters given by Dr. Horn in his description of the species (Trans. Am. Ent. Soc. XXII, p. 114) is the black colour of the first two segments of the abdomen, these being yellow at the sides in *lepida* Lec. There are traces of yellow at the sides of the second segment on some of the Alberta specimens, and the Maine specimen shows a larger yellow area there. The habitat of the species is given by Horn as Wyoming to Vancouver.

A number of specimens of *C. lepida* were taken along a swollen brook in the debris washed down by the spring draining of a cranberry bog in Sherborn, Mass., May 23, 1908, and May 16, 1909. They could not be found on following years nor have they been taken elsewhere. The discal spot of the elytra in some of these specimens shows a tendency toward the cordiform shape of *occidentalis*, but there is no indication of a sutural stripe connecting it with the scutellar spot as in that species.

**Buprestis sulcicollis** Lec. In the "Review of the Genus Buprestis in North America," by Nicolay and Weiss (Jour. N. Y. Ent. Soc., Vol. XXVI) there appears the statement, on the authority of Dr. E. C. VanDyke, that the type "is not a brassy green insect as claimed by Casey, but of a uniform dull, coppery brown with a very slight greenish reflection." As I have examined the unique type four times, and on the last three occasions with special reference to the colour, I feel justified in recording that the statement gives an erroneous impression. With a good light on the specimen, Col. Casey's remarks (Studies in the American Buprestidæ), which are practically a copy of the original description, are correct. On a dark day the green is not so much in evidence, but if the sun is shining it is really a brilliant insect. It is especially green on the head and thorax, while the punctures between the rugæ of the elytral intervals are almost a golden green at the sides, becoming darker on the disk; the whole under side of the specimen is a bright brassy green. The only parts that are not green are the elytral costæ and the smooth places of the pronotum, which are a very dark bronze with greenish reflections. The appearance of the type is that of a wholly verdigris-green insect in which the colour is as fully and completely developed as in the type of *Chrysobothris verdigrispennis*, and

some specimens of *Dicerca tuberculata*. My single specimen of this species is a bronze colour very similar to the dark forms of *Buprestis striata*, and is probably very near to the form *lateralis* Casey. The costæ are a greenish black, and the punctures along the striæ are a bright green set in the bright coppery rugæ of the intervals; it lacks the greenish shading of the type on the under side.

**Chrysobothris orono**, n. sp. Size and form of *verdigrispennis*. Black with the punctured areas of a grayish-green colour, beneath cupreous or bronzed with the prosternum, femora, and sutures of the abdomen greenish. Antennæ bright metallic green, last joint and the lobes of the preceding seven, black. Clypeus arcuately emarginate with sides rounded, front greenish, coarsely, densely punctured and pubescent with two small median callosities; eyes rather widely separated above.

Prothorax not quite twice as wide as long, slightly wider at base than at middle, briefly rounded and narrowed at apex, slightly sinuate at middle, and with a very small sinuation before the hind angles, which are rectangularly acute and not narrowed; median dorsal sulcus limited in front by strong angulate costæ, which broaden out at middle and disappear behind; a short sinuate callosity at middle on each side.

Elytra widest behind and sinuate in front of middle, more convex than *scabripennis*, sutural costæ entire from apex to basal fourth and more strongly elevated than any of the others which are indicated by flattened, smooth, black areas and lines, punctured areas not as well defined as in *scabripennis* and *verdigrispennis*, basal foveæ less evident.

Abdomen with sparse, shallow punctures and indistinct callosities, last ventral body semicircularly emarginate, last dorsal coarsely, sparsely punctured with a small, indistinct notch; prosternum not lobed, very densely pubescent and punctate, sides with coarse, sparse punctures and broad, interlacing, smooth spaces, the dense white pubescence extends along the median line on to the metasternum gradually becoming more sparse; front femora with a strong, serrulate, acute tooth; tibiæ with a large apical dilatation nearly one-third the length of the tibia, sinuate at the distal end, rising in an arc and terminating rather abruptly without sinuation; front and middle tibiæ strongly arcuate, hind tibiæ straight.

Length 14.5 mm., width 6 mm. at apical third.

The unique type is a male from Orono, Maine, July 4, 1908, in my collection. The species is dedicated to the Indian chief Orono, from whom the town where it was taken is named.

