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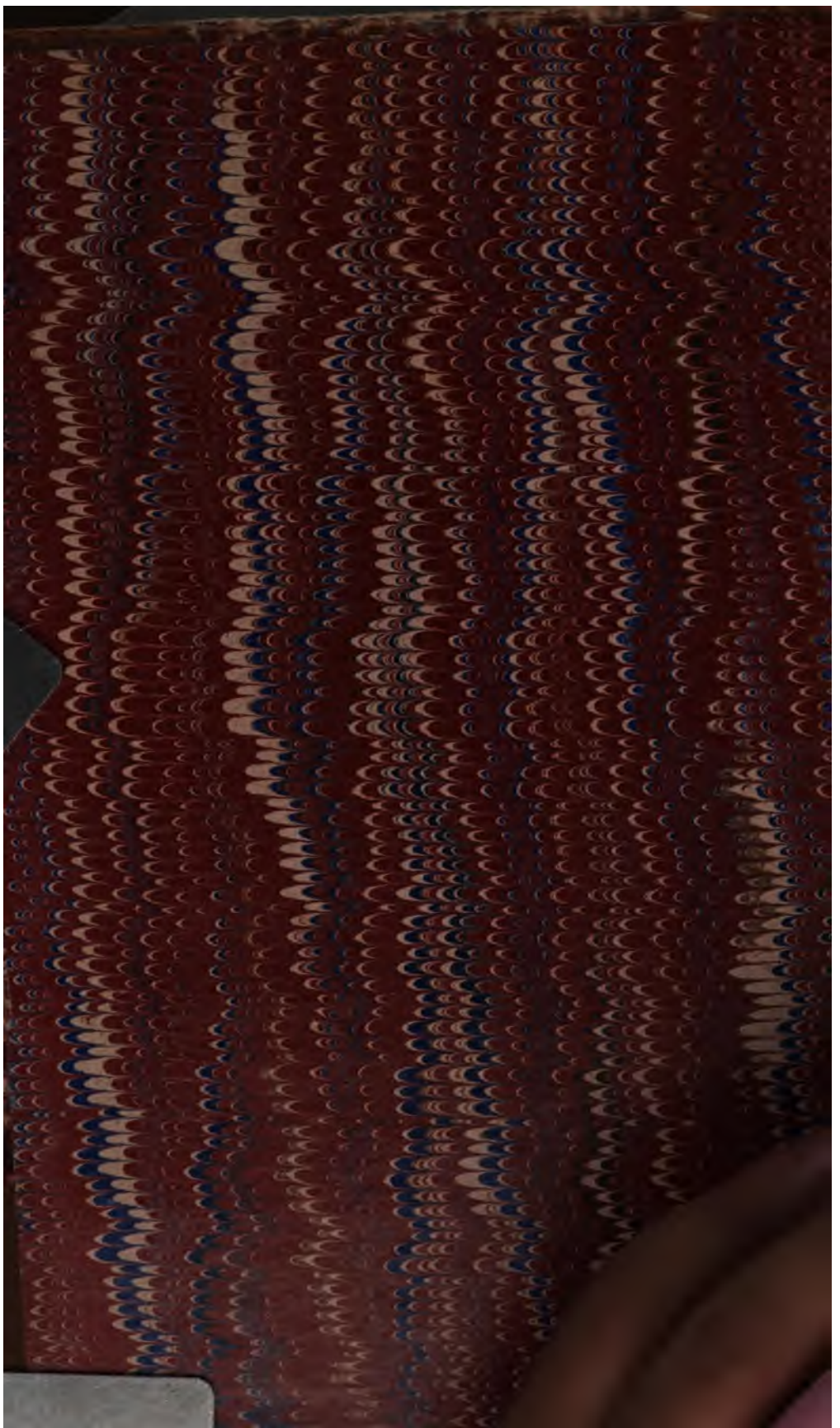
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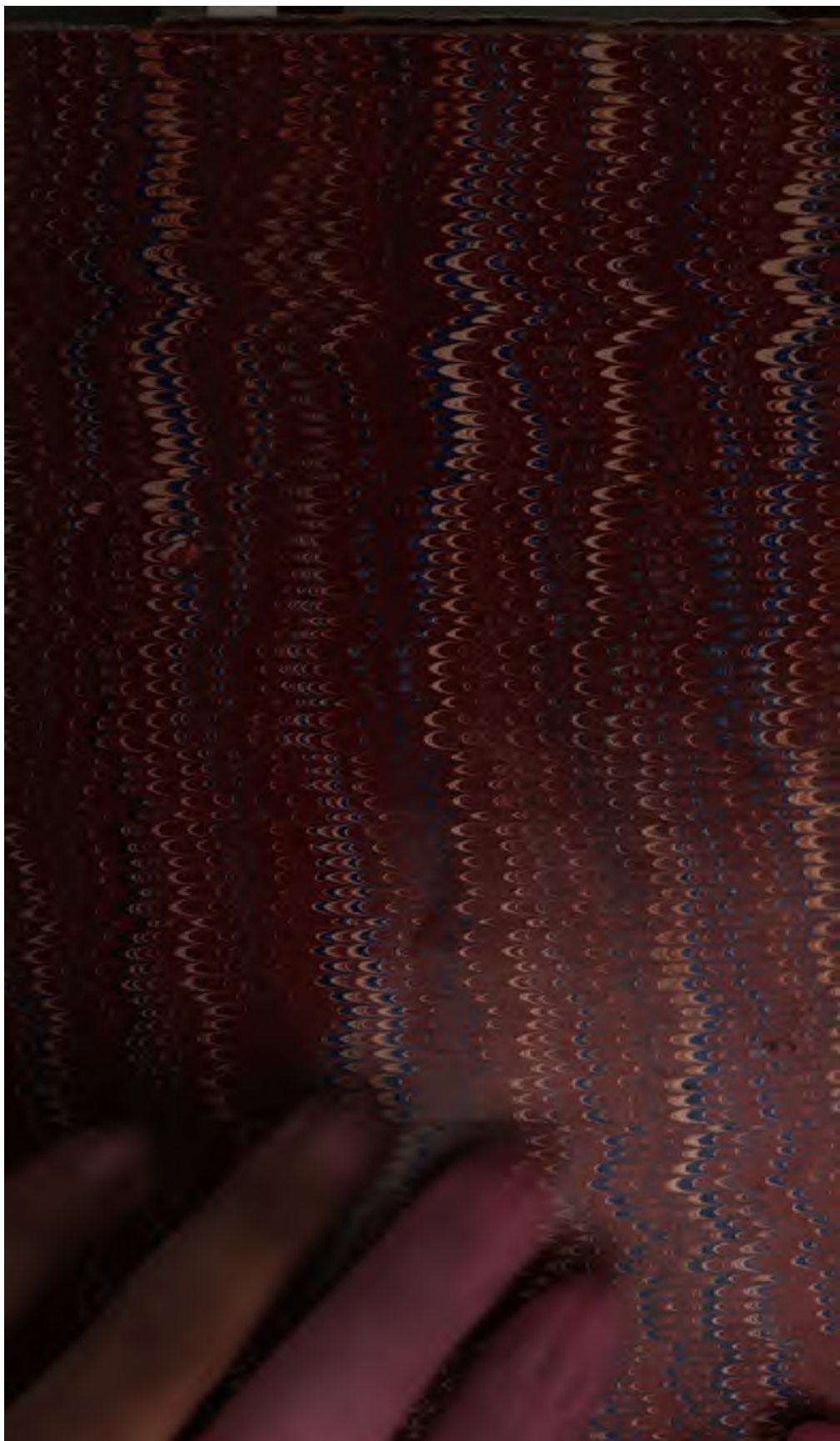
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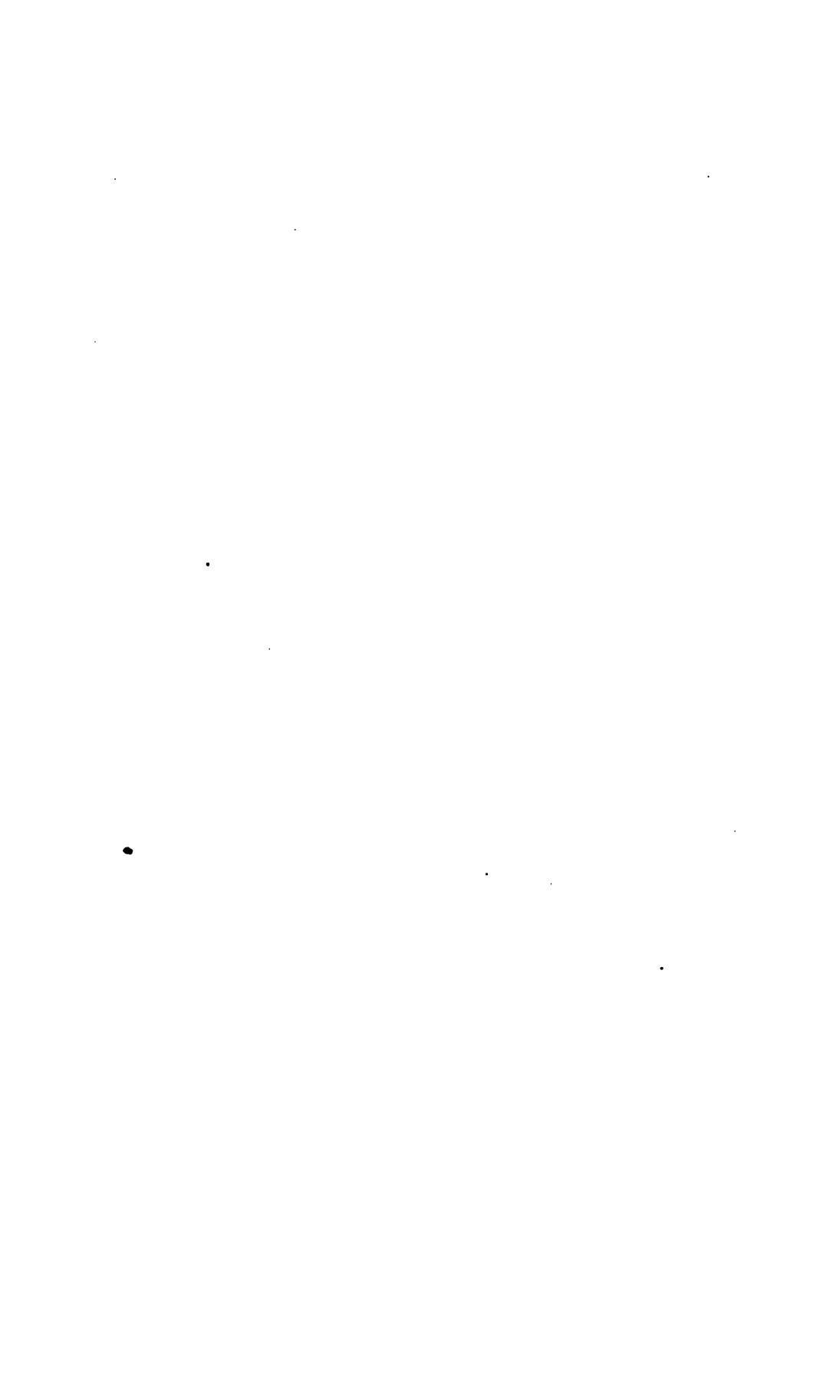


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VOL. I.

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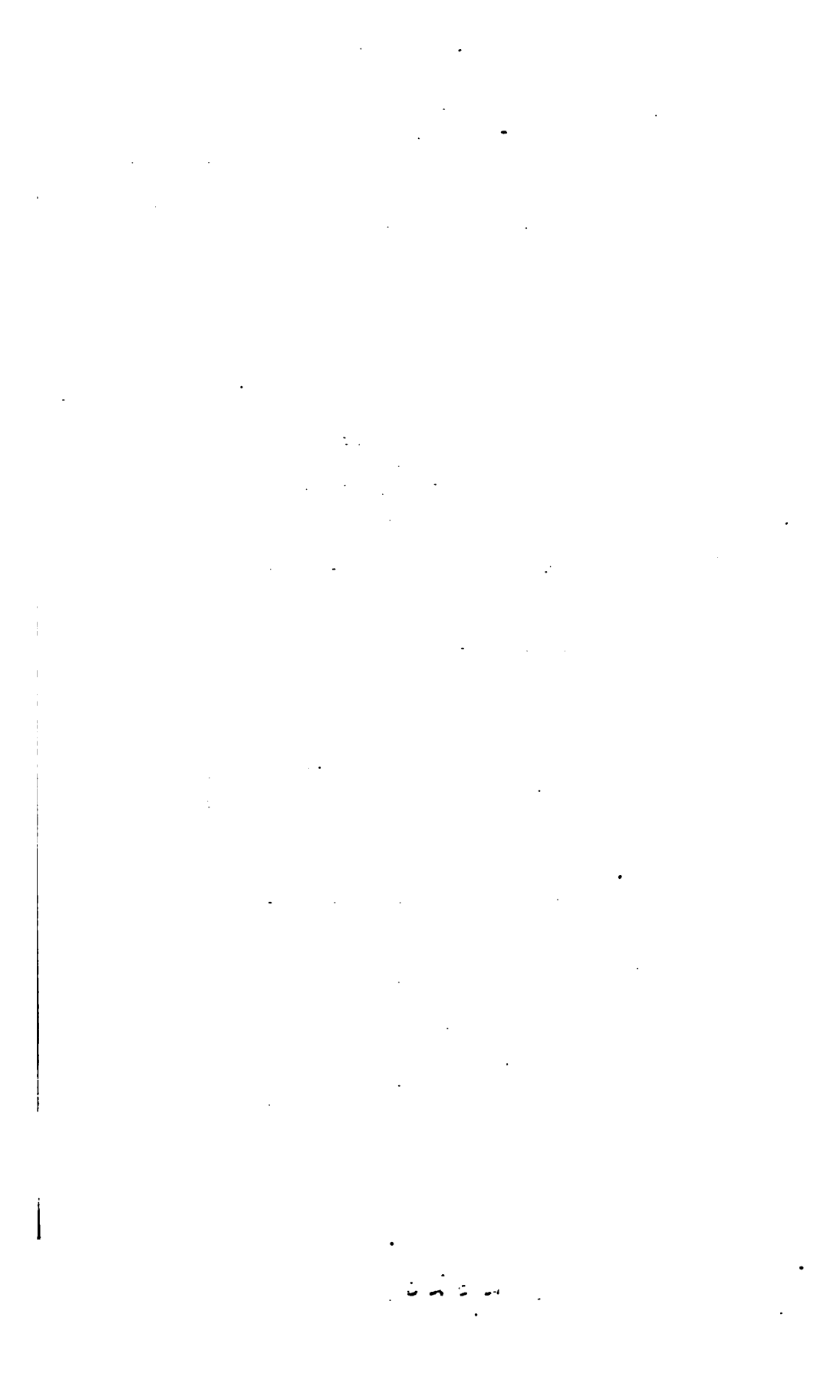
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TRANSACTIONS  
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VOLUME I.

DESCRIPTIONS OF AMERICAN LEPIDOPTERA.—NO. 1.

BY AUG. R. GROTE AND COLEMAN T. ROBINSON.

[Communicated March 11, 1867.]

Family, HESPERIIDÆ.

**HESPERIA**, Fabr.

*Hesperia punctella*, n. sp.

*Male*.—Head, thorax and abdomen, above, olivaceous blackish; beneath, the palpi are clothed with mixed whitish and fuscous hair, the eyes are narrowly bordered inferiorly by pale scales, the thorax is clothed with dull olivaceous hair, and the abdomen is touched here and there with pale scales. Antennæ, slender and moderately long; above, the stem, before the "club," is fuscous and obsolete annulate with a paler shade, which latter becomes more prominent before the apical distension; beneath, more plainly annulate with yellowish-white, which latter shade becomes continuous over the base of the "club;" this latter is elongate, black above, and below, and terminates in the usual short hooklet, carried at right angles with the antennal stem. Legs, fuscous, paler inwardly; posterior femora with two pairs of short, unequal, and slender spurs, which are of a very pale color, and of which the terminal pairs are the most prominent.

Wings, above, glossy olivaceous blackish, with a variable coppery reflection; anterior pair, elongate, sub-triangular, straight along costal margin, produced at apices; an oblique, dull black, stigmal dash, extending from base of 2nd median nervule, inwardly, to above internal nervure; a white dot above this, situate near the base of the interspace between 1st and 2nd median nervules; a white dot within this, placed sub-costally above and near the outer extremity of the discal cell. A cluster of three similar very approximate white dots, one under the other, the lower the largest, slightly curved and placed interspaceally sub-apically between the sub-costal nervules, and forming, with regard

to the two other lines the apex of an oblique triangle, which might be shown to be to include all these measurements equally, the wings are not measured. Triangles are formed with darker spots below the apex and approximately so at the middle posterior wings remaining primary in position, sometimes slightly produced at each angle. Triangles are numerous.

Upper surface of wings and numerous markings with line and narrow streaks. Forewing just beyond middle nearly even and more distinctly so towards the apex. The entire base of the upper surface are dark longitudinal, interrupted by dark spots, minute, dark line marks, but they are more near middle and small and sub-terminal. A line dark, becoming gradually lighter to posterior, spreads posteriorly from apex to about half distance between triangles on an upper surface. The base prominently interrupted with darker spots at the extremity of the nervures. Secondary and anterior divisions somewhat irregular being narrow marks, not obviously marked with light purple at the middle. A dark, even, narrow, anterior band of interrupted irregularity, just anterior to middle, which are interrupted within irregular marks, not dark produced at the base of the median nervure. A narrow line dark, much as on anterior wings. A posterior narrow dark line. Triangles are numerous, interrupted with dark spots at the extremity of the nervures.

*Length*.—3.5 mm. *Length of body*.—1.7 mm.

*Locality*.—Kilimanjaro, Tanzania.

This species bears a slight resemblance to *Leptocryptus* *Leptocryptus* *Leptocryptus* *Leptocryptus*. It is structurally distinct in the shorter antennae, wanting the prominent reflexion of *Leptocryptus*, narrow primary and by having the subcostal as long as the median portion of the cubital. We have examined two male specimens taken by W. James Kilimanjaro, Tanzania, during the early summer of 1950.

*Diagnosis*.—See text.

*Hosts*.—Hosts and numerous other numerous markings. The subcostal veins are marked with narrow brown, which after subcostal extends narrowly above the eye and linearly across the disc and strongly above the median basal line. Terminal the palpi are yellowish-white, which after some extends narrowly above the eye. The thoracic scales are pale yellowish, numerous. The abdomen is marked with obscure whitish. Anterior median suture the anterior disc above. A narrow, brown, anterior, with yellowish-white, which after some extends over the disc and the anterior disc.

rate, elongate, above entirely black, but beneath only terminally so; the terminal hooklet is short, and carried at right angles with the antennal stem. Legs, obscure olivaceous, paler within, hind femora with two pair of very slight, sub-equal spurs.

Wings, above, glossy olivaceous blackish, immaculate; anterior pair slightly produced at apices, moderately straight along external margin; the costal region is somewhat elevated, and, superiorly, the wing is a little wrinkled; there is a faint and variable yellowish-brown reflection equally distributed; fringes, pale, immaculate; posterior wings, rounded along external margin, straight along internal margin, so that the anal angle, without projecting, is yet acute; the coloration as on primaries; fringes, pale, immaculate.

Under surface of wings, shaded with lustrous golden brown scales. Anterior pair, dull olivaceous blackish, shaded with somewhat pale golden brown scales superiorly and terminally; fringes as on upper surface. Posterior wings, evenly covered with pale golden brown scales, except for an inwardly, straightly defined, longitudinal space before internal margin, which is dull olivaceous blackish; fringes as on upper surface.

*Female*.—Resembles the male; the wings are less produced at the apices and angles; the yellowish shades among the palpal and caputal scales in the male, are paler and whitish, as is also the inferior thoracic and abdominal squamation.

*Expanse*, ♂ and ♀, 1.05 inch. *Length of body*, ♂, 0.55, ♀, 0.50 inch.

*Habitat*.—Atlantic District. (Georgia! Ridings; Florida! Linden.)

We have examined one female and three male specimens of this small species, which may be recognized by its immaculate wings and dull obscure coloration, hardly relieved by the golden brown scales of the under surface.

*Hesperia alternata*, n. sp.

*Female*.—Head, thorax and abdomen, above, olivaceous blackish; laterally, the thoracic parts are furnished with long olivaceous hair, which covers the abdomen at base. Beneath, the palpi are clothed with whitish and mixed dark scales, and the eyes are bordered inferiorly with pale scales; the thoracic parts are somewhat loosely clothed with cinereous or slate-ashen hair, which becomes somewhat whitish between the anterior femora; abdomen, sprinkled with grey scales, which form incomplete segmentary bands, narrowly fringing the inferior edges of the abdominal segments laterally, and continued obs-

letely superiorly. Legs, finely scaled, blackish, slightly touched with grey scales; hind tibiae fringed with long and sparse ashen hairs, and provided with two pairs of short, slight, sub-equal spurs. Antennæ, moderate, black, annulate with white, more prominently so beneath, where the base of the "club" is also white, whereas above, this is entirely black.

Wings, blackish-brown, lustrous; anterior pair, trigonate, produced at apices, external margin slightly oblique, hardly rounded, slightly projected at internal angle; posterior pair, rounded along external margin and having internal margin a little shorter than abdomen. Above, the anterior wings are lustrous blackish-brown, faintly shaded with olivaceous at base and along internal margin, immaculate, except a very faint series of disconnected pale marks, three in number, situate sub-terminally and obsoletely, constituting the usual band; these marks are composed of a few powdery pale scales and readily escape observation; the first and longest is situate sub-costally across the apical nervules; the remaining two are situate near the base of the interspaces between the upper median nervules, the upper most the smallest and nearer the external margin. In shape all these marks are linear; that below costa a little arcuate; fringes, white, prominent, narrowly interrupted with blackish at the extremity of the nervules. Posterior wings, blackish-brown, immaculate, with long olivaceous brown hair along internal margin, and spreading sparsely over the base; fringes, white, prominent, obsoletely interrupted with blackish at the extremity of the nervules. Beneath: anterior wings colored as on upper surface, but a little paler, with a slight purple shade, and having the sub-terminal pale marks very slightly more prominent; fringes as on upper surface; the posterior wings are blackish-brown, lustreless, and the whole surface is very distinctly irrorata, or powdered with cinereous or slaty-ashen scales, except for a rather wide longitudinal space before internal margin, extending from base to external margin, towards which it widens, where the ground color of the wing prevails, entirely free from pale scales, which again are sprinkled beyond it along internal margin; these irrorations are gathered centrally so as to form a linear median sinuate band, continued from costal margin to the space before internal margin, which is free from irrorations; fringes as on upper surface.

*Expanse*, 0.95 inch. *Length of body*, 0.50 inch.

*Habitat*—Atlantic District. (Georgia!)

Resembles *Hesperia samoset*, Scudder, (*Hesp. nemoris*, Edwards,) but differs by the obsolescence of the pale marks on anterior wings and the coloration of the posterior wings beneath.



## Family BOMBYCIDAE.

## Sub-family CERATOCAMPIDAE.

## Tribe DRYOCAMPINI.

**PSEPHOPÆCTES**, n. g.

♀. Head, depressed, impacted on the prothoracic parts, which are greatly advanced and projected above it. Eyes, very large and globose. Clypeus, broad, triangulate. Antennæ, slender, shorter than the thorax, bi-pectinate at base for a third of their length, thence simple to tips. Oral structure obsolete. Thorax, globose and elevated, half as long as the abdomen, thus proportionately more elongated than in *Adelocephala*. Abdomen, extending as far as internal margin of secondaries. Wings, rather narrow and elongated.

Primaries, with the costa very straight, and but slightly depressed before the acuminate apices. External margin scolloped, moderately oblique. A shallow excavation below the tips, the margin rising to disco-central interspace where it is produced, but is again and more deeply excavate between first and third median nervule. At the extremity of this latter nervule, the wing is again produced, thence receding to internal angle, this latter rounded and prominent. The nervules are straight or slightly arched. The discal cell is narrow; the 3rd sub-costal thrown off from the nervure itself and not from the discal cross-vein as in *Adelocephala* and *Anisota*, (*Dryocampa*, Harris). The median nervure is straight, and its division into first and second median nervules takes place at a point before the extremity of the discal cell, the second, proceeding straightly to the margin, while the first is slightly arched, but not abruptly taking a divaricating course as in allied genera. The discal cell is closed, but the veinlet is weak, and is, perhaps, not a true nervure. The third median nervule is thrown off from the nervure at a point about midway between the base of the wing and the point at which the first and second nervules divaricate; it is directed downwards, but still slightly arched, and the space on external margin between the nervules is wider than usual, owing more particular to the arcuation of the first median nervule beyond the discal cell. Internal nervule, straight; the sub-median fold runs approximate to third median nervule. Secondaries, irregular in shape. The costa is basally projected, thence depressed or cut away to the apices, these latter rounded and full. The external margin is roundedly produced superiorly, shallowly excavate between the median nervules, again roundedly and shortly produced towards anal angle. Internal

margin long and straight, slightly folded. Costal nervure arched at base and following the shape of the wing, joining the costal margin before the apex. Discal cell somewhat pyriform. The sub-costal nervules are not thrown off together, but the first, on the upper side of the nervure, is thrown off before the divarication of the second and third.

This genus bears a remarkably close though superficial resemblance to *Smerinthus*, *Latr.*; thus the general appearance is very deceptive. The analogies of *Psephopaectes*, with the Sphingidae, are not merely expressed in the conformation of the wings; analogical characters may be traced throughout, as, for instance, in the comparatively large eyes, in which an approximation is shown to the saliency of these organs in a higher Family. The affinities of the moth, on the other hand, are with the Bombycidae, and its true position is with Adelocephala, and allied genera belonging to the lower Tribe of the Sub-family Ceratocampidae—the *Dryocampini*.

In *Psephopaectes*, we have a fresh illustration of the varied and interesting analogical forms afforded by the Bombycidae. Dr. Packard has already remarked: "Within the Sub-order Lepidoptera there is a true and beautiful synthesis located in the Bombyces."\* We take, then, the occasion of repeating Dr. Packard's words on this subject, merely to corroborate his views.

*Psephopaectes simulatilis*, n. sp. (Plate 1, fig. 1, ♂.)

♂. Fawn color, with a light purple shade. Head, thorax and abdomen, uniformly pale fawn color; legs, darker, becoming purplish on tarsi and tibiae outwardly. Primaries, brownish ochreous, obsoletely irrorate, darker at base and outside of the external transverse line. An oblique, basal, darker, transverse line projected superiorly. Median space, paler than the wing elsewhere, limited externally by a narrow, even, oblique, external, dark brown line, which emanates from costa at apical fourth, and joins internal margin without the middle. Discal cross-vein faintly marked and clouded with darker scales. Outside the external transverse line, the wing is more intensely colored than elsewhere, being of a deep tawny ochreous, and is overcast by a light lilac shade, this latter obtaining as a determinate color, from first median nervule to internal angle along the terminal margin of the wing. The short fringes are dark, especially inferiorly. Under surface, resembling up-

\* Packard: On Synthetic Types in Insects, Art. xv, Jour. Bost. Soc. Nat. Hist. Vol. x, p. 662, June, 1863.

per surface of secondaries in ornamentation. Basally and centrally the wing is covered with bright rose-colored, longer, hair-like scales, forming a middle triangular patch. A large, distinct, deep black discal blotch, lying immediately beyond the cell. An external darker transverse band, diffusely shaded outwardly, and becoming roseate where it crosses the middle patch. Internal angle washed with lilac. Elsewhere the ground color of the wing is as on upper surface, becoming very pale along internal margin.

Secondaries, above, with a central bright rose-colored patch of longer, hair-like scales. A large, distinct, deep black, discal blotch like that on under surface of primaries. An arcuate, external, transverse line, becoming roseate where it crosses the central bright shade, above and below which it is more faintly continued. Elsewhere the secondaries are concolorous with upper surface of primaries, and are slightly touched with lilac over anal angle. Under surface, pale dull brownish ochreous, obsolete irrorate, without markings, except a median diffuse darker shade band which is broadest on costa and discontinued inferiorly.

*Expanse*, 3.00 inches. *Length of body*, 1.25 inch.

*Habitat*.—Mexico, (W. H. Edwards, Esq.)

This species is very distinct from *Adelocephala subangulata*, as illustrated by Dr. Herrich-Schaeffer. Our specimen has lost some of the scales, at the base of the wings above, by attrition.

#### ADELOCEPHALA, *Boisd.*

Mr. Walker, (C. B. M., *Lep. Het.* Pl. 6, p. 1498), in writing for the first time upon this genus, ascribes simple antennæ ("*Fœm.*—*Antennæ simplices.*") to the female. But the first species cited—*Adelocephala cadmus*, *Boisd.*—as illustrated by Dr. Herrich-Schaeffer, has the antennæ (fig. 78) feathered at base, and but little less prominently than in the male (fig. 77), from which latter it differs in the rounded external margins of the wings. We describe here a new Mexican species of the genus, which approaches our United States *A. bicolor*, *Harris*, sp., quite closely in habitus and structure, but the antennæ (♀) are simple. In the shape of the secondaries, the peculiar color and structure of the feet, our new species (*A. quadrilineata*), agrees with, and otherwise presents no marked differences when compared with *A. bicolor*. In the female *Adeloccephala anthonilis*, *Boisd.*, the antennæ are basally impectinate, and in a large and heavy, hitherto undescribed Mexican species, (*A. grandis*, *nob.*) which equals in size the Brazillian *A. cadmus*, the ♀ antennæ are also simple. This

genus then, at least provisionally, may contain species in which the ♀ antennal stem may be either simple or basally pectinate; the slight processes with which the antennæ of ♀ *A. bicolor* are provided, contrasting as strongly with the long pectinations of ♀ *A. cadmus*, as with the simple ones of ♀ *A. grandis*. *Adelocephala*, as here considered, stands higher than *Anisota*, of which it is, in a certain sense, an out-growth, so speak. Its position is intermediate between *Citheronia* and *Anisota*. In arranging the species of this latter genus we naturally begin with *Anisota stigma*, and conclude with *A. rubicunda*, a species in which the typical tribal coloration is lost, and the appearance of the moth is disturbed by its analogies with a lower and succeeding Group of Bombycidae.

The North American species referred to, *Adelocephala*, are as follows:

*Adelocephala grandis*, n. s., (Plate 1, fig. 7, ♀).

♀. Size, large; form, stout and heavy. Head, rather small and sunken, invisible from above, owing to the well developed and advanced prothoracic parts. Antennæ, simple, short, basally thickened; compared to the size of the insect they may be termed slight. Abdomen, stout and heavy, projecting beyond the anal angle of secondaries. Thorax, globose, heavy and short. The squamation is thick and close, but not woolly, rather smooth and evenly distributed over the body parts. The color is rather pale brownish ochreous; beneath, with a roseate hue which suffuses the under abdominal parts, and is continued over the under thoracic parts and legs at base. The tarsi and tibiæ are purplish, at least outwardly, the anterior pair the darker.

Wings, full and large. Anterior wings somewhat arched along costa from base to apices, which latter are acuminate but depressed. The external margin is somewhat sinuous, since it retreats inwardly below apex to disco-central nervule, where it is somewhat bulged out, rounding thence to internal angle, this latter improminent and rounded off, the internal nervure and margin of the wing being straight and short. Discal cell retreating towards the base of the wing and squarely closed by a stout and true nervure. Above, the primaries are brownish ochreous. A straight, short, obliquely transverse, darker shade line at base crossing the discal cell. About the discal cross-vein, a faint clouded darker shade. The median space is paler than the wing elsewhere and bounded outwardly by a second, greatly longer and more prominent and deeper colored transverse line, which emanates from



costa at apical fourth and runs, with a slight outward inflection, straightly and very obliquely to internal margin, joining the latter at about the middle. Outside of this second and outer transverse line, the wing is darker colored than elsewhere and obsoletely irrorate with dark dots, becoming faintly paler and obsoletely roseate below apices, this brighter hue touching the fringes between 3rd median nervule and internal nervure before the angle. Between first and third median nervules, the wing is deeply clouded with a darker shade than elsewhere. With the exception noted above, the short fringes are dark brownish. Undersurface, brighter colored than upper. Over the middle, from base to the external diffuse transverse band, the wing is covered with longer hair-like roseate scales. Beyond the discal cross-vein, at the base of the interspace between the disco-central and first median nervules, is a prominent discolorous dark purple brown spot, or rather an accumulation of dark hair-like scales; the disco-central nervule springing very near the inception of the discal cross-vein, at a point where this latter is angulated superiorly, the interspace at base is nearly as wide as the discal cell itself. A broad, transverse, external shade band, corresponding with, but not resembling the outer transverse line of the upper surface, since it appears as a broad, bright ochreous band, widest and most distinct on costa, tapering to the stout sub-median fold (the latter an obsolete nervure) and discontinued before internal margin. Below first median nervule, this band becomes roseate; here it crosses the central roseate patch externally and shows as a darker, more linear shade. Outside the external transverse band, the wing is sparsely sprinkled with blackish striæ; below apices washed with a rose colored shade, becoming obsolete inferiorly.

Secondaries with the costa prominently exerted basally, thence cut away straightly and downwardly obliquely to apex. The costal nervure is correspondingly inflected, and joins the margin before the apex. The external margin is rounded outwardly and evenly to anal angle, immediately before which it is retired inwardly at the expense of the straight and short internal margin. Above: the disc and the centre of the wing are taken up with a large roseate patch, composed of longer hair-like scales. At the discal cross-vein, a large, nearly black scale patch, resembling that of the under surface of primaries, only larger and more prominent and darkly colored. Outside of, and limiting this roseate patch externally, is a transverse, somewhat arcuate, dark roseate band, discontinued above and below. Elsewhere the wings are rather dark brownish ochreous, similarly colored with the

primaries outside of the external transverse band, and obsoletely irrorate. Fringes, pale; thus differing notably from the dark fringes of the primaries. Undersurface, rather pale brownish ochreous, obsoletely irrorate; a very broad dark brownish transverse band, resembling that on primaries, becoming obsolete below first median nervule. Externally, the wing is washed with rose color, but this brighter shade is not continued along internal margin or over the angle. No discal spot of any kind.

The upper surface of secondaries interestingly resembles the under surface of primaries, and vice versa; so that each wing reproduces, on one of its surfaces, the approximate ornamentation of the opposed surface of the other. This not unfrequently occurs among the species of the present group.

*Expanse*, ♀, 5.20 inch. *Length of body*, 2.00 inch.

*Habitat*.—Mexico, (Mr. W. H. Edwards). No. "130."

Is readily distinguished from the Brazilian *Adelocephala cadmus*, by the black discal spot of the secondaries above, as well as by the simple ♀ antennæ and a number of other less prominent characters.

***Adelocephala albolineata***, Grote and Robinson.

*Adelocephala albolineata*, G. and R., Proc. Ent. Soc. Phil., Vol. 6., No. 1, p. 7, Plate 1, fig. 5. (1866).

*Habitat*.—Mexico. (Coll. Am. Ent. Soc.)

***Adelocephala bicolor***, Grote. (Plate 1, fig. 3, ♀., 4, ♀ reverse.)

*Dryocampa bicolor*, Harris, Rt. Ins., Mass., p. 293. (1841).

*Dryocampa bicolor*, Harris, Tr. Ins. Inj., Veg., (3d Ed.), p. 408. (1862).

*Dryocampa bicolor*, Morris, Syn. Lep. N. A., Sm. Ins. p. 232. (1862).

*Anisota bicolor*, Grote, Proc. Ent. Soc., Phil., p. 63. (June, 1864).

*Sphingicampa distigma*, Walsh, Proc. Bost. Soc. Nat. Hist., p. 290. (February, 1864).

*Dryocampa bicolor*, Walsh, l. c., p. 293. (February, 1864).

*Dryocampa bicolor*, Packd., Proc. Ent. Soc., Phil., Vol. 3, p. 384. (December, 1864.)

*Habitat*.—Atlantic District.

This species varies in the ground color of the wings becoming more reddish than in the specimen we figure. Such an individual was taken by Mr. Grote in Arkansas, and is now in the possession of Dr. Packard. Although meagre, Harris' description evidently refers to this species, in which the ♀ antennæ are slightly pectinate at base. Mr. Walsh's error in erecting two genera and species on individuals generically inseparable and specifically identical, has been elsewhere sufficiently exposed. In regard to a critical study of all the species of this Tribe, it has already been remarked, that we must be prepared for slight dif-

ferences of structure between the species. Mr. Grote (l. c.) has also written with regard to *A. bicolor*: "Should, on an examination of actual specimens, our species be found generically distinct, the name proposed by Mr. Walsh will prevail, and our species be known as *Sphingicampa bicolor*." As yet there seems no propriety in adopting this latter determination.

*Adelocephala quadrilineata*, n. s. (Plate 1, fig. 2, ♀).

♀. Size, moderate; form a little slenderer than *A. bicolor*, with which latter species it conforms in appearance and habit. Head, sunken in the prothoracic parts; antennæ, slender, short, and very slightly thickened basally. Thorax, short and stout, globose and elevated, thickly scaled. Above, the head and body parts are bright ochreous tawny; beneath, the abdomen is of a slightly duller and darker color, while the scales fringing the segments and anus are of a brighter tawny ochreous shade. The tibiæ and tarsi are of a dark lead color outwardly.

Wings, full and rounded. Primaries, at base, bright ochreous tawny, which color spreads along costa and over the discal cell, forming a diffuse darker shade about the discal cross-vein. Median space, paler than the wing elsewhere, distinctly limited on either side by two transverse determinate dark brown lines. The first of these is short, slightly angulate at costa, thence running straightly, obliquely inwardly to internal margin. The second, long, emanating from costa at apical fourth, and running straightly and very obliquely inwardly to internal margin, which it joins at about the middle. Outside of this latter line, the wing is again evenly bright tawny ochreous as at base, while the sub-obsolete irrorations are more prominent and perceivable. The external and internal margins are narrowly fringed with dark brown. Undersurface, paler than upper. Over the base, centrally, is spread a diffuse roseate patch; here the scales are longer and hair-like. Beyond the discal cross-vein, a brownish macular discoloration. A single external transverse even dark brown line most distinct on costa, fading towards internal margin. Externally, from the apices downward, the wings are diffusely shaded with a darker hue.

Secondaries, above, largely bright and deep rose color, becoming more intense in hue towards the base and along external margin, where the scales are longer and more hair-like. Costa and external margin, narrowly pale ochreous tawny. Fringes, very pale; thus quite unlike those of the anterior wings. Undersurface, pale dull ochreous tawny, obsolete irrorate. A single brown band is drawn across the wings,

most distinct on costa, fading towards internal margin, before which it becomes obsolete. No discal spots on either surface. In shape the secondaries are as in *A. bicolor*.

*Expanse*, ♀, 2.85 inch. *Length of body*, 1.10 inch.

*Habitat*.—Mexico.

Is at once distinguished from ♀ *A. bicolor*, by the distinct lines of the upper surface of primaries and simple antennæ.

#### Family PHALAEENIDAE.

##### **PERICALLIA**, Stephens.

***Pericallia kentaria***, n. s. (Plate 1, fig. 5, ♀; 6, ♀ reverse).

*Selenia kentaria*, G. and R., MS.

♀. Head and collar, whitish; beneath, the compressed palpi, the under thoracic parts and inside of the legs are deep obscure ochraceous. Outwardly, the legs are palely colored and everywhere sparsely and finely irrorate with blackish scales. Thorax, above, loosely haired. pale, dull whitish fawn color; the scales anteriorly, from beneath the "collar," are darker tinged. Abdomen, hardly as long as internal margin of secondaries, pale ochraceous, irrorate with black scales and with diffuse sementary pale shades continued entirely around. Antennæ, moderate; the stem, above, is covered with pale scales, beneath it is brownish, with a double row of reduced pectinations.

Wings shaped as in *P. syringaria*. Costa of primaries sinuous; roundedly produced at base, depressed before the truncated apices. External margin produced medially, sub-excavate between the nervules. Dull fawn color with bright ochraceous and whitish shades, sparsely and rather coarsely irrorate. At extreme base the costal region is bright ochraceous, mottled with ferruginous transverse streaks, forming a distinct blotch. Below the median nerve, from the base to the third transverse band, the wing is dull fawn color. Costal region more whitish than elsewhere. Three deep brown transverse irregular bands cross the wing from costa to internal margin. These are very broadly marked on costal region, below which they are linear, the first and second slightly diffuse. The first is angulated outwardly on median nerve. The second, at the middle of the wing, is somewhat flexuous or sinuate. The third band follows the second, at a nearer distance than the second does the first; this is distinct and linear, less heavily marked on costa than the others, rounded outwardly to median nerve, where it is bent inwardly, thence running straightly to internal margin. At extremity of the discal cell, between the second and third transverse bands, the wing is suffused with bright ochraceous. A

linear, oblique, clear colored discal streak. Outside of the third transverse line, the wing is broadly pale fawn color, darker in color than the whitish costa. Terminally, the wing is bright ochraceous from apices to internal angle; the whitish costal scales extending downwards and linearly intruding so as to form a pre-apical semi-circular mark; the short fringes are dark brownish. Internal margin fringed with long concolorous fawn colored hair. Undersurface, resembling upper, but brighter colored and more distinctly marked. The paler shades are lighter, and the darker shades deeper than on the upper surface. The nervules are distinctly relieved terminally by dark scales.

Posterior wings, resembling primaries in general coloration and appearance. At base darker, dull fawn color. Two parallel approximate dull brownish transverse lines; between these, the wing is more ochraceous than elsewhere. The inner of these lines crosses the clear colored comma-shaped discal streak. Beyond the outer line, the pale ground color appears as a coincident transverse pale shade. Terminally, the wing is ochraceous, while at anal and costal angles the pale ground of the wing diffusely intrudes. The short fringes are dark brownish. Beneath, as on primaries, the secondaries are very much more brightly marked. Base, largely bright ochraceous, transversely mottled with ferruginous transverse streaks. The inner line is diffuse, distinct and bright ferruginous. Outside the second line the coincident pale shade is white. Beyond it, the wing is darker than on upper surface. The "veins" are generally picked out by dark scales.

*Expanse*, ♀, 2.00 inch. *Length of body*, 0.70 inch.

*Habitat*.—Atlantic District. (Brewster's, Putnam Co., N. Y., April 14th! C. T. R.)

Appears to represent the European *Pericallia syringaria*, *Stephens*, in the fauna of the Atlantic District. It is a larger and brighter colored species. The markings, while quite similar, are more prominently expressed; this is especially true of the ochraceous tints of both surfaces and of the transverse bands of the primaries, which are more broadly marked on the costal region of the upper surface than in the European species. The second transverse band is more irregular, while the third is inwardly bent on the median nervure. In *P. syringaria*, the third band is straight and further removed towards the external margin of the wing. The latter seems to afford a ready character by which we may distinguish this fine species from its European congener. Appearing very early in the season, *P. kentaria* seems as yet to have escaped the notice of our collectors of Lepidoptera. It is an interesting

and beautiful addition to the Lepidopterous fauna of our Middle States.

### Family, PYRALIDAE.

#### Sub-Family, PYRALIDIDAE.

In the *Wiener Entomologische Monatschrift*, Vol. 7, 1863, will be found an extended Revision,\* by Jul. Lederer, of the Pyralidae, which, while it takes cognizance of all the species of the Family that had been noticed by Authors up to that date, is of great interest to the student, from the originality of the classificatory views therein presented. In offering the descriptions of certain Pyralidae, chiefly from the Atlantic District of the United States, it is not our purpose to discuss the merits of Lederer's Classification of the Family, which will be found to differ radically from that of Messrs. Guenée and Walker. We briefly refer to the circumstance, that the species formerly separated under the generic names *Ennychia* (non Led.), *Rhodaria*, and *Pyrausta*, are united to *Botys*, *Treits.* which latter genus thus obtains a much wider signification than had previously been accorded to it by Authros. For the reasons adduced by Lederer for this change, as well as for critical remarks on M. Guenée's so-called "Families" in this Group, we refer the Student to the Paper itself, and have contented ourselves for the present in citing our former MS. determinations of certain species, where such appeared to belong to genera not recognized by the Austrian Entomologist.