The species most nearly resembles *verdigrispennis* superficially, but is distinct by the dark antennal joints, the much different tibial dilatation, and the straight hind tibiæ. In the coloration of the dorsal surface and in the tibial dilatation it resembles *carinispennis*, but in no other respects. From *trinervia* it differs in the shape of the thorax, tibial dilatation, elytral sculpture, size and last dorsal segment of abdomen.

(To be continued.)



## NEW SAW-FLIES FROM MAINE AND NEW YORK (HYMENOPTERA).

BY ALEX. D. MACGILLIVRAY.

University of Illinois, Urbana, Ill.

All the adults of the following species were reared from larvæ. They are published at this time in order that the names can be used with descriptions of the larvæ.

**Pteronidea evanida**, n. sp.—Female. Body black with the following parts rufous: supraclypeal area, clypeus, labrum, mandibles, occipital and vertical orbits, extending onto the caudal aspect of head, collar, femora, profemora and mesofemora more or less irregularly infuscated, protibiae, mesotibiae, protarsi, mesotarsi, abdomen on segments one to six; trochanters whitish; ocellar basin sharply marked with vertical walls, dorsal side of frontal crest three sided; supraclypeal area elevated; median fovea longer than broad, deep, prominent; clypeus faintly semicircularly emarginate; antennæ with third, fourth and fifth segments subequal; head, mesonotum, mesoscutellum, and mesopleuræ dull, finely setaceous; wings hyaline, veins including costa reddish, stigma darker, margined with rufous; saw-guides with dorsal margin straight, ventral margin strongly convex, oblique, prominent point at dorsal angle. Length 7 mm.

*Male*.—Male differs in having median fovea longer, legs and collar lighter in colour, and abdominal segments one to five and lateral portions of six rufous.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Subs. 119, 111, 134.

This species is near *fulvicrus* Prov., but the two species are distinguishable by the form of the median fovea.

**Pteronidea edura**, n. sp.—Female. Body black with the following parts whitish: supraclypeal area, clypeus, labrum, mandibles in part, mouth-parts, collar, tegulæ, and legs beyond the middle of the coxæ, except the distal half of metatibiae and metatarsi; following parts rufous: edge of frontal crest, occipital and vertical orbits faintly, caudal portion of first abdominal segment, second to sixth segments entirely, and cephalic part of sixth segment; ocellar basin moderately distinct; frontal crest rounded, unbroken, three-sided on dorsal margin; median fovea distinct, long, wedge-shaped depression; clypeus broadly angularly emarginate; antennæ with third and fourth segments subequal, fourth segment longer than fifth; mesonotum dull, setaceous, mesoscutellum polished, mesopostscutellum densely punctulate; wings hyaline, dotted with numerous black spinulæ, veins black, proximal portion of costa paler; saw-guides with dorsal margin concave, ventral margin convex and converging toward dorsal margin, distal end bluntly pointed. Length 8 mm.

*Habitat*.—Ithaca, New York, H. Yuasa. No. 8.45(?)<sup>c</sup>-1-1.

This species runs to *lombardæ* Marl., but is differently coloured from the female of that species.

**Pteronidea effusa**, n. sp.—Female. Body black with the following parts yellowish white: supraclypeal area, clypeus, labrum, mandibles, mouth-parts, collar broadly, tegulæ, and legs beyond distal ends of coxæ, except infuscated distal half of metatibiae and the black metatarsi; following parts rufous: frontal crest, occipital and vertical orbits, lateral third of lateral lobes of mesonotum indistinctly, and abdominal segments one to seven except small cephalic

margin of first segment, and mesal spots on caudal margin of sixth and seventh segments; ocellar basin deep, distinct; frontal crest prominent, unbroken, curved on dorsal margin; median fovea shallow, elongate oval; clypeus broadly, shallowly emarginate; head dull, sparsely setaceous; mesoscutellum polished, mesonotum dull, caudal margin of mesopostscutellum punctured with small calices; mesopleura polished; antennæ with third and fourth segments subequal; fourth segment distinctly longer than fifth; wings hyaline, spinulæ inconspicuous, rufous, veins and costa and stigma in great part rufous; saw-guides with dorsal margin concave, ventral margin convex, converging toward distal end. Length 8 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 110.