#### *ASOPHA*, *Treitschitz*, emend. Led.

*Asopia unimacula*, n. s. (Plate 2, fig. 8, ♂.)

*Pyralis unimacula*, G. & R., MS.

Palpi short, whitish beneath. Head and thoracic region, above, obscure olivaceous fuscous or blackish. Abdomen, a little paler than thorax, the segments narrowly edged posteriorly with whitish scales; beneath, glistening, whitish. Legs, testaceous whitish, a little darker shaded inwardly on the femora; under thoracic surface, whitish.

Anterior wings, silky, of an obscure fuscous or blackish color, with a slight opaline reflection; all the markings are obsolete, except a broad, evident, pale yellow costal blotch or abbreviated band, situate at without the middle, and rather distinctly margined; outwardly, this spot has a sinuous depression; it is also somewhat obliquely placed.

\* "Beitrag zur Kenntniss der Pyralidinen." Jul. Lederer, W. E. M. vii Band. Nos. 8—12, Aug.—Dec., 1863, Taf. 2—18.

and is rounded inferiorly. Below this costal patch, are two or three small testaceous spots, fragments of a transverse band and somewhat coalesced in certain individuals. Secondaries, concolorous with primaries, shaded basally with paler scales, these latter allowing a median dark irregular line, margining the paler portion of the wing externally, to become obvious; medially, the costa is diffusely testaceous; fringes, pale. Undersurface of anterior wings, resembling upper surface; the internal margin is diffusely paler, testaceous. Posterior wings, largely testaceous, shaded with fuscous externally; a sinuate dark subterminal line, continued from costa to just before internal margin above the angle; a sub-basal, similar line, which is curved outwardly, and apparently joins the sub-terminal line at the middle of the wing; the space enclosed in this manner superiorly between the two lines, is, perhaps, more yellowish than elsewhere, and corresponds to the paler shade of the upper surface.

*Expanse*, ♂, ♀, 0.80 inch. *Length of body*, 0.40 inch.

*Habitat*.—Atlantic District. (Penna. !)

Allied to the common *Asopia olinalis*, *Lederer*, (*Pyralis olinalis*, Guenée), but a smaller species, with a different coloration and very distinctive ornamentation. Both *Asopia olinalis*, and *Asopia costalis*, *Fabr. sp.*, occur in New York State. Of the former, *Asopia trentonialis*, *Lederer*, is probably a synonym. The latter is regarded as identical with the European species.

*Asopia anthocoides*, n. sp. (Plate 2, fig. 9, ♀).

Head, thorax and abdomen, pale dull brownish above and beneath; head and appendages, a little darker; legs, concolorous; anterior and middle femora, a little richer colored.

Anterior wings, pale brownish, neatly defined into separate fields by the narrow transverse lines and markings. A pale, somewhat greyish, narrow, basal space. Outside of this, and neatly defined by narrow marginal lines, is a transverse oval rich olivaceous brown patch, narrowing to costal and internal margins. The median space, immediately beyond this dark sub-basal space, is, for half its width, paler than the wing elsewhere; a faint median linear shade line, between which, and a narrow clear post-median line, the outer half of the median space is darker shaded and more brownish. The post-median line and the pale line margining the dark sub-basal patch outwardly, remind us of the transverse posterior and transverse anterior lines in *Anthocia*. The post-median line is sub-sinuate; beyond it, the terminal space of the wing is shaded with brownish, a little mixed with reddish, from

the apex downward, apically the shade is deepened, throwing out the pale color of the narrow post-median line at the costa more strongly than elsewhere, from the contrast. Posterior wings, concolorous with abdomen, a little more cinereous and darker basally; terminally, the wing shows a pale shade and a faint continuous transverse line, running within and nearly coincident with external margin. Undersurface of both wings, cinereous, shaded with purplish along external and costal margins; a common, distinct, pale, sub-terminal line crosses both wings; on the primaries this is somewhat S-shaped, corresponding to its analogue on the upper surface. Fringes, dark.

*Expanse*, ♂ ♀, 0.65 to 0.75 inch. *Length of body*, 0.30 to 0.45 inch.

*Habitat*.—Atlantic District. (N. Y. to Penna. !)

The anal segment of the abdomen is somewhat suddenly constricted and produced in the female of this very interesting species, which somewhat curiously recalls the ornamentation of *Anthoecia*, and more distantly the habitus of *Ichthyura*. Of the American species referred to *Asopia*, by Lederer, it seems to more nearly resemble the common *Asopia farinalis*, Linn. sp., than any other, but is much more robust in the body parts, compared with the general size.

**BOTYS**, *Treitschke*, emend. *Led.*

***Botys signatalis***. (Plate 2, fig. 11, ♂).

*Rhodaria signatalis*, Walker, C. B. M. Lep. Het., Pt. 34, Sup. Pt. 4, p. 1282. (1865).

*Male and Female*.—Head, above, and palpal tips, reddish ochraceous; very narrow paler lateral lines on the "front," margining the eyes; beneath, the palpi are whitish. Thorax, dark ochraceous, with a faint reddish tinge; abdomen, cinereous, silky, shaded with ochreous at base, the segments narrowly fringed posteriorly with pale scales; anal tuft rather prominent, reddish ochreous above, beneath whitish. Undersurface of thorax and abdomen, silky, whitish. Legs, whitish, faintly shaded with cinereous outwardly.

Anterior wings acute. Above, of an even intense pinkish-purple color; two transverse distinct yellowish-white lines; the first (ante-median) is discontinued at the costa, and very slightly irregular, nearly straight; the second (post-median) is strongly outwardly arcuate superiorly; over the median nervules, where it is most constricted, it is composed of disconnected dots, closely approximate; inferiorly, it runs parallel with and more approximate to the first line to internal margin. Posterior wings, silky, cinereous, deepening in hue towards external



margin, nervules darker clothed; a pale streak within anal angle, margined without by a very few roseate scales, and discontinued above median nervure. Fringes a very little paler than on anterior wings. Undersurface of wings, silky, cinereous, with a faint purplish lustre, darkest superiorly, and with a median faint pale shade line across both pair, arcuated on anterior wings where it is analogous with the post-median line of the upper surface.

*Expanse*, 0.75 inches. *Length of body*, 0.35 inches.

*Habitat*.—Atlantic District. (Mass. to Pa. !)

Mr. Walker's description makes no mention of the abbreviated band on the upper surface of posterior wings; the anal tuft is not "whitish." nor are the fringes of the secondaries properly characterized as of the same hue. The hind wings are rather dark cinereous, not "æneous." or concolorous with the fringes of the primaries. Nevertheless, the general coloration and the conformation of the distinct lines of the upper surface of anterior wings, lead us to believe, that this is the species intended in the British Museum Lists. In the case that a new name be used for this species, we propose that of *Botys* (*Rhodaria*) *vinulenta*, *nob.* *Athaloessa signatalis*, *Zeller*, sp., had been already described at the time of the publication of *Rhodaria signatalis*, *Walker*.

A single specimen, brought by Mr. Ridings from Colorado Territory, offers no points of distinction, when compared with specimens of *B. signatalis*, from the Atlantic States.

*Botys laticlavata*, n. sp. (Plate 2, fig. 12, ♂.)

*Rhodaria laticlavata*, G. & R., MS.

*Male and Female*.—Head, above, and palpi obscure ochreous fuscous; two narrow, white lines run from the tips of the palpi, along their superior edge, back to the antennal bases, narrowly margining the eyes on the front; beneath, the palpi are white at base. Thorax, ochreous; abdomen, pale dull ochraceous, the segments obsoletely defined by a paler edging of scales posteriorly; beneath, the legs and under corporal surface are of a dull pale color, not whitish, but of an obscure ochraceous or cinereous hue. Antennæ, dark, somewhat purplish superiorly.

Anterior wings, light purple, silky; a broad, rather square, yellow patch at base, resting on internal margin, but not attaining the costal region; a distinct, sub-spherical, yellow discal spot; a broad, yellow, slightly oblique, sub-terminal band, a little narrower and constricted in the female, running from internal margin to costal region, not attain-

ing the costa. Fringes, light purple, concolorous. Posterior wings, silky, pale cinereous, with a purple shade, most prominent along external margin; a faint, rather broad, pale yellow band is obsoletely continued from anal angle, and corresponds to the sub-terminal band of the anterior wings. Under surface, faintly cinereous, silky, with a purple shade superiorly along and beneath costal region of both pair of wings, giving place inferiorly to a faint yellowish tinge.

*Expanse*, 0.80 inch. *Length of body*, 0.35 inch.

*Habitat*.—Atlantic District. (Penn.)

Resembles *Haematia phoenicealis*, *Hübner*, *Zutr. Ites Hund.* No. 58, p. 22, figs. 115—116, but is a slightly larger species, and readily distinguished by the discal spot on the upper surface of the primaries, and the paler, purplish, and almost concolorous under surface of both wings.

*Botys cinerosa*, n. sp. (Plate 2, fig. 13, ♂.)

*Rholaria cinerosa*, *G. & R.* MS.

Head, palpi and thorax, olivaceous cinereous; tegulae and "collar," very slightly shaded with purplish. Two narrow white lines extend, one on each side, from the palpi along their upper edge to the base of the antennae. Abdomen, olivaceous cinereous. Beneath, the under corporal surface and legs are whitish cinereous, palpi narrowly edged with whitish scales.

Anterior wings, silky, light purple, with concolorous fringes. A broad, rather square, olivaceous cinereous patch at base, resting on internal margin, but not attaining the costal region which is everywhere purple; a rather distinct, sub-spherical, cinereous discal spot; a broad, cinereous, slightly oblique subterminal band, running from internal margin to costal region. Posterior wings, silky, pale olivaceous cinereous; the fringes and external margin are stained with light purple, most evident centrally along the extreme edge of the external margin.

Under surface of both wings, obscure cinereous, washed with pale purplish along costal and external margins; fringes, pale purple.

*Expanse*, ♂ ♀, 0.65—0.75 inch. *Length of body*, 0.30—0.40 inch.

*Habitat*.—Atlantic District. (Penna.)

This species resembles *Botys latielavia*, *G. & R.*, exactly in the ornamentation of the upper surface of the primaries, but the markings are here cinereous, not yellow; the corporal coloration presents also the same difference.

*Betys diffusa*, n. sp. (Plate 2, fig. 16, ♂.)

*Rhodaria diffusa*, G. & R., *MS.*

Head and palpi, obscure cinereous; thorax, cinereous; tegulæ stained with reddish-purple; abdomen, cinereous, above and below stained with purple; beneath, the legs and corporal parts are pale yellowish cinereous, the former somewhat the palest.

Anterior wings, dark reddish-purple; a moderately broad, sub-basal, bright yellow band, rests on internal margin, where it is broadest, not attaining costal region. A distinct, yellow, discal spot. A sub-terminal, moderately broad, bright yellow band, runs from costa, before the apex, to internal margin, bent inwardly below the middle of the wing, but elsewhere running parallel with external margin; fringes, purple. Posterior wings, reddish, of a slightly fulvous shade; fringes and external margin, purplish; a narrow, yellow, discontinued streak within anal angle, otherwise the wings are concolorous, without markings.

Under surface of wings, reddish, a little paler than secondaries above; the color is evenly distributed, except along internal margin of primaries, where, as usual, the wings are discolourously shaded with cinereous. The primaries show a yellowish discal spot and narrow sub-terminal band, obsolete before internal margin; apices tinged with obscure purplish. The secondaries show a distinct, continued, yellow, subterminal band, running at variance with external margin, since it emanates at anal angle, and joins the costa within apical angle at a point continuous with the sub-terminal band of the primaries.

*Expanse*, ♂ ♀, 0.60 inch. *Length of body*, 0.30 inch.

*Habitat*.—Atlantic District. (Louisiana!)

Resembles *Haematia phoenicealis*, *Hübner*, but the primaries are more rounded at the apices, and they show a distinct discal dot; the secondaries, as also the under surface of both wings, are almost entirely bright reddish; the corporal parts are also differently colored.

A specimen, taken at New Orleans, was obligingly communicated to us by Mr. Wm. H. Edwards. *B. diffusa*, is also found in Cuba; specimens, with the No. 454 attached to them, have been forwarded to Philadelphia by Prof. Poey.

*Betys haruspica*, n. sp. (Plate 2, fig. 14, ♂.)

*Pyrausta haruspica*, G. & R., *MS.*

Head, palpi and thorax, obscure purplish cinereous; lateral narrow pale lines extend along upper palpal edge to the antennal bases. Abdomen, dark cinereous. Beneath, the palpi and under corporal surface and legs are whitish cinereous; anterior femora, darker colored outwardly.

Anterior wings, acute; above, rather dark purple; fringes, long, yellow. Centrally, the wing is crossed by three approximate, broken, irregular, transverse, yellow bands, which do not extend over the costal region. The costal edge, apically, is yellow. The outer of the central yellow bands appears to enclose a sub-terminal sinuate line of the ground-color of the wing, and angulated inwardly below the middle. Posterior wings, silky, light purple, becoming paler and somewhat cinereous towards the base and along external margin; an interrupted, oblique, yellowish streak, emanates sub-terminally within anal angle, and is obsoletely continued to costa at within apical angle; fringes, yellowish. Under surface, pale testaceous; anterior wings, broadly shaded with obscure purplish along costal and external margins; centrally, the markings of the upper surface are obsoletely indicated; fringes, yellow. Posterior wings, faintly shaded with light purplish along costal and external margins; an obsolete, sub-terminal purplish line and discal spot; fringes, yellowish.

*Expanse*, ♂ ♀, 0.65—0.70 inch. *Length of body*, 0.30—0.40 inch.

*Habitat*.—Atlantic District. (Mass. to Penna.!)

A somewhat variable species in the appearance of the central yellow markings of the upper surface of primaries, and of common occurrence.

*Betys generosa*, n. sp. (Plate 2, fig. 10, ♂.)

Head, palpi and thorax, above, dull obscure blackish; abdomen, blackish, the segments narrowly edged posteriorly with yellowish. Beneath, the palpi, legs and corporal parts are whitish testaceous, silky.

Anterior wings, dull obscure blackish, shaded obscurely and largely with dull brownish over the middle; two transverse dull black lines; the sub-basal acutely dentate, the last outward inflection the most prominent; the sub-terminal, oblique, finely dentate, inwardly inflected below the middle of the wing. A squarish, yellow, discal spot. At the costa, the sub-terminal transverse line is broadly bordered outwardly by a yellow band which, below the first median nervule is obsoletely and quite narrowly continued to internal margin. Terminally, the wing is dark colored, and there is a faint series of black nervular marks before the external margin, on which latter rest a terminal series of interspaceal dark dashes obsoletely separated; fringes, dark, paler at their outer extremities. Posterior wings, black or blackish; a yellowish discal spot, and the base shows a few scattered yellowish hairs; a very broad and evident median yellow band, widest superiorly

where it does not attain the costal margin, tapering to anal angle which it hardly reaches; fringes, whitish, as is the costal margin. Under surface of wings, pale yellow; a black discal dot, sub-terminal band (this on the primaries is very broad, oblique, and discontinued at about the centre of the wing, when, below it, the sub-terminal line of the upper surface is apparent), and a broad, terminal, black shade on both pair of wings.

*Expanse*, ♂, 0.80 inch. *Length of body*, 0.35 inch.

*Habitat*.—Atlantic District. (Penna. !)

Resembles some of the European species referred by Westwood to *Pyrausta*. The primaries are less trigonate than in the common *Botys inaequalis*, *Lederer*, (*Herbula inaequalis*, *Guenée*).

*Botys ventralis*, n. sp. (Plate 2, fig. 23, ♂.)

*Male and Female*.—Blackish-brown, slightly glossy, varying in the depth of shade in the general color, which is sometimes ochraceous. Palpi, head and thorax, above, blackish-brown; a narrow, white line margining the eyes on the "front;" abdomen, paler than thorax, concolorous with posterior wings, the segments are obsoletely margined posteriorly with paler scales. Beneath, the palpi, legs and under thoracic surface, are obscure or dirty whitish, the femora, inwardly, are darker shaded; abdomen, obscure whitish, with a rather broad, distinct, central, brownish ventral stripe, and, laterally, one on each side, narrower and improminent.

Anterior wings, uniformly blackish-brown, concolorous, or nearly so, with the thoracic parts above. All the markings are obsolete, except the usual transverse posterior or post-median line, which is prominently angulated, being greatly produced outwardly, centrally, and which consists of a faint blackish line, connecting a series of white, irregular and variable white marks and spots, which latter are partly cuneiform and lunate as to their shape, discontinued at the sub-median nervure, (above which usually the largest is placed), and, as a whole, become, especially in the darker specimens, more or less obsolete and wanting. A similarly constituted discal dot, more or less distinct, and often obsolete. Posterior wings, nearly uniform brownish cinereous, with faint traces of a median, interrupted and irregular darker line. Fringes, on both pair, paler than the ground-color of the wings, very glossy and rather long. Under surface of both wings, glossy, obscure brownish cinereous, slightly iridescent; the posterior wings are palest, and both pair without defined markings, except in so far as the ornamentation of the upper surface is feebly reflected.

*Expansæ*, ♂ ♀, 1.10—1.15 inch. *Length of body*, 0.50 inch.

*Habitat*.—Atlantic District. (New York to Penna. !)

A common and variable species as to its general coloration, and the distinctness of the markings of the upper surface of anterior wings. The coloration is, however, uniformly distributed, and thus the paler, more ochreous individuals are easily identified from the constancy of the main characteristics of the species; among the specific characters easily seized, are the longitudinal stripes of the inferior abdominal surface, a character to which we have alluded in the choice of the specific name.

*Botys ventralis*, *nov.*, resembles *Tholeria illiberalis*, *Hübner*, *Zutr.* 3tes Hund., No. 175, p. 27, figs. 349—350, but is a smaller species, and wants the terminal white dots on the upper surface of primaries, while the extra mesial line of white dots is straighter and nervular in the South American species.

*Botys posticata*, n. sp. (Plate 2, fig. 25, ♂.)

♂. Head and thorax above, pale ochreous brown. Labial palpi, prominent, beneath with a few whitish scales, laterally concolorous with head and thoracic region above. Abdomen, very pale obscure ochreous, beneath paler, whitish, as are the legs and under thoracic surface.

Wings, shaped nearly as in *Botys ventralis*. Anterior pair ochreous brown, becoming of a clearer and brighter brown along costa and external margin. Ornamentation simple; an inner, transverse, sinuate, blackish shade line; two ill-defined, discal, dark maculations, of which the outer, the larger; an oblique, finely dentate, transverse, posterior, dark shade line, outwardly projected opposite the disc, succeeded by a coincident pale shade. An obsolete series of interspaceal dots on the margin. Fringes, silky, discolorous with the wing, being of an obscure wood-brown. Beneath, whitish ochreous; the blackish markings of the upper surface repeated less distinctly. Secondaries, brownish testaceous, semi-transparent, dark shade along external margin; very faint traces of a median, diffuse, dark shade line. Under surface resembling upper, but paler, more ochreous.

*Expansæ*, ♂, 0.90 inch. *Length of body*, 0.40 inch.

*Habitat*.—Atlantic District. (Penna. !)

Varies by the primaries being of an even, bright brown above, obscuring the ornamentation.

**Botys citrina**, n. sp. (Plate 2, fig. 20, ♀.)

♂ ♀. Size, small. Bright ochre-yellow. Head and thorax ochre-yellow; labial palpi, brownish-ochreous laterally, beneath white. Legs and under body surface, whitish, glistening; anterior femora stained with ochreous inwardly. Abdomen, above, whitish, with a yellowish shade. Antennæ, slender, long, testaceous.

Wings, rather wide. Primaries, above, bright ochre-yellow, with simple ornamentations. A distinct, deep ochreous, longitudinal shade on costa, extending from the base of the wing to the inception of the exterior transverse line, fading as it proceeds, and not equally distinct in all specimens examined. An inner, regularly outwardly curved, deep ochre-yellow, transverse line. Two similarly colored discal ordinary spots. An exterior line, slightly oblique, and roundedly outwardly produced opposite the disc. Fringes, concolorous with the wing. Under surface paler, especially along internal margin, where the wing is whitish. The markings of the upper surface are here reproduced more faintly and incompletely, but the costal shade stripe is wanting.

Secondaries, resembling primaries in color. At base paler, and as well as along internal margin, somewhat whitish. A single, incomplete, deep ochre-yellow, oblique transverse line, corresponding to the exterior transverse line of primaries. Fringes concolorous. On both wings the extreme external edge appears narrowly deeper colored. Beneath as above, but much paler, more whitish, evenly colored; the single, transverse, incomplete line, is here reproduced.

*Expanse*, ♀, 0.80; ♂, 0.70 inch. *Length of body*, ♀, 0.30; ♂, 0.35 inch.

*Habitat*.—Atlantic District. (New York! Penna.!)

Differs by its small size, bright color, simple ornamentation, and by the costal darker longitudinal shade of the upper surface of primaries.

**Botys maculenta**, n. sp. (Plate 2, fig. 21, ♀.)

♀. Size, moderate. Pale ochrey-yellow. Head and thorax, above, ochrey-yellow. Labial palpi, dark ochreous laterally, white beneath. Legs, and under corporal surface, obscure whitish, glistening; anterior femora somewhat cinereous. Abdomen, whitish, stained with yellow above. Antennæ, long and slender.

Wings, full, clear pale yellow, with obsolete ornamentations. Primaries rather brighter colored about the base, but with a generally evenly distributed coloration. The ordinary lines and spots are faint, but perceptible, since they are traced in darker scales than the ground color of

the wing, and are, with the basal portion, slightly dusted with brighter scales. An inner, waved, transverse line. Two ordinary discal spots. An exterior, finely dentated, transverse line, which is prominently and roundedly outwardly projected opposite the disc. A faintly marked and straighter sub-terminal shade line, difficult to discern, but quite distinctly marked in cinereous on the under surface. Fringes, concolorous, or a little paler than the wings. The external edge of both secondaries and primaries is narrowly lined with darker ochrey-yellow; this is quite apparent on the under surface owing to the pallor of the wings, where the line appears broken interspaceally.

Secondaries, resembling primaries. As usual, the base, costal and internal margins are diffusedly paler and whitish, while the darker and yellow color is expressed centrally along external margin, fading medially over the centre of the wing. Outside of the disc the wing is crossed by two sub-parallel shade lines, of which the inner corresponds to the exterior transverse line of the primaries; the outer, to the sub-median shade line. Fringes a little paler than the wing, becoming whitish towards anal angle.

Beneath, both wings are glistening, obscure whitish, with a slight opaline reflection. The markings of the upper surface are here more distinctly reproduced in pale cinereous. The costa of primaries and external margin of both wings are shaded with obscure ochrey yellow.

*Expanse*, ♀, 1.00 inch. *Length of body*, 0.40 inch.

*Habitat*.—Atlantic District. (Penna.!)

Differs from *Botys citrina*, *nob.* by its larger size, paler color, indistinct ornamentation and by the presence of sub-median lines of both wings.

*Botys insularis*, n. sp. (Plate 2, fig. 24, ♂).

♂. Size rather large. Cinereous. Head, thorax and abdomen, of an even dull cinereous. Beneath, the short palpi, legs and abdomen are whitish cinereous, glistening. Legs, long, armature well developed.

Wings, full. Primaries with the tips a little produced, entirely and evenly cinereous, with obsolete ornamentation, but the usual exterior transverse line is faintly visible and greatly and roundedly arcuate at the middle. Fringes, a little paler than the wing, very silky. Secondaries, a little paler than primaries, evenly cinereous, but becoming a little paler basally and along costal and internal margins. As on primaries, a single transverse, irregular, extra discal shade line is barely



visible. Fringes, paler than the wing, becoming whitish over anal angle. Undersurface resembling upper, but a little paler, especially on secondaries. The exterior lines of the upper surface are here reproduced, and there are faint indications of discal marks on both pair; those on the secondaries well removed towards the base of the wing.

*Expanse*, 1.15 inch. *Length of body*, 0.45 inch.

*Habitat*.—Cuba, (Poey). Coll. Ent. Soc.

*Number* 1029, *Poey's MS. Catalogue*.

Resembles *Botys dasconalis*, *Walker*, from our Atlantic District, but is a darker species, and wants the ochreous discolorations over the prothorax and from the base of the wing outwardly along the costa, which characterize our species, of which we have specimens from Massachusetts and Pennsylvania.

*Botys coloradensis*, n. sp. (Plate 2, fig. 18, ♀).

♂ ♀. Size rather large. White. The palpi laterally, head, above, and the sides of the thorax to the insertion of the primaries, are ochreous; the thoracic stains are very bright. Thoracic disc, white. Abdomen, above and beneath, pure white, as are the legs and under corporal surface generally; the anterior tibiæ are somewhat cinereous. In the male, the anal segments are faintly stained with pale yellow.

Primaries of an even faintly yellowish white, stained at base, along costa, with bright ochreous. An interior angulated transverse line, two discal dots and an exterior slightly dentate transverse line medially projected—all yellowish ochreous. A sub-terminal, similarly colored, shaded line, interspaceally broken. Fringes, whitish. Secondaries, immaculate, sub-hyaline, whitish above and beneath; fringes pure white. Undersurface of primaries resembling upper, but more whitish and somewhat obsolete, and reproducing the ordinary ornamentation.

*Expanse*, ♂ ♀, 1.15 inch. *Length of body*, 0.65 inch.

*Habitat*.—Colorado Territory. (Mr. James Ridings).

♂ *Botys gracilis*, n. sp. (Plate 2, fig. 15, ♂).

♂ ♀. Size, small. Form, slender. Pale brownish testaceous. Palpi, white beneath; laterally, covered with brown scales. Above, the head, thorax and abdomen are pale brownish testaceous; beneath, the legs and under thoracic and abdominal parts are whitish, glistening.

Wings, elongate; ornamentation simple and typical. Primaries, evenly pale brownish testaceous. Costa and costal edge shaded with brown. A nearly straight, brown, transverse anterior line. Two dis-

cal, annulate, moderate, ordinary spots: the first, spherical; the last elongate, sub-reniform in shape. Below the median nervure, a slight aggregation of brown scales. A brown transverse posterior line, slightly trembled below the costa, but running straightly outside the disc, over median nervules, where it is strongly inflected backwards to a point beneath the outer discal spot, running thence straightly to internal margin. A very distinct, deep brown, terminal, regularly interrupted line. Fringes, rather long, with a faint linear basal shade on both pair.

Secondaries, resembling primaries in coloration, thinly scaled. A brown discal spot, and a single brown transverse line, analogous to the transverse posterior line of primaries, and prominently inflected backwards below the discal cell. A terminal, distinct, macular, brown line as on primaries. Beneath, both wings are paler than above, with the ornamentation of the upper surface more fluently reproduced.

*Expanse*, ♂ ♀, 0.90 inch. *Length of body*, ♂, 0.45, ♀, 0.30 inch.

*Habitat*.—Atlantic District. (Mass. to Penna. !)

A very slender, thinly scaled, and delicate species of common occurrence throughout the Middle States. Differs by its transparent brownish testaceous color and by the stained costal edge. Specimens occur in which the transverse anterior line of the primaries becomes obsolete along its backward inflection; the primaries then appear to be crossed by *three* transverse lines. The obsolescence of this line at this point is not an unusual occurrence in other species of the genus and family.

*Botys adipaloides*, n. sp. (Plate 2, fig. 19, ♀).

♂ ♀. Size, moderate. Head, prothorax and palpi, obscure brownish, beneath, white. Thorax, above, shading posteriorly to yellowish. Abdomen, above, brownish; the segments are edged with whitish scales, basally mixed with yellow scales above. Beneath, the abdomen, thoracic parts and legs are obscure whitish, silky.

Wings, shaped nearly as in *Botys adipalis*, *Zeller*, as illustrated by Lederer. Primaries arched before apices, on costa. External margin sinuate, retreating within the produced apices, thence outwardly rounded at extremities of median nervules. Secondaries with the apices well produced, the external margin receding immediately below them, thence evenly rounded to anal angle. Both primaries and secondaries are rather bright clear yellow. All the markings are of an obscure purplish stone color. Primaries, dark dull brownish along costa. An inner transverse narrow line. Two large quadrate

discal spots, of which the inner surmounts a third below the median nervure. A narrow, sub-serrate, transverse posterior line, projected outwardly opposite the disc. A very broad distinct terminal dark marginal band. Fringes, paler, with a basal line. Secondaries, resembling primaries. A basal interrupted line. An elongate discal spot. An exterior transverse sinuate line, interrupted along its inferior inward inflection, but distinct from internal margin to beneath the discal spot, where it is also straight; this portion of the line, being thus disconnected, assumes the appearance of an independent middle line. Externally, the secondaries are broadly margined as the primaries. The inner edges of these marginal bands are analogous on both wings, being outwardly oblique, thus constricting the bands over the middle of the wings; before interal angles the bands are widened again, more suddenly on primaries. Beneath, the ornamentation is as on upper surface on both wings, but the ground color is very pale testaceous, not yellow, while the darker markings are also paler than on wings above.

*Expanse*, ♂ ♀, 0.90 to 0.85 inch. *Length of body*, 0.45 to 0.40 inch.

*Habitat*.—Atlantic District. (Mass. ! to Texas !)

Smaller than the Cuban *Botys togalis*, *Led.*, which the present species resembles in ornamentation, and apparently nearest allied to *B. adipalis*, *Zeller*, from Amboina; besides minor differences the dark margins are narrower in *B. adipaloides*, *nob.*, and the inner discal spot is geminate in both sexes and on both surfaces of primaries. The bright yellow color of the wings is easily lost, and captured specimens appear to have an obscure ochreous testaceous ground color of the wings instead of the bright, rather clear and light yellow which is seen in clean and fresh individuals.

*Botys plectilis*, n. sp. (Plate 2, fig. 17, ♀).

♂ ♀. Size moderate. Obscure fuscous, with a slight purplish reflection. Head, thorax and abdomen, above, dull brownish fuscous, abdominal segments obsolete margined posteriorly with pale scales. Beneath, obscure whitish, as are the legs, of which the anterior pair are inwardly darker colored. Labial palpi, moderate, extended horizontally beyond the front, concolorous with the upper body parts, with a few paler scales at base beneath.

Wings shaped as in *B. artificialis*, *Led.* Primaries, largely obscure brownish fuscous. Ornamentation, simple, typical. A transverse inner

line, obscured by the dark ground color of the wing. A square pale yellow discal patch, resting between the small dark discal dots. Transverse posterior line more distinct, brought into relief by a diffuse pale yellow shade, which latter obtains principally opposite the disc within the t. p. line. This latter is projected outwardly opposite the disc, where it is serrated; below the yellow shade it becomes lost, owing to the dark color of the wings. A terminal dark shaded line resting on the external edge; fringes obscure brown, discolorous with the wing. Secondaries resembling primaries; at base fuscous, the dark color obscuring a discal spot apparent beneath; medially pale yellowish testaceous; a distinct median line, followed outwardly by an interrupted yellowish shaded line, so as to be brought into relief by the yellowish color on both sides, of the normal conformation, serrated, outwardly projected opposite the disc. A terminal blackish interspaceal line and fringes, as on primaries. Beneath, paler than above; primaries, darker shaded, with a slight opaline reflection; secondaries, wholly obscure ochreous. On both wings the ornamentation of the upper surface is repeated, the lines are here narrowly interrupted and macular.

*Expanse*, ♂ ♀, 0.70 to 0.90 inch. *Length of body*, 0.35 to 0.45 inch.

*Habitat*.—Atlantic District. (Penna.!).

A common species, variable as to size. When rubbed, specimens present a different and paler appearance. *B. plectilis*, is allied to *B. artificialis*, *Led.*, and certain European species of the genus.

#### LIPICOSMA, *Ledcrer*.

*Lipocosma albolineata*, n. sp. (Plate 2, fig. 22, ♀).

♀. Whitish ochreous. Head and thorax, whitish ochreous. Labial palpi slight, divergent, thinly scaled, porrected and slightly exceeding the "front." Legs and under corporal surface, white, glistening; anterior tarsi and tibiæ, touched outwardly with bright ochreous. Abdomen, above, white. Antennæ, moderate, slender.

Wings full. Primaries, pale ochreous, with darker sub-terminal shades. The inner transverse line is white, margined outwardly with an obscure coincident shade, and is regularly dentate, appearing somewhat angulated at costa. Median space, diffusely shaded posteriorly by an obscure shade, deeper, more brownish than the ground color of the wing. Discal spot, sub-obsolete, whitish. Transverse exterior line, white, neatly margined by narrow dark coincident shade lines of which the inner is more distinct. The line itself is greatly and roundedly  
 dly projected over the middle of the wing; towards the internal

margin it bends inwardly, and is once waved; it is very regularly arcuate and minutely dentated on the nervules.

Terminally it is again continuously obscurely shaded along the outer edge, as on median space immediately inside of the transverse exterior line, but the shade is here interspaceally broken by paler whitish scales on the nervules. A sub-obsolete series of very minute nervular black dots. Fringes, stained with yellow at base. Secondaries, largely white; the ochreous portion distinctly limited and confined to the middle of the wing on external margin. A transverse white line, only visible where it crosses this darker portion of the wing, arcuate, and lined inwardly with a dark coincident linear shade. Fringes, whitish, stained with yellowish at base and medially.

Beneath, both wings are whitish, faintly shaded with pale ochreous-brownish. The transverse exterior line of the primaries alone visible, very distinct and brownish. However, as on upper surface, it is in reality white, the apparent dark brownish line corresponding to the coincident dark shade line of the upper surface, since immediately beyond it there is a second very faint and narrow dark line, and the narrow space between the two is whitish, and thus is plainly analogous to the white exterior line of the upper surface with its dark margins. Disc of the primaries faintly shaded with brownish. Secondaries, very pale, resembling primaries. A single, irregular, brownish line, discontinued inferiorly, and seemingly running at variance with the short, white line of the upper surface. Fringes on both wings, yellowish.

*Expanse*, 0.65 inch. *Length of body*, 0.25 inch.

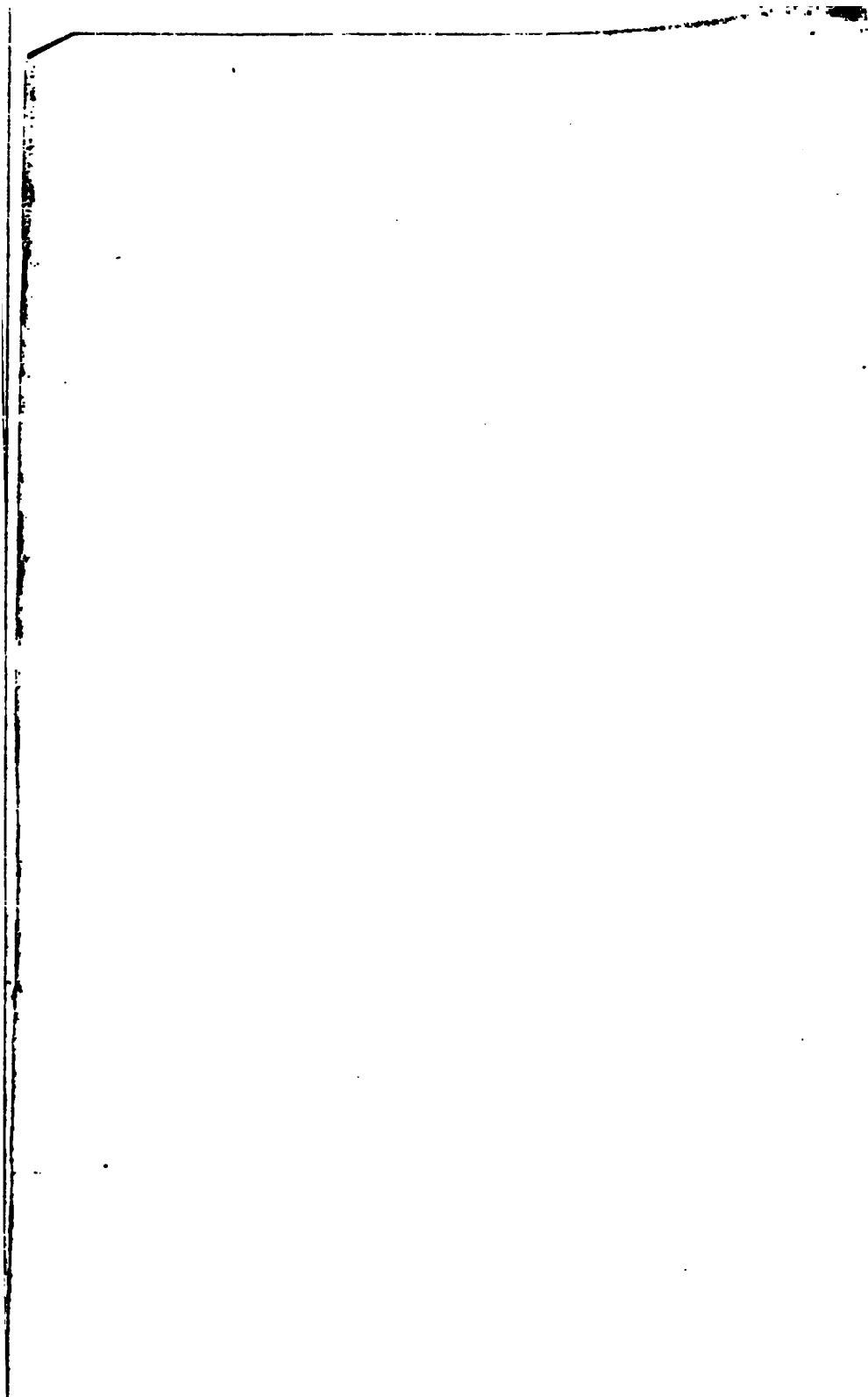
*Habitat*.—Atlantic District. (Penna!)

Differs from *Lipocosma sicalis*, (Walk.,) *Led.*, by the less prominently angulated exterior lines of the upper surface of the wings, by the more ochreous color, and by the absence of the median, sub-discal, black dots and discolorations.

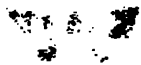
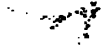
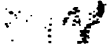
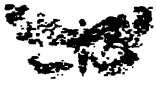
## EXPLANATION OF PLATES 1 AND 2.

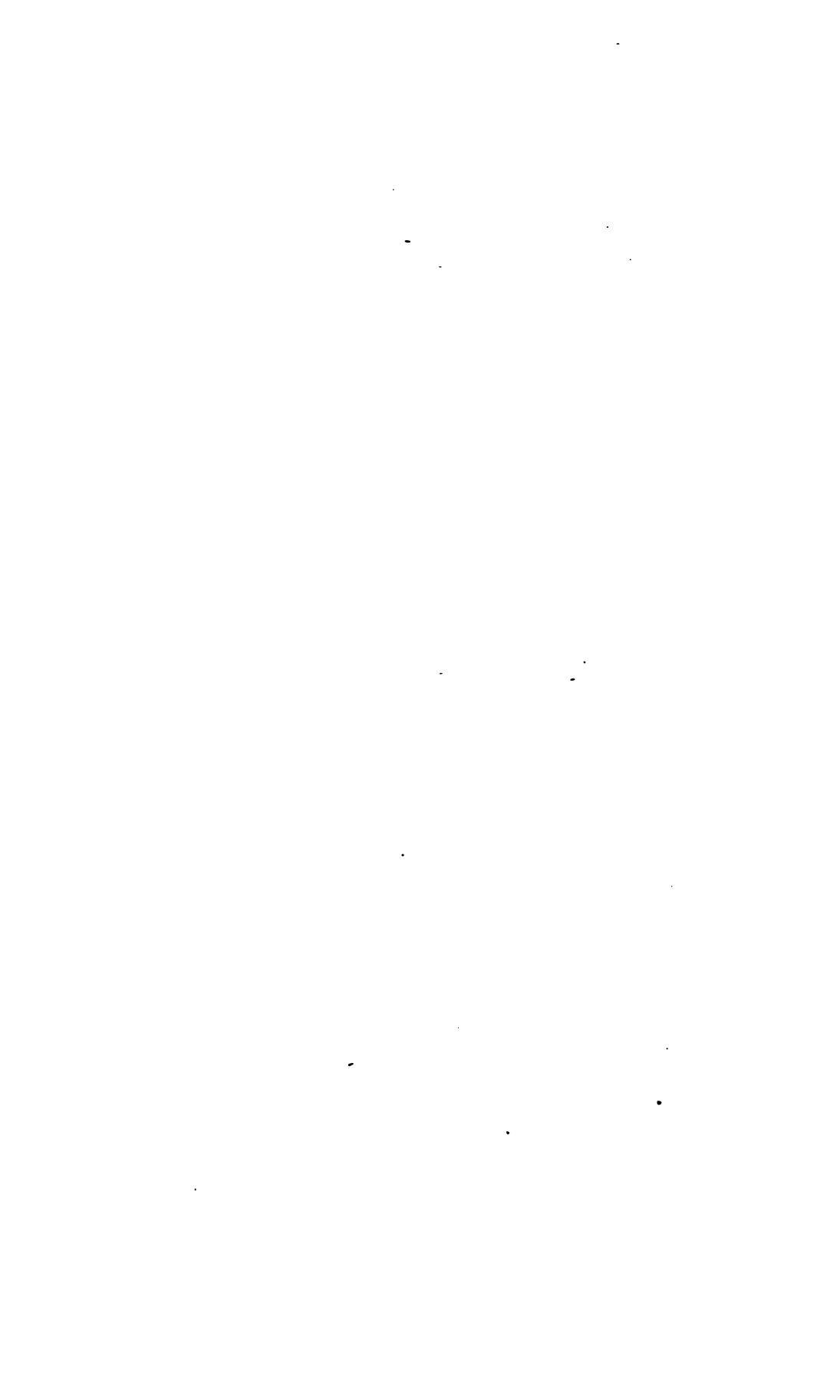
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- Fig. 1, ♂ *Psephopaectes simulatilis*.  
2, ♀ *Adelocephala quadrilineata*.  
3, ♀ *Adelocephala bicolor*.  
4, ♀ *Adelocephala bicolor*, (reverse.)  
5, ♀ *Pericallia kentaria*.  
6, ♀ *Pericallia kentaria*, (reverse.)  
7, ♀ *Adelocephala grandis*.  
8, ♂ *Asopia unimacula*.  
9, ♀ *Asopia anthoecioides*.  
10, ♂ *Botys generosa*.  
11, ♂ *Botys signatalis*.  
12, ♂ *Botys laticlavata*.  
13, ♂ *Botys cinerosa*.  
14, ♂ *Botys haruspica*.  
15, ♂ *Botys gracilis*.  
16, ♂ *Botys diffusa*.  
17, ♀ *Botys plectilis*.  
18, ♀ *Botys coloradensis*.  
19, ♀ *Botys adipaloides*.  
20, ♀ *Botys citrina*.  
21, ♀ *Botys marculeta*.  
22, ♀ *Lipocosma albolineata*.  
23, ♂ *Botys ventralis*.  
24, ♂ *Botys insularis*.  
25, ♂ *Botys posticata*.