This species is similar to *edura* MacG.; but the form of the frontal crest will separate them.

***Pteronidea effeta***, n. sp.—Female. Body black with the following parts yellowish white: clypeus, labrum, supraclypeal area, mouth-parts, collar, tegulæ, caudal angles of lateral lobes of mesonotum, and legs beyond coxæ except distal half of metatibiæ and metatarsi; following parts rufous: caudal portion of first abdominal segment, segments two to six entirely, most of seventh, frontal crest, and occipital and vertical orbits; clypeus broadly deeply emarginate; supraclypeal area swollen; median fovea elongate, linear, comparatively deep; frontal crest distinct, slightly broken, dorsal margin curved; ocellar basin distinct, not deep, open around median ocellus; each side of lateral ocelli depressed; surface for most part polished; mesonotum including mesoscutellum and mesopostscutellum polished, roughened with distinct calices of minute setæ; antennæ with third segment slightly longer than fourth, fourth and fifth subequal; wings hyaline, veins and stigma and costa rufous; saw-guides robust, dorsal margin concave, ventral margin convex, distal portion oblique, bluntly pointed above. Length 10 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 158.

This species runs to *populi* Marl., but the topography of the head will separate the two species.

***Pteronidea emerita***, n. sp.—Female. Body black with the following parts yellowish: labrum, clypeus, supraclypeal area, mandibles, mouth-parts, collar, tegulæ, and legs except distal three-fourths of metatibiæ and metatarsi; following parts rufous: frontal crest, occipital and vertical orbits, and abdominal segments one to six; clypeus broadly, shallowly emarginate; median fovea a large, slightly depressed, triangular area; frontal crest strong, narrow, unbroken, ocellar basin deep, open about median ocellus, strongly elevated above post-ocellar area; antennæ with third segment longer than fourth, and fourth distinctly longer than fifth; head and thorax polished, with numerous minute setæ, mesoscutellum bare, mesopostscutellum with caudal margin roughened; wings hyaline, veins and costa and stigma reddish; spinulæ point-like, black; saw-guides with straight dorsal margin, convex ventral margin, converging convex distal portion, blunt distal end. Length 9 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 139.

This species is very similar in general appearance to *effeta* MacG.

***Pteronidea erudita***, n. sp.—Female. Body black with the following parts yellowish: labrum, clypeus, mandibles, supraclypeal area, collar, tegulæ,

lateral half of each lateral lobe of the mesonotum, and legs beyond middle of coxæ except distal third of metatibiæ and metatarsi; following parts rufous: frontal crest, occipital and vertical orbits, and abdominal segments two to seven; clypeus broadly, shallowly emarginate; median fovea elongate, shallow, furrow-like; frontal crest broken, high adjacent to meson, low on lateral portions, dorsal margin two sided; ocellar basin shallow, flat, open about median ocellus, hardly raised above postocellar area; antennæ with third, fourth, and fifth segments subequal; head and thorax polished, with closely-placed calices of fine setæ; mesopostscutellum roughened; wings hyaline, veins and costa and stigma reddish; saw-guides narrow dorsal margin straight, ventral margin convex, distal portion straight and convergent, pointed. Length 7 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 12.

This species is similar to *effeta* MacG. and *emerita* MacG. The colour of the mesonotum will distinguish them.

***Pteronidea edita***, n. sp.—Male. Body black with the following parts yellowish: clypeus, labrum, supraclypeal area, mandibles, genal orbits, pronotum broadly, tegulæ, legs except metacoxæ and distal end of metatibiæ and metatarsi, and caudal margin of abdominal terga and venter entirely; following parts rufous: occipital and vertical orbits broadly, frontal orbits narrowly; median fovea deep, broad, longer than broad; antennæ with third segment slightly longer than fourth and latter slightly longer than fifth; frontal crest obscure, broken; ocellar basin shallow, flat, lateral walls distinct but narrow and low; head and thorax dull with numerous subadjacent calices; mesopleura, particularly ventral portion, with numerous short, white setæ; caudal margin of last sternum angularly emarginate; wings hyaline, stigma with costal portion dark, remainder yellowish, costa yellowish, veins blackish. Length 6 mm.

*Habitat*.—Ithaca, New York. H. Yuasa. No. 5<sup>1</sup>-1-6.