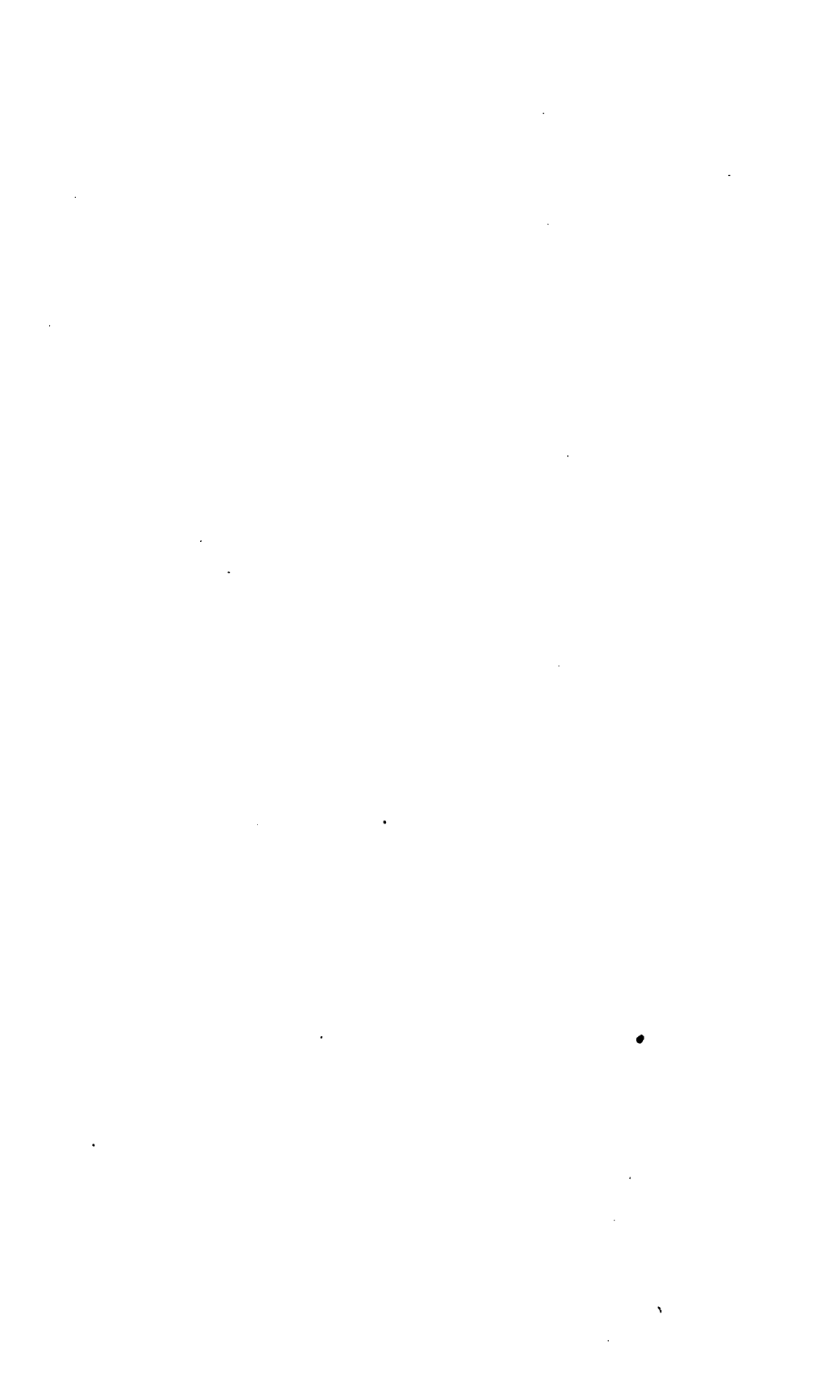












Catalogue of the described **TENTHREDINIDÆ** and **UROCERIDÆ** of North America.

BY EDWARD NORTON.

[Communicated March 11th, 1867.]

This paper is not presented as a complete monograph of these Families, but simply as a catalogue of the genera and species of this continent, with references to all the described genera known to the compiler, for the information of American students who have not access to the original descriptions.

It is to be hoped that it will lead to a closer and wider study of these the most injurious of all Hymenoptera to our trees and plants. As all of their larvæ live on leaves or woody fiber they may all be classed as injurious to vegetation.

In some genera it is very difficult to define a true species, because of the variation in color. This is particularly the case in *Nematus* and in *Tenthredo*. And doubtless some of the species described here, will prove to be varieties. Mr. Walsh has shown that in some species of *Eaura* and *Nematus* bred by him, it was almost impossible to detect any difference in the imago, while the larvæ varied greatly. Doubtless our present opinion will be greatly modified by future discoveries. The bullæ which appear in the wing nervures of all these insects, and which are much noticed by Mr. Walsh, are only referred to in this work, because they have not been sufficiently studied by the writer. Although not *caused* by the folding and unfolding of the wings, they seem to indicate the points at which the wings are folded or unfolded, and the hinges at which they can be bent without breaking. As the same arrangement is often common to several genera, it seems probable they may prove of value in defining Tribes or groups of genera; a most desirable point, as will be seen in the deficiency of many of the generic distinctions hereafter presented.

It is fitting to acknowledge with thanks, the receipt of insects for examination from many persons, especially the following: A. S. Packard, Jr., from Maine and Labrador; S. H. Scudder and A. F. Sanborn, from Massachusetts; J. Akhurst, W. H. Edwards and Mr. Calverley, New York and Virginia; P. R. Uhler and T. Glover, from Maryland; Baron Osten Sacken, District of Columbia and elsewhere. Thanks are also due to Prof. Agassiz for affording free access to collections in the Cambridge Museum; S. H. Scudder to the collection of Dr. Harris, in the Bost. Soc. Nat. Hist.; E. T. Cresson, to the collection of the

American Entomological Society, and in giving most ready and valuable information from rare books, only to be found there. Through the Smithsonian Institute, beside others, insects have been received from the following western localities: from the Hudson's Bay Territory and Russian America, collected by Bobt. Kennicott; from Washington Territory and Puget's Sound, by Dr. C. B. Kennerley; N. W. Boundary Survey, Lieut. G. Beckwith, U. S. A.; Pacific R. R. Survey, near 38° N. L.; St. Louis, Mo., Dr. Engelmann; Mexico, Dr. H. DeSaussure; also others mentioned in the course of the manuscript.

A list of the described species of South America is added, which may be useful at some future time.

## SYNOPSIS OF THE ORDER.

Order HYMENOPTERA, Linn.

### Section I. Terebrantia, Latr.

#### Sub-Section 1. *Phytiphaga*.

##### Division 1. *Serrifera*.

##### 2. *Terebellifera*.

#### 2. *Entomophaga*.

##### 1. *Spiculifera*.

##### 2. *Tubulifera*.

##### 1. *Tenthredinidæ*.

##### 2. *Uroceridæ*.

##### 3. *Cynipidæ*.

##### 4. *Evanidæ*.

##### 5. *Ichneumonidæ*.

##### 6. *Chalcididæ*.

##### 7. *Proctotrupidæ*.

##### 8. *Chrysididæ*.

### Section II. Aculeata, Latr.

#### Sub-Section 1. *Prædones*.

##### 1. *Heterogyna*.

##### 2. *Fossorea*.

##### 3. *Diptoptera*.

##### 9. *Fermicidæ*.

##### 10. *Mutillidæ*.

##### 11. *Scelidæ*.

##### 12. *Pompilidæ*.

##### 13. *Sphogidæ*.

##### 14. *Larridæ*.

##### 15. *Bembicidæ*.

##### 16. *Hyssonidæ*.

##### 17. *Crabronidæ*.

##### 18. *Vespidæ*.

##### 1. Solitary 1. *MASARINI*.

##### 2. *EUMENINI*.

##### 2. Social. 3. *VESPINI*.

#### 2. *Mellifera*, Latr.—*Anthophila*.

##### 19. *Andrenidæ*.

##### 20. *Apidæ*.

## Order HYMENOPTERA, Linn.

*Characters.*—Wings four; naked, membranous, the posterior pair smaller than the anterior, with comparatively few veins.

Mouth with horny jaws, and with a lower lip or tongue, sheathed by the maxillæ.

Tarsi generally five jointed.

Abdomen armed with a multivalve saw ovipositor or sting in the females.

Larva apod and vermiform (or cruciform and pedate in one group.)

Pupa incomplete and inactive.

Section I. *Terebrantia*, Latreille.

The abdomen of the females furnished with an instrument used as a saw or borer for depositing the eggs.

Sub-Section I. *Phytiphaga*.

Abdomen sessile, or soldered in its full width to the base of the thorax.

Group a. *Serrifera*.—*Tenthredinidæ*.

Abdomen of female armed with saws. Anterior tibiæ with two apical spurs.

Group b. *Terebellifera*—*Uroceridæ*.

Abdomen of female armed with a borer. Anterior tibiæ with one apical spur.

## Family TENTHREDINIDÆ, Leach.

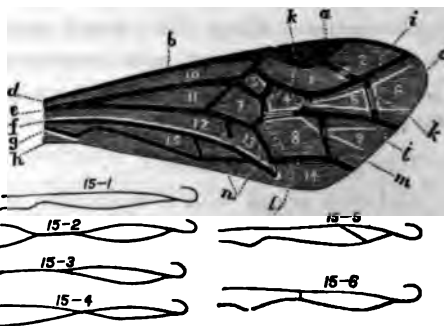
*Antennæ.*—The form and number of articulations or joints serves to indicate the principal divisions of the family.

*Head.*—Eyes large, in general widely separated. Ocelli three. Labrum transverse or quadrate, pilose. Mandibles terminated with teeth, often unequal on opposite sides. Labium with three laminæ; labial palpi 4-jointed; maxillary palpi 6-jointed.

*Wings.*—The divisions of the genera and sub-genera are generally indicated by the number, form and position of the areolets. The marginal areolets are complete.

## UPPER WING.

- a.* Stigma.  
*b.* Costa or costal margin.  
*c.* Apical margin.  
*d.* Costal and post costal veins.  
*e.* Externo medial.  
*f, g.* Anal.  
*h.* Posterior margin.  
*i.* Marginal vein.  
*j.* Submarginal vein.  
*k.* First, second and third (transverse) submarginal nervures.  
*l.* Recurrent nervures (discoidal.)  
*m.* Discoidal vein.



- n.* First and second inner apical or submarginal nervures.

Bullæ or clear spots on the veins or nervures, with bullar or clear lines crossing them.

- 1, 2. Marginal or radial cells.  
 3, 4, 5, 6. Submarginal or cubital cells.  
 7, 8, 9. Discoidal cells.  
 10. Costal cell.  
 11, 12. Brachial or medial cells.  
 13, 14. Inner and outer apical cells. (Hinder cells, *Hartig*. Cellule du limbe, *Lepel.*)

No. 11 is sometimes the medial, and Nos. 12 and 13 the submedial cells.

Nos. 9 and 14 the apical cells; Nos. 7 and 13 discoidal; Nos. 10, 11, 12, 15, the 1st, 2d, 3d, and 4th brachial cells.

15. Lanceolate cell.—1. Open.  
 2. Contracted.  
 3. Petiolate.  
 4. Sub-contracted.  
 5. With oblique cross nervure.  
 6. With straight cross nervure.

*Thorax.*—This is generally wider than the head. The prothorax is its anterior part, its upper edge or collar curving and joining wings; the angular space nearest the wings is called the anterior angle, back of which, next the pleura, is the first spiracle. The mesothorax is between the wings above, and is divided into three lobes, with deep sutures between. Properly connected with this, between this and the metathorax is the scutellum, which is generally small, elevated and rounded or conical. Behind this is the post-scutellum, at the sides of which are usually two minute white dots (cenchri). The metathorax is the hinder part of the thorax, and has attached to it the hinder pair of wings and the two hinder legs. The posterior portion of the metathorax is often divided by a suture from the anterior part, and covers



what is often supposed to be the first abdominal segment. In most genera this is split through the middle and retracted, and hence has been called the basal plates. The second pair of spiracles is on these plates. A pale membrane, as in *Cimbex*, often appears between the basal plates. The pectus is the breast or under part of the thorax. The pleura or side is the space between the pectus and wings.

*Abdomen*.—This is sessile, sub-cylindric; segments distinct, with a spiracle on each side of the first seven. The first or basal segment is attached to the extended portion of the metathorax, which resembles a segment, and is often described as the first.\* The ovipositor of the females is attached to the extremity beneath. It consists of a pair of compressed saw-like plates, each of which is in two pieces, the saw and its back support which is also serrate. These saws vary in shape in different genera, but are curved upward, serrate and ribbed on the sides. They are inclosed in a pair of outer sheaths.

*Legs*.—Length moderate. Trochanters 2-jointed. The ends of the tibiæ with two acute spines. In some genera there are one or more spines on the sides of the tibiæ. The four basal joints of the tarsi generally have a membranous appendage beneath.

*Pupa*.—A soft chrysalis, when mature distinctly exhibiting eyes, antennæ, wings and legs; in some cases more or less thickened externally, mostly with a parchment-like silken cocoon. Transformations in the ground or on the surface, or on limbs of trees.

*Larvæ*.—Like caterpillars, with a horny head, and on either side simple eyes; six horny pectoral, and from 12—16 skin-covered, ventral feet. In one case in default of these last, there are two antennæ-like organs on the side of the final segments. (*Lyda*.)

*Eggs*.—Generally deposited in the leaves or ribs of plants. In some few cases in slender or hollow stems.

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\* Mr. Walsh (Proc. Ent. Soc., Dec., 1866, 225,) has noted several of my former errors of this kind. For a long time I supposed that there was a first segment beneath these basal plates, and that the abdomen had nine segments. But if one examines the larva of *Cimbex*, he will find but nine pair of spiracles, of which in the imago the first pair appear beneath the anterior wings; and the second pair in all the Ichneumonidæ and other genera examined, is found distinctly on the metathorax, back of the hinder wings, while the remaining seven pair of spiracles, which in the larva, are in the seven succeeding segments, also follow in succession on the abdomen of the imago.

Mr. Walsh also notes the fact that there is one more segment visible upon the dorsum than upon the venter. Burmeister states, that in the Hymenoptera the dorsum generally has one more segment; while Shuckard says, that in all the Aculeate Hymenoptera the males have seven and the females but six segments. (Burm. Man., 108.)

## GENERIC SYNOPSIS.

### Family TENTHREDINIDÆ.

Subfamily 1. **CIMBICIDES**.—Antennæ 5-8 articulate, short, clavate.

**A. Wings with two marginal and three submarginal cells.**

**a. First submarginal cell with two recurrent nervures.**

Lanceolate cell with straight cross line.

1. Antennæ 7-articulate.....1, **Cimbeæ**.
2. " 8 " .....2, **Trichiosoma**.
3. " 5 " .....3, **Clavellaria**.

Lanceolate cell closed in middle.

4. Antennæ 6-articulate.....4, **Zarea**.
5. " 7 " .....5, **Abia**.
6. " 5 " .....7, **Plagiocera**.

**b. First and second submarginal cells each with one recurrent nervure.**

7. Antennæ 5-articulate .....6, **Amasis**.

**c. Second submarginal cell with two recurrent nervures.**

8. Antennæ 5-articulate.....8, **Pachylesticta**.

**B. Wings with one marginal cell.**

Three submarginal cells.

**d. First and second submarginals each with one recurrent nervure.**

1. Antennæ 6-articulate.....9, **Thulea**.
2. " 6 " not clavate .....10, **Acordulecera**.

Four submarginal cells.

**e. Second and third submarginals each with one recurrent nervure.**

1. Antennæ 6-articulate.....11, **Sizygonia**.
2. " 6 " marginal cell appendiculate.....12, **Perga**.
3. " 7 " marginal cell appendiculate.....13, **Cephalocera**.

Subfamily 2. **HYLOTOMIDES**.—Antennæ 3-4 articulate, third long and often furcate in the males.

**C. Wings with two marginal and three submarginal cells.**

**a. First and second submarginals each with a recurrent nervure.**

1. Antennæ 4 articulate.....14, **Blasticotoma**.

**D. Wings with one marginal, not appendiculate cell.**

Four submarginal cells.

**a. Second and third submarginals each with a recurrent nervure.**

1. Antennæ of male furcate; of female slender, bliform.....15, **Sericocera**.
2. Antennæ of male furcate; of female somewhat clavate.....16, **Schisocerus**.
3. Antennæ of male simple; of female somewhat clavate.....17, **Atomacera**.

**b. Second and intersection of second and third submarginals each with a recurrent nervure.....18, **Scobina**.**

Three submarginal cells.

**c. First submarginal receiving two recurrent nervures..19, **Thomos**.**

*E. Wings with one marginal, appendiculate cell.*

Three submarginal cells.

- 1. First submarginal with two recurrent nervures 20, \*\*\*\*
- 2. Second " " " " 21, \*\*\*\*\*
- 3. First and second submarginal each with one recurrent nervure.....22, *Didymia*.

Four submarginal cells.

- 1. Second and third submarginals each with one recurrent nervure.  
Posterior tibiæ without side spur.....23, *Ptilia*.  
Posterior tibiæ with side spur.....24, *Hylotoma*.
- 2. Second submarginal with two recurrent nervures.....25, *Pachylota*.

Subfamily 3. TENTHREDINIDES.—Antennæ 9-15 articulate.

*F. Wings with one marginal cell.*

Three submarginal cells.

- 1. First and second submarginals each with one recurrent nervure.....26, *Cladius*.
- 2. First submarginal with two recurrent nervures.....27, *Pristiphora*.
- 3. Second submarginal with two recurrent nervures... .. *Euura*.

Four submarginal cells.

Antennæ 9-articulate.

- 4. Second submarginal with two recurrent nervures.  
Lanceolate cell closed in middle.....30, *Leptopus*.  
Lanceolate cell petiolate; posterior tibiæ much flattened.....29, *Crasus*.  
Lanceolate cell petiolate; posterior tibiæ as usual.....31, *Nematus*.  
Lanceolate cell petiolate; second recurrent nervure received at intersection of second and third submarginal cells.....32, *Messa*.
- Antennæ 13-articulate.....33, *Perreyia*.
- " 11 " .....34, *Camptoprium*.
- 5. Second and third submarginals each with a recurrent nervure.  
Antennæ 10-articulate.....35, *Dictynna*.  
" 9 " .....36, *Aulacomerus*.

*G. Wings with two marginal cells.*

Three submarginal cells.

- 1. First and second submarginals each with a recurrent nervure.  
Antennæ 10-articulate.....37, *Druida*.  
" 11 " .....39, *Fenella*.  
" 9 " .....  
" " " short, subclavate.....38, *Fenusa*.  
" " " long, slender.  
Third joint longer than fourth.....41, *Melicerta*.  
Third and fourth joints nearly equal length..42, *Emphytus*.
- 2. Second submarginal with two recurrent nervures.....43, *Dolerus*.

## Four submarginal cells.

Antennæ 9-articulate; second submarginal with two recurrent nervures.

1. Lanceolate cell closed.....44, *U. Dinoura*.2. " " contracted..... *V. Hemichroa*.3. Second recurrent nervure received at intersection of second and third submarginals. *W. Mesoneura*.

3. Second and third submarginals each with a recurrent nervure.

Antennæ 11—15-articulate. ....40, *Heterarthrus*.

" 9—11 "

## I. Abdomen short, egg-shaped.

Antennæ 10 or 11-articulate.....47, *Athalia*." 9 " short; wings broad in crassate.....45, *Sciapteryx*." 9 " wings as usual.....48, *Selandria*.

## II. Abdomen lengthened. Antennæ 9-articulate.

## Coxæ lengthened, large.

1. Antennæ filiform, enlarged in middle.....46, *Waldheimia*.2. Antennæ filiform, enlarged in middle.....50, 1. *Macrophya*.3. Antennæ setaceous, long..... 2. *Pachyprotasis*.

## Coxæ as usual.

1. Antennæ short, thickened towards the apex 49, *Allantus*.

2. Antennæ setaceous, long.

Lanceolate cell with oblique cross nervure.

Head not unusually extended back of eyes 51, *Taxonus*.Head extended back of eyes.....52, *Strongylogaster*.Under wings with one middle cell.....53, *Poecilostoma*.Under wings with the outer cells complete 54, *Perineura*.Lanceolate cell with straight cross nervure.55, *Tenthredo*.Lanceolate cell closed in middle..... (*Synairema*.)

## Subfamily 4. LYDIDES.—Antennæ multi-articulate.

## II. Wings with one marginal cell.

## Three submarginal cells.

Antennæ of males pectinate.....57, *Pterygophorus*.

## Four submarginal cells.

Antennæ of males bi-pectinate.....56, *Lophyrus*.Antennæ of males pectinate..... *Monoctenus*.Antennæ of males somewhat fissate.....58, *Tarpa*.Antennæ setaceous, long.....59, *Lyda*.

## Subfamily 5. CEPIIDES.—Antennæ multi-articulate, neck elongate.

## I. Wings with two marginal and four submarginal cells.

1. Antennæ subclavate, about 21-articulate; abdomen compressed ..... 60, *Cephus*.2. Antennæ subclavate, about 27-articulate; abdomen compressed.....62, *Phyllocus*.3. Antennæ filiform, abdomen short, cylindrical and subclavate.....61, *Janus*.

## Subfamily 6. XYELIDES.—Antennæ 13-articulate. third very long; ovipositor nearly as long as abdomen.

J. Wings with three marginal and four submarginal cells.....63, *Xyela*.

## Family II.—URO CERIDÆ.

- A. Neck not elongate, ovipositor concealed.*  
*a. Wings with one marginal and two submarginal cells.....1, Oryssus.*
- B. Neck elongate, ovipositor distinct.*  
*b. Wings with one marginal and four submarginal cells. Ovipositor exerted, short.....2, Deroeyra.*  
*c. Wings with two marginal and four submarginal cells. Ovipositor long.*  
 1. The first, second and third submarginals each with a recurrent nervure.....3, *Xiphydria.*  
 2. The second and third submarginals each with a recurrent nervure.  
 Antennæ 17—25-articulate.....4, *Urocerus.*  
 Antennæ 5—6-articulate.....6, *Teredon.*  
*d. Wings with two marginal and three submarginal cells.....5, Tremex.*

*Tubular Statement of the Form and Habits of the larvæ of the Tenthredinidæ. (From Westwood's Int. Vol. II, p. 97.)*

“Larvæ, with extremity of the body not armed with a spine.

- A. Larvæ with 22 legs, ( 6 pectoral, 14 abdominal, and 2 caudal.)*  
*a. Feeding upon the leaves of plants.*  
 Solitary, resting in a spiral manner, ejecting a fluid from the pores of the body; forming a cocoon (*Cimbex, Trichiosoma, Clavellaria.*)  
 Solitary or social, not ejecting a fluid from the sides of the body; forming or not forming a cocoon. (*Tenthredo, Athalia, and certain Allanti and Dolerus.*)  
*b. Feeding upon the leaflets of the pine, social, not ejecting a fluid from the sides of the body; quiescent, attached by the legs to the edges of the leaflets: forming a cocoon. (Lophyrus.)*
- B. Larvæ with 20 legs, (6 pectoral, 12 abdominal, and 2 caudal.)*  
*a. Feeding upon the leaves of plants; resting at the edges or upon the surface of the leaves. (Hylotoma atrata, &c., Cladius, Pristiphora, Nematius, Croesus, and certain Tenthredines. [Likewise Zarea and Abia, according to St. Fargeau.]*  
*b. Feeding upon the leaflets of the pine, social; resting at the edge of the leaflets; forming a simple cocoon, (Nematius abietinus and Leachii.)*  
*c. Living in the galls of plants. (Nematius intercus.)*
- C. Larvæ with 18 legs, (6 pectoral, 10 abdominal, and 2 caudal,) Hylotoma enodis.*
- D. Larvæ with only 6 pectoral legs, (Lyda [and Xiphydria, according to Dahlbom] Cephus.) (According to Westwood the larva of Xiphydria has a horny tail.”)*

## Sub-family I.—CIMBICIDES, Westw.

- Antennæ 5—8-jointed, short, generally clavate, third article longest.
- A. Wings with two marginal and three submarginal cells.*  
*a. First submarginal cell with two recurrent nervures.*  
 Lanceolate cell with straight cross-line.

Genus I. **CIMBEX**, Oliv.*Cimber*, Oliv., Ent., 1789.*Crabro*, Geoffr., Hist. des Ins., 1764.*Tenthredo*, Linn., Fabr., &c.

*Wings* with two marginal and three submarginal cells; first submarginal receiving two recurrent nervures; lanceolate cell with straight cross-line; under wings with two middle cells; stigma lengthened, hardly wider than costa; costal edge wavy on each side of stigma. Bullæ in the submarginal cells as follows: one at the point receiving the first recurrent nervure, one below the middle of first cross nervure, and two, one near the bottom and one near the top of second nervure.

*Antennæ* clavate, 7-articulate, third as long as fourth and fifth; soldered, oblong-ovate.

*Head* as wide as thorax, labrum narrow, hardly visible below the nasus; mandibles 3-dentate.

*Body* stout, obscurely villose. Abdomen ovate in the females, cylindrical in males, with a deep, whitish, membranous notch, which is apparently in first segment of tergum, but is really the basal membrane between the basal plates of metathorax.

*Legs*.—Femora unarmed, the two posterior pair much thickened in males, with a shallow channel beneath to receive the bent tibiæ; tibiæ with two obtuse spurs at apex; anterior tarsi with obtuse processes beneath; a strong hook at tip of first joint of posterior tarsi of males; claws simple.

*Larvæ* twenty-two-footed, (6 pectoral, 14 abdominal, and 2 caudal,) solitary; bodies without hair, except in numerous small setigerous tubercles. But one brood during the year. They rest in a spiral position, tail inward, on the under side of leaves, and when disturbed sometimes eject a fluid from pores above the spiracles.

They form a strong, brown, oval cocoon, which drops to the ground with the falling leaves, and remains on the surface during the winter, the insect coming forth in June or July. This is the largest of the Tenthredinidæ, but does not appear in such numbers as to be injurious to vegetation.

1. **C. americana**.*Cimber americana*, Leach, Zool. Misc. III, 1817, 104. ♂.

Lepel, Mon. Tenth. 33, 87.

Harris, Inj. Ins, 519, ♂ ♀, fig. 243.

Norton, Proc. Ent. Soc. Phil. I, 201.

*Cimber femorata*, Kirby, Faun. Bor. Am., 254, ♂.

Steel blue; abdomen purple tinged, in the females more or less spotted with yellow-white; antennæ and tarsi in part testaceous; wings variable. Length 0.80—1.08. Br. wings 1.80—2.28 inch.

♂. Antennæ luteous, the three basal articles more or less black; head and thorax black, with a bluish tinge; abdomen steel-blue, often tinged with purple; pectus widened and rounded, forming an acute angle with pleura; body and tibiæ thinly covered with long, blackish hair; legs long and stout; color blue, the second, third, fourth, and base of fifth tarsal joints testaceous. Wings hyaline, their apex and a spot below stigma fuscous.

♀. The female differs only from the male in having yellowish spots on each side of the abdomen, varying in number, size and form.

Both sexes differ in the color of the wings, some being clear and some violaceous. And the males differ in the color of the abdomen, some having it rufous. The abdominal spots also vary much in the females, thereby causing much confusion among different authors.

a.) 1. *C. americana*. ♂, as above.

With clear wings; abdomen of ♀ 6-spotted, spots on the third, fourth and fifth segments.

Canada, Massachusetts, Connecticut, Georgia, (Leach.)

a.) 2. *C. americana*, var. *Ulmi*, ♂.

*Cimex ulmi*, Peck., MS. Harris Cat. and Inj. Ins., ♀.

Emmons, Nat. Hist. N. Y. Agric. V, 101, ♂ ♀.

Wings more or less obscure violaceous; abdomen of ♀ 6-spotted; spots on the third, fourth and fifth segments.

b.) 1. *C. americana*, var. *LaPortei*, ♂.

With clear wings; abdomen, except at base, chestnut or purplish-red. Mt. Washington, N. H.; Canada.

b.) 2. var. *LaPortei*, ♂.

*Cimex LaPortei*, Lepel, Ann. Soc. Ent. II, 1833, 454, ♂.

*Cimex Kirbyi*, Brullé, Hym. IV, 872, ♂.

Wings obscure violaceous; abdomen, except at base, chestnut or purplish-red.

Mass., Conn., New York.

No females as yet seen with this variation.

c.) 1. *C. americana*, var. *luctifera*, ♀.

Wings hyaline; abdomen 8-spotted; on each side of second, third, fourth and fifth segments.

New England; Canada.

c.) 2. *C. americana*, var. *luctifera*.

*Cimex luctifera*, Klug, Verhandl. &c., Berlin I, 85, ♀ ♂. Jahrb. I, 225, ♂.

*Cimex viardi*, Lepel, Ann. Soc. Ent. II, 454, ♀.

Wings obscure violaceous; abdomen 8-spotted; on each side of second, third, fourth and fifth segments.

Georgia, (Klug.) New York; Pennsylvania.

The wings are not always equally obscure, but sometimes have irregular clearer spots.

Two specimens from Pennsylvania, (Coll. Am. Ent. Soc.) are 7-spotted, having four on one side and three on the other side of abdomen.

d.) 1. *C. americana*, var. *decem-maculata*.

*Cimex decem-maculata*, d'Urban, Can. Zool., 18, 7085, ♀.

Wings hyaline; abdomen 10-spotted, on second, third, fourth, fifth and sixth segments.

Spots approaching, not coalescing. Arctic Am. Youkon River, (Smith. Ins.)

Spots coalescing. Lake Superior, (Cambr. Mus.) Canada; Hudson's Bay Territory.

d.) 2. *C. americana*, var. *Dahlbomii*.

*Cimex Dahlbomii*, Guer. Icon. Reg. Anim. III, 393, ♀.

Wings obscure violaceous. Abdomen 10-spotted; second, third, fourth, fifth and sixth segments.

Spots not coalescing, those on second and sixth small.

Spots coalescing, with or without the apical segment pale.

New Jersey; New York; Pennsylvania.

e.) 1. *C. americana*, var. *Alba*, ♀.

Wings hyaline. Abdomen 12-spotted, on second, third, fourth, fifth, sixth and seventh segments.

Spots coalescing on the fourth, fifth, sixth and seventh segments, the anal segment and apical half of venter, white.

Big Island; Gt. Slave Lake, (Smiths. Ins.) Mr. Kennicott.

The great similarity in kind of variation seems to prove that the clear and dark winged specimens belong to the same species, subject to as great changes as the *C. variabilis* of Europe, which it greatly resembles. The b.) 2, (*La Portei*) has been bred from larvæ which produced also *C. Ulmi*, a.) 2, ♂ ♀, (Proc. Ent. Soc. Phil., I, 201.) Dahlbom (Westwood Mod. Class. II, 98) states that the variations in color of *C. variabilis* are produced by its diversity of food. This species like that, is an exception to ordinary rules, for most Hymenoptera are true to their types.

The range of this insect is from the Atlantic to Russian America, and but few of the clear-winged species are found south of the Great lakes, while few of those with obscure wings are found north of this.

Klug described the male of *C. luctifera* as having spots on the abdomen, and in appearance like females. It would seem best to con-



sider this an error, until such specimens are taken in Georgia or elsewhere.

The larvæ are known to feed on the elm, the willow and the linden. They get their full growth about the middle of August, when they are from one and a half to two inches in length. Skin rough, transversely wrinkled; color pale grayish-yellow, with a stripe of two slender black lines along the back, from head to tail. Spiracles black. When at rest they hold to the leaf with the fore feet, and twist the body inward sidewise into a spiral position.

2. *C. Klugii*, Leach Zool. Misc., No. 6. Lepel, Mon. Tenth. 30, 85, ♀.—St. Domingo.
3. *C. McLeayi*, Leach, Zool. Misc., No. 2. Lepel, Mon. Tenth. 30, 82, ♂.—St. Domingo.
4. *C. venusta*, Perty, Delect. Anim. Art. 1. 1830, 129, Tab. xxvi, fig. 1.—Brazil.

Genus 2. **TRICHIOSOMA**, Leach.

*Trichiosoma*, Leach, Zool. Misc.

*Cimex*, Fabr. and authors.

Wings as in *Cimex*.

Antennæ 8-articulate; 3d article nearly half the length of antennæ, very slender; club 3-articulate, the two last closely soldered.

Head of ♂ as wide as thorax, of ♀ not as wide as thorax, nasus retracted, labrum orbicular; mandibles generally bidentate.

Body densely pilose. Abdomen much like *Cimex*, notch in first segment not so deep.

Legs stout; the four posterior femora of males thickened, deeply channeled and dentate; tibiæ with two obtuse spurs.

Larvæ and metamorphoses as in *Cimex*.

1. *T. triangulum*.

*Trichiosoma triangulum*, Kirby, Faun. Bor. Am. iv, 1837, 254.

*Trichiosoma lucorum*, Kirby, Faun. Bor. Am. iv, 1837, 255.

*Trichiosoma bicolor*, Harris, MSS., Norton, Proc. Bost. Soc. viii, 150, ♂.

"Black, hairy, with cinereous lanuginous hairs; fourth, fifth and sixth articles of antennæ, wings, tibiæ and tarsi, testaceous. thighs black-blue; abdomen ferruginous, with a dorsal black isosceles triangle." Length 0.60—0.68. Br. wings 1.32—1.56 inch.

♂ ♀. Body black, shining, more or less punctured, covered with soft and woolly whitish hairs.

Head, excluding the mandibles, depressed, orbicular, as wide as the trunk, (that of female much narrower); mandibles crossed, very sharp, black, polished, distinctly bidentate; anterior margin of the nose wavy, emarginate; labrum extended, sub-orbicular, convex in middle, depressed in middle before, sides turned up; antennæ, the second, base

of third, fourth, fifth and sixth articles testaceous; eyes prominent, vertex square, marked out by a ridge on each side; trunk sub-globose, anterior lobe of thorax with a longitudinal furrow; thighs and coxæ black-blue, under a strong magnifier, beautifully, minutely reticulated, which gives them a silky lustre, the rest of the leg testaceous; a single strong dentation near the tip, on each side of the groove beneath the two hinder pair of thighs. Wings testaceous hyaline, with piceous nerves and a cloud at the apex; a dense testaceous spot at juncture of marginal nerve with stigma; stigma as in *Cimbex*; abdomen ferruginous or ochraceous, with a dorsal, triangular, black spot, extending from base toward the apex, but not entering the last segment; the basilar ventral segments are spotted with brown.

*Var. ♂*. Abdomen, except apex, entirely black. (*T. bicolor.*) Mt. Washington, N. H.; Summit, (*T. lucorum*, Kirby.)

*Var. ♂*. Abdomen wholly purple-brown. (Canada.)

Lat. 65°, (Kirby.) Canada, Hudson's Bay Territory; Youkon River; Arct. Am., (Kennicott.) Puget's Sound, (Kennerley, Smiths. Inst.)

This seems to be exclusively a northern insect.

Mr. Kirby does not give the sex of either *T. triangulum* or *T. lucorum*, but from the description, it is evident that one is a male and the other a female. I have concluded, whether rightly or not, that they belong to the same species.

## 2. *T. lanuginosa*, n. sp.

Purple-black, labrum angulate before; shoulders and pleura with dense cinereous hair; wings blackish hyaline. Length 0.64. Br. wings 1.60 inch.

♀. Shining purple-black, thickly covered with minute punctures; antennæ piceous black; head narrow; nasus with a triangular notch in middle; labrum as in *T. triangulum*, produced to an angle instead of being rounded; prothorax and pleura covered with long, dense, pale cinereous hair, less dense on the scutel and very little upon the tergum; abdomen stout and very wide; legs black; tarsi piceous, except base of first and apical two-thirds of last joint; wings blackish hyaline, with a yellowish tinge, clouded at apex; a dense piceous spot, extending from stigma across most of first discoidal cell.

Sierra Cxy, California. (Coll. Smiths. Inst. J. Behren.)

## 3. *CLAVELLARIA*. Leach.

*Clavellaria*, Leach, Zool. Misc.

*Cimbex*, Fabr.

Wings as in *Cimbex*.

Antennæ 5-jointed, fifth joint forming a club as large as the third.

*Head* nearly as wide as thorax; eyes not approximate; labrum large; mandibles long in the males.

*Body* slightly villose; emargination of first segment of abdomen very slight; the four posterior femora unarmed, thickened in males.

*Inhabits* Europe.

Lanceolate cell closed in middle.

4. **ZAREA**, Leach.

*Zarea*, Leach, Zool. Misc.

*Tenthredo*, Spec., Jurine, Fab., &c.

*Wings* as in *Cimbex*, excepting that the lanceolate cell is closed; they are generally fasciate; the stigma is wider.

*Antennæ* 6-articulate, third article long, slender and curved; fifth and sixth forming an obtuse club.

*Head* small, much narrower than thorax; eyes united behind in the male; maxillary palpi having the three first joints short, the three others elongate; nasus retracted; labrum advanced.

*Body* glabrous; abdomen as in *Cimbex*, but rather more ovate and flattened, with deeper sutures in females; basal plates not emarginate.

*Legs* slender; femora of males not incrassate; tibiæ with two obtuse apical spurs.

1. **Z. inflatus**.

*Zarea inflatus*, Norton, Proc Bost. Soc. viii, 151, ♀.

Greenish-black; abdomen blue-black, obovate, glabrous; apex of basal membrane whitish; legs testaceous; wings fasciate. Length 0.48. Br. wings 1.00 inch.

♀. Head and thorax metallic, greenish-black; antennæ black, apical joints piceous beneath, apical joint of club longest; head coarsely punctured, and, with the prothorax and pleura covered with whitish hair; eyes large, reniform, partly inclosing ocelli and base of antennæ; nasus not so much retracted as in *Trichiosoma*, with a sinuous edge and large fovea behind; thorax sparsely, abdomen finely punctured; collar and abdomen blue-black; the cenchri at sides of post-scutel, ordinarily round, are oval and lengthened; base of metathorax and of basal membrane whitish; abdomen flattened, sutures distinct, curved; each of the five apical segments having in the middle a transverse glaucous band of fine hair, greenish beneath, the basal segments beneath and the legs brownish-yellow; coxæ at base and a band in middle of femora black; wings hyaline, nervures and stigma yellow testaceous; apex of superior wings, a broad band at the stigma and a dense darker spot fuscous.

Farmington, Conn. One specimen.

Mr. Walsh informs me that he has both ♂ ♀ from Massachusetts.

5. **ABIA**, Leach.

*Abia*, Leach, Zool. Misc.

*Tenthredo*, Jurine, Fab.

Wings as in *Zarea*.

*Antennæ* seven-jointed; third article long and bent; club obtuse, of three articles, the two last coalescing.

*Head* small, eyes nearly meeting behind in male; nasus and labrum as in *Zarea*; joints of maxillary palpi unequal.

*Body* villose; abdomen having a metallic silken hue as in *Zarea*; a raised velvety patch on the tergum in males (wanting in females); basal plates not emarginate.

*Legs* rather short, slender; femora not incrassate, tibiæ with rather obtuse spurs.

These insects are of smaller size and apparently gregarious.

1. ***Abia Kennicotti***, n. sp.

Black, varied with blue and green; legs white, at base blue; wings yellow hyaline, with piceous fasciæ. Length 0.32. Br. wings 0.64 inch.

♂. *Antennæ* black; third article not so long as the fourth and fifth together; sutures of club distinct. Head metallic-green, coarsely punctured, eyes nearly meeting; nasus hardly retracted, curved, but slightly emarginate; labrum pointed, oval, and with the mandibles ferruginous; palpi varying in color; head, thorax and tip of abdomen covered with sparse, long, blackish cinereous hair. Thorax black above, pleura greenish, pectus bluish; abdomen with metallic reflections; a brownish velvety patch on the summit of third, fourth, fifth and sixth segments, with a shining cinereous band of short hair on each side; edges of abdomen beneath, brownish; coxæ and femora blue; tips of femora and remainder of legs white; tarsi growing darker toward apex; spurs not very obtuse. Wings hyaline; on the apex of superior pair and the basal half below stigma two fuscous obscure fasciæ, in the larger of which the first discoidal and second brachial are clear; nervures testaceous, stigma a little enlarged, with a dense spot beneath the base; lower wings smoky hyaline.

♀. The female has the tergum beyond the second segment sericeous with whitish hair.

2. ***Abia caprifolium***, n. sp.

Black, with faint greenish reflections on abdomen; two white bands at base of metathorax; wings fasciate. Length 0.36. Br. wings 0.70 inch.

♀. *Antennæ* ferruginous toward tip, third joint not longer than fourth and fifth together; sixth and seventh closely soldered, the apex truncate; eyes reniform; nasus slightly emarginate; palpi white; head and thorax delicately punctured and covered with long pale hair; a

whitish band across metathorax below scutel, and another beneath, covering most part of basal plates; tergum sericeous with whitish hair on all but the two basal segments; ovipositor pale; apical segment and base of venter whitish; coxæ and a wide band on all the femora black; trochanters and legs below the knees white; wings yellowish hyaline, both pair fasciate across the middle and at tip; the second brachial clear, a denser spot below stigma; nervures yellowish.

Illinois.

One specimen (Coll. Am. Ent. Soc.) collected by Mr. C. V. Riley, of Chicago. He mentions it as quite common there at times. "Color of larva bluish-green on back; yellow at sides, which is pale near spiracles, and covered with small black dots. Between every segment is a small, transverse, yellow band, with a black spot in the middle and at each end. Head free, of a brownish-black above and color of the body beneath. Eyes quite black and distinct. Legs color of sides and body. When touched it curls up and falls to the ground. It spins a compact cocoon, (Long 0.50 inch), oval, rounded at ends, slightly transparent, color of thin glue. Remains dormant during the winter in the caterpillar state, and early in the spring changes to a chrysalis, which is soft, pale yellow on abdomen above and on sides, rather greenish below; remainder of body white; the antennæ, legs and wing-sheaths also white, transparent; eyes brownish. Shortly before it comes forth it becomes blackish, and the eyes quite black," Number of legs not given.

The larva feeds on the *Caprifolium* (honeysuckle).

### 3. *A. cerasi*.

*Abia cerasi*, Fitch, Third Report N. Y. State Agr. Soc, 1859, p. 67—93.

"Black; club of antennæ 4-jointed; abdomen and thighs blue-black and the feet and tips of the shanks pale yellow; thorax thinly covered with pale greenish-yellow hair; wings transparent, smoky yellowish, with black veins, those on the basal third pale yellow. Length 0.60. Br. wings 1.35 inch."

New York. (Not seen.)

Dr. Fitch states that he bred this insect from one of two cocoons found on the wild cherry, and that the club of the antennæ is  $\frac{1}{2}$ -jointed instead of three, and the antennæ 8-jointed instead of seven. Cocoons coarse brown, firm and tough, cylindrical, with rounded ends. Length 0.80. Wide 0.38 inch. The insect came forth in March.

- b. Wings with first and second submarginal cells each receiving a recurrent nervure.

6. **AMASIS**, Leach.

*Amasis*, Leach, Zool. Misc.

*Wings* with two marginal and three submarginal cells; first and second submarginal each with a recurrent nervure; lanceolate cell closed in middle.

*Antennæ* 5-articulate, the fifth forming an obtuse club.

*Head* small; eyes not approximating in the males; labrum short; mandibles bidentate.

*Abdomen* naked, punctate, depressed, basal membrane not visible.

*Legs* short, the fourth posterior tibiæ with acute spurs; last joint of tarsi much shorter than that preceding.

*Inhabits* Europe.

- a. Wing with first submarginal cell receiving the two recurrent nervures.

7. **PLAGIOCERA**, Klug.

*Plagiocera*, Klug.

*Wings* with two marginal and three submarginal cells; first submarginal with two recurrent nervures; wings rounded at apex; lanceolate cell closed in middle. Under wings two middle cells.

*Antennæ* 5-articulate; the fifth forming an obtuse truncate club.

*Legs*.—Spurs simple; claws with an inner tooth.

1. *P. thoracica*, Klug, Jahrb., 1834, 228, Tab. II, fig. 5.—Brazil.

2. *P. Klugii*, Brullé, Hym. iv. 1846, 672, Pl. 48, fig. 3.—South America.

- c. Wings with second submarginal cell receiving two recurrent nervures.

8. **PACHYLOSTICA**, Klug.

*Pachylostica*, Klug.

*Wings*.—Two marginal and three submarginal cells, the second submarginal with two recurrent nervures, hexagonal in form; lanceolate cell closed in middle; wings oblique truncate at apex; stigma forming an outward projection on anterior wings.

*Antennæ* 5-articulate, the fifth forming a lengthened outward club.

*Legs*.—The spurs lamellate.

Only the females known.

1. *P. tibialis*, Klug, Monogr. 1824, 173, 1 ♀; Jahrb., 228, 1.—Brazil.

2. *P. violacea*, Klug, Monogr. 174, 2 ♀; Jahrb., 228, 2.—Brazil.

3. *P. albiventris*, Klug, Monogr. 174, 3 ♀; Jahrb., 228, 3; Brullé, Hym. iv, 671, Pl. 48, 4.—Brazil.

4. *P. chalybea*, Party, Delect. Am. Art. 1, 1830, 129, Tab. xxvi, fig. 2.—Brazil.

*B. Wings with one marginal and three submarginal cells.*

First and second submarginal cells each with one recurrent nervure.

9. **THULEA**, Say.

*Thulea*, Say, Bost. Jour. I, 1835, 213.

*Wings*.—One marginal and three submarginal cells.

*Antennæ* 6-jointed, the sixth clavate; second twice as long as first and second; fourth minute, shortest; fifth as long as third; sixth nearly as long as third and fifth, slightly dilated at tip.

*Scutel* large.

1. **T. nigra**.

*Thulea nigra*, Say, Bost. Jour. I, 1835, 213.

"Body black; nasus and labrum green; spot before the wings, wing scale and feet yellowish green.

"Length to the tip of the wings, three-twentieths of an inch.

"*Inhabits Mexico.*"

Not seen.

10. **ACORDULECERA**, Say.

*Acordulecera*, Say, Bost. Jour., I, 1835, 210.

*Wings*.—One marginal and three submarginal cells; first and second submarginal each with a recurrent nervure; first submarginal long; lanceolate cell wanting. Stigma large, as in *Hylotoma*.

Under-wing with one inner cell. It has but one marginal, two submarginal, one discoidal and two medial cells, and the externo-medial nerve joins the costa without bending, leaving the marginal cell with an acute angle behind.

*Antennæ* six articulate, very short, not clavate, apical joint not enlarged, but somewhat globose.

*Body* short and stout, maxillary palpi having the three apical joints long, the sixth longest.

*Legs* short; the four posterior tibiæ with a side spur, as in *Hylotoma*, apical spurs all sharp, claws simple.

This genus would seem to require a separate division, as its antennæ are filiform and not clavate, and its affinities are rather toward the *Hylotomides* or *Tenthredinides*.

1. **A. dorsalis**.

*Acordulecera dorsalis*, Say, Bost. Jour. I, 1835, 200. ♀ ♂.

"Black; hypostoma, a spot at base of the tergum and feet whitish." Length 0.12—0.16. Br. wings 0.36—0.48 in.

"♂ ♀. Black, with minute whitish hairs; nasus, labrum and mouth white; mandibles rufous at tip; thorax, with the anterior segment, curving to the base of the wing, white; line of the insertion of the wings white; wings a little dusky; nervures fuscous; tergum pale

yellowish on the basal disk; blackish brown at tip; venter more or less yellowish white, dusky or blackish at tip; feet and coxæ whitish green.

*Var. a.* Feet and part of the costal rib green; scutel and posterior portion of the stethidium whitish.

*Var. b.* Thorax and abdomen entirely black."

Indiana, (Say.) New England, Maryland.

*Wings with one marginal and four submarginal cells.*

Second and third submarginal cells each with a recurrent nervure.

#### 11. SYZYGONIA, Klug.

*Syzygonia*, Klug, Jahrbucher, die Ins., 1834, 229.

*Wings* with one marginal and four submarginal cells, of which the first and second are the smallest, and the second and third each receive a recurrent nervure; wings rounded at apex.

*Antennæ*, six-articulate, the sixth clavate, the third longest.

*Legs*. Anterior inner tibial spur at apex bifid!

a.) *Antennæ* 5-articulate before the club, (third submarginal cell not receiving the recurrent nervure.)

1. *S. cyanoptera*, Klug., Monogr. 1824, 171, ♀; Perty, Spix. and Mart. Delect., III, 130, Pl. xxvi, 4.—Brazil.
2. *S. cyanea*, Klug, Brullé, Hym. iv, 671, Pl. 48, 2.—Brazil.
3. *S. ænea*, Perty, Spix. and Mart. Delect. 1830. 130, Pl. xxvi, fig. 3.—Brazil.

β.) *Antennæ* 4-articulate before the club, (third submarginal wing cell receiving one recurrent nervure.

4. *S. cyanocephala*, Klug, Monogr. 1824, 180, 2; Jahrb. 229, 2, Pl. II, 6, 1.—Brazil.

The figure drawn by Klug has the marginal wing cell appendiculate.

#### 12. PERGA, Leach.

*Perga*, Leach, Zool. Misc. Latr. Norw. Dict., 2d ed.

*Wings* with one marginal, appendiculate cell and four submarginal cells; the first and second very small, the second and third each receiving a recurrent nervure.

*Antennæ* six-articulate, the first five short, the last long and more dilated within than without.

*Inhabits* New Holland.

The following genus is thought by Brullé and Klug to belong more properly to Hylotomidæ.

#### 13. CEPHALOCERA, Klug.

*Cephalocera*, Klug, Jahrbuch., 1843. 252.

*Wings* with one marginal, appendiculate, and three or four submar-



ginal cells; the first and second (or second and third, if one counts the incomplete cell at the base), each receiving a recurrent nervure.

*Antennæ* seven-articulate, third longest, seventh slightly enlarged.

1. *Cephalocera* † *calcar*, n. sp.

Testaceous; antennæ and two vittæ on thorax black; apical half of wings obscure. Length 0.24. Br. wings 0.52 in.

♀. Testaceous; antennæ villose, dark piceous, seven jointed, the first twice as long as second, the second four times as long as first, sixth slightly globular at tip, seventh as long as sixth, not clavate, (somewhat like *Selandria*); the two basal joints white; head and body testaceous; two vittæ on side lobes of meso-thorax, five or six obscure spots on middle of tergum; breast piceous; legs testaceous, hinder tibiæ at apex black; the four hinder tibiæ each with a side spur; all the apical spurs acute; first tarsal joint nearly as long as all the remainder; tarsi slender, not dilated, no patellæ visible; wings hyaline, all appendiculate, their apical half clouded; nervures yellowish, stigma large, nearly white; one marginal and four submarginal cells, the first nearly as long as second; the 2d receiving the two recurrent nervures at or very near the intersection of first and second, and second and third cells; first and second submarginal of equal length; third shorter, not much widened at outer end; lower half of first submarginal cross nervure wanting; lanceolate cell wanting, obsolete; underwings one middle cell.

Cordova, t. c. Mexico. (1 ♀.) (Coll. of H. deSaussure.)

This can hardly belong to *Cephalocera*, which I have not seen, but seems rather a connecting link between *Hylotoma* and Tenthredinides, having the wings and side spurs of the one, and the antennæ of the other. The bullæ occupy the lower half of the first submarginal cross nervure, and most part of second and third.

2. *C. pumila*, Klug, Jahrbuch. 1834, 252. Pl. II, 10 ♂.—Brazil.

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Sub-Family 2. HYLOTOMIDES.\* Westw.

*Antennæ* three or four-articulate; third joint long, and in the males often furcate; marginal cells not appendiculate.

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\* The arrangement of genera here presented is arbitrary, and probably incorrect, as the definitions of Klug are short, and founded only on the upper wing cells, and are apparently faulty, while the arrangement of other authors seems to be taken up without seeing the insects, and the very few specimens within my reach do not agree with the diagnoses laid down.

C. *Wings with two marginal and three submarginal cells.*

14. **BLASTICOTOMA**,\* Klug.

*Blasticotoma*, Klug, Jahrb., 1834. 251, Tab. II, fig. 9.

*Wings* with two marginal and three submarginal cells; the first and second submarginals each with a recurrent nervure; lanceolate cell with oblique cross line; under wings with two middle cells.

*Antennæ* four-articulate—the third long, the fourth very small.

The males are not yet described.

*Inhabits* Germany.

The first submarginal wing cell probably has an incomplete cross line, as Klug says this genus has four submarginal cells, and other writers three.

D. *Wings with one marginal cell.*

Four submarginal cells.

a. The second and third submarginal cells each with a recurrent nervure.

15. **SERICOCERA**, Le Pel. MS.

*Sericocera*, Brullé, Hym. iv, p. 669.

*Hylotoma*, \*\*\*\*\* Klug, Jahrb., 249.

*Wings*, one marginal, not appendiculate, and four submarginal cells, of which the second and third each receive a recurrent nervure; lanceolate cell closed in middle; under wings with two inner cells. The bullæ in this differ from those of *Hylotoma* in there being but one, which is small, near the base of second submarginal cross nervure, from which two clearer lines run to the two bullæ at the ends of the third cross nervure.

*Tibiæ* all simple, (without side spurs).

Brullé considers this to be identical with the eighth division of *Hylotoma*, Klug, doubtless on the ground that the first submarginal cell is wholly or partially incomplete. Klug states that the species have three submarginal cells, first and second each with a recurrent nervure.

In the absence of proper data, I have chosen to consider the antennæ of the ♀ filiform, and those of *Schizocerus* ♀ subclavate.

***Sericocera plumicornis***, n. sp.

Black, shoulders white, antennæ ♂ bifurcate, slender, curled, ciliate. Length, 0.28. Br. wings, 0.60 inch.

♂. Shining black. Antennæ black, third joint bifurcate, slender, decreasing in size towards apex, curled, ciliate; tegulæ and prothorax white, remainder of body black; abdomen rather stout; legs black;

\* This is considered by authors as intermediate between Cimicidæ and Hylotomidæ. Hartig makes for it a separate sub-family.

anterior pair distinctly white before; tibiæ simple, first tarsal joint as long as all the rest. Wings violaceous sub-hyaline, most obscure in marginal cell; first submarginal cross nervure imperfect; recurrent nervures received in middle of second and third cells; third cell contracted below, half as wide as above; lanceolate cell widely contracted; under wings with two inner cells, no lanceolate cell.

Cordova, t. c. Mexico. One male. (H. deSaussure.)

2. *Sericocera villosus*, n. sp.

Black, antennæ setaceous, villose, thorax waxen, wings violaceous. Length 0.35. Br. wings 0.92 in.

♀. Head and abdomen black; antennæ black, not longer than to scutel, setaceous, woolly, with black hair; head small, not more than two-thirds the width of thorax; tegulæ and whole of thorax pale yellow waxen color; thorax quite globular before; abdomen black, short and stout. Anterior coxæ, femora and tibiæ before, medial coxæ and femora, except tips, yellowish; remainder of legs black. Wings violaceous, quite ample, darkest toward base, a dark spot covering marginal and upper half of submarginal cells; stigma black, first submarginal cell almost square, second and third each with a recurrent nervure in middle; third submarginal contracted below, its outer nervure angulate, with a short produced nervure near upper end, below upper bullæ; lanceolate cell widely contracted; under wings with two middle cells, their lanceolate cell small, with an indistinct cross line above.

Cordova, t. c. Mexico. One ♀. (H. deSaussure.)

3. *Sericocera alternator*, n. sp.

Ochraceous; head, metathorax and breast black; wings semi-obscure. Length 0.40. Br. wings 1.02 in.

♀. Shining, ochraceous. Basal joint of antennæ black, remainder wanting; head not as wide as thorax, black; eyes widely separated; ocelli ruby colored; nasus slightly emarginate; tegulæ black; thorax and abdomen ochraceous, with the metathorax, and a large spot on breast black; abdomen stout; coxæ and legs black; the anterior pair pale before. Wings ample, violaceous semi-obscure, darkest at base; stigma and nervures black; first submarginal cross nervure obsolete, second and third cells receiving the recurrent nervures in middle; third contracted to half its width below; lanceolate cell widely closed, that in lower wing wanting.

Jalapa, Mexico. One female. (H. deSaussure.)

4. ♂. (*Hylotoma compressicornis*, Klug, Jahrbuch. 1834, 249, 93, ♀.—Brazil.

5. ♂. (*Hylotoma hypoleuca*, Klug, Jahrbuch. 1834, 250, 95, ♂.—Brazil.

6. *S. (Hylotoma) mesomela*, Klug, Jahrbuch. 1834, 250, 94, ♀.—Brazil.  
 7. *S. (Hylotoma) nigrita*, Klug, Jahrbuch. 1834, 250, 96, ♂.—Brazil.  
 8. *S. (Hylotoma) piceiventris*, Klug, Jahrbuch. 1834, 250, 97, ♀.—Brazil.  
 9. *S. (Hylotoma) præcox*, Klug, Jahrbuch. 1834, 249, 92, ♂.—Bahia, Brazil.  
 10. *S. spinolæ*, Brullé, Hym. iv, 1846, 669, ♂. Pl. 47, fig. 5.—South America.

16. **SCHIZOCERUS**, Latr.

*Schizocera*, Latr., Lepel. et Serv., Brullé, Westw., Stephens, Hartig, Curtis, &c.  
*Hylotoma*, \* \* \* Klug.

*Cryptus*, Leach, Lepel.

*Wings*.—One marginal, not appendiculate, and four\* submarginal cells, the first imperfect (or with obsolete nervure,) and the second and third each with a recurrent nervure; lanceolate cell petiolate; third submarginal narrow, not greatly wider above, the cross-nervures curved, nearly parallel; submarginal bullæ five—one on first transverse nervure, one near the reception of first recurrent nervure, one near the base of second, and two on the third transverse nervures.

*Antennæ* 3-articulate, bifurcate above the second article in the males, either clavate or long and simple in the females.†

*Tibiæ* simple.

1. *S. plumigera*.

*Hylotoma plumigera*, Klug, Berl. Mag. vi, 1814, 306, 37. B. a.; Jahrb., 243, 71.

*Cryptus Klugii*, Leach, Zool. Misc. III, 125, 2 ♂ ♀.

Lepel. Monogr. 53, 150 ♂ ♀.

*Schizocerus Klugii*, Lep., et Sel. Encyc. Meth. Ins. ix, 573.

♀. Antennæ black; Head black; thorax saffron-yellow; abdomen yellow, anus black; legs black, the anterior yellow; wings fuscous hyaline. Long 2½ lines. Br. wings 6½ lines.

♂. The male has the back black, with antennæ above the second article bifid and quite ciliate.

Klug adds: "Nasus, mandibles and palpi, clear brownish; spot on thorax enclosing most of middle lobe; a black-brown spot on breast; legs yellow, the tarsi dusky; wings throughout a uniform blackish color; nerves and stigma dark brownish; femora at base, and tibiæ, also the tarsi are sometimes blackish."

Georgia, (Leach.) New York, (Klug.)

A female from the Eastern States has the antennæ short, the head black, a vitta on anterior lobe of mesothorax, spots on metathorax, a spot on breast, apical segment of abdomen, and the three apical seg-

\* Lepel., Klug and Hartig, give this four submarginal cells. Brullé and Stephens but three.

† Westwood and Stephens state that the antennæ of the females are long and simple. Lepel. calls them clavate.

ments of venter black; legs wholly black, except the anterior femora at tip before, and the tibiæ and tarsi pale; wings clouded, darkest at base; first submarginal with incomplete cross-line; the second and third narrowest at top and bottom, their outer nervures curved. In this species the second submarginal bulla is at the reception of the first recurrent nervure. Specimens from Colorado are a little larger, and have the back of head more or less yellowish. These may prove to be a separate species. Long  $3\frac{1}{4}$ — $4$  lines. Br. wings  $7$ — $8\frac{1}{2}$  lines.

**2. *S. abdominalis*.**

*Schizocerus abdominalis*, Cresson, Proc. Ent. Soc. Phil. iv, 1865, 243, 2, ♂.  
Length  $3\frac{1}{2}$  lines. Br. wings  $7\frac{1}{2}$  lines.

“♂. Black, polished; face clothed with short, pale, sericeous pubescence; mouth piceous; antennæ as long as the head and thorax, black; the third joint pale within, furcate and clothed with long black pubescence. Thorax smooth and polished; prothorax honey-yellow; tegulæ piceous. Wings ample, tinged with fuliginous, especially about the base; nervures and stigma black. Legs shining black, the anterior tibiæ and tarsi pale. Abdomen bright honey-yellow, with two transverse spots at the extreme base and the extreme tip fuscous.”

Colorado Territory.

This is probably the male of the specimens of *S. plumigera* from Colorado.

**3. *Schizocerus ebenus*, n. sp.**

Black; antennæ furcate, anterior legs pale before; wings blackish. Length 0.18. Br. wings 0.50 inch.

♂. Shining black; antennæ furcate above second joint, filiform, pilose, juncture of second and third joints pale; nasus emarginate; mouth black; body and legs black, the anterior pair pale beneath below the knees; hinder tibiæ somewhat swollen at apex; wings blackish opaque; near the apex less obscure; first submarginal cross-nervure obsolete; second and third submarginals contracted at top and bottom, third submarginal narrow; fourth submarginal quite large.

New York. One ♂.

In this and all the following species the second submarginal bulla covers most of the nerve between the recurrent nervure and the second transverse vein.

**4. *Schizocerus sericeus*, n. sp.**

Black, the head and thorax bronze sericeous; tegulæ and two edges of anterior angle whitish; wings hyaline. Length 0.26—0.30. Br. wings 0.50—0.60 inch.

♀. Black: antennæ short, not reaching scutel, clavate, but larger in the middle than at apex, second joint very short; head and thorax

with metallic reflections and covered with short whitish pile; ridge between antennæ elevated; nasus emarginate; palpi pale; tegulæ and anterior angle waxen-white; a semi-obsolete whitish band on apex of each segment of tergum; abdomen stout; legs with the coxæ, a band on all the femora and apex of posterior tibiæ blackish, remainder fuscous, paler before; inner space of anterior tibiæ large and obtuse; wings hyaline, very faintly clouded; nervures brown-yellowish at base; first submarginal square, not rounded behind; second and third cells receiving the recurrent nervures near their base; third submarginal large, form approaching that of *Atomacera*.

Maine; Illinois.

5. *Schizocerus privatus*, n. sp.

Black, with semi-obscure wings; abdomen yellow-red. Length 0.20. Br. wings 0.54 inch.

♀. Black. Antennæ moderate, flattened above the middle and thus appearing filiform from above, pilose; head wide, nasus yellowish. Thorax black, except the sides of metathorax and basal plates, which, with the abdomen are yellow-red, tip of ovipositor sheath black; legs black, their four hinder coxæ, trochanters, and base of femora yellow; wings blackish, sub-opaque, the first submarginal cell distinct, but the dividing nervure obsolete in middle; third submarginal quite narrow.

La. New Orleans. One ♀.

This may be the same as *Atomacera cellularis* of Say.

6. *S. (Hylotoma) albicollis*, Klug, Jahrb., 1834, 245, 76, ♀.—Brazil.

7. *S. (Hylotoma) brasiliiana*, Klug, Berl. Mag. vi, 1814, 308, 40; Jahrbuch., 245, 75.—Brazil.

8. *S. cyanoptera*, Perty, Spix and Mart., Delect. Hym. 1830, 130, Tab. xxvi, 4.—Brazil.

9. *S. (Hylotoma) filicornis*, Klug, Jahrbuch., 1834, 244, 74, ♂ ♀.—Brazil.

10. *S. (Hylotoma) gibba*, Klug, Jahrb., 1834, 245, 77, ♀, Tab. II, fig. 7.—Brazil.

11. *S. hyaloptera*, Perty, Spix and Mart., Delect. 1830, 130, Tab. xxvi, fig. 6.—Amazon.

12. *S. obscura*, Brullé, Hym. iv, 1846, 668, Pl. 47, fig. 4.—South America.

13. *S. xanthoptera*, Perty, Spix and Mart., Delect. 1830, 130, Tab. xxvi, fig. 5.—Rio Negro, Brazil.

17. **ATOMACEEA**, Say.

*Atomacera*, Say, Bost. Jour. I, 1835, 212.

“Wings—One marginal, not appendiculate, and three or four submarginal cells, the dividing nervure between first and second being obsolete” or sub-obsolete; third submarginal with the cross-nervures rather widely separated, the outer nervure nearly twice as long as the

inner, an obtuse angle at the reception of the second recurrent nervure.

*Antennæ* 3-articulate, simple, ciliate in male.

*Body* short.

*Tibiæ* simple.

1. *A. debilis*.

*Atomacera debilis*, Say, Bost. Jour. I, 1835, 212, 1, ♂.

“Black; *tibiæ* whitish. Length 0.15 inch.

♂. Body black, polished; *antennæ*, *ciliæ* longer than the transverse diameter of the *antennæ*; mouth dull piceous; wings fuliginous, a little paler at tip; first and second cubital cellules confluent; *tibiæ*, anterior pair dull pale yellowish.”

Indiana. Not seen.

Mr. Walsh writes, that he has taken one specimen in Illinois. The *antennæ* about three-fifths as long as body, the third joint of equal thickness to the middle, beyond which it tapers a little to the tip; the first submarginal cross-vein is distinct. He thinks *A. ruficollis* to be the ♀ of this.

2. *A. cellularis*.

*Atomacera cellularis*, Say, Bost. Jour. I, 1835, 213, 2, ♀.

Black; abdomen rufous. Length, less than one-fourth of an inch.

♀. Body black, polished; *antennæ* distinctly and rather densely ciliated with hairs, which are a little shorter than the transverse diameter of the *antennæ*; *nasus*, *labrum* and *palpi* whitish; wings dusky violaceous; cubital cellules three; the second very small, hardly one-third the length of the first, and but little wider at its tip than at its base; abdomen entirely yellow rufous; feet, *coxæ*, *trochanters* and base of the *tibiæ* whitish; anterior pair of *tibiæ* dull whitish.

Indiana.

3. *A. ruficollis*.

*Atomacera ruficollis*, Norton, Proc. Ent. Soc. Phil., 1864, 6, 7, ♀.

Black; the prothorax above, mesothorax and scutel rufous; wings sub-violaceous. Length 0.17. Br. wings 0.40 inch.

♀. Shining black, short and stout; *antennæ* black, short, thickly ciliate; second joint very short; third hardly clavate, but decreasing gradually in size to tip; the fourth and fifth joints of *palpi* flattened and enlarged, apical joints of equal length, but slender; basal third of *antennæ* above and beneath ferruginous; *tegulæ*, anterior angle, mesothorax and scutel yellow-red; legs black, their anterior *tibiæ* dull whitish before, their spurs short and sharp; wings ample, violaceous, sub-opaque, clearer toward apex, stigma large; four submarginal cells, second and third each receiving a recurrent nervure; lanceolate cell petiolate; under wings with two middle cells.

Penna.; Virginia, (Coll. Am. Ent. Soc.) Illinois, (B. D. Walsh.)  
Three females.

The abdomen is short and stout and pointed like *Nematus*.

b. Second and intersection of second and third submarginal cells each with a recurrent nervure.

18. **SCOBINA**, Lepel.

*Hylotoma*, † † † Lepel., Monogr. 1823, 48, 140.

*Scobina*, Lep. et Serville, Encyc. Meth. x. 1827.

Brullé, Hym. iv, 669.

*Wings*.—One marginal, not appendiculate, and four submarginal cells, the second and intersection of second and third each receiving a recurrent nervure.

*Antennæ* of females villose, clavate, sub-capitate.

*Tibiæ* simple.—Brullé. The four hinder tibiæ unispinose in the middle.—Lepel.

Country unknown.

Three submarginal cells.

19. **THEMOS**.

*Hylotoma*, \*\*\*\*\* Klug, Jahrbuch., 1834, 249.

*Wings*.—One marginal, not appendiculate and three submarginal cells, of which the first receives two recurrent nervures.

*Tibiæ* all simple.

1. **Themus hyaline**, n. sp.

Head and thorax ochraceous; abdomen black; wings violaceous opaque, at apex hyaline. Length 0.48. Br. wings 0.49 inch.

♂. Antennæ very short, not reaching scutellum, clavate, villose with short brownish hair; color black, the two basal joints pale. Head nearly as wide as thorax, color of both ochraceous; tegulæ same color; metathorax and abdomen black, with bluish reflections; abdomen stout, wider in middle. Anterior legs ochraceous, the tibiæ black above, posterior legs purple. Wings ample, brownish violaceous, opaque, apex of upper pair abruptly and perfectly clear; first submarginal large, and receiving two recurrent nervures; lanceolate cell petiolate; under wings with two middle cells, the lower one diamond-shaped, small, its lanceolate cell small.

But one bulla in each of the submarginal cross-nervures, the outer one small and in the middle of the nervure.

Pennsylvania. One male.

This came from the Smithsonian Institute and is marked Pennsylvania, but is probably from Mexico or South America.

2. **T. (Hylotoma) Olfersii**, Klug, Jahrbuch., 1834, 249, 91, ♂. Brullé, Hym. iv, 669.—Brazil.



3. *T. (Hylotoma) surinamensis*, Klug, Berl. Mag. vi, 307, 38. B. b.; Jahrbuch., 249, 90.—Surinam.

*E. Wings with one marginal cell appendiculate.*

Three submarginal cells.

20. **HYLOTOMA, \*\*\*\*** Klug.

*Hylotoma, \*\*\*\** Klug, Jahrbuch., 1834, 248, 88.

*Wings*, one marginal, appendiculate and three submarginal cells, of which the first receives two recurrent nervures.

*Tibiæ* all simple.

1. (*Hylotoma*) *formosa*, Klug, Jahrbuch., 1834, 248, 88, ♀.—Brazil.

21. **HYLOTOMA, \*\*\*\*\*** Klug.

*Hylotoma, \*\*\*\*\**, Klug, Jahrbuch., 1834, 248.

*Wings*, one marginal, appendiculate and three submarginal cells, of which the second receives two recurrent nervures.

*Tibiæ* all simple.

1. (*Hylotoma*) *leucocephala*, Klug, Jahrbuch., 1834, 248, 89, ♀.—Cayenne.

22. **DIDYMIA**, Lepel. et Serv.

*Hylotoma*, ††, Lepel., Monogr. 1823, 48.

*Hylotoma, \*\*\**, Klug, Jahrbuch., 245.

*Didymia*, Lepel. et Serv. Encyc. Meth. 1827, x.; Brullé, Hym. iv, 668.

*Gymnia*, Lepel. MS.

*Wings*, one marginal, slenderly appendiculate and three submarginal cells, of which the first and second each receive a recurrent nervure; lanceolate cell contracted.

*Antennæ* 3-articulate; furcate in the males above the second article.

*Tibiæ* all simple.

Remainder as in *Hylotoma*.

1. *D. concinna*.

*Hylotoma concinna*, Klug, Jahrbuch., 1834, 246, 82, ♂. Pl. II, fig. 8.

"*Antennæ* longer than the abdomen, furcate, ciliate, pale; with the apex of abdomen and the hinder tarsi black; wings fuscous in the middle, fuscous hyaline."

"Somewhat larger than *H. plumigera*; pale yellow; head between antennæ shining brown; antennæ dark at tip; anterior legs wholly yellow; hinder legs yellow, with the tibiæ, spines and tarsi blackish; wings in the middle pale yellow, transparent; at base and tip blackish; nerves and stigma yellow.

Mexico. One male."

Not seen. In the colored plate this is figured with the head and apex of abdomen black, and the apical half of marginal cell and basal half of both pair of wings very dark.

2. *D. versicolor*.

*Hylotoma versicolor*, Klug, Jahrbuch., 1834, 246, 83, ♀.

"Luteous, with the vertex of head, back of thorax and apex of abdomen black; wings black, in the middle flavo-hyaline."

"Hardly as large as the *H. melanictera*. Head smooth and shining black, in front pale yellow; antennæ as long as to scutel, compressed, covered with fine hair, dusky, somewhat bent outward at the tips. Thorax above yellow; lobes distinctly separated, smooth and shining; middle of the middle lobe and the whole of the side lobes black; abdomen yellow, tip black; legs yellow; posterior tibiæ at tip and final joints of tarsi blackish; wings large, yellow, transparent; their base a cross band before the middle and tips black; nerves and middle of stigma yellow, other nerves black."

Mexico. One female.

The antennæ of female much flattened at base of third joint, their basal half yellow; scutel and metathorax pale; marginal wing cell beyond the middle and all the apical cells obscure; one-fourth of the wing at base dark, with an oval, clear spot in the middle of first and second brachial cells; stigma pale, large, almost triangular. Lanceolate cell petiolate, small. There are three submarginal cells, of which the first is more than twice as long as the second; second quite short; appendiculate cell not slender.

The male has the antennæ furcate, formed like those of ♀, not so much compressed. Length 0.32. Br. wings 0.72 inch.

Cordova and Tampico; Mexico. One ♂, two ♀. (H. deSaussure.)

3. *D. fusca*.

*Hylotoma fusca*, Klug, Jahrbuch., 1834, 247, 87, ♂.

"Antennæ furcate, fuscous black; the wings obscure hyaline; costa and stigma yellow."

"Of the usual form and size. Head deep black, with furcate, finely ciliate antennæ; back of thorax black, anterior lobe at tip yellow; abdomen wholly black-brown; wings blackish transparent, with black nerves, yellow costa and stigma; legs yellow, femora, tibiæ at apex, and final joints of tarsi blackish.

Mexico. One male."

Not seen.

4. *D. (Hylotoma) elegans*. Klug, Jahrbuch., 1834, 247, 84, ♂ ♀.—Brazil.

5. *D. (Hylotoma) hirticornis*. Klug, Jahrbuch., 1834, 247, 86, ♀.—Brazil.

6. *D. (Hylotoma) lugubris*, Klug, Jahrbuch., 1834, 247, 85, ♀.—Brazil.

7. *D. (Hylotoma) Martini*, Lepel., Monogr. 1823, 48, 139, ♂. Klug, Jahrbucher, 246, 80.—Brazil.

*Didymia Martini*, Brullé, Hym. iv, 669, Pl. 47, fig. 8, ♂.—Brazil.

8. *D. (Hylotoma) melanictera*, Klug, Berl. Mag. vi, 1816, 309, 41; Jahrbucher, 245, 78.—Para.
9. *D. (Hylotoma) trigemina*, Klug, Berl. Mag. vi, 1816, 307, 39; Jahrb. 246, 81.—Brazil.

*Wings with one marginal and four submarginal cells.*

1. Second and third submarginals each with a recurrent nervure.  
Posterior tibiæ without side spur.

23. **PTILIA**, Lepel.

*Ptilia*, Lepel., Monogr. 1823, 49, k.

Westwood, Mod. Class., App. 52.

*Hylotoma*, \*\*, Klug, Jahrbuch.

*Hylotoma*, A, Stephens.

*Wings* with one marginal, appendiculate, and four submarginal cells, of which the second and third each receive a recurrent nervure; the third produced and wider on its upper edge.

*Antennæ* 3-articulate, of females pilose, somewhat filiform, of males furcate.

*Tibiæ* all simple.

Lepel., in his original diagnosis, gives but three submarginal cells. Brullé in his synopsis confounds this with *Sericocera*.

1. **P. biramosa.**

*Hylotoma biramosa*, Klug, Jahrbuch., 1823, 242, 64, ♂.

"Antennæ furcate, black; thorax before and on each side white; abdomen luteous, with the sides black at base. Larger than *H. furcata*."

"♂. Head black, with white hairs; antennæ bifurcate, the branches ciliate; corselet white, black in the middle, with white hairs; scutel and tegulæ black; legs brownish, thickly hairy; wings dusky, at the base clear, transparent; nervures and stigma black; two recurrent nervures touch the second submarginal cell, the second in the middle, and the first at the junction of the first and second cells; abdomen reddish-yellow, toward the base whitish; the second and third segments black at the sides."

"Mexico. One male."

A female from Mexico agrees with this description. The antennæ are like *Hylotoma*, compressed, ciliate within. Anterior angle white. Legs black, with the femora and tibiæ whitish before, pilose, all the spurs stout, rather obtuse; wings evenly violaceous, their basal fourth perfectly clear; the appendiculate cell is rather large; the first and second submarginals are of equal size, the second receiving both the recurrent nervures; the third much retracted below, about one-third as wide as above; lanceolate cell widely contracted, apparently petiolate; under wings not appendiculate, with two middle cells, the lower very

small; lanceolate cell very small, with an interrupted cross-nervure in brachial cell above it. Length 0.36. Br. wings 0.96 inch.

2. *Ptilia filiformis*, n. sp.

Black; the anterior angle rufous, most of the legs white; antennæ long, filiform, ciliate; wings sub-hyaline. ♀. Length 0.28. Br. wings 0.72 inch. ♂. Length 0.24. Br. wings 0.54 inch.

♀. Shining black; antennæ as long as to base of abdomen, very slender, curled, gradually decreasing to tip, thickly ciliate; labrum hairy, palpi black, second joint white; head and thorax polished; an orange-colored spot on shoulders covering tegulæ, anterior angle and behind; legs black, the tips of coxæ, trochanters, four anterior femora at apex and tibæ, except at tip, all of posterior femora and their tibæ, except at tip, white; all the tarsi blackish; spurs rather obtuse, claws simple; wings violaceous, subhyaline, nerves, stigma and costa black; appendiculate cell very small; the first and second submarginals of equal length, third about two-thirds as wide below as above; the first recurrent nervure received in middle of second submarginal, and the second at junction of second and third; lanceolate cell widely contracted; under wings two middle cells; their lanceolate cell very small, with an imperfect cross-line above.

♂. The male has the third joint of antennæ bifurcate, very slender, ciliate, curled; the spot on anterior angle extends over one-half of pleura; abdomen slender.

Cordova, T. C. Mexico, (Coll. of H. deSaussure.)

The difference in the form of the antennæ is very marked, as well as the position of the recurrent nervures.

3. *P. brasiliensis*, Lepel., Monogr. 1823, 50, 143, ♀.—Brazil.

4. *P. (Hylotoma) ephippiata*, Klug, Jahrbuch., 1834, 242, 63, ♂.—Surinam.

5. *P. (Hylotoma) gonagra*, Klug., Jahrbuch., 1834, 241, 61, ♀.—South Brazil.

6. *P. (Hylotoma) ovalis*, Klug, Jahrbuch., 1834, 241, 62, ♀.—Montevideo.

7. *P. pubicornis*.

*Hylotoma pubicornis*, Fab., Syst. Piez. 21, 5, ♀ ♀.

*Ptilia! pubicornis*, Lepel., Monogr. 50, 144.—South America.

8. *P. (Hylotoma) plumicornis*, Klug, Jahrbuch. 1834, 241, 60, ♀.—Brazil.

Posterior tibæ with a side spur.

24. **HYLOTOMA.**

*Hylotoma*, Latr., Nouv. dict. d'Hist. Nat. Fabr., Div. 2\*\*, Pal. de Beauv, Leach, Lepel.†, Klug\*, Hartig, Stephens, &c.

*Arge*, Schank.

*Cryptus*, Jurine, Hym. 1807, 49.

*Tenthredo*, Linn., Schank, Ames. &c.

*Wings* with one marginal, appendiculate, and four submarginal cells,

somewhat equal, first shortest; second and third cells receiving a recurrent nervure; lanceolate cell contracted; under wings appendiculate, with two middle cells; stigma of upper wings large, distinct, semi-ovate within; submarginal bullæ, six, viz.: one near bottom of first transverse vein, one on submarginal vein just beyond the first recurrent nervure, sometimes but rarely actually at the point of reception, and two on each of the second and third transverse veins. In the dark-winged species a paler line connects these bullæ.

*Antennæ* 3-articulate; third article long, (composed of numerous soldered articles,) filiform and ciliate in males, shorter and rather clavate in males and nearly glabrous.

*Head* transverse, with a tubercle between antennæ; labrum transverse; mandibles without distinct teeth; (emarginate, Lepel.; bidentate, Stephens); joints of maxillary palpi lengthening regularly from base to apex.

*Body* rather short and stout, scutel large, sometimes prominent behind, produced to an obtuse angle, the post-scutel forming a lunate elevated ridge, the cenchri on each side white, lengthened, oval.

*Legs* simple, anterior tibial spurs not bifid, the four posterior tibiæ each with a spine on inner side below the middle; spurs rather sharp and covered with sparse coarse hairs; tarsi with small processes beneath; claws simple.

*Larva* 20-footed, (six pectoral, twelve pectoral, the last pair very small, and two caudal,) the base of the claws of the thoracic (pectoral) feet with a fleshy tubercle. (Hartig, pl. fig. 12—15.) The larvæ of *H. rosæ*, of Europe, are often seen with the extremity of the body elevated or curved into the form of the letter S. (Westwood Int. II, 99). The pupa is placed in a gauzy, double-enveloping cocoon.

The egg is greenish, oval, and is deposited under the surface of the leaf or in the ribs or tender stems.

They do not seem to appear in such numbers as to be injurious to vegetation, although not uncommon. Several species feeding upon the rose and willow, have been described and figured by Hartig, Dahlbom, Klug, DeGeer, &c.



the third submarginal cell near the middle in the females. In one male (Mass.) it is received near the third cross-nervure, and with another (Ill.) at the junction of the second and third cells. In all, the spot below the stigma is nearly round, extending nearly or quite across the second submarginal cell. The next species agrees with Leach better than this in the wings, but as this has come to be considered *H. McLeayi*, and is very common, while the other is rare, it seems better not to change the name, at least until more specimens of that are seen.

2. *H. cœruleus*.

*Hylotoma cœruleus*, Norton, Proc. Ent. Soc. Phil. III, 1864, 5, 3, ♀.

Blue-black, with violaceous wings, paler at tip. Length 0.32. Br. wings 0.70 inch.

♀. Color violaceous, shining; antennæ short, stout, black; palpi white, legs the color of body, their knees and anterior tibiæ dark piceous; wings smoky violaceous, clearer at tips; the whole of marginal cell fuscous; a round, darker spot below the stigma, covering most of first and second submarginal cells; nervures black; lower middle cell of under wings not more than half as long or large as the upper.

Pennsylvania, (Coll. Am. Ent. Soc.) One female.

3. *H. analis*.

*Hylotoma analis*, Leach, Zool. misc. III, 1817, 123, 5, ♂.

Lepel., Mon. Tenth. 47, 134.

“♂. Antennæ black, head and thorax blue-black; abdomen fulvous yellow, at the apex dark; legs black; wings sub-fuscous, at apex sub-hyaline.

*Var.* With the wings somewhat luteous.

Georgia. Length 4 lines. Br. wings 7 lines.”

Not seen.

4. *H. virescens*.

*Hylotoma virescens*, Klug., Berl. Mag. vi, 1816, 296, 15, ♂; Jahrb., 231, 17.

“Aeneous black; abdomen yellow, at apex aeneous; wings with a fuscous spot. Length 3½ lines. Br. wings 7 lines.

Wings of a yellowish color, the fuscous spot not fasciate; thorax wholly black, with a metallic reflection, faint through whitish hair; mandibles at the point brown; antennæ black; abdomen reddish-yellow, the three last segments black; femora and coxæ of the same color; tibiæ white, with brownish spines; the two first joints of tarsi are white, the two next brownish and the claws black; wings wholly shining hyaline; nerves brown, and a light brown spot extending beyond the second submarginal cell.”

Georgia.

Not seen.

5. *H. clavicornis*.

*Tenthredo clavicornis*, Fab., Ent. Syst. II, 1793, 108, 14.

*Hylotoma clavicornis*, Fab., Syst. Piez. 24, 12.

Lepel., Mon. Tenth. 45, 125.

Head, thorax and base of legs blue-black; antennæ, abdomen, except tip, and legs yellowish; wings hyaline, with a spot below stigma. Length 0.36. Br. wings 0.74 inch.

♀. Antennæ yellowish, their first, second and base of third joint blackish; head and thorax blue-black, polished, with fine, sparse hair; labrum and mandibles ferruginous; palpi paler; abdomen yellowish, with the anal segments beneath black; legs above the knees blue-black; apical third of anterior femora before, tips of the four posterior femora and all the tibiæ and tarsi yellowish; apical tarsi fuscous. Wings hyaline, basal half slightly smoky; a fuscous semi-cylindrical spot below the stigma, (the flattened side toward the apex); second recurrent nervure received near the base of third submarginal cell.

*Var. a.* Abdomen entirely of one color. (White Mountains).

*Var. b.* Tergum in middle of segments and at base steel-blue; about the sutures ferruginous. (White Mountains).

*Var. c.* Head and thorax greenish-black. Tergum with blackish bands in middle. Legs wholly yellowish. (♂ ♀ Albany, N. Y.)

New England. English River, (Smithsonian Institute). New York, (Dr. Peck).

Only one, of many specimens examined, has the apical segments black above. Some have fuscous or black irregular spots on different parts of the abdomen.

6. *H. abdominalis*.

*Hylotoma abdominalis*, Leach, Zool. Misc. III, 1817, 123, ♀.

Lepel., Mon. Tenth. 45, 124, ♀.

Length 4—6 lines. Br. wings 8—10 lines.

“♀. Antennæ black; head and thorax blue-black; abdomen deep yellow; legs blue-black; tibiæ black; wings fuscous.”

Georgia.

A male from Maine (Cambr. Mus.) resembles this. Wings tinged with violaceous; abdomen reddish-yellow. One of the wings is perfect; in the other the third submarginal cell has a supplementary cross-line, making five cells. The discoidal cell beneath it has also another cross-nervure, making four discoidal cells.

A single female from Connecticut differs only in having the apical half of wings hyaline, basal half fuscous, (not yellowish,) and a cylindrical darker spot beneath the stigma as in *H. McLeayi*. The antennæ are short as in that; the face covered with rather long whitish hair;



the second recurrent wing-nerve received upon the second submarginal cross-nerve. Klug thinks this identical with his *H. miniata*.

b. Thorax partly black.

1. Abdomen black.

7. *H. scapularis*.

*Hylotoma scapularis*, Klug, Berl. Mag. vi, 1814, 268, 19, ♂.

Jahrbucher, 231, 23.

*Hylotoma calcanea*, Say, Bost. Jour. 1, 211, 2.

Violaceous black; thorax reddish-yellow; wings violaceous. Length 0.45. Br. wings 0.94 inch.

♀. Antennæ black, extending as far as back of scutel, quite clavate, deeply channeled before, punctured and covered with short, reddish hair, the two basal articles enlarged and cup-shaped at apex, the first compressed in the middle. Head, breast, metathorax, abdomen and legs shining blue-black, (legs blackish,) and with rather sparse patches of whitish hair on thorax. The prothorax, mesothorax, scutel, (except its black posterior angle,) anterior angle, and a large spot on pleura, reddish or honey-yellow; the first three joints of the tarsi whitish, their tips black, (sometimes almost wholly black,) side spurs white, sometimes difficult to see, apical spurs short, sharp. Wings ample, blackish sub-fuscous, least obscure at apex, an indistinct darker spot below stigma; second recurrent nervure alike in both sexes, received half way between dividing nervure and middle of third submarginal cell; stigma and costa yellowish, nervures dark.

♂. The male has the antennæ longer and more slender, ciliæ beneath tawny. Scutel all yellowish; anterior tibiæ and all the tarsi whitish; wings not so dark, generally no spot below stigma.

*Var. a.* ♂. Thorax entirely blue-black, except the anterior angle; legs whitish before, below knees; a spot below stigma.

*Var. b.* ♂. Sides of metathorax and the pleura black, apical half of wings clear. (English River and Lake Saskatchewan). Penna.

New Hampshire, Connecticut, Pennsylvania, Maryland. Hudson's Bay Territory, English River, Lake Saskatchewan, (Smithsonian Institute).

Specimens from Mt. Washington, N. H. have the wings darker violaceous and the scutel mostly black. The rufous spot on the pleura is sometimes indistinct.

8. *H. dorsalis*.

*Hylotoma dorsalis*, Klug, Jahrbuch., 1834, 236, 44, ♀.

"Black, with the back of thorax red; breast and sides black; wings blackish, with black nervures and stigma."

Mexico. Probably the same as above.

## 2. Abdomen partly black.

9. *H. humeralis*.

*Hylotoma humeralis*, P. deBeauv., Ins. Afr. et Am. 1797, 99, p. ix, Hymen. fig. 6, ♂.

Lepel., Mon. Tenth. 47, 133.

*Hylotoma sanguinea*, Klug, Berl. Mag. vi, 299, 22; Jahrbuch., 231, 20, ♀.

*Hylotoma scutellata*, Say, Bost. Jour. I, 211, 1, ♀.