This species runs to *ventralis* Say, but the difference in their coloration will differentiate them.

***Pteronidea exacta***, n. sp.—Male. Body black with the following parts white: labrum, clypeus, supraclypeal area, mandibles, mouth-parts, genal orbits, collar broadly, tegulæ, and legs except a fuscous ring on distal end of metatibiæ; following parts rufous: occipital and vertical orbits broadly, frontal orbits narrowly; clypeus roundly, shallowly emarginate; supraclypeal area not prominent; median fovea a small, rather deep pit; frontal crest fairly strong, unbroken, transverse, straight; ocellar basin shallow, lateral walls hardly elevated, surface flat, open between ocelli, and not as high as postocellar area; antennæ with third segment slightly longer than fourth, and fourth slightly longer than fifth; head and thorax setaceous; mesoscutellum polished, mesopostscutellum somewhat roughened; procidentia short, rounded, strongly convex; wings hyaline, veins and costa and stigma yellowish. Length 4.5 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 172.

This species is similar to *dubia* Marl., but the length of the third antennal segment will separate them.

***Pteronidea equina***, n. sp.—Female. Body black with the following parts yellowish white: supraclypeal area, clypeus, labrum, mandibles, mouth-parts, genal and occipital and vertical orbits broadly, frontal orbits narrowly,

orbital markings more brownish than others, antennæ for most part, collar, tegulæ, mesopleuræ for most part, mesosternum, sides of mesoscutellum, legs except distal portion of metatibiæ and metatarsi, venter of abdomen entirely, caudal margin of abdominal terga, becoming successively broader on caudal terga, caudal tergum entirely, and saw-guides except tips; clypeus narrowly roundly, emarginate; median foveæ broad, round depression with sloping sides; frontal crest narrow, distinct, unbroken, dorsal margin two-sided; ocellar basin distinct, flat, lateral walls narrow, sharp, and distinct; postocellar area not depressed below ocellar basin; head and thorax setaceous; mesopostscutellum setaceous, not roughened; wings hyaline with numerous spinulæ, veins and stigma and costa yellowish; saw-guides with dorsal margin straight, ventral margin straight, distal portion oblique, convex, bluntly pointed above. Length 5.5 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 71.

This species runs to *kincaidi* Marl. Its coloration is distinctive.

**Pteronidea enavata**, n. sp.—Female. Body rufous with the following parts black: small, transverse area surrounding ocelli, small spot on caudal margin of postocellar area, antennæ, mesal area of median lobe of mesonotum, mesopostscutellum in great part, metascutellum, ring on metatibiæ, and cephalic band, narrower on caudal segments, on abdominal terga; following parts whitish: labrum, pronotum, tegulæ, and legs in great part, except tarsi; clypeus broadly emarginate, almost truncate; median fovea pit-like, deep; frontal crest broken by oblong depression bearing median fovea, two-sided, angular; ocellar basin flat, roughened, limiting lateral walls narrow, not strongly raised; antennæ with third and fourth segments subequal, fifth shorter; head and thorax dull, setaceous; wings yellowish, veins and costa and stigma pale, spinulæ not prominent; saw-guides with dorsal margin straight, ventral margin convex, distal portion oblique, pointed at distal end above. Length 6 mm.

*Habitat*.—Orono, Maine. Maine Agricultural Experiment Station, Sub. 25.

This species resembles *pinguidorsum* Dyar, but they are easily separated by the difference in the form of the head ridges.

**Pristiphora ostiaria**, n. sp.—Female. Body black with the following parts white: labrum, mandible, mouth-parts, collar broadly, tegulæ, and legs except a spot on proximal end of metacoxæ, distal one-fourth of metafemora, distal one-third of metatibiæ, and metatarsi; antennæ with third segment longer than fourth, fourth and fifth subequal; clypeus truncate; median fovea an inconspicuous depression; frontal crest wanting; ocellar basin distinguishable, lateral walls not conspicuous; head uniformly finely punctured; occipital, ocellar, and interocellar furrows wanting; mesonotum including mesoscutellum and mesopostscutellum, polished; mesopleuræ with white setæ; wings hyaline, veins and stigma brownish, costa pale, spinulæ numerous; saw-guides narrow with dorsal margin straight, ventral margin convex, distal end oblique and blunt. Length 6 mm.