Color blue-black; scutel, pleura and abdomen, except at apex, coccineous; wings violaceous. Length 0.45. Br. wings 0.94 inch.

♀ ♂. Antennæ in both sexes as long as thorax, piceous, palest toward tip; second article as long as first, both slightly obliquely truncate above; head, thorax, apex of abdomen and legs shining blue-black; scutel, anterior angle, pleura and abdomen bright red, sometimes yellow-red; third joint of palpi swelled; side spines of tibiæ black; apical spines rather long; inner spine of anterior tibiæ blunt. Wings violaceous sub-opaque, usually darkest toward base; a large dark spot covering all of the marginal and the upper half of submarginal cells; under wing less obscure.

Var. a. Scutel blue. New York; Virginia.

Var. b. Scutel blue. Tergum mostly blue. Illinois, (Walsh).

New England, New York, Pennsylvania, District of Columbia, Kansas. Georgia, (Klug).

10. *H. procera*.

*Hylotoma procera*, Klug, Jahrbuch., 1834, 235, 38, ♀.

"Red, with the thorax before and legs blue-black; abdomen testaceous, anal segment blue-black. Length 6 lines.

♂. Antennæ black, almost as long as thorax; head shining blue-black; the back of thorax yellow-red, bordered with blue; wing-scales and legs deep blue; wings dusky brownish, transparent, with black nerves and stigma; abdomen reddish-yellow, the last ventral segment shining blue; body slender."

Mexico. Not seen.

11. *H. pœcila*.

*Hylotoma pœcila*, Klug, Jahrbuch., 1834, 239, 54, ♂.

"Testaceous; the head, spots on thorax, apex of abdomen, tibiæ and tarsi black; wings fuscous, in the middle hyaline." Length 0.29—0.32. Br. wings 0.60—0.68 inch.

♂. Head and antennæ black, palpi yellow. On each side of scutel is a black spot; the four last segments of abdomen as well as the tarsi and hinder tibiæ are black; wings transparent in the middle, with yellow nerves; their base and tips blackish, with black nerves, (that is, they are blackish, with a clear band across the middle); costa toward the end and stigma yellow."

Mexico.

The antennæ are long, as long as to third segment of abdomen, setaceous, densely ciliate; second joint yellow; nasus and labrum emarginate, with a sharp ridge from edge of nasus to venter, dividing between antennæ, and enclosing lower ocellus in a long, deep basin; third joint of palpi short, globose, fourth enlarged at apex, the two black vittæ are on the side lobes of mesothorax; the spurs are pale, long and sharp, the inner spur of anterior tibiæ twice as long as the other, and sharp. Intermediate tibiæ and all the tarsi black. The wings are obscure black, with a yellowish hyaline band across their middle, edges distinctly marked; first submarginal cell short, and wider than long; second recurrent nervure received at or near intersection of second and third submarginal cell. The female resembles the male.

Cordova, Tampico, Mexico, T. C., Huastec, t. f. Mexico, (H. deSaussure.) (12 ♂, 2 ♀.)

This and the two following species and probably that preceding, are much more slender than the northern species.

12. *Hylotoma fascialis*, n. sp.

Testaceous, with most part of the head, two vittæ on thorax, and three apical segments of abdomen black; wings black, with a broad yellowish fascia in middle. Length 0.26. Br. wings 0.60 inch.

♀. Testaceous; antennæ as long as thorax, compressed, widest at base, curved, setaceous, ciliate, the two basal joints pale. Head black, the whole face around and beneath antennæ whitish; nasus and labrum emarginate; a sharp ridge from edge of nasus dividing between antennæ, and forming a deep basin, enclosing lower ocellus; two vittæ on the side lobes of metathorax and the three apical segments of abdomen black. Legs testaceous; apical two-thirds of hinder tibiæ piceous; apical joints of all the tarsi blackish; spurs pale, all long and sharp; inner anterior tibial spur nearly as long as first tarsal joint. Wings with a broad, yellow hyaline band across the middle of both pair; their basal fifth and about one-quarter of their apex blackish (including tip of stigma and all of third and fourth submarginal cells).

Mexico. One ♂. (H. deSaussure).

The abdomen is not very stout.

13. *Hylotoma semifuscus*.

Testaceous, with the head, three vittæ on thorax, most of tergum, and a spot on breast black; the wings yellow hyaline, their apical half black. Length 0.26. Br. wings 0.60 inch.

♂. Testaceous; antennæ as long as thorax, slender, sickle-shaped, ciliate; their two basal articles pale; nasus emarginate and ridged as in *H. procera*, the deep basin enclosing ocellus divided into two by a

cross ridge below. Head black; about and beneath antennæ pale; a vitta on each lobe of mesothorax, the four apical segments of abdomen, obsolete spots on all the tergum, and a spot on the breast black. Legs yellow-white; coxæ at base, femora, except at tip, apical two-thirds of the tibiæ, and the four apical joints of tarsi black. Wings yellow hyaline; their apex from the middle of stigma across the wing black; second recurrent nervure received near the second submarginal cross-nervure,

Mexico. One ♂, (Coll. of H. deSaussure).

Closely resembles *H. lepida*, Klug.

3. Abdomen rufous.

14. *H. pectoralis*.

*Hylotoma pectoralis*, Leach, Zool. Misc. III, 1817, 124, 10, ♀.

Lepel, Mon. Tenth. 47, 132, ♀.

"Antennæ black; head, breast and legs blue-black; thorax coccineo-luteus; abdomen luteus; wings luteus-hyaline. Length 4 lines. Br. wings 10 lines."

North America. Not seen.

15. *H. dulciaria*.

*Hylotoma dulciaria*, Say, Long's Second Exp. II, 1824, 314, ♀.

"Pale rufous; head, wings and feet violaceous black." Length 0.34—0.48. Br. wings 0.74—1.04 inch.

♀. Antennæ black, with a violaceous tinge; nasus emarginate, short; head, a spot on pectus and ovipositor sheaths blue-black, remainder of body testaceous or yellowish-red; legs steel-blue, spines same color, inner spines rather blunt. Wings violaceous, sub-hyaline, less obscure at apex, a large darker spot below stigma covering marginal and the upper half of all the submarginal cells. Under wings with but one middle cell.

Maine, N. Hampshire, Connecticut, New York. N. W. Ter., (Say.) Illinois; English River, (Smithsonian Institute).

This is probably the same with *H. pectoralis*, Leach, from which it differs only in the color of the wings and the black ovipositor sheaths, which Say calls the "tail black."

16. *H. miniata*.

*Hylotoma miniata*, Klug. Berl. Mag. vi, 1814, 298, 22, ♂; Jahrbuch., 231, 22.

*Hylotoma scutellata*, Lepel., Mon. Tenth. 47, 135. (Patria ignota.)

"Coccineus; head, three spots on the thorax and the legs black. Length 3½ lines. Br. wings 7 lines.

♂. The color of the body is a vermillion or cinnabar red. The head and antennæ are black; mandibles brown, with black teeth; a black spot on the thorax, extending over the middle and side lobes; a larger

black spot on the breast. Abdomen entirely red; feet black; wings blackish; upper pair at the end pale and transparent, the nerves and stigma black. It conforms in size with *H. cærulascens* (of Europe)."

North America. Not seen.

The *H. scutellata* of Lepel. is thought by Klug to be identical with this. It seems to approach closely to *H. humeralis*.

*C. Head rufous.*

a. Thorax partly black.

1. Abdomen partly black.

17. *H. lepida*.

*Hylotoma lepida*, Klug, Jahrbuch., 1834, 239, 53, ♂.

Testaceous: spots on the thorax, apex of abdomen and the tarsi black; wings yellow hyaline, at apex fuscous.

♂. Antennæ black; the two basal joints and the head pale yellow; a long, black spot on each side of the scutel; the middle of the breast, the four last segments of the abdomen, the spines on tibiæ and the tarsi black; wings as far as the middle pale yellow with yellow nerves; toward the tip blackish, with black nerves; stigma in the middle black.

Mexico. One male.

This only differs from No. 13, *H. semifuscus*, in the color of the head and the number of vittæ on the thorax.

2. Abdomen rufous.

18. *H. coccinea*.

*Hylotoma coccinea*, Fab., Syst. Piez. 1807, 24, 11.

"Coccineus, with the antennæ exarticulate; antennæ and legs black; wings cyaneus.

Form and size of *H. enodis*, (of Europe). Antennæ thickened without, black. Head coccineus. Thorax coccineus, with the back black. Abdomen coccineus, immaculate. Wing obscure cyaneus, at the apex hyaline. Legs black."

Carolina. Not seen.

19. *H. rubra*.

*Hylotoma rubra*, Klug, Berl. Mag. vi, 1814. 209, 21, ♀; Jahrbucher, 231, 21.

"♀. Coccineus; a dorsal thoracic spot, the antennæ and feet black. Length  $4\frac{1}{2}$  lines. Br. 9 lines.

The ground color of the body is cinnabar red; mandibles yellow-red, with black teeth; on the thorax a black spot covers most of the middle lobe and summits of the two side lobes; tegulæ black; the breast is without spots, the abdomen wholly red, the legs black, the wings brown running into blackish, with darker nerves and stigma."

New York. One female. Not seen.

As Klug remarks, this coincides with *Hyl. coccinea*, except that the wings of this are not "obscure cyaneus, at the apex hyaline."

β. Thorax and abdomen rufous or yellow.

20. *H. rubiginosa*.

*Tenthredo rubiginosa*, P. de Beauv., Ins. Afr. et Am. 1805, 98, Pl. ix, fig. v.

*Hylotoma rubiginosa*, Klug, Berl. Mag. vi, 300, 27.

Lepel. Mon. Tenth. 47, 131, ♀.

*Hylotoma erythrosoma*, Leach, Zool. Misc. III, 124, 8, ♀.

"♀. The antennæ and four hinder legs blue-black; head, thorax, abdomen and two anterior legs reddish; wings black fuscous."

North America, (Beauv.) Georgia, (Leach).

Antennæ violaceous black, reaching as far as scutel, truncate, finely punctured, second article one-fourth as long as first, smooth and shining; body smooth and shining; nasus white, not deeply emarginate, labrum and tips of mandibles black; head and whole body coccineus, scutel prominent, almost transparent red; legs blue-black, anterior pair tinged with rufous about the knees and tarsi, spines rather short, inner anterior one blunt. Wings brownish violaceous, almost hyaline at tip, very dark at base, a large fuscous spot covering marginal and upper half of submarginal cells; hinder wings marked in the same way; nerves, stigma, costa and scale almost blue-black.

New York. One ♀. (Coll. Mr. Calverley).

The *H. erythrosoma* of Leach has all the legs black.

*South American species.*

21. *H. americana*, Fab., Syst. Piez. 1804, 24, 14.

Lepel., Mon. Tenth. 49, 142?

*Tenthredo americana*, Fab., Ent. Syst. II, 109, 16.

Linn., Syst., Nat. II, 921, 9.

DeGeer. Ins. III, 599, 2, Tab. 30, fig. 21!

*Hylotoma xanthothorax*, Leach, Zool. Misc. III, 124, 9!—Surinam.

22. *H. basalis*, Klug, Jahrbuch., 1834, 237, 48, ♀.—Surinam.

23. *H. carbonaria*, Klug, Jahrbuch., 1834, 240, 58, ♀.—Surinam.

24. *H. collaris*, Klug, Jahrbuch., 1834, 236, 42, ♀.—Brazil.

25. *H. fulvata*, Klug, Jahrbuch., 1834, 240, 57, ♂.—Brazil.

26. *H. geniculata*, Klug, Jahrbuch., 1834, 237, 45, ♀ ♂.—Brazil.

27. *H. helvola*, Klug, Jahrbuch., 1834, 238, 50, ♀.—Brazil.

28. *H. infusata*, Klug, Jahrbuch., 1834, 236, 42, ♂.—Brazil.

29. *H. lurida*, Klug, Jahrbuch., 1834, 238, 49, ♀.—Surinam.

30. *H. maculipes*, Klug, Jahrbuch., 1834, 238, 52, ♀.—Brazil.

31. *H. melanaria*, Klug, Jahrbuch., 1834, 249, 59, ♂.—Brazil.  
 32. *H. melanopyga*, Klug, Jahrbuch., 1834, 237, 36, ♀.—Brazil.  
 33. *H. notata*, Klug, Jahrbuch., 1834, 237, 47, ♀.—Brazil.  
 34. *H. rubricollis*, Klug, Jahrbuch., 1834, 236, 40, ♀ ♂.—Brazil.  
 35. *H. stigmaticollis*, Klug, Jahrbuch., 1834, 236, 41, ♂.—St. Pauls, Brazil.  
 36. *H. terminalis*, Klug, Berl. Mag. vi, 1814, 297, 17; Jahrbuch. 236, 39.—Brazil.  
 37. *H. testacea*, Klug, Jahrbuch., 1834, 238, 51, ♀.—Brazil.  
 38. *H. ventralis*, Klug, Jahrbuch., 1834, 240, 56, ♀ ♂.—Brazil.  
 39. *H. xanthospila*, Klug, Jahrbuch., 1834, 239, 55, ♀ ♂.—Brazil.

2. Second submarginal cell with two recurrent nervures.

25. **PACHYLOTA**, Westwood.

*Pachylota*, Westw., Arcana. Ent. I, 1845, 24.

*Wings* with one marginal, appendiculate, and four submarginal cells, the second long and receiving two recurrent nervures; lanceolate cell closed; under wings not appendiculate, with two inner cells.

*Antennæ* a little compressed, angulate, third article arcuate at the base; maxillary palpi 4-jointed.

*Legs* thick, compressed; tarsi all dilated and short, except the first joint, and furnished with little processes beneath; tibiæ without apical spurs.

1. **P. Audouinii**.

*Pachylota Audouinii*, Westwood, Arc. Ent. I, 1845, 24, Pl. 7, fig. 3.—Africa.  
 Brullè, Hym. iv, 667, Pl. 47, 6, ♀.—South America.

Sub-family 3, **TENTHREDINIDES**, Lepel.

*Antennæ* from 9—15 articulate, generally setaceous, sometimes sub-moniliform or even enlarged toward the end; labrum apparent; saws of ovipositor with parallel sides.

*F. Wings with one marginal cell.*

Three submarginal cells.

The first and second submarginals each receiving a recurrent nervure.

26. **CLADIUS**, Ill.

*Cladius*, Illiger, Nam. der Ins. Mag. des Ins., 1801. Klug., Latr., Leach.

*Hylotoma*, Fab., Fam. 1.

*Pteroma*, Jurine, Nouv. Meth. Hym. 1807. Fam. 1.

*Lophyrus*, Latr., Gen. Ins. Paris, 1810.

*Tentaredo*, Panz., Fourc. Geoffr.

*Wings* with one marginal and three submarginal cells; the first and second each with a recurrent nervure; the first submarginal with an

incomplete cross-line near the base; lanceolate cell contracted. Under wings two middle cells. Submarginal bullæ three, one quite long on submarginal vein at reception of first recurrent nervure, one at base of second, and a large one in middle of second transverse vein. The position of another, usually the first transverse vein, is indicated by a clear cross line.

*Antennæ* nine-articulate, setaceous, the two basal articles short and straight; the rest obliquely inserted and generally pectinate in males, on one side of several articles; in the females, simple, with both somewhat pilose.

*Head* transverse; mandibles with one inner tooth in the middle, below which are many little irregular teeth; maxillary palpi with the fourth joint short, inner maxillary lobe sharp.

*Body* short and stout.

*Legs* simple, with two tibial apical spurs; the inner one shortest on anterior pair; the tarsal claws have an inner tooth.

*Larvæ* twenty-footed, the fourth and eleventh segments without feet. The transformations of various European species have been noted. Curtis states that the larvæ of *Cladius difformis* remain on the under side of the leaves of the China rose, eating small holes through the leaves, and that they do not use the anal feet in walking. Dahlbom noted it on *Salix viminalis*. Hartig has noted the habits of several species, (*Cladius eucera*, on the *Populus balsamifera* and *C. albipes* on the cherry, &c.) He states that they form a double cocoon in the earth.

#### Section 1—*Cladius*, Hartig.

Antennæ of males with the lower half pectinate without; the inner lobe of maxillæ sharp, not membranous.

##### 1. *C. isomera*.

*Cladius isomera*, Harris Cat. Norton, Bost. Proc. viii, 1861. 223, ♀.

Shining black, with whitish tibiæ and feet. Length 0.24. Br. wings 0.50 in.

♂. Antennæ black, pilose, with outer branches on the third, fourth, fifth and sixth articles, (very short on the sixth), a blunt process on the third within, and the apex of the other joints acute within; head polished; a sinus behind each of the two upper ocelli, and a basin enclosing the lower ocellus; a ridge is produced between the antennæ; body black, with outer half of palpi, the tips of knees, tibiæ and tarsi white; remainder of legs black; apical joints of tarsi and claws blackish; anterior tibial spurs sharp; claws with an inner tooth.



Wings violaceous hyaline, sometimes yellowish; stigma large, black; costa pale.

♀. The female has the third and fourth articles of antennæ enlarged at apex; basal articles tipped with coarse hairs resembling minute spines within.

*Var.* ♀. Wings hyaline, at base smoky.

*Var.* ♀. Basal two-thirds of all the wings black, sub-obscure; their apex hyaline. Norway, Me., (Camb. Mus.)

Mass., Ct., N. Y., Ill.

A number of specimens taken June 29th, at Farmington, Conn., on the leaves of the *Clematis virginiana*.

Section 2—(*Trichiocampus*), Hartig.

Antennæ of the males not branched, the third article dilated at base within, as in Section 1.

Europe.

Section 3—(*Priophorus*), Latr.

The third article of antennæ of males, simple, without process within; the inner lobe of maxillæ blunt.

Europe.

First submarginal wing cell with two recurrent nervures.

27. **PRISTIPHORA**, Latr.

*Pristiphora*, Latr. Nouv. Dict., 1816-19.

Lepel, Mon. Tenth, 59-†.

Westw. Ent. Ins. App.

*Pteronus*, Jurine, Fam. 3.

*Wings*—One marginal and three submarginal cells, the first submarginal large, and receiving two recurrent nervures, second small and quadrate; lanceolate cell petiolate; under wings with two middle cells.

*Antennæ* nine articulate; the third, fourth and fifth of nearly equal length, simple, pubescent in the males, shorter and glabrous in the females. Mandibles slightly dentate. Remainder as in *Nematus*. Stephens remarks that this genus seems to occupy an intermediate space between *Cladius* and *Nematus*, nearly agreeing in the neuriation of the wings with the former and in the form of the antennæ with the latter. In certain species of *Nematus*, the dividing nervure between the first and second submarginal cells is quite indistinct, and can only be seen by holding them up to the light. Mr. Walsh remarks that in

five out of forty-nine females of his *P. grossulariæ* traces of a first submarginal cross vein could be discovered.

1. *P. sycophanta*.

*Pristiphora sycophanta*, Walsh, Proc. Ent. Soc., Phil., vi., 1866, 263, ♂. Length, ♂, 0.16 in. Br. wings 0.32 in.

“♂. Black. Head polished, but sparsely and rather coarsely punctate. Face with a lofty, but obtuse carina extending from between the antennæ to the clypeal suture. Clypeus squarely truncate. Labrum twice as wide as long. Mouth entirely black. Antennæ nearly as long as the body, black above, brown-black beneath, joints 3—5 sub-equal, 6—9 very slowly shorter and shorter. Thorax polished, with fine shallow punctures. Tegulæ and cenchri dull yellowish. Abdomen polished, with fine shallow punctures, sparse towards the base. Legs whitish; coxæ, except their extreme tips, femora, tarsal tips and in the hind legs the terminal one-eighth of the tibiæ and of the entire tarsi, all black. Wings hyaline; veins black, costa and stigma dusky, first submarginal cross vein obsolete, the ante-penultimate cell receiving both veins in the normal manner.

Rock Island, Ill.

One ♂, Inquiline. Bred August 9, from a cocoon found July 27, inside the Cecidomyioid galls, *Salix brassicoides*, Walsh, of the same years growth. The following is probably the same species.

2. *Pristiphora tibialis*, n. sp.

Shining black, legs white, with black banded femora; wings hyaline. Length 0.22. Br. wings 0.46 in.

♀ Black. Antennæ black, about half the length of the body, third joint a little longer than fourth. Head closely punctured; channels at sides of ocelli almost obsolete; the ridge between antennæ channeled through the middle; nasus moderately notched; labrum piceous; tegulæ reddish-white. Legs white; basal two-thirds of coxæ, a wide band on the femora and apical third of posterior tibiæ black; tarsi blackish, basal joint white; tibial spurs all sharp, pilose; claws with a short inner tooth. Wings hyaline, nervures blackish, stigma full.

♂. Antennæ longer, slender; nasus hardly incurved, labrum white; the white and black on legs very clearly defined.

Ct. Md. (Mr. Uhler.) Pa. (Smith's Inst.) Va. and Ill. (Am. Ent. Soc.,) Phil.

The body is short and stout, as in *Selandria*. It seems most probable that this is identical with *P. sycophanta*, of Mr. Walsh, although differing in form of antennæ.

**3. *Pristiphora relativus*, n. sp.**

Black, legs whitish, with black banded femora, tarsi white, wings hyaline. Length, 0.18. Br. wings, 0.38 in.

♀. Color, shining black. Antennæ as in *P. tibialis*. Head coriaceous, without sensible depressions about ocelli; edge of nasus incurved. Tegulæ and legs whitish; coxæ and a wide band on femora black; tips of posterior tibiæ and their tarsi, except basal joint, fuscous. Wings hyaline, stigma and costa luteous, the latter pale at base; second submarginal cell contracted at junction with third cell.

Great Slave Lake, H. B. T. (R. Kennicott, Smiths. Inst.)

This is not as stout as the preceding species, but resembles it much.

**4. *Pristiphora idiota*, n. sp.**

Black; mouth and legs yellow-red; tips of hinder tibiæ and their tarsi black; wings hyaline. Length, 0.20. Br. wings, 0.52 in.

♂. Shining black. Antennæ long, compressed toward base; labrum and palpi pale; tegulæ reddish; abdomen slender; base of coxæ, tips of hinder femora and tibiæ and their tarsi black; tips of wings hyaline, stigma and costa greenish white.

Illinois. (Coll. Am. Ent. Soc.) 2 ♂.

**5. *Pristiphora identidem*, n. sp.**

Black; mouth, tegulæ and collar yellow-red; a rufous band on abdomen. Length 0.22. Br. wings 0.52 in.

♀. Black. Antennæ long and slender, somewhat like those of *Cladius*. Head and thoax closely punctured, pleura polished; clypeus not incurved, labrum truncate; labrum and palpi white, tegulæ and collar reddish-white; a yellow-red band on the second, third and part of fourth segments of tergum, and all of venter, except apex. Legs mostly yellow-red; about the trochanters and all the tibiæ whitish; tips of the four anterior tibiæ, apex of posterior femora above, apical third of their tibiæ and the tarsi black. Wings hyaline; stigma piceous; costa greenish.

Illinois. (Coll. Am Ent. Soc.) Maine. (A. S. Packard, Jr.) 3 ♀.

It is very likely that this is the ♀ of *P. idiota*.

**6. *P. grossulariæ*.**

*Pristiphora grossulariæ*, Walsh, Pract. Ent. I, 1866, 123, ♀ ♂.

Length, ♀ 0.17—21. ♂ 17—18 in. Br. wings, ♀ 0.41—45. ♂ 35—38 in.

♀. "Shining black, with fine, rather sparse punctures. Head with the entire mouth, except the anterior edge of the labrum and the tip of the mandibles dull luteous. Labrum transverse and very pilose. Cly-

peus short, squarely truncate, immaculate. *Antennæ* two-thirds as long as the body, third joint three and a half times as long as wide, joint four fully one-quarter shorter than three, brown-black above, dull luteous beneath, except joints one and two, which are black, tipped below with luteous. *Thorax* with the wing scales honey-yellow, and the cenchri whitish. *Abdomen*, basal membrane whitish; ovipositor honey-yellow, its sheath black. *Legs* honey-yellow, or paler, with the six tarsal tips, and sometimes the extreme tips of hinder tibiæ and of the tarsal joints one-quarter pale dusky. *Wings* sub-hyaline; veins black; costa honey-yellow, stigma dusky, edged all round with honey-yellow, especially below.

♂. "Differs as follows:—The antennæ a little longer, and as usual, vertically more dilated, joint three being only two and a half times as long as wide. The coxæ, except their tips and the basal half of the femora are black; the extreme tip of the hinder tibiæ, and all but the extreme base of the tarsus dusk. Anal forceps honey-yellow."

Davenport, Iowa. (Walsh.) Me. (Packard.) N. Y. (Calverley.)

49 ♀. 4 ♂. (Walsh.) 2 ♀. (Norton.) Mr. Walsh bred these Sept. 2, twelve from larvæ found on the cultivated gooseberry. This is the *Pristiphora atripes* of my collection and MSS.

"*Larva*—A pale, grass-green worm, about half inch long, without any black dots on its body, and with a black head; after the last moult the head becoming principally green, with a lateral brown-black stripe commencing at the eye spot, and more or less distinctly confluent with the other one on the top of the head, where it is also more or less confluent with a large central brown-black spot on the face. When immature the larva has a darker dorsal line and a lateral yellowish line above the spiracles, the space below which line is darker than the back. Head black. Legs brown, except the sutures."

Mr. Walsh found these larvæ in great numbers on the gooseberry and currant, about the last of June and early in July, and the second brood in August, from which last he bred the above described imago. They strip the plants of the leaves, not gathering in numbers on any particular leaf nor boring round holes through the leaves when young. The second brood spun their cocoons on the bushes on which they fed, and came forth August 26th, and during the last week in August. Doubtless their eggs are laid in the twigs of these same bushes, so that the larva in coming forth find their appropriate food close at hand.

## 4. Second submarginal cell with two recurrent nervures.

23. *EUURA*, Newman.

*Euura*, Newman, Ent. Mag., iv., 1837, 258.

*Pristiphora*, ††, Lepel, Mon. Tenth, 60.

*Pristiphora*, B. Stephens, Br. Ent. Mand. vii., 26.

*Pteronus*, Farm. 2, Jurine.

*Cryptocampus*, I. Hartig. Die Blattwespen.

*Wings*, one marginal, and three submarginal cells; the first small, rounded, second long, receiving two recurrent nervures; lanceolate cell contracted; under wings with two middle cells.

*Antennæ* nine-articulate, moderate, joints gradually decreasing in length and size from the third.

*Head* nearly as wide as thorax; mandibles slightly dentate.

From late studies of Mr. Walsh, this is subject to as great variations, and is as difficult of indentification at times, as species of the genus *Nematus*.

Mr. Walsh having bred many specimens from willow-galls, makes the following divisions in the genus:

## 1. GALL-MAKERS.

1. *E. orbitalis*.

*Euura orbitalis*, Norton, Proc. Ent. Soc., Phil., I, 1862, 144, ♀ ♂.

*Euura genuina*, Walsh, Proc. Ent. Soc., Phil., VI, 1866, 250, ♀ ♂.

Black; head and legs pale luteous, a black spot on vertex. Length, 0.12—16. Br. wings, 0.32.

♂ ♀. Shining black, polished. *Antennæ* moderate, slightly flattened, apical joints pale beneath; head pale luteous; a large black or brownish spot enclosing ocelli, and a dusky spot on summit, nasus deeply incurved; tegulæ and most part of the anterior angle, sides of apical segments, and in some cases, all the sides of venter, and the legs luteous, the trochanters paler; basal membrane visible, pale; tips of hinder tibiæ and of their tarsi brownish; wings hyaline, stigma pale at base.

*Var. a.* ♂. A male from Labrador has the whole body beneath pale.

*Var. b. nigra.* ♀. A female from Labrador has the whole head, except the mouth, black; the coxæ and femora, except at tip, black; the trochanters white.

Conn., N. Y., Ill., Labrador.

Mr. Walsh has named a species "*genuina*," which differs from the above in having the flagellum of the male entirely bright rufous beneath. As he does not seem to have seen the above species, I have

thought best to consider it the same, especially as I have received specimens from several quarters, as taken on the willows. Mr. Walsh found his galls on the *Salix humilis*. "The lateral bud of a twig enlarged so as to be twice or thrice as long, wide and thick as the natural bud, before it begins to expand in the spring," otherwise externally unchanged. Internally "it contains early in the autumn a homogeneous grass-green fleshy matter, which is afterwards gradually consumed by the larva, leaving nothing at last but a mere shell, as thin as paper, and partly filled with excrement. The gall is monothalamus, sometimes one only on a twig; sometimes two or three, or more, at irregular intervals, rarely as many as three or four found out of three or four consecutive buds. Common, but not local. Described from thirty-four specimens. Length, .17—36 inch; breadth, .10—17 inch.

*Larva*.—The larva is twenty-footed, and on Oct. 2, is 13—19 inches long, of a greenish white color, the head tinged with dusky, and with the usual fuscous eye spots. Mouth dusky. At this date, few galls were already bored, and the other larvæ not long after this bored out and retired an inch or so under ground, where they spin a thin, whitish silken cocoon, to which many particles of earth adhere externally."

This statement is very interesting, as well as all the observations of Mr. Walsh on this subject, which the length of this paper will not admit of being reprinted in full.

**E. s. ovum.**

*Euura s. ovum*, Walsh, Proc. Ent. Soc., Phil., vi, 1866, 252.

♀. Length, .17—12 inch. Br. wings, .36—48 inch.

"♀. Shining honey-yellow. *Head* with the eyes, a square spot enclosing the ocelli, but separated from the eyes by a pretty wide orbit, and also the tips of the mandibles, all black. Clypeus emarginate in a circular arc of about 90°. Labrum rounded at tip. Occiput more or less clouded with black on the disk. Antennæ dull rufous above, with their basal half black, honey-yellow below, with the scape black, and more or less of the basal half of the flagellum dusky, three-fifths as long as the body, joints 3—5 subequal, 4 slightly the longest, 5—8 very slowly shorter and shorter, 9 full as long as 8. *Thorax* with an oblong spot on the anterior lobe of the mesonotum, generally extending from the collare two-thirds of the way to the hind angle of the lobe, rarely covering almost its entire surface, the interior half of each lateral lobe and sometimes its entire surface, base and tip of the scutellum and rarely its entire surface, anterior disk of the metanotum, and the edges of the basal plate that border on the basal membrane, or rarely

the entire surface of the basal plate, all black. Cenchri whitish. A more or less distinct black cloud on the pectus, and another on the posterior disk of the pleura, the former occasionally obsolete. *Abdomen* with that part of the anterior edge of joint one, that borders the whitish basal membrane, or rarely the basal half of joint one, black. Ovipositor honey-yellow, its sheaths dusky. Cerci full as long as the last tarsal joint of the legs, honey-yellow, lightly tipped with dusky. *Legs* honey-yellow, the tarsal claws dusky. *Wings* hyaline; veins black; those on the costa, as well as the basal half of the stigma, whitish or yellowish; the rest of the stigma dusky. Length ♀ .17—.22 inch; front wing ♀ .18—.24 inch.

“♂ Differs from the normal ♀ only as follows:—*1st.* The ground color is greenish-white, not honey-yellow. *2nd.* The black spot enclosing the ocelli is larger, and is separated from the eyes only by a narrow orbit, and occasionally touches them for a small space. *3rd.* The occiput, except the orbit, is distinctly black. *4th.* In the antennæ the pale colors are more dominant, and verge more or less on greenish-white; and the antennæ are three-fourths (not three-fifths) as long as the body. *5th.* The thorax is black, except the tegulæ, the superior margin of the collare and the cenchri, which are all greenish-white. *6th.* The abdomen is black above, greenish-white below, the lateral plates basally black, but terminally clouded with the pale color. Basal membrane white. *7th.* The legs are greenish-white, sometimes, especially the hind legs, more or less honey-yellow. In the hind legs the base of the coxæ, the extreme tips of the femora and the tarsi are more or less fuscous. *8th.* The veins on the costa are scarcely whitish, and only the extreme base of the stigma is whitish. Length ♂ .10—.17 inch; front wing ♂ .11—.19 inch.

“Ten ♂, five ♀, bred April 16—27. Absolutely undistinguishable by any reliable character from the inquiline *Euura perturbans*, n. sp., u. v. Distinct at once from *E. s. gemma* and from *E. orbitalis*, Nort., by the abdomen ♀ being honey-yellow above and below, and by the abdomen ♂ having its lateral plates partly pale, and the venter entirely pale.”

The gall is found on *Salix cordata*. An oval or roundish, sessile, monothalamous swelling, 0.30—0.50 inch long, placed lengthwise on the side of small twigs, green whenever it is smooth, but mostly covered with shallow longitudinal cracks and irregular rough scales, which are pale opaque-brown. Particular twigs on badly infested bushes some-

times have one of these galls on about every half inch of their length, and not placed in a regular row.

*Larva*.—August 30. Many 0.10—.12 inch long, imbedded in the slit at the base of the gall, in other galls not hatched. Larva pale yellowish, with a pale fuscous head and dark eye spots; removed from gall it uses its legs freely.

October 2. Many larvæ still in galls, from others they had bored out.

April 16—27. Fifteen imagos, all transformed in the gall, the galls gathered in March.

Mr. Walsh mentions another gall found on *S. humilis*, which he names *S. ovulum*. On this he found larvæ, but failed to obtain the imago. The gall is formed like the last, but the larvæ differ in color.

### 3. *E. s. nodus*.

*Euura s. nodus*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 253, ♂.

Length ♂ 0.16—0.17 inch. Br. wings 0.34—.35 inch.

“♂. Differs from *E. s. ovum* only as follows: 1st. The pale color is bright honey-yellow, not greenish-white throughout, i. e. both in antennæ, body and legs. 2d. The black spot enclosing the ocelli is larger and is confluent with the eye for its entire length, leaving no orbit between them. 3d. The venter (dried) is honey-yellow on the terminal third and fourth joints, and in the middle only of one or two more. Basal plates black as in *E. s. gemma*. When recent the venter was noted as being greenish and the legs as pale fulvous. 4th. The legs (dried) are honey-yellow immaculate, except the extreme tarsal tips. 5th. The basal half of the stigma is whitish as in *E. s. ovum* ♀.

Two ♂.

The gall is found on *S. longifolia*. A mere gradual enlargement of the twig, from one-fourth more than its normal diameter up to twice its normal diameter, almost always without any roughness on the external bark; general color that of twig.

August 28. When cut into, the interior of each gall is found to be pithy, and to contain 1—3 larvæ in separate cells. Frequently, on a piece of twig six inches long, two, three or four of these galls are placed at irregular intervals. Length 0.75—1.50 inch; diameter 0.10—0.25 inch. Described from thirty-one twigs. Very like the Cecidomyous gall *S. nodulus* on the same willow, but is much larger.

*Larva*.—August 28 the larva is 20-footed. Color pale greenish-



white, with the mouth dark and the usual eye spots. Length about 0.15 inch.

April 2. One larva was cut out of a gall gathered the preceding August, showing that some larvæ undergo their transformation in the gall, and do not go into the pupa state until spring.

Div. 2.—INQUILINES or Guest-flies.

4. *E. perturbans*.

*Euura perturbans*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 254.

♀. Differs from the gall-making *E. s. ovum* ♀ only by the dorsum of the abdomen varying from honey-yellow, including the lateral plates, through obfuscated to deep black, with the lateral plates also black. The ♂ does not differ in any respect from *E. s. ovum* ♂.

Two ♂, five ♀. One ♂ bred April 7, from the Cecidomyidous gall *S. strobiloides*, O. S.

One ♂, two ♀, bred May 7—22, from the Cecidomyidous gall *S. batatas*, Walsh.

One ♀, bred May 16, from the Cecidomyidous gall *S. rhodoides*,

Two ♀, bred from an undescribed Cecidomyidous bud-gall *Vitis fusus*, Walsh, composed of bunches of 6—50 fusiform galls on the stem of the wild grape-vine.

Hartig divides his sub-genus *Cryptocampus* into two sections, of which the second, *Diphadnus*, resembles the above, except that it has but two submarginal cells, the first receiving the recurrent nervures.

Lanceolate cell petiolate;

Posterior tibiæ much flattened.

29. **CRÆSUS**, Leach.

*Cræsus* and *Nematus*, Div. 1, Leach.

*Nematus*, Sec. 2, I, Hartig, Die Blattw. 184.

*Nematus*, †††, Lepel. Mon. Tenth. 62.

*Wings* with one marginal and four submarginal cells; the second long, receiving two recurrent nervures; first and third small, lanceolate cell petiolate. Four submarginal bullæ, one in each of the transverse nervures, long one on the submarginal nervures, beginning at the first recurrent nervure; under wings two middle cells.

*Legs*.—The four anterior legs simple; the posterior pair rather stout, their tibiæ dilated at apex; the basal joint of tarsi longest, much dilated and flattened; remaining joints small and simple.

*Larvæ* attenuated behind, with six pectoral, twelve abdominal and two anal feet. Pupa enclosed in a cocoon in the earth.

The larvæ of *C. septentrionalis* has been observed in England feeding in great numbers on the hazel and willow, (Curtis I, 17.)

Remainder as in *Nematus*.

1. *C. latitarsus*.

*Cræsus septentrionalis*, Harris Cat.

*Cræsus latitarsus*, Norton, Proc. Ent. Soc. Phil. I, 1862, 199, ♀.

Color black, base of tibiæ white. Length 0.32. Br. wings 0.72 inch.

♀. Antennæ as long as body, black; body shining blue-black, a crescent-shaped elevation between antennæ; clypeus notched; labrum, mandibles and palpi piceous; mesothorax with confluent longitudinal punctures; pleura dull, with dense punctures; legs black, the anterior pair piceous toward tip; posterior trochanters and basal half of all the tibiæ white; posterior tibiæ enlarged and very much flattened toward the tip; first joint of tarsi still wider, compressed, longer than remaining four joints together, its edges elevated to a rim on both sides; wings hyaline, a little smoky below stigma; a dot in middle of both second and third submarginal cells.

Massachusetts, (Harris' Coll.) Pennsylvania, (Coll. Am. Ent. Soc.) (Smithsonian Institute.)

(Three ♀.) Quite rare. Wild cherry, Aug. 16.

Bred by Mr. Walsh from larvæ feeding on birch.

Lanceolate cell closed in middle.

30. **LEPTOPUS**, Hartig.

*Leptopus*, Hartig, Die Blattw. 1860, 184. *Nematus*, Sec. I.

*Wings* with one marginal and four submarginal cells, the second receiving two recurrent nervures; lanceolate cell closed in middle.

Remainder as in *Nematus*.

Europe.

[ TO BE CONTINUED.]

NOTES ON THE POMPILIDÆ OF NORTH AMERICA,  
with descriptions of new species.

BY E. T. CRESSON.

[Communicated March 11th, 1867.]

Genus **POMPILUS**, Fabr.

*Head* transverse, broader than the thorax, sometimes transversely compressed, as in fig. 2 c, (*purpuripennis*, *Murizæ*, *legatus* and *elegans*); eyes lateral, oblong-ovate; ocelli placed in a triangle on the vertex; face variable in length and breadth; clypeus variable in shape, the anterior margin emarginate, rounded or truncate; antennæ convolute in the females, straight, or but slightly bent, and sometimes crenulate (as

Figure 1.



in Fig. 1) in the males, the length variable in different species, inserted in the middle of the anterior part of the face, sometimes in broad, rather deep fossæ, (species Nos. 23, 50, 51 and 52).

*Thorax* oblong, more or less gibbous in front, and more or less compressed at the sides; prothorax generally broader

Figure 2.



than long, sometimes oblong-subquadrate, (as in Fig. 2 c = *purpuripennis*, *Murizæ*, *legatus* and *elegans*), the posterior margin either arcuate (as in Fig. 2 b), or more or less angular, (as in Fig. 2 a); metathorax generally smooth and rounded above, sometimes, but rarely, rugose, the apex truncate or obtuse.

*Wings*: the anterior pair with one marginal and three or four submarginal cells, the first submarginal generally as long as the two following together, the second and third receiving each a recurrent nervure; the marginal cell varies in shape in different species, sometimes long, and regularly lanceolate, sometimes short, broad, and nearly triangular; the second and third submarginals vary much in shape, sometimes in different individuals of the same species, the third is especially variable, being sometimes quadrate, sometimes triangular and sometimes petiolated; the basal series of transverse nervures are sometimes widely dislocated; in some species of the subgenera *Priocnemis* and *Agenia* there are four distinct submarginal cells, the cubital nervure extending entirely and clearly to the apical margin of the wing.

*Legs* variable in length and strength, the posterior pair the longest; in the subgenus *Pompilus* all the legs are more or less spicose, and

the anterior tarsi of the females more or less ciliated with spines; in the subgenus *Priocnemis* the intermediate and posterior tibiæ are serrated exteriorly, and the anterior tarsi are simple; while in *Agenia* all the legs are simple; tarsal claws sometimes toothed beneath near the base, sometimes cleft.

*Abdomen* exceedingly variable in form, being generally ovate or oblong-ovate in the females, and elongate and sub-depressed in the males; in some species the form is long, narrow, and more or less cylindrical, sometimes sub-clavate, sometimes ovate and depressed above, and varying from sessile to petiolate.

The species of this genus are numerous, and are most of them easily separated; but in the black species of the subgenus *Pompilus* there seems to be a great similarity, and it is difficult to separate them, unless the specific characters are well marked.

#### Subgenus **POMPILUS.**

This subgenus is characterized by the anterior tarsi of the females being more or less ciliated with spines, and by the intermediate and posterior tibiæ being more or less spinose, without being serrated exteriorly as in the next subgenus. The shape of the posterior margin of

Figure 3.



the prothorax seems to be a good specific distinctive character, as is also the shape of the anterior margin of the clypeus, which, however, generally differs in the male and female of the same species. In some species the form of the cells of the wings is very constant, while in others it is exceedingly variable; the same may be said of the armature of the legs. The accompanying outline figure is given to illustrate

some of the characters of the species belonging to this subgenus. Species Nos. 23, 50, 51 and 52, because of the different structure of the head, prothorax and front legs, do not, strictly speaking, belong to this subgenus, and may belong to *Parapompilus* Smith, (= *Micropteryx* St. Farg.), but until the characters of that genus are better defined, they are, provisionally, included under this head.

*A. Body black, blue or purple.*  
(From the United States.)

1. *Pompilus philadelphicus*.

*Pompilus philadelphicus*, St. Farg., Hym. iii, p. 423.

*Female*.—Large, robust, velvety black, with a deep blue, violet or purple reflection; anterior margin of the clypeus obtusely emarginate in the middle; posterior margin of the prothorax angular; metathorax smooth and rounded, slightly flattened posteriorly, with a more or less distinctly impressed, longitudinal, medial line; legs with numerous short spines, more abundant on the tarsi, the anterior tarsi ciliated with short spines, the posterior tarsi sparsely spinose; wings deep violaceous-black, sometimes fuscous, with a beautiful violet or purple reflection; marginal cell lanceolate, long, the apex oblique, acute; second submarginal cell longer than the third, which is much narrowed towards the marginal; abdomen oblong-ovate, convex, apex pilose. Length 9—11 lines.

*Male*.—Resembles the female in color, but smaller, the form narrower, the clypeus not emarginate, the marginal cell broader and shorter, the second submarginal cell shorter, and the legs much less spinose.

*Hab*.—Delaware, (Coll. Am. Ent. Soc.); Connecticut, Louisiana, (Coll. Mr. E. Norton).

Thirteen ♀, two ♂ specimens. Generally larger than *æthiops*, from which it differs by the uniform bluish or purple reflection of the body, and by the angular posterior margin of the prothorax.

Mr. Smith (*Brit. Mus. Cat. Hym.* iii, p. 160) has erroneously placed this species as synonymous with *P. nebulosus* Dahlb., which is a very different insect, belonging to the sub-genus *Priocnemis*.

2. *Pompilus æthiops*.

*Pompilus æthiops*, Cresson, Proc. Ent. Soc. Phil. iv, p. 451.

*Hab*.—R. I., Conn., N. Y., Penna., Del., Md., Ills., Colorado Terr., (Coll. Am. Ent. Soc., and Mr. E. Norton).

Forty-four ♀, seventeen ♂ specimens. This common species is less robust and generally smaller than *philadelphicus*, which it closely resembles; but may be at once separated by the posterior margin of the prothorax being arcuated and not at all angular. The anterior margin of the clypeus is very deeply emarginate in the middle and the sides broadly rounded.

Three ♀ specimens from Delaware, and one from Pennsylvania, vary in the paler color of the wings, which are fuscous, with a beautiful purple reflection, instead of violaceous-black.

The males of this species vary much in size (6—9 lines long), and differ from the females by being smaller, by the more slender form, by the anterior margin of the clypeus not being emarginate, and by the less spinose legs.

3. *Pompilus maurus*, n. sp.

*Female*.—Deep black, sometimes with a purplish tint, smooth and shining; head much compressed transversely; clypeus smaller than usual, the anterior margin arcuate, the sides angular; prothorax larger than usual, prominent, convex, the posterior margin angular; metathorax rounded above, abrupt on the sides and behind, the latter somewhat emarginate; wings dark fuscous, with a violaceous or purplish reflection, the marginal cell short, subtriangular, rather narrow, second submarginal cell obliquely quadrate, much larger than the third, which is triangular, being narrowed to a point towards the marginal; legs velvety black, subsericeous, the tibiæ and tarsi with rather numerous, long, slender spines, the tarsal claws cleft, as in the male; abdomen oblong-ovate, convex above at base, more or less compressed at tip, which is slightly pilose. Length  $6\frac{1}{2}$ —9 lines.

*Male*.—Smaller and narrower than the female, and has the antennæ crenulated beneath. Length  $6\frac{1}{2}$  lines.

*Hab.*—West Virginia, Georgia, (Coll. Am. Ent. Soc.); Florida, (Coll. Mr. E. Norton).

Eight ♀, two ♂ specimens. This species is remarkable for the compressed head and abdomen, and by the tarsal claws of the female being cleft as in the male. In most species of *Pompilus* the claws of the female are toothed beneath at base, while those of the male are cleft.

4. *Pompilus scelestus*.

*Pompilus scelestus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 451, ♀ ♂.

*Hab.*—Conn., N. J., Col. Terr., (Coll. Am. Ent. Soc., and Mr. E. Norton).

Ten ♀, three ♂ specimens. The ♂ is remarkable for having the tarsal claws *not* cleft, but toothed beneath near the base, as in the female.

5. *Pompilus luctuosus*.

*Pompilus luctuosus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 452, ♀.

*Hab.*—Hudson's Bay Terr., Maine, Illinois, Colorado and Dakota Territories, (Coll. Am. Ent. Soc., and Mr. E. Norton).

Nine ♀, one ♂, specimens. Allied to *scelestus*, but is smaller, more shining, wings paler, and the legs less spinose. The posterior margin

of the prothorax is angular. The ♂ is, as usual, narrower than the ♀, and has the legs almost destitute of spines; the tarsal claws are cleft.

6. *Pompilus tenebrosus*.

*Pompilus tenebrosus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 453, ♀.

*Hab.*—Colorado Territory, (Coll. Am. Ent. Soc.); Maine, (Coll. Mr. E. Norton).

Six ♀ specimens. Much like *luctuosus*, but is easily recognized by the petiolated third submarginal cell of the anterior wings. The posterior margin of the prothorax is arcuate.

7. *Pompilus angustatus*.

*Pompilus angustatus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 452, ♂ ♀.

*Hab.*—Colorado Territory, (Coll. Am. Ent. Soc.).

Two ♀, one ♂, specimens. Resembles *scelestus* in color, but the form is much narrower and more slender, the wings are longer and the posterior margin of the prothorax is arcuate.

8. *Pompilus ingenuus*, n. sp.

*Female.*—Body narrow, velvety black, with a brilliant purple or bluish-purple reflection over the entire body, legs and wings; clypeus short and broad, the anterior margin broadly truncate; antennæ short, black above, sericeous-brown beneath; prothorax moderately short, the posterior margin arcuate; metathorax convex above, abrupt and excavated behind, sometimes with a well-impressed, longitudinal, central line; wings fuliginous, much darker on the apical margins, the violaceous reflection brilliant, the second submarginal cell subquadrate, smaller than the third, which is nearly triangular, being much narrowed towards the marginal; tarsi strongly spinose, the tibiæ sparsely so, anterior tarsi strongly ciliated; abdomen elongate, narrow, convex above, subcompressed at tip, which is slightly pilose. Length 7—7½ lines.

*Male.*—Differs from the female only by the slightly narrower form, by the metathorax being more deeply excavated behind, by the more ample wings, and by the less spinose legs. Length 6½ lines.

*Hab.*—West Virginia, Illinois, Dakota Territory, (Coll. Am. Ent. Soc.)

Two ♀, three ♂ specimens. A very pretty species, distinguished from *æthiops* by its beautiful violet color, narrower form and shorter antennæ.

9. *Pompilus hyacinthinus*, n. sp.

*Female*.—Deep blue, sericeous, with a purplish shade in certain lights; face short, the orbits and clypeus with a silvery-grey pubescence; anterior margin of the clypeus truncate; antennæ short, black; prothorax prominent, its posterior margin arcuate; metathorax short, very abrupt and truncate behind; legs same color as the body, except the tarsi, which are black, the tibiæ and tarsi thickly spinose, the anterior tarsi strongly ciliated; wings dark fuscous, with a strong violaceous reflection, the apex rather broadly margined with blackish; marginal cell sublanceolate, broad and rather short, second submarginal quadrate, the third longer than the second and much narrowed towards the marginal; posterior wings hyaline, fuscous at tip; abdomen ovate, convex, nearly sessile. Length 5 lines.

*Hab.*—Connecticut, (Coll. Mr. E. Norton.)

One ♀ specimen. Resembles *ingenuus*, but is much smaller, more blue in color, and the legs more strongly spinose.

10. *Pompilus brevicornis*, n. sp.

*Male*.—Narrow, subcylindrical, black, with a beautiful purple reflection; the face, sides of the scutellum, and the apical half of the metathorax, clothed with a fine, dense silvery pubescence; apical margin of the clypeus truncate; antennæ opaque black, stout, not as long as the head and thorax; posterior margin of the prothorax arcuate; metathorax with a deeply impressed line down the middle; legs sericeous, the tibiæ and tarsi with numerous, rather stout spines; wings fusco-hyaline, with a purplish reflection, hyaline or subhyaline at base and darker on the apical margins; marginal cell elongate, lanceolate, oblique at tip, third submarginal cell subtriangular, being much narrowed towards the marginal; abdomen elongate, narrow, subcylindrical, convex, immaculate, the purple reflection brilliant. Length 5—6 lines.

*Hab.*—Pennsylvania, (Coll. Am. Ent. Soc.)

Five ♂ specimens. This pretty species is recognized by the narrow form, by the short antennæ, by the conspicuous purple color, and by the silvery ornamentation of the thorax, which is very beautiful.

11. *Pompilus atramentarius*.

*Pompilus atramentarius*, Dahlb., Hym. Eur. i, p. 48, ♂.

“Body black, opaque, with a violaceous-sericeous pubescence; wings black; tibiæ and tarsi sparsely spinose, anterior tarsi ciliated. Length  $3\frac{1}{2}$  lin. Mens. Suec.”

*Hab.*—“North America.” Not identified.



12. *Pompilus subviolaceus*, n. sp.

*Female*.—Small, black, with a rather strong purplish or violaceous reflection over the entire body; anterior margin of the clypeus truncate; antennæ short, not as long as the head and thorax; mandibles brownish; posterior margin of the prothorax arcuate; metathorax smooth, rounded, with a slightly impressed line down the middle, abruptly truncate behind; legs sparsely but strongly spinose; anterior wings fusco-hyaline, darker at tips, with a purplish reflection, marginal cell short, subtriangular, second and third submarginal cells small, the former subquadrate, the latter triangular; posterior wings hyaline, dusky at tips; abdomen ovate, convex, immaculate, the purple reflection conspicuous; tip acute. Length  $3\frac{1}{2}$ — $4\frac{1}{2}$  lines.

*Hab*.—Delaware, Illinois, (Coll. Am. Ent. Soc.); New York, (Coll. Mr. E. Norton.)

Five ♀ specimens. Closely allied to *parvus*, of which it may be only a variety; but the marginal and submarginal cells are differently shaped.

13. *Pompilus parvus*.

*Pompilus parvus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 453, ♀.

*Hab*.—Colorado Territory, (Coll. Am. Ent. Soc.)

One ♀ specimen. Length 3 lines.

14. *Pompilus humilis*, n. sp.

*Female*.—Small, black, somewhat shining; head wider than usual, the face clothed with a cinereous pubescence; anterior margin of the clypeus broadly rounded; antennæ longer than the head and thorax together; thorax slightly pruinose; posterior margin of the prothorax subarcuate; metathorax smooth and rounded, the apex silvery on each side; wings hyaline, with a double fuliginous band at tip; second submarginal cell large and subquadrate, the third much smaller and triangular, being much narrowed towards the marginal; posterior wings hyaline, dusky at tips; legs black, slightly pruinose, the posterior tibiæ with a white spot above near the base; anterior tarsi strongly ciliated, the intermediate and posterior tibiæ sparsely spinose; abdomen rather short, ovate, convex, shining black, immaculate, apex slightly compressed. Length  $3\frac{1}{2}$  lines.

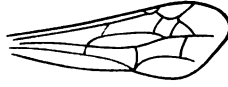
*Hab*.—New York, (Coll. Am. Ent. Soc.)

One ♀ specimen. Recognized at once by the bifasciate apex of the wings and the white spot on the posterior tibiæ.

15. *Pompilus cylindricus*.

*Male*.—Small, cylindrical, deep black; head, thorax and legs more or less silvery-sericeous, especially bright on the face and metathorax; anterior margin of the clypeus subtruncate or subarcuate; posterior

margin of the prothorax subangular; metathorax smooth and rounded, sometimes with a faintly impressed central line; legs sparsely spinose; wings narrow, hyaline, the apex broadly margined with fuscous, marginal cell short, subtriangular, the third submarginal cell petiolated (see Fig. 4); abdomen subsessile, subdepressed, cylindrical, immaculate, sometimes faintly sericeous. Length  $3\frac{1}{2}$ — $5\frac{1}{2}$  lines.



*Hab*.—Pennsylvania, Illinois, Dakota Territory, Texas, (Coll. Am. Ent. Soc.); Virginia, (Coll. Mr. E. Norton.)

Thirteen ♂ specimens. This is one of our smallest species, easily recognized by the narrow, cylindrical form of the body, and by the petiolated third submarginal cell of the anterior wings.

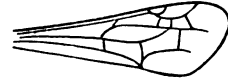
16. *Pompilus arctus*.

*Pompilus arctus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 453, ♂.

*Hab*.—Colorado Territory, (Coll. Am. Ent. Soc.)

One ♂ specimen. Resembles *cylindricus* very much, but is distinguished by the longer marginal cell, and by the

subquadrate third submarginal cell, which is fully a third larger than the second (see Fig. 5). This species belongs to the subgenus *Pompilus*, and not to *Agenia*, as I stated in the original description.

17. *Pompilus virginiensis*, n. sp.

*Male*.—Long and slender, black, varied with a more or less brilliant silvery pile, especially brilliant on the face, thorax, coxæ and base of the abdomen above; anterior margin of the clypeus subtruncate or slightly arcuate; face, clypeus and mandibles silvery; posterior margin of the prothorax angular; metathorax smooth and rounded, densely silvery at the apex; legs sparsely spinose; wings hyaline, iridescent, apical margin fuscous, marginal cell long and lanceolate, as usual, the third submarginal cell much narrowed towards the marginal; abdomen elongate, subcylindrical, narrowed at base; the first, second and base of the third segments covered with a fine silvery-sericeous pile, more obvious in certain lights; sometimes the second, third and fourth segments have a silvery band at base. Length 3—5 lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Eleven ♂ specimens. Closely allied to *cylindricus*, but is easily distinguished by the beautiful silvery reflection of the body, by the different form of the marginal and third submarginal cells of the anterior wings and by the abdomen being sensibly narrowed at base and not so cylindrical as in that species.

18. *Pompilus funereus*.

*Anoplius funereus*, St. Farg., Hym. iii, p. 449, ♂.

*Hab.*—"Philadelphia." Not identified.

This species seems to approach *virginiensis*, but the wings are described as being uniformly black, with a violaceous reflection. Size not given.

19. *Pompilus argenteus*, n. sp.

*Male.*—Black, tinged with blue or purple, brilliantly varied with silvery pile, which is especially bright on the face and metathorax; anterior margin of the clypeus truncate; prothorax prominently produced on each side beneath the anterior wings, the posterior margin arcuate; metathorax with a deeply impressed line down the middle; legs strongly spinose; wings hyaline, iridescent, margined with fuscous at tip, the marginal cell shorter than usual and somewhat triangular, the third submarginal cell triangular or subtriangular; abdomen cylindrical, the three basal segments covered above with a dense silvery pile, very brilliant in certain lights. Length  $3\frac{1}{2}$ — $4\frac{1}{2}$  lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Two ♂ specimens. This beautiful species is shaped much like *cylindricus*, but is at once distinguished from it by the purplish tint, by the brilliant silvery pile, by the shorter antennæ, by the arcuated posterior margin of the prothorax, and by the strongly spinose legs; these last three characters also separate it from *virginiensis*.

20. *Pompilus calipterus*.

*Pompilus calipterus*, Say, Bost. Jour. Nat. Hist. i, p. 302.

"Black, polished, slightly pruinose; antennæ and feet honey-yellow; wings hyaline, bifasciate with blackish; Length three-tenths of an inch."

*Hab.*—"Indiana." Not seen.

Probably belongs to the subgenus *Agenia*.

(From Cuba, Mexico and Panama.)

21. *Pompilus cubensis*.

*Pompilus anceps*, Cresson, Proc. Ent. Soc. Phil. iv, p. 130, ♂, (nec Smith).

*Hab.*—Cuba, (Coll. Am. Ent. Soc.)

One ♀, two ♂ specimens. The ♀ varies much in size (8—11 lines long), and the color of the body is much more greenish than in the ♂;

the anterior margin of the clypeus is deeply emarginate, the posterior margin of the prothorax is angular, and the wings are deep violaceous-black. This species resembles *philadelphicus* very much, but is at once separated from that species by the strong greenish color of the body.

22. *Pompilus fulgidus*.

*Pompilus fulgidus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 131, ♀.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.).

One ♀ specimen. Easily recognized by the brilliant blue and violet, polished abdomen. The anterior margin of the clypeus is subarcuate, and the posterior margin of the prothorax is angular.

23. *Pompilus* (?) *purpuripennis*.

*Pompilus purpuripennis*, Cresson, Proc. Ent. Soc. Phil. iv, p. 130, ♀.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.).

One ♀ specimen. This magnificent species is recognized at once by the rough and curious sculpture of the metathorax. The head is much compressed, making the front very flat, and the antennæ are inserted in deep fossulets just above the clypeus, in which respects it approaches the genus *Parapompilus* Smith (= *Micropteryx* St. Farg.); the prothorax is longer than in the true *Pompilus*, and differently shaped, the anterior margin being rounded, and not suddenly depressed and strangulated; the metathorax, however, is not longer than in the true *Pompilus*, neither are the wings any shorter, as they reach beyond the tip of the abdomen when closed.

24. *Pompilus regalis*.

*Pompilus regalis*, Smith, Journal of Entomology, i, p. 396, ♀.

"Purple-blue; clypeus, mandibles and antennæ black; metathorax truncate, transversely grooved at the verge of the truncation, and with some longitudinal divergent striæ at the base; wings ample, dark purple, with brilliant shades of violet; abdomen slightly compressed. Length 10 lines."

*Hab.*—"Mexico." Not seen.

25. *Pompilus lepidus*.

*Pompilus lepidus*, Say, Bost. Jour. Nat. Hist. i, p. 303, ♂.

"*Male.*—Black, slightly sericeous; wings dark purplish; second and third cubital cellules a little narrowed at the radial cellule, particularly the latter, which is less than two-thirds the length of the second, in that part; basal series of transverse nervures not dislocated; metathorax with a very slight reflection of purplish, and without any impressed lines; tergum with a distinct purplish reflection; beneath

black ; in a favorite light the thighs have a slight purplish reflection. Length two-fifths of an inch."

*Hab.*—"Mexico." Not identified.

26. *Pompilus anceps*.

*Pompilus anceps*, Smith, Trans. Ent. Soc. Lond. 3d ser. i, p. 36, ♀.

"*Female.*—Length 11 lines. Black ; head and thorax with a beautiful changeable blue silky pile ; six apical joints of the antennæ orange-yellow ; metathorax transversely striated ; wings blackish-brown, with bright violet iridescence in certain lights, their extreme apex milky-white ; tibiæ and tarsi thickly set with short stout spines ; abdomen with a splendid blue iridescence."

*Hab.*—"Panama." Not seen.

*B. Body black, banded with cinereous.*

27. *Pompilus unicus*, n. sp.

*Male.*—Small, black, most of the body clothed with a dense, appressed, cinereous pubescence, the portions not covered with this pubescence are black, with a slight opaline reflection ; antennæ short, stout and opaque black ; anterior margin of the clypeus truncate ; thorax unusually gibbous ; prothorax with a transverse, slightly interrupted, black band near the posterior margin, which latter is arcuate ; mesothorax with two large, black, subquadrate spots on the disk, nearly confluent ; metathorax abrupt on the sides and behind, black, the apical half silvery-cinereous ; wings hyaline, the apical third fuliginous, with a faint, transverse, subhyaline streak just beyond the tip of the third submarginal cell ; the basal series of transverse nervures is narrowly margined with fuliginous ; marginal cell broad sublanceolate, second submarginal subquadrate, the third smaller and much narrowed towards the marginal ; legs rather short and stout, the femora within, extreme tips of tibiæ, and the tarsi, except basal joint, black, the rest covered with a dense cinereous pile ; anterior legs short and stout, not spinose, the four posterior tibiæ strongly spinose ; abdomen short, ovate, convex, second segment very large, forming a shield, as it were, to cover the remaining segments when retracted, apex subcompressed ; shining black, first and second segments each with a broad band of dense cinereous pubescence, placed a little before the middle, remaining segments each with a large, transverse, cinereous spot on the apical middle, covering nearly the entire disk of the fourth and following segments ; venter clothed with a fine, dense, cinereous pile. Length  $3\frac{1}{2}$  lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach, No. 532).

One ♂ specimen. A beautiful little species, with handsomely ornamented body and wings.

*C. Body black, marked or banded with white or yellow.*

28. *Pompilus biguttatus*.

*Pompilus biguttatus*, Fabr., Ent. Syst. Suppl. p. 249; Syst. Piez. p. 193. Say, Bost. Jour. Nat. Hist. i, p. 303.

*Pompilus 5-notatus*, Say, Bost. Jour. Nat. Hist. i, p. 304, (var).

*Female*.—Black, sometimes covered with a grayish-sericeous pile; head with narrow white orbits, interrupted above, sometimes very indistinct, or entirely wanting; anterior margin of the clypeus rounded or subtruncate, reflexed; posterior margin of the prothorax arcuate, sometimes margined with white, generally interrupted in the middle, or entirely wanting; in some specimens the tegulæ have a white spot; sides of the scutellum and the metathorax more or less silvery; legs more or less grey-sericeous, anterior tarsi strongly ciliated, tibiæ and tarsi strongly spinose, the extreme tips of the anterior tibiæ are sometimes white, and their tarsi sometimes brownish; in one specimen with immaculate abdomen, the posterior tibiæ have a white line at extreme base; tarsal claws cleft as in ♂; wings vary from fuscous to hyaline, always more or less blackish at tips, with the violaceous reflection more or less conspicuous, third submarginal cell shorter than the second, sometimes nearly quadrate, but generally narrowed towards the marginal; abdomen elongate, convex, acuminate at tip; first segment sometimes clothed with an appressed silvery pile, immaculate; second segment with a transverse white spot on each side at base, sometimes reduced to a dot, or entirely wanting; third segment also with a transverse white spot on each side at base, sometimes confluent and forming an uninterrupted band, sometimes these spots are reduced to dots, or are entirely wanting; fourth segment with a transverse, white line on each side at base, sometimes almost confluent, and sometimes obsolete or entirely wanting; sixth segment has sometimes a white spot on the disk; venter immaculate. Length 4—7 lines.

*Male*.—Much smaller and narrower than the ♀, much more silvery, especially the face, prothorax and metathorax; the prothorax is generally margined posteriorly with white, which is sometimes subobsolete or entirely wanting; the anterior tibiæ and tarsi are sometimes tinged with ferruginous, the former often tipped with white; the posterior tibiæ have generally a white line at base above, and the tibial spurs are sometimes entirely white; the wings are more hyaline, iridescent, the tips are always margined with fuscous; the abdomen is flattened, the second segment has generally a white dot on each side, while the third

segment has a whitish band, sometimes broad and entire, but generally more or less interrupted in the middle, and sometimes reduced to a mere dot; the fourth, fifth and sixth segments are immaculate; the seventh more or less silvery, sometimes whitish. One specimen has the abdomen entirely black, except the silvery tip. Length 3—4½ lines.

*Hab.*—Connecticut, New York, New Jersey, Pennsylvania, Delaware, Illinois, Canada, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Thirty ♀, fourteen ♂ specimens. The markings of this species are extremely variable, and I can find no constant character by which to separate *5-notatus* from *biguttatus*. Of the ♀, I have before me two specimens with the body entirely immaculate, except a faint, whitish orbital line; fifteen specimens have a transverse white spot, sometimes very faint, on each side of the third segment—these are the *biguttatus* of Fabr.—and in one of this last variety, the second segment has a white dot on one side only, and another specimen has a white spot on the sixth segment; one specimen has two dots on the second segment, two large ovate spots on the third, and a spot on the sixth, while another has the addition of a very small, faint, whitish line on each side of the fourth segment; and nine specimens have a white spot, variable in size, on each side of the second, third and fourth segments, those on the third sometimes confluent, and a spot on the sixth segment—these are the *5-notatus* of Say.

## 29. *Pompilus flavopictus*.

*Pompilus flavopictus*, Smith, Journal of Entomology, i, p. 396, ♀.

“Length 5 lines. Black; face yellow, with two longitudinal black stripes running from ocelli to insertion of antennæ, and a transverse waved black line at base of clypeus; a broad, yellow stripe behind the eyes; scape of antennæ yellow, flagellum ferruginous, base and apex black; mandibles yellow, tips black; posterior margin of prothorax, two longitudinal stripes on mesothorax above, ovate spot on each side of scutellum, post-scutellum, large macula on each side of metathorax and its posterior margin, yellow; sides of thorax with several large yellow spots beneath the wings; legs yellow, with longitudinal black stripes on femora and tibiæ; wings subhyaline, anterior margin of superior pair fuscous; base of abdomen yellow, and the apical margins of the segments with yellow bands. Closely resembles species of the genus *Ichneumon*.”

*Hab.*—“Mexico.” Not seen.

*D. Body black, abdomen marked or banded with red.*

30. *Pompilus tropicus*.

*Sphex tropicus*, Linn., Syst. Nat. i, 945. Fabr., Ent. Syst. ii, 250.

*Pompilus tropicus*, Fabr., Ent. Syst. Supp. 250; Syst. Piez. 194. St. Farg., et Serv. Ency. Méth. x, 181. Dahlb., Hym. Eur. i, 62. St. Farg., Hym. iii, 434.

♂ ♀.—Black; second abdominal segment with a more or less broad, orange-yellow band, generally emarginate behind, and sometimes interrupted down the middle; antennæ shorter than the head and thorax; anterior margin of the clypeus subtruncate; posterior margin of the prothorax angular; wings blackish, subviolaceous, third submarginal cell triangular. Length 6—8½ lines.

*Hab.*—Pennsylvania, Delaware, Georgia, Illinois, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Seven ♀, four ♂ specimens.

31. *Pompilus atrox*.

*Pompilus atrox*, Dahlb., Hym. Eur. i, p. 63.

♂ ♀. Black; second abdominal segment with a more or less broad, orange-yellow band, as in *tropicus*; antennæ longer than the head and thorax; anterior margin of the clypeus deeply emarginate in ♀, slightly so in ♂; posterior margin of the prothorax arcuate; wings blackish, subviolaceous, third submarginal cell subquadrate. Length 7—11½ lines.

*Hab.*—Pennsylvania, Delaware, Maryland, Virginia, Illinois. (Coll. Am. Ent. Soc.); Connecticut, Louisiana, (Coll. Mr. E. Norton).

Twelve ♀, six ♂ specimens. This species, though larger than *tropicus*, resembles it closely, but is readily distinguished by the much longer antennæ, by the anterior margin of the clypeus being notched in the middle, by the posterior margin of the prothorax being arcuate, and by the shape of the second submarginal cell, which is subquadrate, while that of *tropicus* is triangular.

32. *Pompilus marginatus*.

*Pompilus marginatus*, Say, Long's Second Exped. ii, p. 333. (1824.)

*Pompilus (Miscus) petiolatus*, Say, Bost. Jour. Nat. Hist. i, p. 305. (1835.)

*Female.*—Black; first and second abdominal segments above yellow or orange-yellow, more or less emarginate behind on the second segment: the first segment is entirely black in fourteen specimens, with a reddish spot or shade in twelve specimens, entirely yellowish, or nearly so, in five specimens, and in one specimen the reddish or yellowish color is very obscure; anterior margin of the clypeus rounded or subtruncate; posterior margin of the prothorax subangular; wings vary from subhyaline with a fuscous terminal margin (as described by Say



in his *marginatus*), to uniformly fuscous, and even to blackish-violaceous; the third submarginal cell is generally more or less petiolated; and in some specimens triangular and not at all petiolated. Length 3—6 lines.

*Male*.—Narrow, cylindrical; head, thorax and legs covered with a dense silvery-sericeous pile; legs sparsely spinose; wings hyaline, iridescent, with a broad, fuscous, apical margin; abdomen narrow, sub-depressed, with a broad reddish band on the second segment. Length 4½ lines.

*Hab*.—Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Virginia, Illinois, Colorado and Dakota Territories, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Thirty-eight ♀, one ♂, specimens. This is a common and a very variable species, both in size and coloration. Some specimens mimic small examples of *tropicus* so closely, that it is difficult to separate them.

### 33. *Pompilus americanus*.

*Pompilus americanus*, Beauv., Ins. Afr. et Amér. p. 117, pl. 3, fig. 6.

Smith, Brit. Mus. Cat. Hym. iii, p. 157.

*Pompilus trifasciatus*, Beauv., Ins. Afr. et Amér. p. 118, pl. 3, fig. 6, (var.)

*Pompilus plebejus*, Dahlb., Hym. Eur. i, p. 60.

*Female*.—Black; second and third, and sometimes the first, segments of the abdomen above with a reddish-yellow or orange-yellow band, broader on the second segment, more or less emarginate behind, and sometimes interrupted down the middle; anterior margin of the clypeus truncate, or subtruncate; posterior margin of the prothorax angular: wings fuscous, or fusco-hyaline, sometimes with a darker apical margin; third submarginal cell triangular; legs thinly spinose. Length 5½—7½ lines.

*Male*.—Resembles the females, but is narrower; the body has a slight purplish hue; the face silvery; the legs less spinose; the abdomen less convex, sericeous, the first segment with a slight reddish stain, the second and third segments with an orange-yellow band, broader and more distinct on the second segment. Length 6 lines.

*Hab*.—Pennsylvania, Delaware, Maryland, Illinois, Florida, Louisiana, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Eighteen ♀, one ♂, specimens. This is a tolerably common species, and the specimens before me vary but little in size and color.

### 34. *Pompilus ephippiger*.

*Pompilus ephippiger*, Smith, Brit. Mus. Cat. Hym. iii, p. 158, ♀.

“*Female*. Length 6—8½ lines.—Black; head thinly sprinkled with

black pubescence; anterior margin of clypeus emarginate; posterior margin of prothorax arcuate; metathorax rounded, smooth, and having a fine sericeous pile of a purple tint; wings dark fuscous, apical margins with a darker border; tibiæ and tarsi spinose; second and third segments of abdomen with a broad yellow fascia, the posterior margin of which is emarginate."

*Hab.*—"North America." Not seen.

Closely allied to *americanus*, but differs by the emarginate clypeus and by the arcuate posterior margin of the prothorax.

35. *Pompilus semirufus*, n. sp.

*Female.*—Black; head, thorax and legs covered with a rather dense cinereous pile; anterior margin of the clypeus truncate; mandibles dull reddish, black at base and tips; antennæ slender, moderately long; posterior margin of the prothorax angular; metathorax smooth and rounded, abrupt behind, with a slightly impressed line down the middle; legs rather long, tibiæ and tarsi strongly spinose; wings dark fuscous, darker at tips, subviolaceous, third submarginal cell triangular; abdomen ovate, convex, polished, yellowish-ferruginous, the three apical segments black. Length  $4\frac{1}{2}$  lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.).

One ♀ specimen.

36. *Pompilus divisus*, n. sp.

*Female.*—Black, shining; head, antennæ, thorax and legs covered with a rather dense cinereous pile; face short; anterior margin of the clypeus subtruncate; mandibles rufous, black at tips; antennæ slender, scarcely as long as the head and thorax; posterior margin of the prothorax arcuate; metathorax rounded, smooth and shining, with a deeply impressed line on the basal middle; legs thickly spinose, anterior tarsi strongly ciliated; wings fuscous, subviolaceous, darker on the apical margin, and paler at base, third submarginal cell triangular; abdomen elongate, subovate, convex, polished, pilose towards the apex, the two basal segments above rufo-ferruginous, the remainder black, the apical segment large, convex and pilose; beneath, the three basal segments rufo-ferruginous. Length 6 lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.)

One ♀ specimen. Allied to *semirufus*, but differs by being more elongate, by the shape of the posterior margin of the prothorax, and by the coloration of the abdomen.

37. *Pompilus bipartitus*.

*Pompilus bipartitus*, St. Farg., Hym. iii, p. 439, ♀.

*Hab.*—"Philadelphia." Not identified.

This is described as being black, with the abdomen *entirely* testaceous-ferruginous; wings uniformly fuscous and violaceous; prothorax short and arcuate behind; metathorax long, convex, with a deep, longitudinal, dorsal channel. Size not given.

38. *Pompilus algidus*.

*Pompilus algidus*, Smith, Brit. Mus. Cat. Hym. iii, p. 158, ♂.

*Female.*—Black, covered with a purple iridescent pile, in one specimen the sides of the face, apical margin of the clypeus, labrum, base of the antennæ beneath, angles of the prothorax, tegulæ and anterior legs, are obscurely tinged with ferruginous; anterior margin of the clypeus sinuate; posterior margin of the prothorax angular or subangular; metathorax abruptly truncate behind; wings dark fuscous, with a brilliant violet or purple iridescence, second submarginal cell about twice longer than broad, the third narrowed one-half towards the marginal; legs strongly spinose, the anterior tarsi strongly ciliated exteriorly; abdomen subdepressed, in one specimen covered with a rich purple iridescent pile, the second segment with a rather narrow, obscure ferruginous band at base, and the third with a much broader one, emarginate behind; in certain lights, these bands are more distinct, and assume a golden hue; in the other specimen the abdomen is of a deep bluish-black color, somewhat shining, with a broad, orange-yellow band across the base of the third segment, deeply emarginate behind. Length 11 lines.

*Male.*—In this sex the variation in color is very great, the body varying from brown-black to almost entirely ferruginous; the antennæ are thickened and crenulate beneath; the abdomen is flattened above, with the band on the third segment always the most distinct, and even this is sometimes reduced to a mere line; in the darkest specimen the band on the third segment is broad and very distinct, and on each side of the second segment, near the base, there is a reddish dot; in another specimen the whole body is covered with a dense, silvery-sericeous pile, very brilliant, and so dense on the abdomen as to almost hide the markings. Length 7—8 lines.

*Hab.*—West Virginia, Georgia, (Coll. Am. Ent. Soc.)

Two ♀, six ♂ specimens. A very handsome species, and so variable that not two of the eight specimens are colored alike.

39. *Pompilus fuscipennis*.

*Pompilus fuscipennis*, St. Farg., Hym. iii, p. 434.

*Pompilus sordidus*, Smith, Brit. Mus. Cat. Hym. iii, p. 160.

*Female*.—Narrow, black, the two basal segments of the abdomen yellowish-ferruginous; wings broad and long, fuliginous, with a faint, hyaline, semicircular line near the apex of each anterior wing; third submarginal cell larger than the second, and narrowed one-half towards the marginal; anterior margin of the clypeus rounded; posterior margin of the prothorax arcuate, sometimes very slightly subangular; metathorax with a deep central channel widening posteriorly; legs long and slender, spinose; abdomen subcompressed towards the apex. Length 5—6 lines; expanse of wings 10—13 lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc.)

Six ♀ specimens. Easily distinguished by the narrow, compressed form, and long, broad fuliginous wings.

40. *Pompilus cinotipes*.

*Ceropales apicalis*, Say, Bost. Jour. Nat. Hist. i, p. 366, (nec *Van d. Lind.*)

*Male*.—Narrow, subcompressed, black, covered with a sericeous cinereous pile; face and metathorax silvery; anterior margin of the clypeus broadly rounded; posterior margin of the prothorax subangular and margined with whitish; legs long, slender, black, sericeous; anterior tibiæ and tarsi tinged with ferruginous, the second, third and fourth joints of the four posterior tarsi broadly annulated with whitish, posterior tibiæ with a white streak at base above; wings long, broad, hyaline, with an opaline iridescence, apical half of anterior wings fuliginous, violaceous, with a faint, transverse, hyaline streak near the tip; second and third submarginal cells subequal, the second longest and the third broadest and narrowed towards the marginal; posterior wings fuliginous at tip; abdomen rather long, narrow, subpetiolate, subclavate, black, sericeous; apical margin of the first segment, and the second entirely, ferruginous; beneath, both these segments are entirely ferruginous; apical segment above whitish. Length 4½—6 lines; expanse of wings 8—11 lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc., and Mr. E. Norton).

Five ♂ specimens. This handsome species is easily recognized by the narrow form, allied to that of *fuscipennis*, by the long and ample hyaline wings, broadly tipped with fuliginous, by the subpetiolate abdomen and by the annulated tarsi. It may be the ♂ of *fuscipennis*.

(From Mexico and West Indies.)

41. *Pompilus coruscus*.*Pompilus coruscus*, Smith, Brit. Mus. Cat. Hym. iii, 156. Cresson, Proc. Ent. Soc. Phil. iv, p. 128.*Pompilus juxtus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 128.—Var.*Female*.—Black, opaque; wings yellowish-fuscous, third submarginal cell petiolated; abdomen ferruginous, the apex fuscous. Length  $4\frac{1}{2}$ — $6\frac{1}{2}$  lines. Two specimens.*Var. JXTUS* ♀.—The third submarginal cell triangular; apex of abdomen black. Length  $4\frac{1}{2}$  lines. One specimen.*Var. INSIGNIS* ♀.—Most of the prothorax above ferruginous; third submarginal cell triangular; extreme apex of the abdomen fuscous. Length  $5$ — $5\frac{1}{2}$  lines. Three specimens.*Hab.*—Cuba, (Coll. Am. Ent. Soc.)42. *Pompilus subargenteus*.*Pompilus subargenteus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 129, ♂.*Male*.—Black, covered with a silvery-sericeous pile; posterior margin of the prothorax whitish; wings fuscous, third submarginal cell petiolated; abdomen with a broad ferruginous band near the base; legs spinose. Length  $4\frac{1}{2}$  lines.*Hab.*—Cuba, (Coll. Dr. J. Gundlach). One ♂ specimen.43. *Pompilus orbitalis*.*Pompilus orbitalis*, Cresson, Proc. Ent. Soc. Phil. iv, p. 131, ♀.*Female*.—Velvety-black; orbits, and a central line down the front, golden; prothorax with a transverse ferruginous line; wings deep violet-blue; abdomen with the four dorsal segments mostly dull ferruginous; legs spinose. Length 8 lines.*Hab.*—Cuba, (Coll. Dr. J. Gundlach). One ♀ specimen.44. *Pompilus apiculatus*.*Pompilus apiculatus*, Smith, Brit. Mus. Cat. Hym. iii, p. 157, ♀.*Female*.—Length  $4\frac{1}{2}$  lines.—Head, thorax and legs black; abdomen red; entire insect covered with a fine, white, silky pile, most dense on the face, cheeks, coxæ and metathorax; clypeus rounded anteriorly; posterior margin of prothorax with a band of silvery pile, a spot of the same on each side of scutellum and post-scutellum; metathorax rounded, with a longitudinal slightly impressed line; wings fusco-hyaline, the first recurrent nervure entering the second submarginal cell in the middle, third submarginal subpetiolate; tibiæ and tarsi with a few sharp spines, anterior tarsi ciliated, the tarsi obscurely rufo-piceous; apical ventral segment of abdomen with an elongate-ovate fuscous spot."*Hab.*—"Vera Cruz, Mexico." Not seen.

*E. Body fuscous, marked and banded with yellowish.*

45. **Pompilus interruptus.**

*Ceropaies interruptus*, Say, Bost. Jour. Nat. Hist. i, p. 365, ♂.

*Female*.—Blackish-fuscous; orbits before and behind narrowly yellow; clypeus either entirely fuscous, or entirely yellowish-ferruginous, or of the latter color, with a large, central, square, blackish mark, anterior margin truncate; the mandibles vary from fuscous to entirely pale ferruginous; palpi yellowish; antennæ convolute, as long as the head and thorax together, orange-yellow or ferruginous, the apical half fuscous or black; posterior margin of prothorax angular, more or less distinctly margined with yellowish; a spot on each side of the scutellum, sometimes wanting, a transverse spot on the post-scutellum, and a transverse spot on each side of metathorax at tip, bright-yellow; metathorax rounded, convex, without any impressed line; tegulæ ferruginous; wings fuscous, varied with yellowish-fuscous; marginal cell long, narrow, sublanceolate; third submarginal large, subtriangular, much narrowed towards the marginal; legs blackish-fuscous, tips of the femora pale ferruginous; tibiæ ferruginous, yellow at base above, and dusky at tips; tarsi yellowish, annulated with dusky, anterior pair ciliated, but not strongly so; four posterior tibiæ rather thickly spinose; abdomen somewhat shining, somewhat sericeous, subdepressed, brown-ferruginous at tip and beneath; second segment with a small triangular spot on each side at base, and a narrow, sub-basal band on the third segment, yellowish; this latter is sometimes reduced to a lateral spot, similar to that on the second segment; in one specimen the abdomen is brown-ferruginous, with the sutures blackish and without any yellow spots, while another specimen has the abdomen blackish-fuscous, and immaculate. Length 6—7½ lines.

*Male*.—Smaller than the ♀, with thickened, crenulate antennæ and subdepressed abdomen; the antennæ are entirely ferruginous, darker above, the basal joint beneath sometimes yellow; the orbits broader in front and interrupted above, the clypeus, except a large, black, central, quadrate spot, the tips of the mandibles and the palpi, are yellow; in one specimen the clypeus, except its anterior margin, is entirely black, and the mandibles are blackish, dull yellow in the middle; the thorax is marked like unto that of the female, with the addition of a rather large, cuneiform, yellow mark on each side of the pleura, which mark, however, is sometimes wanting; the spot on each side of the scutellum is present in all the specimens but one; the wings are paler than those of the ♀; the abdomen is slightly iridescent, the third and fourth segments have a narrow yellow band at base, subobsolete on the

fourth segment; sometimes all the markings of the abdomen are very indistinct; beneath fuscous, immaculate. Length  $4\frac{1}{2}$ —5 lines.

*Var. ♂*—Black; antennæ, prothorax, legs, except coxæ, and abdomen, ferruginous; head marked and colored as in the normal ♂; posterior margin of the prothorax yellowish; scutellum at tip and sides ferruginous; post-scutellum and metathorax marked as in the ♀; tarsi yellowish-ferruginous; basal margin of all the abdominal segments narrowly black, that on the third and fourth segments followed by a continuous yellow band, very narrow and subobsolete on the fourth segment; beneath ferruginous, varied with dusky. Length 6 lines.

*Hab.*—Mass., Conn., Penn., Del., (Coll. Am. Ent. Soc. and Mr. E. Norton).

Five ♀, three ♂ specimens. This is also an exceedingly variable species.

46. *Pompilus navus*, n. sp.

*Female.*—Fusco-ferruginous, sericeous; head broad, the orbits much broader in front, yellow; clypeus ferruginous, yellowish on the sides, the anterior margin truncate; mandibles ferruginous, dusky at tips; palpi yellow; antennæ ferruginous, paler beneath, dusky above from beyond the middle to the tip; prothorax ferruginous, margined laterally and posteriorly with yellowish, the disk and a spot on each posterior angle black, the posterior margin angular; rest of thorax black; the tegulæ, a quadrate spot on the posterior middle of the mesothorax, ferruginous; an ovate spot at each side of the scutellum near the insertion of each posterior wing, the post-scutellum, a cuneiform mark on each side of the pleura, all yellow; metathorax smooth and rounded above and behind, with a small spot on each side just behind the posterior wing, a broad subapical band, constricted in the middle, and a narrow band at the extreme tip, interrupted in the middle, yellow; wings fusco-hyaline, tinged with yellowish, with the costa towards the tip broadly fuscous, with a purple reflection; marginal cell narrow, wing-cells as in *interruptus*, posterior wings subhyaline; legs bright yellow, most of the coxæ and the femora, except tips, blackish-fuscous; anterior coxæ with a large, irregular yellow spot in front, the intermediate pair with a faint yellowish mark on each side at tip, the posterior with a yellow line behind; posterior femora with a yellow stripe beneath; tips of the four posterior tibiæ and tips of the tarsal joints fusco-ferruginous; tibiæ and tarsi with numerous short spines; abdomen oblong-ovate, subdepressed above, fusco-ferruginous, base of the first segment, a band at the base of the second and third segments, broader

laterally, and a spot on each side of the fourth and fifth segments, all yellowish; beneath fuscous. Length  $6\frac{1}{2}$  lines.

*Male*.—Blackish-fuscous; broad orbits, a spot between the antennæ, the clypeus, except a quadrate spot on the disk, middle of the mandibles, and the palpi, yellow; antennæ stout, attenuated at tips, crenulate beneath, fuscous above, ferruginous beneath, with the basal joint yellow; prothorax margined on the sides and behind with yellow; remainder of the thorax marked like the female, with the marks more developed and all yellow; the lateral margins of the mesothorax are narrowly yellowish, the quadrate spot on the disk is forked towards the head, and the apical margin of the scutellum is yellow; wings hyaline, the apex fuliginous, covering the third submarginal and a portion of the marginal cells; legs marked much as in the female, the anterior coxæ has a broad yellowish stripe in front and the intermediate pair has a large spot of the same color beneath; the intermediate and posterior femora are yellow beneath, the latter not yellowish at the apex above; basal half of the tibiæ blackish, as well as the tips of the tarsal joints; abdomen narrower than that of the female and much more depressed above, dark fuscous, the first segment with two small, yellow spots at base; second and three following segments each with a narrow yellow fascia at base, much the broadest on the third segment, while those on the fourth and fifth are very narrow and slightly interrupted; venter fuscous, the first and second segments with a broad, yellowish band at base. Length  $5\frac{1}{2}$  lines.

*Hab*.—Georgia, (Coll. Am. Ent. Soc.)

One ♀, one ♂, specimens. This may prove to be an extreme variety of *interruptus*, although the difference in coloration is great.

47. *Pompilus mundus*.

*Pompilus concinnus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 122, (nec *Wesm.*)

♂ ♀. Fusco-ferruginous, variegated with bright yellow; wings yellowish-hyaline, the costal two-thirds of the anterior pair yellowish-fuscous; legs yellow and fuscous; antennæ of ♂ thickened, crenulate beneath, ferruginous, black at tips; abdomen subdepressed, banded with yellow, the bands indistinct in the ♀. Length 4— $7\frac{1}{2}$  lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.)