*Male*.—The male differs in having supraclypeal area, genal orbits, clypeus, and venter of abdomen pale; median fovea is larger and more conspicuous; procidentia is comparatively broad, flat, rounded. Length 5 mm.

*Habitat*.—Ithaca, New York. H. Yuasa. No. 212-1-1.

This species is near *banksi* Marl., but they can be separated by the difference in coloration.

NOTES ON GALERUCELLA NYMPHAEAE L., THE POND-LILY  
LEAF-BEETLE (COLEOP.)BY HARRY B. WEISS AND ERDMAN WEST.  
New Brunswick, N. J.

This species occurs throughout New Jersey on the yellow pond-lily (*Nymphaea advena* Ait.) which is common along the lower Delaware River and adjacent ditches and tide-water streams. During the seasons of 1919 and 1920, it was particularly abundant at Monmouth Junction, Westville and several other places in New Jersey, defacing the leaves and flowers and rendering them ragged and unsightly.

Blatchley<sub>1</sub> states that the adult probably hibernates and this appears likely as adults have been taken during the middle and last of May and early June. The yellow eggs are deposited on the upper surfaces of the leaves in clusters of 18 to 20, each egg being stuck on end to the leaf surface and close to its neighbor. MacGillivray<sub>2</sub> states that he found clusters containing as few as 6 eggs and gives the number as ranging from 6 to 20. These hatch in about a week, each larva emerging from the upper half of the egg and feeding takes place in colonies on the upper layers of the leaf tissue, resulting in irregular, unsightly, denuded areas. As the larvae become larger they separate and feed independently on either side of a leaf.

In the latitude of New Jersey, many become full-grown about the third week of June, pupation taking place on the upper or under leaf surface. This stage lasts about one week, the beetles appearing the last of June and first part of July. There are at least two generations in New Jersey. During the middle and last of June it is possible to find all stages of the insect except eggs.

Chittenden<sub>3</sub> records the adult as attacking plants belonging to botanical families not at all related to its normal food plants such as aquatic species of *Nymphaea*, *Sagittaria*, *Brasenia*, *Nuphar* and mentions basket willow and beans. He further states that it frequently has received mention under the name *Galeruca sagittariae* Gyll, and is evidently of foreign origin, being found abundantly in northern Europe, and Siberia. In this country it has been recorded from Texas, California, Oregon, Indiana and occurs from the Hudson Bay region southward to the District of Columbia and Virginia. It is, therefore, a well distributed species. Both Schaupt<sub>4</sub> and MacGillivray<sub>5</sub> have described the early stages and the latter's descriptions being the most detailed are given below together with additional material in brackets which it was thought desirable to add.

*Egg*.—(Length 0.9 mm. Width 0.5 mm.) "Oblong or short cylindrical with smoothly, obtusely rounded ends; yellow, shining." (The surface is sculptured with hexagonal markings having depressed centres.)

*Larva*. (Length 7 to 8.5 mm. Width about 1.8 mm.). Head black; the antennae mere tubercles, three jointed; the labrum three-sided, the distal and lateral margins in the form of a continuous convex curve constituting one side, the remaining sides formed by the proximal end of the labrum with an angle

1. The Coleoptera of Indiana, p. 1169.
2. Bull. 68, N. Y. State Mus., 1903, pp. 325-326.
3. Bul. 54, U. S. D. A. Bur. Ent., p. 58, 1905.
4. Bul. Brook. Ent. Soc., Vol. VI, p. 54.
5. Loc. cit.

on the median line, the distal margin with a row of comb-like bristles attached to the ental surface, two long discal and two long lateral setae, the two groups forming a transverse line, and four marginal setae; the mandibles tridentate, the two inner teeth subequal, the outer one much shorter; the thorax and abdomen black above except at the sutures and with fine whitish fuscous lines, dividing the black into distinct areas—there is such a line on the meson of the notum of the three thoracic segments and a line on each abdominal segment dividing it into two parallel transverse bands, the posterior being the longer; at the end of each of these bands a subquadrangular spot, and laterad of each anterior spot another subequal in size which bears the spiracle, and laterad of the spiracle a much larger spot as long as the width of the segment," (bearing two comparatively long hairs; the last abdominal segment bears a row of long fine hairs on the posterior edge and the dorsal black spots on this segment are fused.) "The sternum of the thorax and abdomen pale except a spot on either side of the thorax laterad of the legs and homodynamous spots on each abdominal segment (all of the foregoing spots bearing one or two hairs,) a spot on either side mesad of the spots just described (each abdominal spot bears a short hair,) and a median broad spot; and the last ventral abdominal segment with a well developed proleg, legs blackish except at the sutures." (In many specimens the lines dividing the segments are decidedly yellow giving the larva a banded appearance dorsally. In others these lines and the lines dividing the black areas are indistinct and the entire dorsal surface appears black. The ventral surface is usually yellowish and the median brownish to black spots vary in area.)

*Pupa.* "Length (5 to) 7 mm. Width, (2.6 to) 4 mm. Black except the sternum of the thorax and abdomen, the apical segment of the abdomen which is covered by the cast skin of the larva, the basal segments of the legs, and a median tergal line which are yellowish; the legs, wing-pads and antennae not closely joined to the body; the very young pupae are lighter (yellowish at first) in colour."

*Adult.* This was described by Linnaeus in 1758 (*Syst. Nat.* p. 376). The following redescription is by Blatchley.

"Oblong-oval, narrower in front, subdepressed. Piceous brown, finely pubescent; thorax dull yellow, usually with three piceous spots; side margin, apex and epipleura of elytra yellowish; under surface and antennae piceous, the basal joints of the latter partly dull yellow; legs pale. Thorax twice as wide as long, sides rather strongly angulate; front angles small, prominent, hind angles nearly obsolete; disk with median narrow depression and a larger one each side which is densely punctured and piceous; surface otherwise smooth or with a few coarse punctures. Elytra slightly broader behind, margins distinctly flattened, surface coarsely and rather closely punctate. Length 4.5-6 mm.

DeGeer as early as 1775 gave an account of this insect in *Memoires pour servir à l'histoire des Insects*, vol. V, pp. 326-329, Pl. 10, figs. 1-6, and it has received attention since then from other foreign authors.

Chittenden states that arsenicals are quite effective remedies in checking the beetle on willow and for aquatic plants suggests flooding together with a few drops of oil on the water to destroy the floating insects. If this is not possible

6. Loc. cit.

7. Loc. cit.

the arsenical could be applied to the infested plants either as a dust or as a spray. If applied as a spray, care should be taken not to use a pressure strong enough to submerge the pads. Plant parts well out of the water could be coated readily. It was noted that this insect was absent in areas where the pond-lilies were entirely covered by the tide each day.

### A NEW GRACILARIA INJURIOUS TO AVOCADO (LEPID.).

BY AUGUST BUSCK, WASHINGTON, D.C.

#### *Gracilaria perseæ*, n. sp.

Labial and maxillary palpi ochreous shaded on the underside with black. Face light golden ochreous. Head and thorax purplish ochreous. Antennae whitish with black annulations. Forewings light ochreous with a purplish sheen especially on dorsal half and apex; a few black scales on costa at basal fifth, a small black dot on costa near the middle, and a few scattered black scales at apical fifth seem to be constant in all the specimens before me; there are also a few scattered black scales on the dorsal margin and the extreme apex is slightly clouded with dark scales. Cilia very dark nearly black. Hind wings blackish fuscous with black cilia. Abdomen blackish fuscous above

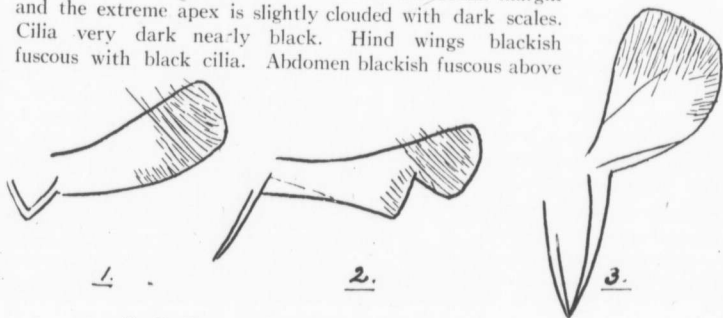


Fig. 22.—Harps of *Gracilaria perseæ* (1), *G. burserella* (2) and *G. violacella* (3).

light golden yellow on the underside. Anterior tibiae thickened with blackish-brown scales; posterior coxae and femora golden yellow with broad, black fasciae; all tarsi white with extreme tip of each point touched with light brown.