Two ♀, one ♂, specimens.

48. *Pompilus Gundlachii*.

*Pompilus Gundlachii*, Cresson, Proc. Ent. Soc. Phil. iv, p. 122, ♀.

*Female*.—Fusco-ferruginous; apical half of antennæ black, the basal half fulvous; the legs fulvous and spinose; wings deep yellow-



ish, the apical margins fuliginous; abdomen marked with yellowish. Length  $9\frac{1}{2}$  lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach). One ♀ specimen.

*F.* Body reddish, marked and banded with black.

**49. *Pompilus ferrugineus.***

*Ceropales ferrugineus*, Say, Long's Second Exped. ii, p. 334. (1824).

*Pompilus ferrugineus*, Dahlb., Hym. Eur. i, p. 63. (1845).

*Female.*—Blackish-brown, covered with a purplish pile, strongly sericeous in certain lights; orbits ferruginous; clypeus and mandibles tinged with ferruginous; anterior margin of the clypeus arcuate; sometimes the head is entirely ferruginous; antennæ black, more or less ferruginous at base; prothorax sometimes entirely ferruginous, swollen, with a central, longitudinal, deeply impressed line, the posterior margin arcuate; lateral margins of mesothorax, the scutellum and post-scutellum, sometimes tinged with ferruginous; metathorax prominent, with a very deep, large, triangular excavation posteriorly, the stigmata very prominent; wings uniformly dark fuscous, with a brilliant purple reflection; third submarginal cell rather larger than the second, much narrowed towards the marginal; legs ferruginous, four posterior coxæ blackish; femora, except tips, and the tips of the tarsi sometimes blackish; anterior tarsi strongly ciliated, the four posterior tibiæ and tarsi sparsely covered with short spines; abdomen elongate, convex, more or less bright ferruginous, rather strongly sericeous; extreme base of the first segment, and apical margins of all the segments—broad on the three basal segments and dilated in the middle and extreme sides of the second and third segments—black; beneath much as above. One specimen has the body entirely bright rufo-ferruginous, except the apex of the antennæ, the pleura, the metathorax, and the apical margins of the abdominal segments, which are black. Length 9—10 lines.

*Male.*—Smaller than the ♀, and generally more ferruginous. One specimen is entirely ferruginous, except the pleura, metathorax, apical margins of the first and second abdominal segments, flagellum of the antennæ and anterior margin of the mesothorax, which are black; while another specimen has the whole of the mesothorax black; in the largest specimen the head, legs and abdomen are ferruginous, and the rest black; the wings are not so dark as those of the ♀. Length 5—7 lines.

*Hab.*—Delaware, Illinois, (Coll. Am. Ent. Soc.); Louisiana, (Coll. Mr. E. Norton).

Three ♀, four ♂ specimens. The ♀ of this species is one of the largest and most elegant insects belonging to this family.

50. *Pompilus? Mariae*, n. sp. (Figure 6, ♀ enlarged).

*Female*.—Head broader than the thorax, much compressed transversely, black; front broad, flattened, smooth and shining; antennæ inserted in deep fossulets just above the clypeus, the two basal joints ferruginous, the third and fourth shading off into fuscous, (the remaining joints wanting); clypeus small, flattened, anterior margin rounded,

Figure 6.



*Pompilus? Mariae*, ♀ (enlarged).

a large red spot on the disk; mandibles reddish at tips; palpi rufo-fuscous; face and orbits covered with a cinereous pile; thorax orange-yellow, opaque; mesothorax, scutellum and metathorax strongly tinged with ferruginous; prothorax oblong-subquadrate, much longer than usual, rounded in front, the posterior margin slightly arcuate, nearly truncate; mesothorax very small; metathorax abruptly truncate behind and slightly excavated, the truncation transversely rugose, the sides abrupt; thorax beneath silvery-sericeous, with a large blackish stain in front of the middle coxæ; legs stout, rather short, black, clothed with a cinereous sericeous pile; the posterior femora, except base and tips, reddish, their tibiæ and the intermediate femora slightly tinged with reddish; anterior legs short, not spinose; intermediate and posterior tibiæ and tarsi with a few short spines; wings narrow, shorter than usual, yellowish-subhyaline, the apex—covering the marginal, second and third submarginals, and outer half of the third discoidal cell—most of the interno-median cell, and the extreme base of the wing, fuscous; marginal cell lanceolate, regular, i. e. the lower nervure is regularly curved from the base to the apex; second and third submarginal cells subquadrate, the third rather the largest and more regularly quadrate; posterior wings hyaline, iridescent, tinged with dusky at tips; abdomen subsessile, convex, elongate-ovate, narrowed more rapidly than usual towards the tip, which is acute and subcompressed; basal segment brown-ferruginous, second and third segments bright orange-yellow, somewhat golden, the apex of the second segment with a ferruginous stain, dilated in the

middle, the apical margin of the third segment with a narrow brown band, also dilated in the middle; fourth segment black, opaque; fifth and sixth segments silvery-cinereous; venter ferruginous, the apical half fuscous. Length  $7\frac{1}{2}$  lines; expanse 11 lines.

*Hab.*—Pennsylvania, (Coll. Am. Ent. Soc.)

One ♀ specimen. This beautiful and rare species may belong to the genus *Parapompilus* Smith, along with *purpuripennis*, *legatus* and *elegans*, all having the head and prothorax formed alike.

51. *Pompilus*? *legatus*. n. sp.

*Female.*—Rufo-ferruginous; shape and structure same as in the preceding species; head uniformly dark rufous, shining; antennæ short, scarcely longer than the head and prothorax, black, the two basal joints rufous; thorax uniformly rufo-ferruginous; metathorax silvery-sericeous on the sides, the rugosity on the posterior truncation more strongly marked than in the preceding species; legs black, the coxæ at base, the tibiæ, except base and apex, and the four posterior tibiæ beneath, rufous; tibial spurs pale yellowish; anterior legs short and stout, without spines; the four posterior tibiæ and tarsi with a few short spines; wings shaped and colored as in the preceding species, except that they are shorter and the apical fuscous band is not so broad, leaving the subhyaline space between it and the middle cloud larger; abdomen opaque, with the two basal segments rufo-ferruginous, the apex of the second fuscous, remaining segments black, third with a narrow, subinterrupted, luteous band at base, and a small spot of the same color on each extreme side of the fourth segment; venter ferruginous, apical half fuscous. Length 5 lines; expanse of wings 7 lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.)

One ♀ specimen. Resembles *Marixæ* very closely, but is smaller in size, and the coloration of the abdomen is very different, the apical segment being not at all silvery as in *Marixæ*.

52. *Pompilus*? *elegans*.

*Pompilus elegans*, Cresson, Proc. Ent. Soc. Phil. iv, p. 126, ♀.

*Female.*—Ferruginous; head wider than the thorax and flat, prothorax oblong-subquadrate, much larger than usual, rounded anteriorly; head, antennæ, legs and broad band near base of abdomen, blackish; metathorax, legs and base of apex of abdomen, densely covered with cinereous pile; wings whitish-hyaline, with a very large fuliginous spot near the tip, as well as a small spot at base and middle. Length 5 lines; expanse of wings 8 lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach).

One ♀ specimen. Closely allied to *Marixæ* and *legatus*.

53. *Pompilus compressiventris*.

*Pompilus compressiventris*, Cresson, Proc. Ent. Soc. Phil. iv, p. 127, ♀.

*Female*.—Long and narrow, ferruginous; antennæ, sides of mesothorax, the whole of the thorax beneath and the legs, black; wings fuscous; abdomen elongate, compressed beneath and at tip. Length 7 lines.

*Hab*.—Cuba, (Coll. Dr. J. Gundlach). One ♀ specimen.

54. *Pompilus marcidus*.

*Pompilus marcidus*, Smith, Journal of Entomology, i, p. 395, ♀.

*Female*. Length 8 lines.—Fusco-ferruginous, covered with a fine, changeable, silky pile, that on the face is silvery; clypeus rounded and margined anteriorly; seven apical joints of antennæ black; cheeks with a thin cinereous pubescence; legs of a clearer red than the thorax; tibiæ and tarsi armed with stout spines, the extreme apex of tarsal joints of intermediate and posterior legs black; wings dark reddish-brown, gradually blending into a pale or subhyaline margin posteriorly; abdomen palest at base, with its extreme base black, apical margins of the segments very narrowly black or fuscous."

*Hab*.—"Orizaba, Mexico." Not seen.

*G. Body entirely reddish.*

55. *Pompilus uniformis*.

*Pompilus uniformis*, Cresson, Proc. Ent. Soc. Phil. iv, p. 125, ♂ ♀.

♂ ♀.—Fusco-ferruginous, with a purplish tinge, antennæ darker at tips; metathorax abrupt and depressed behind; wings subhyaline; legs spinose. Length  $4\frac{1}{2}$ —7 lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.)

One ♀, three ♂ specimens. Easily recognized by the color being entirely and uniformly purplish-ferruginous.

56. *Pompilus erythrus*.

*Pompilus erythrus*, Smith, Brit. Mus. Cat. Hym. iii, p. 156, ♀.

*Female*. Length 10 lines.—Brick-red; apical joints of antennæ and tarsi fuscous; clypeus emarginate, rounded at the sides; wings dark fuscous and iridescent; tibiæ with a few sharp spines, tarsi slightly spinose, anterior pair ciliated; abdomen smooth, shining and impunctate; pectus with black stains; rest of body of a brighter red than above; first recurrent nervure received by the second submarginal cell near its apex."

*Hab*.—"Jamaica." Not seen.

57. *Pompilus torridus*.

*Pompilus torridus*, Smith, Journal of Entomology, i, p. 396, ♀.

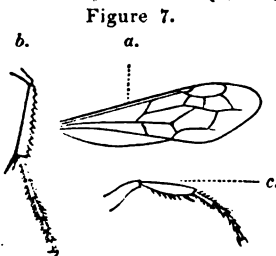
*Female*. Length  $6\frac{1}{2}$  lines.—Ferruginous, inclining to a tile-colored

red; antennæ red at base, becoming black towards their apex; face with a slight silky cinereous pile; metathorax, coxæ and femora with a slight cinereous pile; wings fusco-hyaline, with a faint violet iridescence; apical joints of tarsi dusky; abdomen smooth and shining."

*Hab.*—"Mexico." Not seen.

Subgenus **PRIOCNEMIS.**

This subgenus is characterized by the intermediate and posterior tibiae being serrated (♀ Fig. 7, *b.*) or serrulated (♂), and by the anterior legs not being ciliated with spines (Fig. 7, *c.*). The venuration of the anterior wings is variable in different species, but generally quite constant in individuals of the same species; the marginal cell is generally long, narrow and more or less acute at tip, but in several species the tip is more or less obtuse or rounded (as in Fig. 7, *a.*); the shape of the submarginal cells is variable in different species, and appear to be a good specific distinctive character; the basal series of transverse nervures is widely dislocated in all the species known to me, except in *alienatus* and *pulchellus*. The specific characters are well marked, and therefore the species are easily separated.



(From the United States).

58. *Pompilus (Priocnemis) magnus*, n. sp.

*Female.*—Large, robust, deep black, head and thorax opaque, abdomen subopaque; face and cheeks clothed with rather long pubescence; anterior margin of the clypeus arcuate, labrum and palpi fuscous; antennæ about as long as the head and thorax, orange-yellow, the two basal joints black; the breast and anterior coxæ clothed with long black pubescence; posterior margin of the prothorax angular; metathorax smooth and rounded, without any impressed line; wings black, violaceous; marginal cell long and narrow, the tip oblique; second submarginal obliquely-quadrangle, narrower than the third which is narrowed towards the marginal, the second recurrent nervure much bent outwardly about the middle; legs stout, black, somewhat shining, tarsi brownish at tips; abdomen ovate, convex, apical segment covered with brownish hairs. Length 13 lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.)

One ♀ specimen. This is the largest and one of the finest species of *Priocnemis* known to me.

59. *Pompilus (Priccnemis) fulvicornis*, n. sp.

*Female*.—Dull black, subopaque, sometimes with a bluish tint, immaculate; antennæ orange-yellow, two basal joints black or fuscous; anterior margin of the clypeus arcuate, the face sometimes brown-sericeous; posterior margin of the prothorax angular; metathorax opaque, with a well impressed, longitudinal, dorsal line; wings uniformly fuscous or dark fuscous, more or less violaceous, marginal and submarginal cells as in *magnus*, the second recurrent nervure is rounded outwardly, but not suddenly bent; legs brown-black, tarsi brown; abdomen ovate, convex, apical segment brownish pubescent. Length 8—9 lines.

*Male*.—Very similar to the female, but the form is more slender and the tibiæ are only slightly serrated. Length 6—8 lines.

*Hab*.—Pennsylvania, Delaware, Virginia, Louisiana, Texas, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Nine ♀, five ♂ specimens. Much smaller and less robust than *magnus*, and with paler wings. One ♀ specimen from Virginia has the anterior orbits and the mandibles pale ferruginous.

60. *Pompilus (Priccnemis) unifasciatus*.

*Pompilus unifasciatus*, Say, Amer. Ent., plate 42.

*Pompilus pallidicornis*, Smith, Brit. Mus. Cat. Hym. iii, p. 160, ♀.

♂ ♀.—Black; antennæ, except the base, bright yellow; anterior margin of the clypeus broadly but not deeply emarginate; posterior margin of the prothorax angular; wings dark fuscous, the anterior pair with a large, yellow, subapical spot. Length 6—10 lines.

*Hab*.—Conn., Del., Md., West Va., Ill., La., (Coll. Am. Ent. Soc. and Mr. E. Norton).

Twelve ♀, four ♂ specimens. Recognized at once by the deep black color of the body, the yellow antennæ and the large yellow spot at the tip of each anterior wing.

61. *Pompilus (Priccnemis) maculipennis*.

*Pompilus maculipennis*, Smith, Brit. Mus. Cat. Hym. iii, p. 159, ♀.

*Female*. Length 8 lines.—Black; the tips of the mandibles ferruginous; the head and thorax covered with very short velvety pubescence; wings brown, with a purple iridescence, the anterior wings having a large, ovate, yellow macula a little beyond the middle, touching their anterior margin; the anterior and intermediate tibiæ and tarsi slightly spinose, the posterior tibiæ serrated exteriorly, the tarsi spinose. Abdomen obscurely sericeous, the apical margins of the segments without pile, smooth and shining.

*Hab*.—"North America."

This species is unknown to me. From the above description the antennæ are inferred to be *black*, in which character only it seems to differ from *unifasciatus* Say.

62. *Pompilus (Prionemis) terminatus*.

*Pompilus terminatus*, Say, Amer. Ent., plate 42; Cresson, Proc. Ent. Soc. Phil. iv, p. 454.

♂ ♀.—Black, opaque; antennæ black in five specimens, orange-yellow, except base, in three specimens; anterior margin of the clypeus deeply concave; posterior margin of the prothorax subarcuate or slightly subangular; wings bright orange-yellow, the apical margin blackish, sometimes broadly so. Length 4—7 lines.

*Hab.*—Colorado and Dakota Territories, (Coll. Am. Ent. Soc.)

Five ♀, three ♂ specimens. Easily recognized by the black body, and bright yellow wings, tipped with black.

63. *Pompilus (Prionemis) nebulosus*.

*Prionemis nebulosus*, Dahlb., Hym. Eur. i, p. 96, ♀.

*Female.*—Black, somewhat shining; clypeus broadly margined anteriorly, with a broad, somewhat square, but not a very deep, emargination in the middle; antennæ longer than the head and thorax, filiform, slender at tips; posterior margin of the prothorax arcuate, very slightly subangular; metathorax rounded; wings long, fuliginous, violaceous, darker at the apex, in the second submarginal cell, and along the basal series of transverse nervures, base of anterior wings and the posterior wings entirely, paler; marginal cell long, narrow, subacute at tip; second submarginal longer than broad, pointed towards the base of the wing, and receiving the first recurrent nervure beyond the middle; third submarginal cell larger than the second, narrowed considerably towards the marginal and receiving the second recurrent nervure at about the middle; basal series of transverse nervures widely dislocated; legs black, the tibiæ and tarsi with numerous short, palish hairs; tarsi brownish, abdomen short, ovate, convex, much narrowed at base, smooth, shining black; apical segment densely clothed with brown hairs. Length 6½ lines.

*Hab.*—New York, (Coll. Am. Ent. Soc.)

One ♀ specimen.

64. *Pompilus (Prionemis) fortis*, n. sp.

*Female.*—Robust, black, shining, clothed with a very short, brownish, subsericeous pubescence, more obvious on the head, thorax beneath and legs; anterior margin of the clypeus subtruncate, margined and very slightly concave; the front with a finely impressed longitudi-

nal line; antennæ short and thick, brown-sericeous beneath; posterior margin of the prothorax arcuate; metathorax rounded above, subtruncate behind, finely and transversely rugose; wings uniformly pale fuliginous, violaceous, darker at tips; marginal cell long, narrow, acute at tip; second submarginal cell obliquely quadrate; third submarginal larger than the second, nearly quadrate, being only slightly narrowed towards the marginal, and receiving the second recurrent nervure a third from the base; legs stout, shining black, covered with a brown sericeous pile; tarsi brownish; tibiæ not strongly serrated; abdomen broad-ovate, subconvex, black, polished above, not much narrowed at base; apex with brown hairs. Length  $7\frac{1}{2}$  lines.

*Hab.*—New York, (Coll. Am. Ent. Soc.)

Two ♀ specimens. Much more robust than *nebulosus*, with the antennæ scarcely two-thirds as long, and with the abdomen smooth and polished.

65. *Pompilus (Priocnemis) subopacus*, n. sp.

*Female.*—Black, subopaque; clypeus much produced, its anterior margin arcuate; antennæ brownish beneath; thorax compressed at the sides; posterior margin of the prothorax angular; metathorax rounded; wings rather short, pale fuliginous, the apex broadly margined with dark fuliginous, posterior wings subhyaline; marginal cell rounded at tip, second submarginal pointed towards the base of the wing, the third larger and nearly quadrate; basal series of transverse nervures dislocated; legs black, tarsi brownish; tibiæ rather strongly serrated; abdomen oblong-ovate, convex, apex with numerous brownish hairs. Length 5 lines; expanse of wings  $7\frac{1}{2}$  lines.

*Male.*—Closely resembles the ♀; but the wings are paler, with the apical margin broader and more blackish, and the tibiæ are very slightly serrated. Length  $5\frac{1}{2}$  lines.

*Hab.*—Pennsylvania, (Coll. Am. Ent. Soc.)

Two (♂ ♀) specimens.

66. *Pompilus (Priocnemis) fulgifrons*, n. sp.

*Female.*—Slender, black, strongly sericeous; head large, black, polished, the face, clypeus, cheeks and mandibles at base, bright golden; anterior margin of the clypeus truncate; palpi brownish sericeous; antennæ long, rather slender, black, brownish sericeous beneath, the scape beneath golden; pro- and mesothorax and scutellum smooth and highly polished, sides of the prothorax and the collar golden sericeous; posterior margin of the prothorax subangular; metathorax rounded; smooth, opaque, slightly golden sericeous at tip; thorax beneath gol-



den sericeous; wings hyaline, slightly tinged with yellowish, with a golden gloss, apical margin of both pairs dusky; marginal cell long, narrow and acute at tip; second submarginal oblique-quadrate, the third nearly twice as large, longer than wide, slightly narrowed towards the marginal, and receiving the second recurrent nervure about the middle; basal series of transverse nervures widely dislocated; legs long, rather slender, black, strongly sericeous, especially the coxæ and anterior tarsi, which are bright golden beneath; abdomen petiolate, oblong-ovate, convex, strongly ashy sericeous, especially at base; apex pilose. Length  $5\frac{1}{2}$  lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.).

One ♀ specimen. Easily recognized by the golden face, polished thorax and petiolate abdomen.

67. *Pompilus (Fricoenemis) conicus*.

*Pompilus (Miscus) cornicus*, Say, Bost. Jour. Nat. Hist. i, p. 305, ♂ ♀.

*Female.*—Black, subsericeous, subopaque, except the abdomen, which is more or less highly polished; anterior margin of the clypeus subarcuate; posterior margin of the prothorax angular; metathorax rounded; wings long, fusco-hyaline, not uniformly so, the second and third submarginal and the third discoidal cells have each a fuscous spot, sometimes indistinct, and the first submarginal cell an oblique hyaline streak beneath the stigma; the externo-medial cell is nearly hyaline; marginal cell long, narrow and acute at tip, the second submarginal rounded at tip, and much pointed towards the base of the wing, the third larger than the second, subquadrate, but slightly narrowed towards the marginal and with the lower basal angle pointed within, by reason of the second transverso-cubital nervure being rounded outwardly; the basal series of transverse nervures widely dislocated, in some specimens the cubital nervure is continued clearly and entirely to the apical margin of the wing, thereby making four distinct submarginal cells; legs black, sericeous, especially the coxæ; intermediate and posterior tibiæ strongly serrated; tarsi brownish; abdomen ovate, convex, polished, black, subpetiolate; apex pilose. One specimen (probably immature), has the apical margins of the abdominal segments rufo-testaceous. Length  $5\frac{1}{2}$ —6 lines.

*Male.*—Much like the ♀, but more slender, more sericeous, wings clearer and the tibiæ less strongly serrated. Length  $4\frac{1}{2}$ —5 lines.

*Hab.*—Maine, Conn., Penna., Canada, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Six ♀, two ♂ specimens.

68. *Pompilus (Pricnemis) pomilius*, n. sp.

*Female*.—Black, subopaque, abdomen more or less polished; anterior margin of the clypeus subtruncate; mandibles reddish in the middle; antennæ long and slender, black; posterior margin of the prothorax subangular; metathorax rounded, slightly impressed down the middle; wings uniformly fusco-hyaline, strongly iridescent; marginal cell long, wider than usual, and acute at tip; second and third submarginal cells shaped much like those of *conicus*; legs brown-black, subsericeous, tarsi brown, tibæ not strongly serrated; abdomen ovate, convex, subpetiolate, polished black. Length 3—4 lines.

*Hab*.—New Jersey, Pennsylvania, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Three ♀ specimens. Closely allied to *conicus*, but is much smaller, wings uniform in color, and the tibæ less strongly serrated.

69. *Pompilus (Pricnemis) germanus*, n. sp.

*Female*.—Black, subopaque, abdomen polished; anterior margin of the clypeus subtruncate; apical half of the mandibles reddish; antennæ long, rather slender, brownish towards the tip and beneath; posterior margin of the prothorax angular; metathorax rounded, with a finely impressed line down the middle; wings hyaline, iridescent, the apical third fuliginous, with a large, subovate, whitish-hyaline spot near the tip, the basal series of transverse nervures is more or less broadly margined with fuliginous; marginal cell long, narrow, acute at tip; second and third submarginal cells shaped much like those of *conicus*; legs black, sericeous, tarsi brownish, tibæ rather strongly serrated; abdomen rather short, ovate, convex, black, smooth and highly polished, apex clothed with brown hairs. Length 4 lines.

*Hab*.—Connecticut, Delaware, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Three ♀ specimens. Allied to *conicus*, but is smaller, and readily separated by the bifasciate wings.

70. *Pompilus (Pricnemis) validus*, n. sp.

*Female*.—Large, robust, opaque, velvety black; anterior margin of the clypeus truncate; antennæ short and stout, black above, yellowish-testaceous beneath, except the base; posterior margin of the prothorax arcuate; metathorax short, excavated down the middle and abruptly truncate behind; wings long and broad, uniformly black, with a beautiful violaceous reflection; marginal cell long, narrow and acute at tip; second submarginal cell small, quadrate, the third three times as large as the second, twice longer than broad, considerably narrowed towards

the marginal, and receiving the second recurrent nervure at about one-third from the base; legs black, robust, tarsi brownish, tibiæ not strongly serrated; abdomen subsessile, ovate, subconvex, shining above; first, second and third segments above rufo-testaceous, their apical margins black; apex clothed with numerous black hairs; beneath black. Length 9 lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.).

One ♀ specimen. This fine species is easily recognized by the short, stout antennæ, by the large violaceous-black wings, and by the coloration of the abdomen.

71. *Pompilus (Prioenemis) nigripes.*

*Pompilus nigripes*, Cresson, Proc. Ent. Soc. Phil. iv, p. 454, ♀.

*Female.*—Purplish-brown; three basal segments of abdomen ferruginous, apex piceous; legs and antennæ black; wings fusco-hyaline, with a fuliginous cloud near the tip. Length 5½ lines.

*Hab.*—Colorado Territory, (Coll. Am. Ent. Soc.).

One ♀ specimen.

72. *Pompilus (Prioenemis) alienatus.*

*Pompilus fascipennis*, Say, Long's 2nd Exp. ii, p. 333, ♀, (nec Van d. Lind.).

*Pompilus alienatus*, Smith, Brit. Mus. Cat. Hym. iii, p. 159.

*Female.*—Black, clothed with a silvery-cinereous pile, most obvious on the face, metathorax and coxæ; apical margin of the clypeus smooth, polished and truncate; mandibles reddish in the middle; antennæ long, slender, convolute, brownish; posterior margin of the prothorax slightly subangular; metathorax smooth and rounded, rather abrupt behind, the sides bright silvery; wings hyaline, with four submarginal cells; the extreme tip, a large cloud covering most of the marginal cell, the whole of the second and third submarginal cells, and the tip of the third discoidal cell, fuscous; sometimes the basal series of transverse nervures, which is scarcely dislocated, is margined with fuscous; marginal cell long, lanceolate, acute at tip; second submarginal cell obliquely quadrate, the third much narrowed towards the marginal, receiving the second recurrent nervure at about the middle; posterior wings hyaline, the tip slightly dusky; legs black, the four anterior tibiæ and tarsi more or less varied with rufo-testaceous; the posterior femora and tibiæ red, their tips generally black, their tarsi brownish; tibiæ strongly serrated; the coxæ silvery; abdomen short-ovate, subconvex, subsessile, polished, red above and beneath, the three or four apical segments black. Length 3—4½ lines.

*Hab.*—Connecticut, New York, New Jersey, Pennsylvania, West Virginia, (Coll. Am. Ent. Soc. and Mr. E. Norton.)

Thirteen ♀ specimens. This is a pretty and easily recognized species. The ♂ has not been identified.

73. *Pompilus (Prionemis) scitulus*, n. sp.

*Female*.—Small, bright honey-yellow, polished; head large, black; anterior margin of the clypeus broadly rounded; mandibles brown; antennæ rather long and slender, blackish above, brown beneath; thorax narrow, compressed at the sides; posterior margin of the prothorax angular; mesothorax stained with blackish, the region on each side of the scutellum and post-scutellum black; metathorax smooth and rounded, the stigmata black; wings hyaline, iridescent, marked as in *alienatus*, the second submarginal cell is longer than in that species, while the third submarginal is not so much narrowed towards the marginal; the basal series of transverse nervures is widely dislocated; legs honey-yellow, tips of tibiæ and tarsi dusky; tibiæ not strongly serrated; abdomen ovate, subpetiolate, convex, polished, honey-yellow, the apical half of the third and the remaining segments entirely, black, tip piceous and hairy. Length 3 lines.

*Hab*.—Illinois, (Coll. Am. Ent. Soc.)

One ♀ specimen. This handsome little species is closely allied to *alienatus*, but is at once separated by the color of the body, except the head and apex of abdomen, being entirely honey-yellow.

74. *Pompilus (Prionemis) nothus*, n. sp.

*Female*.—Black, somewhat shining; anterior margin of the clypeus subarcuate; mandibles rufo-piceous at tips; antennæ brown-black; posterior margin of the prothorax arcuate; metathorax oblong, rounded above, with a well impressed line down the middle; wings pale fusco-hyaline, nearly hyaline at base, iridescent; marginal cell long, narrow and acute at tip; second submarginal pointed towards the base of the wing, the third subquadrate, broader than long, slightly narrowed towards the marginal, and receiving the second recurrent nervure before the middle; basal series of transverse nervures widely dislocated; legs brown-black, tarsi paler, tibiæ strongly serrated; abdomen short, ovate, convex, polished, dull ferruginous, apex brown. Length 4 lines.

*Hab*.—Connecticut, (Coll. Mr. E. Norton.)

One ♀ specimen.

75. *Pompilus (Prionemis) nuperus*, n. sp.

*Female*.—Head golden-ferruginous, with golden hairs, very long on the cheeks; clypeus large, its anterior margin truncate; mandibles blackish at tips; antennæ long and slender, golden-ferruginous, the

seven apical joints black; prothorax ferruginous, the anterior margin sometimes blackish, the posterior margin subangular; mesothorax and scutellum ferruginous, sometimes stained with blackish; metathorax rounded, black, golden-sericeous, one specimen has a large, rounded, ferruginous spot on each side, and the pleura a spot of the same color beneath the wings; wings long, uniformly fuliginous, with a strong purplish reflection; marginal cell long, narrow, acute at tip; second submarginal rather small, oblong-subquadrate, pointed towards the base of the wing, the third submarginal very large, nearly twice as long as wide, slightly narrowed towards the marginal and receiving the second recurrent nervure at about one-third from the base; basal series of transverse nervures widely dislocated; legs golden-ferruginous, the coxæ and the tips of tarsi blackish; posterior tibiæ strongly serrated; abdomen oblong-ovate, convex, golden-ferruginous at base, the four or five apical segments more or less stained with dusky, the extreme base of the first segment black, apical segment clothed with dense golden pubescence. Length 7—10 lines.

*Hab.*—Pennsylvania, (Coll. Am. Ent. Soc.)

Three ♀ specimens. Readily distinguished by the almost entirely yellow-ferruginous color of the body, and by the bicolored antennæ.

(From Cuba and Mexico.)

76. *Pompilus (Pricnemis) flammipennis*.

*Pompilus flammipennis*, Smith, Brit. Mus. Cat. Hym. iii, 155.

*Pompilus ignipennis*, Cresson, Proc. Ent. Soc. Phil. iv, p. 121.

♂ ♀.—Black, abdomen tinged with blue; antennæ orange-yellow; wings bright ferruginous, the apex more or less fuliginous; metathorax transversely rugose. Length 3½—9 lines.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.); "St. Domingo," (Smith).

Three ♀, four ♂ specimens.

77. *Pompilus (Pricnemis) parvus*.

*Pompilus terminatus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 128, (nec Say).

Female.—Black; three basal segments of the abdomen ferruginous; wings fuscous. Length 3½ lines.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.)

One ♀ specimen. This is allied to *nothus*, but is quite distinct.

78. *Pompilus (Pricnemis) nubeculatus*.

*Pompilus nubeculatus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 128, ♀.

Female.—Fusco-ferruginous; antennæ, except tips, legs, and tip of abdomen, fulvous; wings yellowish-hyaline, with the apex and a cloud between the middle and apex fuscous. Length 7½ lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach). One ♀ specimen.

79. *Pompilus (Prionemis) pulchellus*.

*Pompilus pulchellus*, Cresson. Proc. Ent. Soc. Phil. iv, p. 126, ♀.

*Female*.—Ferruginous; head, antennæ and disk of metathorax black; wings hyaline, with two broad, fuscous, purple bands. Length  $3\frac{1}{2}$  lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.)

One ♀ specimen. This beautiful little species is allied to *alienatus*, and has the most handsomely ornamented wings of any species of *Pompilus* known to me.

80. *Pompilus (Prionemis) Sartorianus*, n. sp.

*Female*.—Black; head clothed with a golden pubescence, long on the cheeks and anterior margin of the clypeus, and brightest on the face; clypeus much depressed anteriorly, with the anterior margin arcuated and tinged with brownish; mandibles piceous at base; antennæ long, acuminate at tip, ferruginous, the four apical joints black; prothorax densely covered with a golden pubescence, the posterior margin arcuate; lateral and posterior margins of the mesothorax, the scutellum, except disk, pleura, base of metathorax, and a large rounded spot on each side at tip, densely clothed with a bright golden pubescence; wings yellow subhyaline, the costal two-thirds of the anterior pair fuscous and subviolaceous; marginal cell very long and narrow, acute at tip; second and third submarginals shaped like those of *nuperus*; legs black, coxæ golden; tips of the femora, and all the tibiæ and tarsi ferruginous; abdomen oblong-ovate, convex, subpetiolate, fusco-ferruginous, the second segment with a round, blackish spot on the basal middle; apical segment densely clothed with golden pubescence; venter blackish, fusco-ferruginous at tip. Length  $8\frac{1}{2}$  lines.

*Hab*.—Vera Cruz, Mexico. (Coll. Am. Ent. Soc.)

One ♀ specimen. This is allied to *nuperus* in general shape of the body and in the shape of the wing-cells.

It gives me much pleasure to dedicate this fine species to my friend Mr. Charles Sartorius, of Mexico, to whose kindness the Society is indebted for this and a host of other Mexican insects.

81. *Pompilus (Prionemis) cincticornis*, n. sp.

*Female*.—Opaque-black, more or less densely clothed with a short golden pubescence; face and cheeks densely golden; broad frontal orbits, a spot on the posterior orbits near the summit of the eyes, and a large spot on each side of the clypeus, luteous; clypeus strongly margined in front, the margin subarcuate; mandibles luteous at base; antennæ long, black, the fourth and fifth joints pale yellowish; posterior

margin of the prothorax arcuate; metathorax short, rather abrupt, rounded above; wings uniformly pale yellowish-hyaline, slightly dusky at tips; the cells shaped as in the preceding species; legs ferruginous, the coxæ, trochanters and extreme tips of the tarsi, black; abdomen short, ovate, convex, yellowish-ferruginous; extreme base of abdomen and of the first and second segments black; apical margin of the first and second segments and a stain on the middle of the latter, fuscous; apical segment densely clothed with a golden pubescence. Length 6 lines.

*Hab.*—Vera Cruz, Mexico. (Coll. Am. Ent. Soc., from Mr. Sartorius).

One ♀ specimen. Easily recognized by the broad yellowish band on the antennæ.

82. *Pompilus* (*Priocnemis*) *velox*.

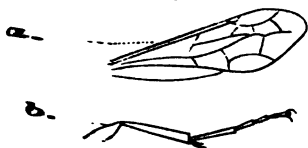
*Priocnemis velox*, Smith, Journal of Entomology, i, p. 398, ♀.

“*Female*. Length 5 lines.—Ferruginous, inclining to a brick-red; the head black, with the clypeus, mandibles and antennæ ferruginous, the six apical joints of the latter, and the tips of the mandibles black. The sutures of the base of the metathorax and post-scutellum black; the pectus and the coxæ behind black; the trochanters and extreme base of the femora black; the wings flavo-hyaline, the anterior pair with a fuscous fascia and the tips fuscous, the nervures testaceous. The extreme base of the abdomen black, and its apex with a little fuscous pubescence.”

*Hab.*—“Oajaca, Mexico.” Not seen.

Subgenus **AGENIA**.

This subgenus is characterized by the legs being destitute of spines, (Fig. 8, *b*, posterior leg); the form of most of the species is more graceful than in the preceding subgenera, with the legs longer and slenderer; the wings vary in their style of neuration, but most of the species have the marginal cell lanceolate, the second submarginal long and narrow and the third submarginal large (as in Fig. 8, *a*); the abdomen in most species is subpetiolate, sometimes subsessile or petiolate. Some species resemble those of the genus *Ceropaltes* very much, having four distinct submarginal cells, long, slender legs, &c., but the antennæ of the ♀ are convolute and the head differently shaped. The species have all of them good distinctive characters, and are easily separated.



(From the United States.)

83. *Pompilus (Agenia) cupidus*, n. sp.

*Female*.—Dark blue, shining; clypeus, mandibles, palpi and antennæ opaque-black; clypeus finely margined and truncate anteriorly; head and scutellum with a slight greenish tinge; posterior margin of the prothorax subarcuate; pleura and metathorax opaque-black, the latter slightly silvery sericeous and transversely rugose behind; anterior wings uniformly fuliginous, with a brilliant blue and purple reflection; wing-cells shaped much as in Fig. 8, *a*, except that the marginal cell is narrower, the second submarginal receives the first recurrent nervure at about the middle, and the third submarginal is a little more narrowed towards the marginal; posterior wings hyaline, slightly dusky at tips; legs long, black, with a strong blue reflection, tibiæ black or brown-black; abdomen ovate, convex, attached to the abdomen by a short, stout petiole, dark blue, smooth and polished, apical segment black. Length 6 lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.)

One ♀ specimen. This lovely species is easily recognized by the dark blue body, and brilliant purple anterior wings.

84. *Pompilus (Agenia) architectus*.

*Pompilus architectus*, Say, Bost. Jour. Nat. Hist. i, p. 303.

*Female*.—Dark blue, clothed with a short cinereous pubescence, long on the shoulders and on the metathorax, the latter with a finely impressed central line, and the posterior angles are silvery; head tinged with green; clypeus broadly rounded anteriorly; mandibles ferruginous; antennæ black or brown-black; posterior margin of the prothorax arcuate; wings hyaline, iridescent, the extreme tips slightly dusky; wing cells as in the preceding species, except that the marginal cell is broader and the third submarginal is longer; legs black, with a very slight tinge of blue on the femora, anterior tibiæ and all the tarsi brown, coxæ silvery beneath; abdomen ovate, convex, petiolate, polished blue-black, apical segment brown and hairy. Length 2½—4 lines.

*Hab.*—Connecticut, Illinois, (Coll. Am. Ent. Soc., and Mr. E. Norton).

Four ♀ specimens.

85. *Pompilus (Agenia) cærulescens*.

*Agenia cærulescens*, Dahlb., Hym. Eur. i, p. 93.

“Submedium, 2 lin. Mens. Succ. long.; blue, posterior coxæ black, antennæ fuscous above, luteous beneath; mouth, mandibles, palpi, anterior legs, intermediate femora entirely, and apex of posterior femora,



fulvous; wings whitish-hyaline, apex slightly smoky; abdomen very short, convex, conical, with a very short, but indistinct petiole."

*Hab.*—"South Carolina." Not seen.

86. *Pompilus (Agenia) pulchripennis*, n. sp.

♂ ♀.—Black, shining, subsericeous; anterior margin of the clypeus slightly emarginate; antennæ dull black or brown-black; posterior margin of the prothorax arcuate; metathorax rounded, finely impressed down the middle, and thinly clothed behind with a fine whitish pubescence; wings hyaline, with a large fuscous cloud covering the marginal cell, except its tip, the whole of the second and third submarginals and a portion below them, and a transverse fuscous spot on the basal series of transverse nervures, this is sometimes wanting; marginal cell long and narrow; second submarginal obliquely quadrate, receiving the first recurrent nervure in the middle, the third submarginal subquadrate, narrowed towards the marginal, and receiving the second recurrent nervure near the base; legs black, subsericeous; abdomen ovate, convex, subpetiolate, polished, sericeous, apex clothed with brownish hairs. Length 3—5 lines.

*Hab.*—Massachusetts, Pennsylvania, West Virginia, (Coll. Am. Ent. Soc.).

Five ♀, one ♂, specimens. Readily distinguished by the handsomely ornamented wings. It approaches *Priocnemis germanus* in general appearance, being of the same color and with the wings similarly marked.

87. *Pompilus (Agenia) brevis*, n. sp.

*Male.*—Black, clothed with a short greyish pubescence; head opaque; a line on the front orbits, most of the clypeus—the anterior margin of which is truncate—the mandibles, except tips, and the palpi dull fulvous; antennæ as long as the head and thorax, stout, crenulate beneath, brown-black above, fulvous beneath; thorax robust, broad in front, narrowed behind, the pro- and mesothorax opaque, the posterior margin of the prothorax arcuate; scutellum and metathorax shining, the latter smooth and rounded, faintly impressed down the middle, and whitish-sericeous at tip; wings long, hyaline with a fuscous cloud on

the apical third, and a narrow band margining the basal series of transverse nervures; wing-cells as in Figure 9; posterior wings hyaline, slightly dusky at tips; legs black, sericeous; the anterior femora within, the four posterior femora, except tips, the anterior tibiæ at tip and within, their tarsi entirely and the intermediate



Figure 9.

tarsi, except base, all testaceous or dull fulvous, the posterior tarsi is tinged with the same color; abdomen small, short, narrow, subovate, subpetiolate, shining black. Length 2½ lines.

*Hub.*—Georgia, (Coll. Am. Ent. Soc.).

One ♂ specimen. A very distinct little species, remarkable for the large thorax, small abdomen, and curious shape of the marginal and submarginal cells.

88. *Pompilus (Agenia) Dakota*, n. sp.

*Male.*—Slender, black, subopaque, the prothorax, metathorax and coxæ clothed with a silvery sericeous pile; anterior orbits yellow; clypeus truncate anteriorly; mandibles rufo-testaceous near the tips; palpi fuscous, varied with testaceous; antennæ long, rather slender, filiform, black above, beneath testaceous at base and toward the tips; thorax more gibbous than usual; posterior margin of the prothorax subangular; scutellum convex and pubescent; the mesothorax has a small tubercle on the disk; metathorax small, subconvex, densely silvery in certain lights; wings long, ample, uniformly fuliginous, subviolaceous, with a transverse, darker cloud beneath the marginal cell, and another at the extreme apex; marginal cell lanceolate; second submarginal cell oblong, subquadrate, pointed towards the base of the wing; third submarginal cell large, shaped as in Fig. 8, *a*; legs long, black; coxæ silvery sericeous; anterior tibiæ testaceous; intermediate tibiæ and all the tarsi more or less brownish; abdomen long, subclavate, subpetiolate, subconvex, black, shining, the two apical segments above orange-yellow. Length 5 lines; expanse of wings 10 lines.

*Var. ♂.*—Frontal orbits obscurely yellowish; mandibles piceous; palpi fuscous; antennæ orange-yellow, blackish at base and apex; anterior tibiæ and tarsi brownish; apex of abdomen obscurely testaceous; otherwise same as the other ♂ specimen.

*Hab.*—Dakota Territory; West Virginia, (Coll. Am. Ent. Soc.).

Two ♂ specimens. Should the variety from West Virginia prove to be a distinct species, it may be named *pallidicornis*.

89. *Pompilus (Agenia) nigropilosus*, n. sp.

*Male.*—Black, shining, rather thickly clothed with a black pubescence, long and dense on the head; thorax and abdomen with a very short cinereous pile, seen only when viewed in certain lights; clypeus small, truncate anteriorly; mandibles reddish near the apex; antennæ moderately long, incrassate, tapering towards the tip, opaque-black; thorax densely punctured; posterior margin of the prothorax arcuate; disk of metathorax and scutellum flattened; metathorax roughly punc-

tured, with a well impressed line down the middle, and slightly excavated on each side behind; wings subhyaline, stained with fuscous and subviolaceous towards the apex; marginal cell lanceolate; second and third submarginals quadrate, the third much larger than the second, receiving the second recurrent nervure near the base; legs stout, black, subsericeous, clothed with short black pubescence; abdomen subsessile, polished, convex above, clothed with very short black pubescence; venter polished. Length  $4\frac{1}{2}$  lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc.).

One ♂ specimen.

90. *Pompilus (Agenia) albopilosus*, n. sp.

*Male*.—Form and color of the preceding species, but the pubescence is rather more dense and is white or ashy instead of black, the vertex has a few black hairs; thorax opaque, the posterior margin of the prothorax is angular; wings hyaline, iridescent, slightly smoky at tip; wing-cells much as in the preceding species; anterior tibiæ testaceous in front; abdomen more ovate, subdepressed, polished. Length  $3\frac{1}{2}$  lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc.).

Two ♂ specimens. This may prove to be only a variety of *nigropilosus*.

91. *Pompilus (Agenia) bombycinus*, n. sp.

*Female*.—Black, subopaque, strongly ashy sericeous, especially strong on the abdomen; clypeus large, apical margin broadly rounded and recurved; antennæ long, slender at tips; prothorax broadly margined posteriorly, the posterior edge angular or subangular; wings hyaline, dusky at tips; marginal cell long, sublanceolate, second and third submarginals about equal in length, the third the largest, slightly narrowed towards the marginal and receiving the second recurrent nervure a little before the middle; legs black, coxæ strongly sericeous; anterior tibiæ, and all the tarsi, beneath golden sericeous; abdomen short, ovate, convex, petiolate, shining, very strongly sericeous; apex with a few long, pale hairs. Length  $4\frac{1}{2}$  lines.