*Habitat*.—Miami, Florida. U. S. N. M. Type No. 23515.

Bred from leaves of Avocado (Aquacate), *Persea perseæ*, at Miami, Florida, during July by Mr. G. F. Moznette, who states that the species is seriously destructive to the young growth. The larvæ are typical of the genus; they first make a small mine between the veins of the young leaves, and subsequently fold the tip or the sides of the leaf downwards. The cocoon is white, narrow, oblong, and is spun in a fold on the leaf.

The species is typical of the genus; in coloration it is similar to and intermediate between *G. violacella* Clemens and *G. burserella* Busck, but the male genitalia are so different in the three species as to indicate that they are not truly closely allied. The outline sketches of the harps suffice to separate the three species. The vinculum of *perseæ* is unusually short for the genus, and the harps are straight oar-shaped (Fig. 1), very different from the deeply-notched harps of *burserella* (Fig. 2), and the broadly-curved harps of *violacella* (Fig. 3); the last form is the more common in the genus.

## BOOK REVIEW.

THE USE OF CARBON BISULPHIDE AGAINST THE WHITE GRUB. By W. H. W. Komp. Soil Science, Vol. X, No. 1, pp. 15-28. Miscellaneous Soil Insecticide Tests by J. J. Davis, Soil Science, Vol. X, No. 1, pp. 61-72, pls. 1, 2, 1920.

The above two papers, which are of entomological interest, have recently appeared in Soil Science, a journal devoted to soil physics, soil chemistry and soil biology. While they are clearly within the field of soil biology, it is doubtful if they will reach the eyes of many entomological readers and, for such a reason, it was thought advisable to prepare this brief notice. Mr. Komp's paper deals with the determinations of the maximum dosage of carbon bisulphide non-injurious to such plants as blue-grass and clover, the minimum dosage fatal to the grub, and the influence of temperature and moisture conditions upon the effectiveness of the fumigation. Presumably, *Lachnosterna* larvæ were used. A detailed account of the experiments is given together with tables showing air and soil temperatures, dosages, effect of carbon bisulphide on plants and percentages of grub mortality, using different dosages at different depths and distances in the soil. Mr. Komp concludes that the maximum dosage for ordinary lawn and golf-grasses appears to lie somewhere between 1 and 5 ounces per square foot and considerably above the former, while the minimum dosage for the white grub is about 1 ounce, also that temperature exerts a decided influence on the minimum dosage for the white grub (1 oz. at 65 degrees F. and less than 1 oz. at 85 degrees or above). The injections should not be much over six inches apart. The soil moisture must be medium (10%) to wet (20%) for good results. In addition the charge of carbon bisulphide should be placed several inches below the point where the grubs are working. A limiting factor in the use of carbon bisulphide against the white grub in situations in which it cannot be reached by cultural methods is its relatively high cost. According to the tables in Mr. Komp's paper, the number of larvæ used in a single experiment varied from 2 to 4, and the mortality figures or percentages are based on these numbers. These appear to be far too small to insure any degree of certainty in the results.

The second paper by Mr. Davis reviews briefly the results obtained by various workers using such soil insecticides as carbon bisulphide, sodium cyanide, potassium cyanide, hydrocyanic acid, calcium cyanamide and kerosene emulsion against various soil infesting insects. In addition, he gives the results of his own field tests with such materials as kerosene emulsion, creosote preparations, corrosive sublimate, sulphuric acid, acetaldehyde, Kopper's solution, and especially sodium cyanide against the grubs of *Popilia japonica*. Tables are presented showing rates of application per acre, areas treated, areas examined, dates of treatment and percentages of mortality. After summarizing the present knowledge of the effect of treatments of cyanide and of cyanide in combination with ammonium sulphate on soil, Mr. Davis concludes that while many isolated experiments have been made to determine the possible use of sodium cyanide as a soil insecticide, the entire study lacks continuity, and that until a consistent and continuous program of work is inaugurated, very little in the way of definite results can be expected.

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HARRY B. WEISS, New Brunswick, New Jersey.

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