*Male*.—Slenderer than the female, with the head and thorax more strongly sericeous; clypeus deeply and broadly emarginate; metathorax with a shallow channel down the middle; wings darker at tips; anterior legs brownish; abdomen much smaller than in the ♀, subclavate, subdepressed. Length  $4\frac{1}{2}$  lines.

*Hab*.—West Virginia, (Coll. Am. Ent. Soc.).

One ♀, two ♂ specimens.

92. *Pompilus (Agenia) varipes*, n. sp.

*Female*.—Black, clothed with a dense ashy-sericeous pile; anterior margin of the clypeus sinuous; tips of mandibles piceous; prothorax broadly margined posteriorly, the posterior edge arcuate; metathorax silvery, finely sculptured, with scattered deeper punctures, and a finely impressed line down the middle; wings hyaline, the extreme tip dusky; marginal and submarginal cells shaped much as in the preceding species, except that the third submarginal cell is larger, longer and more narrowed towards the marginal; legs black, tips of anterior femora, their tibiæ and most of their tarsi fulvous, as well as the extreme tips of the four posterior tibiæ; the tarsi tinged with testaceous; abdomen ovate, convex, petiolate, shining, pruinose, the apical segment with a large ovate polished space surrounded by long pale hairs. Length 5 lines.

*Hab.*—Illinois, (Coll. Am. Ent. Soc.).

One ♀ specimen. Closely allied to *bombycinus*, but the thorax is broader and the legs differently colored.

93. *Pompilus (Agenia) pulchrinus*, n. sp.

*Male*.—Slender, black, clothed with fine, silvery-white pubescence; broad anterior orbits not reaching the summit of the eyes, narrow posterior orbits, the clypeus, except a large square spot on the middle, and the mandibles, except extreme base and apex, white; clypeus large, sinuous anteriorly; antennæ long, filiform, opaque-black above, testaceous beneath, especially beyond the middle; posterior margin of the prothorax angular; scutellum prominent, convex; metathorax smooth, rounded, and densely silvery; wings hyaline, slightly iridescent, the apical margin fuliginous; wing-cells as in Fig. 8, *a*; legs long, slender, black; coxæ silvery, the anterior pair with a broad white stripe in front; extreme tips of the anterior femora, a stripe on their tibiæ exteriorly, and a band on the three basal joints of the four anterior tarsi, yellowish-white; all the tibial spurs are white; abdomen ovate, subpetiolate, subdepressed, posterior margins of the segments subhyaline, the apical segment more or less whitish. Length  $4\frac{1}{2}$ —5 lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.).

Two ♂ specimens. Easily recognized by the white markings of the head and front coxæ.

94. *Pompilus (Agenia) agilis*, n. sp.

*Male*.—Very slender, black, clothed with a silvery pile, very brilliant on the face, metathorax and coxæ; clypeus small and truncate in front, densely covered with silvery pubescence, as well as the mandi-

bles at base and the cheeks, tips of mandibles piceous; antennæ long, slender, dull black, the scape silvery pubescent; posterior margin of the prothorax much depressed and arcuate; wings hyaline, iridescent, apical margin fuliginous; wing-cells shaped as in *bombycinus*; legs long and slender, sericeous, the coxæ silvery, anterior tibiæ and tarsi more or less, and all the tibial spurs, pale testaceous; abdomen long, slender, strongly clavate, the first segment long and cylindrical, the remaining segments together forming, as it were, an oblong-ovate club; apical segment more or less white. Length 4 lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.).

Two ♂ specimens. Resembles *pulchrinus* in general shape, but is more slender, and is at once separated from that species by the absence of the white markings on the face and anterior coxæ; the abdomen is also more strongly petiolated.

95. *Pompilus (Agenia) petiolatus*, n. sp.

*Male.*—Small, slender, black, densely covered with a fine, short, whitish pubescence, very dense on the face, metathorax and coxæ; clypeus truncate in front; mandibles reddish at tips; antennæ robust, moderately long; prothorax arcuate behind; wings hyaline, iridescent, extreme tips dusky; marginal cell oblique at tip, the second submarginal conical when viewed longitudinally, receiving the first recurrent nervure before the middle, third submarginal subquadrate, slightly narrowed towards the marginal, receiving the second recurrent nervure at the middle; tips of the anterior femora, their tibiæ entirely, and the base of their tarsi, testaceous; tibial spurs black; abdomen long, very slender, strongly petiolated, the apical segment with a white spot. Length 3 lines.

*Hab.*—Illinois, (Coll. Am. Ent. Soc.)

One ♂ specimen. Closely allied to *agilis*, but is much smaller, more slender, and with shorter, thicker antennæ.

96. *Pompilus (Agenia) iridipennis*, n. sp.

*Male.*—Small, black, rather thinly clothed with a fine whitish pile, dense and silvery on the face, metathorax and coxæ; face short; clypeus small, broadly rounded anteriorly; mandibles reddish at tips; antennæ moderately long, slender, entirely black; posterior margin of the prothorax angular; wings hyaline, beautifully iridescent, the apical margin and a spot in the second and third submarginal and third discoidal cells, pale dusky; marginal cell lanceolate; second submarginal much longer than the third, subquadrate, pointed towards the base of the wing, receiving the recurrent nervure in the middle; third

submarginal cell quadrate, wider than long, slightly narrowed towards the marginal, receiving the second recurrent nervure in the middle; anterior legs more or less pale testaceous; abdomen subpetiolate, subcylindrical, subconvex, shining, immaculate. Length  $2\frac{1}{2}$ — $3\frac{1}{2}$  lines.

*Hab.*—New Jersey, West Virginia, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Five ♂ specimens. Readily distinguished by the beautifully iridescent wings.

97. *Pompilus (Agenia) mellipes*.

*Pompilus mellipes*, Say, Bost. Jour. Nat. Hist. i, p. 304. (1835).

*Agenia fulvipes*, Dahlb., Hym. Eur. i, p. 92. (1845).

*Female.*—Black, pruinose, clothed with a fine, silvery-cinereous pile, more dense and brilliant on the face, metathorax and coxæ; anterior orbits sometimes faintly margined with luteous; palpi whitish; antennæ strongly pale sericeous, brownish beneath and at tips above; posterior margin of the prothorax much depressed and subangular; metathorax finely impressed down the middle; wings hyaline, slightly iridescent, faintly tipped with dusky; wing-cells as in Fig. 8, a; legs fulvous, coxæ black, tips of tarsi dusky; abdomen ovate, convex, subpetiolate, shining, pruinose; apical segment with a smooth, oblong space, surrounded by pale pubescence. Length  $4$ — $4\frac{1}{2}$  lines.

*Male.*—More slender than the ♀; broad frontal orbits, clypeus, except a central black streak, the mandibles and the palpi, white; antennæ long, filiform, brown-black above, pale testaceous beneath, the basal joint white; the coxæ, except the posterior pair above, are fulvous; abdomen sometimes nearly cylindrical, with the apical margins of the segments testaceous, the apical segment more or less whitish. Length  $3\frac{1}{2}$ — $4$  lines.

*Hab.*—New York, Maryland, West Virginia, (Coll. Am. Ent. Soc., and Mr. E. Norton).

Two ♀, two ♂ specimens.

98. *Pompilus (Agenia) calcaratus*, n. sp.

*Male.*—Slender, cylindrical, black, clothed with a fine, whitish pubescence; clypeus truncate in front, white, with a more or less large black spot at base; mandibles generally with a whitish spot near the tip; palpi pale fuscous; antennæ rather short, thick, entirely dull black; prothorax broadly margined posteriorly with white; metathorax rounded, and silvery on the sides and behind; wings hyaline, slightly iridescent, the extreme apex and a faint cloud over the submarginal cells, pale dusky; marginal cell lanceolate; second and third submarginal cells small, subequal, the former quadrate, the latter con-

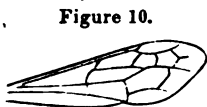
siderably narrowed towards the marginal; legs fulvous; the coxæ, trochanters, base of anterior femora, and the four posterior tarsi, black; anterior coxæ at tips, and the tibial spurs, white; sometimes the four posterior femora and tibiæ are more or less varied with blackish; abdomen subcylindrical, sessile, black, immaculate. Length 3—3½ lines.

*Hab.*—Conn., N. Y., Penna., Ills., (Coll. Am. Ent. Soc. and Mr. E. Norton).

Six ♂ specimens. Allied to *mellipes*, but easily separated by the prothorax being margined with white and by the white tibial spurs.

99. *Pompilus (Agenia) congruus*, n. sp.

*Female.*—Black, covered with very fine, dense, pale sericeous pile, silvery on the thorax beneath and on the coxæ; clypeus very short and transverse, its anterior margin very slightly arcuate; prothorax larger than usual, its posterior margin nearly truncate, very slightly arcuate; metathorax smooth and rounded, silvery on the sides; wings



hyaline, faintly clouded at tip, the wing-cells as in Fig. 10; legs black, strongly sericeous, the anterior tibiæ and tarsi pale in front, coxæ silvery; abdomen short, ovate, convex, sessile, entirely reddish-fulvous, strongly sericeous. Length 5 lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.).

One ♀ specimen. This fine species is remarkable for having the third submarginal cell furnished with an appendiculate nervure at tip, as represented in the above cut, being the only instance of the kind that I have seen in this family.

100. *Pompilus (Agenia) longulus*, n. sp.

*Male.*—Long, narrow, black, opaque; face short, somewhat silvery, clypeus short, very transverse, truncate in front; antennæ long, slender, filiform, entirely black; thorax long, narrow, subdepressed above; prothorax larger than usual, its posterior margin angular; metathorax rounded, somewhat silvery on the sides; wings subhyaline, iridescent, the apical margin fuscous; marginal cell long, sublanceolate; second and third submarginal cells small, the former longest, the latter widest and narrowed towards the marginal; legs entirely black; abdomen rather short, subpetiolate, convex, reddish-fulvous, shining, the extreme base of the first segment black. Length 4½ lines.

*Hab.*—Dakota Territory, (Coll. Am. Ent. Soc.).

One ♂ specimen. Remarkable for the long, narrow form of the body.

101. *Pompilus (Agenia) acceptus*, n. sp.

*Female*.—Robust, entirely and uniformly ferruginous, covered with a very fine, whitish sericeous pile; head large, clypeus large, truncate in front, tips of mandibles blackish; antennæ entirely ferruginous; prothorax large, its posterior margin arcuate; metathorax rounded, with a short, well-impressed line on the basal middle; wings narrow, pale yellowish-hyaline, with three fuscous bands, the middle one the broadest; wing-cells as in Fig. 11; legs long and slender, ferruginous, the four posterior coxæ with a blackish stain beneath; abdomen ovate, convex, subpetiolate, ferruginous, the apical segment with a fuscous spot. Length 5 lines.



Figure 11.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.).

One ♀ specimen. Easily distinguished by the color being entirely ferruginous, and by the trifasciate wings.

(From Cuba and Mexico.)

102. *Pompilus (Agenia) bellus*.

*Pompilus bellus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 124, ♂ ♀.

♂ ♀.—Bright blue, shining; antennæ black; wings hyaline. Length 3—4½ lines.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.).

Two ♀, three ♂ specimens. A beautiful little species, easily recognized by the bright blue color of the body.

103. *Pompilus (Agenia) violaceipes*.

*Pompilus violaceipes*, Cresson, Proc. Ent. Soc. Phil. iv, p. 129, ♀.

*Female*.—Black; thorax and abdomen above ferruginous, the latter strongly tinged with a beautiful violet color; legs deep violet; wings fuscous, the anterior pair with a strong brassy gloss, the tip violet. Length 5½ lines.

*Hab.*—Cuba, (Coll. Am. Ent. Soc.).

One ♀ specimen.

104. *Pompilus (Agenia) macer*.

*Pompilus macer*, Cresson, Proc. Ent. Soc. Phil., iv, p. 125, ♂.

*Male*.—Slender, black, basal half of the abdomen ferruginous; wings subhyaline. Length 2½ lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach). One specimen.

105. *Pompilus (Agenia) mexicanus*, n. sp.

*Female*.—Black, with a dull purplish tinge; somewhat pruinose, clothed with a fine cinereous pile, most dense on the face; head more transverse than usual; clypeus broadly rounded in front; antennæ long, slender, black; thorax robust; posterior margin of the prothorax



nearly transverse, being very slightly arcuate; metathorax rounded, slightly excavated behind; wings hyaline, the extreme apex faintly dusky; wing-cells much as in Fig. 8, *a*; legs dull fulvous, coxæ black, tips of the tarsi blackish; abdomen short, convex, petiolate, polished, pruinose. Length 6 lines.

*Hab.*—Vera Cruz, Mexico, (Coll. Am. Ent. Soc., from Mr. Chas. Sartorius).

Three ♀ specimens. Larger than *mellipes*, to which it is closely allied.

106. *Pompilus (Agenia) subvirescens*, n. sp.

*Female.*—Black; head and thorax rather densely clothed with a golden pubescence, that on the thorax having a beautiful green reflection in certain lights; anterior margin of the clypeus sinuous; antennæ testaceous, dusky at tips; posterior margin of the prothorax depressed and subarcuate; metathorax short, oblique, with a shallow channel down the middle; wings hyaline, slightly tinged with yellowish; wing-cells much as in Fig. 8, *a*; legs luteous; coxæ, trochanters and base of femora black; abdomen ovate, petiolate, convex, polished, the apex with an ovate polished space. Length  $4\frac{1}{2}$  lines.

*Hab.*—Vera Cruz, Mexico, (Coll. Am. Ent. Soc., from Mr. Chas. Sartorius).

One ♀ specimen.

107. *Pompilus (Agenia) aureus*, n. sp.

*Female.*—Black, opaque, with a strong blue and purple reflection; head black, without any blue or purple reflection, face narrow, sericeous, clypeus small, its tip truncate; antennæ black, pale sericeous; prothorax large, its posterior margin angular; the scutellum with a finely impressed line down the middle; metathorax with a very deep channel down the middle, leading into a large and deep excavation at the tip, leaving the posterior angles acute; anterior wings black, with a strong purple reflection, the apical margin darker than the rest of the wing; marginal cell large, the tip obliquely pointed; second submarginal quadrate, receiving the first recurrent nervure beyond the middle; third submarginal narrowed towards the marginal, receiving the second recurrent nervure in the middle; posterior wings clearer, the tips dusky; legs with a strong blue reflection; abdomen oblong-ovate, sessile, convex, with a strong blue and purple reflection. Length 6 lines.

*Hab.*—Vera Cruz, Mexico, (Coll. Am. Ent. Soc., from Mr. Chas. Sartorius).

108. *Pompilus (Agenia) Montezumia*,

*Agenia Montezumia*, Smith, Journal of Entomology, i, p. 397.

"*Male*. Length  $4\frac{1}{2}$  lines.—Black; face with a dense golden pubescence; clypeus transverse, widely emarginate in front; head with a long, thin, black pubescence. Thorax thinly covered with long black pubescence; tips of anterior femora in front, tibiæ in front and their apex rufo-testaceous; wings ample, flavo-hyaline, their apical margins faintly clouded, and with a fuscous fascia crossing the superior pair at the base of the marginal cell. Abdomen subpetiolate, black, with an obscure blue tinge; the apex with a short black pubescence."

*Hab.*—"Oajaca, Mexico." Not seen.

109. *Pompilus (Agenia) orbiculatus*.

*Agenia orbiculata*, Smith, Journal of Entomology, i, p. 397.

"*Female*. Length 6 lines.—Head and thorax black, adorned with golden pile; inner orbits of the eyes, a spot behind them, two spots on the clypeus, mandibles, and third and fourth joints of the flagellum yellow; wings flavo-hyaline, nervures testaceous; legs and abdomen ferruginous, coxæ black; apical joints of tarsi fuscous; basal margins of the segments of the abdomen fuscous.

"*Male*. Length  $4\frac{1}{2}$  lines.—Closely resembles the female, but has the coxæ yellow beneath; abdomen fuscous, apex of the basal segment yellowish, second and third segments with a large yellow spot on each side, the extreme apex reddish-yellow."

*Hab.*—"Mexico." Not seen.

110. *Pompilus (Agenia) œrulipes*.

*Agenia œrulipes*, Smith, Journal of Entomology, i, p. 397.

"*Female*. Length  $5\frac{1}{2}$  lines.—Nigro-æneous, legs steel-blue; five apical joints of antennæ yellow; clypeus transverse, margined anteriorly, and widely emarginate; posterior margin of prothorax curved; metathorax with bright silvery pile at its apex; wings flavo-hyaline; anterior pair with two narrow, brown fasciæ, the basal one crossing at the apex of the externo-medial cell, the second at the base of the marginal cell; apex of the wings with a pale fuscous margin. Abdomen subpetiolate and clothed with golden pubescence. This species when recently disclosed, would probably have the head and thorax clothed with shining yellowish-white pile."

*Hab.*—"Orizaba, Mexico." Not seen.

Genus **FERREOLA**, St. Farg.

The species of this genus are said to have the "antennæ short, thickened, and gradually tapering to a point; the head narrower than the thorax; the prothorax larger than in *Pompilus*, in the males nearly as long as the meso- and metathorax combined; the abdomen sessile and as wide as the thorax." I have not seen any of the described North American species belonging to this genus.

1. ***Ferreola sanguinea*.**

*Ferreola sanguinea*, Smith, Brit. Mus. Cat. Hym. iii, p. 170, ♀.

"*Female*. Length 9 lines.—Thorax and abdomen ferruginous; head, antennæ, legs, and three apical segments of the abdomen, black; the scape of the antennæ ferruginous beneath; wings dark fuscous, the third submarginal cell narrowed towards the marginal, of the same width as the second submarginal; the legs spinose."

*Hab.*—"Georgia."

2. ***Ferreola variegata*.**

*Ferreola variegata*, Smith, Journal of Entomology, i, p. 398, ♀.

"*Female*. Length 5 lines.—Black; the head smooth and shining; the apex of the scape, the basal joint of the flagellum, and the tips of the mandibles, rufo-piceous. Thorax: the metathorax clothed above and at the sides with silvery white pubescence; the coxæ and femora beneath with a thin ashy pile; the wings subhyaline, the base of the superior pair, a fascia in the middle, and a second and a broader one crossing at the marginal cell, dark fuscous. Abdomen: the first segment with silvery pubescence above; the third of a pale dull ferruginous color; beneath, thinly covered with ashy pile,"

*Hab.*—"Mexico."

3. ***Ferreola formosa*.**

*Ferreola formosa*, Smith, Journal of Entomology, i, p. 399, ♀.

"*Female*. Length  $7\frac{1}{2}$  lines.—Black; the head above the insertion of the antennæ, and the pro- and mesothorax above, clothed with a rich fulvo-ferruginous pubescence; the metathorax with silvery-white pubescence, the base and apex black; the thorax beneath and the legs with a silvery-white pubescence; the tibiæ and tarsi spinose; wings subhyaline, mottled and clouded with smoky stains, the apex of the superior wings pale, as well as the base of the posterior pair; a slightly yellowish subhyaline band crosses the anterior pair at the first submarginal cell. Abdomen: the first segment, the base of the second laterally, and the entire under surface with a fine, thin, silvery-white pubescent pile; the second and sixth segments with an obscure-purple lustre, the third and fourth with a rich rufo-fulvous pubescence.

"*Hab.*—Oajaca, Mexico.

"This is one of the most beautiful species of the family Pompilidæ. The variety of its coloring, the brightness of the silvery pile that covers the legs and other portions of the body, and its mottled wings, readily distinguish it from every known species of the genus."

Genus **NOTOCYPHUS**, Smith.

Mr. Smith (*Brit. Mus. Cat. Hym.* iii, p. 172) gives the following characters for this genus:—

"Head as wide as the thorax; eyes large, lateral and ovate; ocelli three, in a triangle on the vertex; antennæ convolute at their apex; the clypeus short and transverse; the *labrum elongate and produced*. The prothorax subelongate, the metathorax elongate; the thorax is rounded anteriorly, and truncate posteriorly. Wings narrower than in

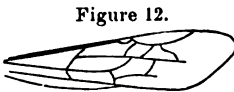


Figure 12.

the genus *Pompilus*; the anterior pair [see Fig. 12] having one marginal and three submarginal cells; the second submarginal cell oblique, and receiving the first recurrent nervure *towards its base*; the third submarginal cell about the same length as the second, much narrowed towards the marginal. Abdomen sessile, acuminate at its apex."

Three species are described from Brazil and two from Mexico. I have not met with any of them.

1. **Notocyphus plagiatas.**

*Notocyphus plagiatas*, Smith, *Journal of Entomology*, i, p. 398, ♀.

"*Female.* Length 1 inch.—Black; the abdomen with a fine, changeable, silky lustre; the head above the insertion of the antennæ and a broad longitudinal stripe on the pro- and mesothorax, the scutellum and post-scutellum, blood-red; the labrum oblong, narrowed towards its anterior margin, which is transverse; the wings very dark brown, with a slight violet iridescence; the legs elongate, very slightly spinose; the claws bifid."

*Hab.*—"Mexico."

2. **Notocyphus albopictus.**

*Notocyphus albopictus*, Smith, *Journal of Entomology*, i, p. 398, ♂.

"*Male.* Length  $4\frac{1}{2}$  lines.—Black, the inner orbits of the eyes, not extending to their summit, the posterior margin of the prothorax, a spot on the scutellum and another on the postscutellum, the apical angles of the metathorax; and the basal half of the third segment of the abdomen, white; the anterior tarsi rufo-testaceous; the body covered with a thin cinereous pile; the wings hyaline, the apical portion of the superior pair, beyond the second submarginal cell, fuscous."

*Hab.*—"Mexico."

Genus **PARAPOMPILUS**, Smith.

*Micropteryx*, St. Farg., Hym. iii, p. 396, (nec *Hübner*).

Mr. Smith says (*Brit. Mus. Cat. Hym.* iii, p. 176,) that this "genus is characterized by having the head compressed, the face forming an oblique plane, the antennæ inserted in deep fossulets on the anterior part of the face; the prothorax longer than in the true *Pompilus*, the metathorax elongate; the wings inserted about the middle of the thorax, the anterior pair having one marginal and three submarginal cells. Abdomen sessile."

Three species are described from Africa, all of which have abbreviated wings, and one from St. Domingo, the wings of which are also short, reaching only to the tip of the second abdominal segment. I have, provisionally, placed under the genus *Pompilus* four species, (*purpuripennis*, *Muriæ*, *legatus* and *elegans*,) all of which may properly belong to this genus; but none of them have abbreviated wings.

**Parapompilus Naomi.**

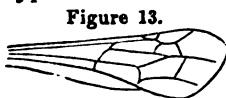
*Parapompilus Naomi*, Smith, *Brit. Mus. Cat. Hym.* iii, p. 177, ♀.

"*Female*. Length 4—6 lines.—Black; the anterior legs, pro- and mesothorax covered with a very short, black, velvety pubescence, which in certain lights has a rich purple iridescence; the second segment of the abdomen has a similar clothing, the third segment has two oblique stripes meeting about the middle of the segment; the other parts of the insect, including the legs, densely coated with very short white pubescence; the metathorax has on each side of its disk a longitudinal waved carina, extending from the base to the apex; the anterior wings hyaline, with a broad, dark, fuscous cloud crossing from the marginal cell, being of the same width as that cell, and leaving the apex clear; the wings extending to the apical margin of the second submarginal segment."

*Hab.*—"St. Domingo." Not seen.

Genus **PLANICEPS**, Latr.

*Head* transversely compressed, wider than the thorax, front flat; antennæ short and stout, more or less convolute in the ♀, straight and thickened in the ♂; inserted in fossulets just above the base of the clypeus. *Thorax* elongate, the prothorax large, subquadrate, flattened



above in ♀; mesothorax and scutellum also flattened in ♀; metathorax moderately short. *Wings* inserted in the middle at the sides of the thorax; the anterior pair (Fig. 13) with one marginal and two submarginal cells; the marginal cell small, sublanceolate; the first submarginal

elongate, more than twice as long as the second, which is large, subquadrate, both side nervures slightly narrowed towards the marginal, and receiving the first recurrent at about the middle; the second recurrent nervure joins the cubital nervure a little beyond the tip of the second submarginal cell. *Legs* short and stout, more or less spinose; anterior femora (♀) much swollen. *Abdomen* subsessile, long and robust in ♀, the apex generally incurved and subcompressed.

The form of the head and prothorax of the females of the genus closely resembles that of *Pompilus*? *purpuripennis*, and three other species which I have doubtfully referred to *Pompilus*.

1. *Planiceps niger*, n. sp.

*Female*.—Entirely black, with a very faint violaceous reflection; tips of mandibles rufo-testaceous; posterior margin of the prothorax nearly straight across or truncate; metathorax abrupt on the sides and behind, with a finely impressed line down the middle; legs beneath, especially the coxæ, brownish sericeous; anterior wings fuliginous, with a violaceous reflection, the apical margin darker; posterior wings subhyaline, dusky at tips. Length 6 lines.

*Hab*.—Connecticut, (Coll. Mr. E. Norton); Georgia, (Coll. Am. Ent. Soc.).

Two ♀ specimens.

2. *Planiceps collaris*.

*Planiceps collaris*, Cresson, Proc. Ent. Soc. Phil. iv, p. 132, ♀.

*Female*.—Black; anterior and posterior margin of the prothorax, and the abdomen entirely, ferruginous; wings fusco-hyaline, the anterior pair with a strong golden reflection. Length 5½ lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.).

One ♀ specimen.

3. *Planiceps cubensis*, n. sp.

*Male*.—Black, densely clothed with a pale sericeous pile; anterior orbits and clypeus silvery; tips of mandibles and the palpi dull testaceous; antennæ short and thickened; posterior margin of the prothorax arcuate, with a broad luteous band; metathorax and coxæ silvery, the former well impressed down the middle; wings hyaline, the apical third fuscous, with a strong golden reflection; wing-cells as in Fig. 13; legs clothed with a dense cinereous pile, rather strongly spinose, tibiæ and tarsi brownish; abdomen narrow, convex, about as long as the thorax, subcompressed at tip, shining, subsericeous. Length 3½ lines.

*Hab*.—Cuba, (Coll. Dr. J. Gaudlach, No. 85).

One ♂ specimen.

4. *Planiceps concolor*.

*Planiceps concolor*, Smith, Journal of Entomology, i, p. 80.

"*Female*. Length 5 lines.—Deep blue, with brilliant reflections in different positions; mandibles obscurely ferruginous; antennæ black; wings beautifully iridescent, the anterior pair dark brown, the posterior pale fusco-hyaline; anterior tarsi rufo-testaceous, the intermediate tibiæ and tarsi slightly spinose; abdomen of a smooth, shining, iridescent blue."

*Hab.*—"Mexico." Not seen.

5. *Planiceps notabilis*.

*Planiceps notabilis*, Smith, Journal of Entomology, i, p. 80.

"*Female*. Length  $7\frac{1}{2}$  lines.—Black, subopaque, convex, with a fine, silky, silvery pile; that on the vertex and disk of thorax has a purple iridescence; mandibles obscurely ferruginous at their apex; scape of the antennæ compressed; posterior ocelli situated on the posterior margin of the vertex; wings very dark and slightly iridescent; intermediate and posterior tibiæ and tarsi slightly spinose. Abdomen: a large subovate, yellowish-white spot on each side of the second and third segments, and a single one at the base of the apical segment."

*Hab.*—"Mexico." Not seen.

Genus *APORUS*, Spinola.

"*Head* subrotund, a little wider than the thorax; eyes lateral and ovate; the stemmata in a triangle on the vertex; the antennæ inserted forward on the face at the base of the clypeus; the labrum concealed. *Thorax* elongate, the prothorax as long as the metathorax; the wings inserted in the middle at the sides of the thorax; *the superior pair* [Fig.

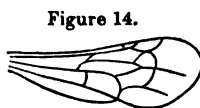


Figure 14. 14] *with one marginal and two submarginal cells; the marginal cell small; the first submarginal elongate, twice as long as the second, which is subquadrate, and receives both the recurrent nervures, the first at about one-third from its base, the second uniting with the second transverse cubital nervure; legs of moderate length, the anterior tarsi not ciliated. Abdomen elongate-ovate.*"—Smith, *Catal. Brit. Acul. Hym.* p. 78.

*Aporus fasciatus*.

*Aporus fasciatus*, Smith, Cat. Hym. Br. Mus. iii, p. 175.

"*Male*. Length 4 lines.—Black; the face covered with short silvery pubescence, the cheeks and the thorax have a similar clothing, on the pro- and mesothorax it is very thin, but dense on the metathorax, sides, coxæ and femora beneath; wings hyaline, their apical margins clouded. Abdomen: the apical margins of the first and three

following segments have fasciæ of silvery pubescence; the apical segment pale testaceous."

*Hab.*—"Warm Springs, South Carolina." Not seen.

Genus **CEROPALES**, Latr.

*Head* transverse, wider than the thorax, sometimes compressed; antennæ thickened, not convolute in the ♀; labrum exerted. *Thorax* gibbous; scutellum prominent; metathorax short and inclined. *Wings* with one marginal and four submarginal cells; marginal cell long, lanceolate; second submarginal cell generally elongate-quadrate, sometimes regularly quadrate, receiving the first recurrent nervure beyond the middle; third submarginal large, much narrowed towards the marginal, receiving the second recurrent nervure before the middle; the fourth submarginal cell extending to the apex of the wing. *Legs* stout, entirely or almost destitute of spines; posterior legs very long. *Abdomen* ovate, convex, subsessile.

The species of this genus are distinguished from those of *Pompilus* by having the antennæ of both sexes porrect and thickened, never convolute, and by having the posterior legs much longer, sometimes disproportionately long.

1. *Ceropales bipunctata*.

*Ceropales bipunctata*, Say, Long's Second Exped. ii, p. 334.

*Female.*—Black, more or less sericeous; anterior orbits not reaching the summit of the eyes, yellowish-white; the clypeus with a small whitish spot on each side, sometimes wanting; antennæ as long as the head and thorax, the basal joint with a whitish line beneath; one specimen has a faint yellowish dot on the post-scutellum; metathorax abruptly truncate behind, the posterior angles with a whitish spot; wings violaceous-black, paler at tips; legs black, strongly silvery-sericeous, the posterior femora, except base and apex, rufo-ferruginous; abdomen immaculate. Length 5—8 lines.

*Male.*—Closely resembles the ♀, but the face, spot between the antennæ, clypeus, labrum, and two basal joints of the antennæ beneath are yellow; the posterior orbits have a faint yellowish line; the posterior margin of the prothorax has a yellow line, sometimes slightly interrupted in the middle; two specimens have a yellow spot on the post-scutellum, and the front tibiæ and tarsi are more or less ferruginous; otherwise like the ♀. Length 6 lines.

*Hab.*—Connecticut, New York, Delaware, Georgia, Illinois, Canada, (Coll. Am. Ent. Soc. and Mr. E. Norton).

Twelve ♀, four ♂ specimens. Easily recognized by the black body and legs, and red posterior femora.



2. *Ceropales nigripes*, n. sp.

*Female*.—Black, opaque, somewhat sericeous; narrow anterior orbits, small spot on each side of the clypeus, and a very narrow, faint line on the posterior orbits, white; antennæ rather short, not as long as the head and thorax; post-scutellum with a white spot; extreme posterior angles of the metathorax with a lunate white spot; wings blacker than in *bipunctata*, the violaceous reflection more brilliant; legs *entirely* black, sericeous, especially the coxæ beneath; abdomen immaculate. Length 7 lines.

*Hab.*—Dakota Territory, (Coll. Am. Ent. Soc.).

One ♀ specimen. Differs from *bipunctata* only by the shorter antennæ, and by the legs being *entirely* black.

3. *Ceropales longipes*.

*Ceropales fasciata*, Say, Long's Second Exped. ii, p. 333, (nec *Fabr.*)

*Ceropales longipes*, Smith, Brit. Mus. Cat. Hym. iii, p. 179, pl. 4, fig. 2.

*Ceropales frigida*, Smith, Brit. Mus. Cat. Hym. iii, p. 180.

*Female*.—Black; clypeus, a spot above, labrum, mandibles, and orbits of the eyes, interrupted on the summit, a spot on the two basal joints of the antennæ beneath, posterior margin of the prothorax, as well as a spot on each anterior angle, a short longitudinal line on the disk of the mesothorax, a dot on the scutellum, a spot on each posterior angle of the metathorax followed by an angular line, and a triangular spot on each side of the thorax, above the intermediate coxæ, all lemon-yellow; metathorax silvery sericeous in certain lights; wings hyaline, the tips dusky; legs honey-yellow, posterior pair very long; coxæ black, the two anterior pair yellow in front, the posterior pair honey-yellow at tips and with an exterior yellow stripe; tarsi yellow; extreme base of the joints of the posterior pair blackish; abdomen shining, black, first segment with a rather large yellow spot on each side; four following segments each with a waved, transverse line, slightly interrupted in the middle, and dilated into an ovate spot on each extreme side, the fascia on the fifth segment is broadest; sixth segment with a large yellow spot, nearly occupying the whole segment in one specimen; venter immaculate. Length 4—5 lines.

*Hab.*—Florida, (Coll. Mr. E. Norton); Illinois, (Coll. Am. Ent. Soc.).

Two ♀ specimens. A very handsome species, easily recognized by the black body, and honey-yellow legs, the posterior pair of which are unusually long.

4. *Ceropales Robinsonii*, n. sp. (Fig. 15.)

*Male*.—Black, polished, impunctured; face silvery; orbits, broader in front, face, spot above antennæ, clypeus, labrum, mandibles and



*Ceropales Robinsonii*, ♂.

palpi, lemon-yellow; antennæ longer than usual, thickened beyond the middle, black, the three basal joints yellow, tinged with ferruginous above; posterior margin of the prothorax, as well as a spot on each anterior angle, a spot on the posterior middle of the mesothorax, another on the scutellum and post-scutellum, a transverse line on each extreme posterior angle of the metathorax, and a spot on each side of the thorax just above the intermediate coxæ, all lemon-yellow; pleura and metathorax silvery-sericeous, the latter much flattened behind; wings hyaline, slightly tinged with yellowish, iridescent; legs honey-yellow, the posterior pair longer than usual; the coxæ spotted with yellow, tips of the femora, the anterior tibiæ, tips of the intermediate pair and all the tarsi, yellow; tips of the tarsi, and the incisures of the posterior pair, blackish; abdomen honey-yellow, an ovate yellow spot on each side of the second, third and fourth segments, much larger on the second; venter immaculate. Length 4 lines.

*Hab.*—West Virginia, (Coll. Am. Ent. Soc.).

One ♂ specimen. This is the most elegant species of *Ceropales* that I have seen, and it gives me great pleasure to dedicate it to my kind and generous friend, Coleman T. Robinson, of New York, in whom American Entomology finds a most liberal patron.

5. *Ceropales fraternæ*.

*Ceropales fraternæ*, Smith, Brit. Mus. Cat. Hym. iii, p. 180, ♀.

*Female*.—Black; orbits broad in front and interrupted on the summit, clypeus, except a longitudinal black spot in front, and the labrum lemon-yellow; antennæ robust, rather long, the two basal joints beneath more or less yellowish; thorax opaque, with numerous deep punctures; posterior margin of prothorax, as well as a spot on each anterior angle, a spot on scutellum, sometimes wanting, a transverse line on post-scu-

tellum, a spot on the posterior angles of metathorax, and a spot on each side of the thorax just above the intermediate coxæ, sometimes wanting, all lemon-yellow; wings hyaline, sometimes stained with yellowish, extreme tips dusky; legs black; a stripe on the anterior coxæ, most of the intermediate pair, tips of the posterior pair and an exterior stripe, tips of all the femora, and the four anterior tibiæ exteriorly, lemon-yellow; the four anterior tibiæ beneath and their tarsi are generally pale brownish; the posterior legs are sometimes entirely brown or reddish-brown, with the femora not tipped with yellow, and sometimes their tibiæ are more or less yellow at base; posterior legs not disproportionately long, as in the preceding species; abdomen with a broad yellow band on each of the four basal segments, that on the first segment is sometimes more or less interrupted in the middle; fifth and sixth segments more or less yellow; venter immaculate. Length 3—5½ lines.

*Male*.—Closely resembles the ♀, but the clypeus is entirely yellow, and the first segment of the abdomen has a large ovate spot on each side, except in one specimen, which has a broad band, constricted and slightly interrupted in the middle. Length 2½—5 lines.

*Hab.*—Mass., Conn., N. Y., Peuna., West Va., Ills., Colorado Terr., (Coll. Am. Ent. Soc. and Mr. E. Norton).

Twelve ♀, six ♂ specimens. The legs of this species vary much in color, and the markings of the body are sometimes yellowish-white; the abdominal fasciæ are generally very broad in the ♀, sometimes wavy, and more or less emarginate on each side anteriorly.

#### 6. *Ceropaltes cubensis*.

*Ceropaltes cubensis*, Cresson, Proc. Ent. Soc. Phil. iv, p. 132, ♀.

*Female*.—Black; head, thorax and legs silvery-sericeous; orbits, very broad in front, face beneath antennæ, a spot between them, the clypeus and labrum, pale yellowish; two basal joints of antennæ more or less yellowish beneath; prothorax with a spot on each side, and its posterior margin, spot on scutellum, and a transverse one on the post-scutellum, and the extreme posterior angles of the metathorax, pale yellowish; mesothorax with deep, close punctures; wings hyaline, dusky at tips; legs ferruginous, the four anterior coxæ black, more or less yellowish beneath; posterior tarsi very long, fuscous; basal segment of abdomen with a sublunate pale yellowish spot on each side; remaining segments each with an apical pale yellowish fascia, very broad on each extreme side, deeply emarginate anteriorly on each side of the middle, and more or less dilated on the disk; the fasciæ are

sometimes more or less interrupted on the middle or on each side. Length  $3\frac{1}{2}$ —4 lines.

*Male*.—Like the ♀, with the anterior tibiæ and tarsi, and base of the intermediate tarsi, pale yellowish; the coxæ are ferruginous, the two anterior pair yellowish beneath; the fasciæ on the second and third abdominal segments are widely interrupted in the middle. Length  $3\frac{1}{2}$  lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.).

Three ♀, and one ♂, specimens examined.

#### 7. *Ceropales clypeata*.

*Ceropales clypeatus*, Cresson, Proc. Ent. Soc. Phil. iv, p. 133, ♀.

*Female*.—Black; clypeus, except a black central spot, the palpi, posterior margin of prothorax, and tegulæ, yellowish white; basal joint of antennæ ferruginous beneath; wings whitish-hyaline, with a small, pale fuscous cloud near the apex; legs ferruginous, posterior tarsi fuscous, tibial spurs white; abdomen piceous-black, immaculate, the basal segment tinged with obscure ferruginous. Length 3 lines.

*Hab*.—Cuba, (Coll. Dr. J. Gundlach). One ♀ specimen.

#### 8. *Ceropales agilis*.

*Ceropales agilis*, Smith, Journal of Entomology, ii, 269, ♀.

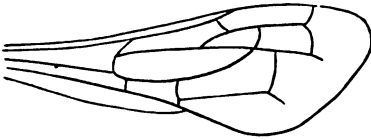
*Female*. Length  $3\frac{1}{2}$  lines.—Black; inner orbits of the eyes, sides of the clypeus broadly, and outer orbits of the eyes narrowly, white; a line on the scape in front, and basal joint of flagellum in front, white; head punctured before the ocelli, being smooth and shining behind; posterior margin of prothorax, tubercles, spot on scutellum, post-scutellum, and posterior lateral angles of metathorax, white; mesothorax with scattered punctures, its anterior margin with a series of very short, fine striæ; sides of metathorax with silvery pile; legs ferruginous, posterior pair elongate; coxæ black; apical joints of intermediate and posterior tarsi fuscous; wings hyaline, nervures black; abdomen ferruginous, with the base fuscous above."

*Hab*.—"Mexico." Not seen.

Genus **MYGNIMIA**, Smith.

For this genus, Mr. Smith (*Brit. Mus. Cat. Hym.* iii, p. 182) gives the following characters: "The superior wings [Fig. 16] with one

Figure 16.



elongate marginal cell and three submarginal cells; the first recurrent nervure uniting with the second transverso-cubital nervure; the second recurrent nervure entering the third submar-

ginal cell about one-third from its base; the legs strongly serrate or spinose, the claws having a tooth beneath more or less developed, in some species as stout as the claws themselves." All the species described are from the Old World, except the following:—

1. **Mygnimia mexicana**, n. sp.

*Female*.—Large, deep black, without any violaceous or purplish reflection; head and thorax opaque, abdomen shining; antennæ pale-yellowish, the scape and base of flagellum, black; wings deep bright-yellow, the anterior pair tinged with bright ferruginous; the extreme apex of both wings fuliginous; metathorax transversely rugose, truncate behind. Length 10—12½ lines.

*Hab.*—Vera Cruz, Mexico, (Coll. Am. Ent. Soc., from Mr. Chas. Sartorius).

Four ♀ specimens. Differ from the description, given below, of *ustulata* by the much larger size, by the color not being violaceous-black, and by the yellow antennæ.

2. **Mygnimia ustulata**.

*Hemipepsis ustulata*, Dahlb., *Hym. Eur.* i, p. 123.

*Mygnimia ustulata*, Smith, *Brit. Mus. Cat. Hym.* iii, p. 189.

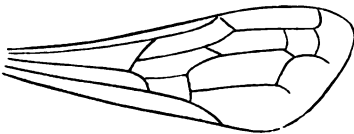
"*Female*.—Medium (¾ inch long), violaceous-black; wings fulvous, somewhat golden, base and apex dark fuliginous."

*Hab.*—"Mexico." Not seen.

Genus **PEPSIS**, Fabr.

This genus is characterized by having the wing-cells arranged as in Fig. 17. The antennæ are convolute in the ♀; long, porrect and

Figure 17.



incrassate in the ♂; the four posterior tibiæ are serrated in the ♀, simple in the ♂, which have the posterior legs very long in proportion to the two anterior pairs, and have the joints of their tarsi flat.

The species are of large size, and most of them are very handsome.

(From the United States.)

1. *Pepsis formosa*.*Pompilus formosus*, Say, West. Quar. Rep. ii, p. 76; American Entomology, Plate 42.

*Female*.—Black, with a bluish or greenish reflection; clypeus arcuate in front; antennæ black, sericeous; metathorax abruptly truncate behind, the verge of the truncation strongly carinate, the disk above transversely striated, with a shallow channel down the middle, and a longitudinal carina on each side, just before the stigmata; wings bright fiery fulvous, the apical margins paler, the extreme base black; abdomen shining, with a very strong blue or violet reflection; apex hairy. Length 13—18 lines.

*Hab*.—Texas, California, (Coll. Am. Ent. Soc.).

Two ♀ specimens.

2. *Pepsis dubitata*, n. sp.

*Female*.—Velvety-black, with a more or less brilliant purple reflection, less obvious on the head and thorax; antennæ orange-yellow, the two basal joints black; metathorax transversely striated; wings uniformly black, violaceous, the extreme tip slightly paler. Length 13 lines.

*Male*.—More slender than the ♀, with the purple reflection more uniform over the body; antennæ long and thick; abdomen *entirely* black, with the purple or violet reflection more brilliant than on the rest of the body. Length 10 lines.

*Hab*.—Georgia, (Coll. Am. Ent. Soc.).

One ♀, four ♂ specimens. This may be identical with *elegans*, but none of the ♂ specimens have the slightest indication of reddish margins to their segments.

3. *Pepsis elegans*.*Pepsis elegans*, St. Farg., Hym. iii, p. 489, ♂. Smith, Brit. Mus. Cat. Hym. iii, p. 201, ♀.

*Male*.—Antennæ thick, yellow; the two basal joints black; head and thorax black, without any reflection; disk of the metathorax with a few transverse striæ; abdomen bluish-black, covered with a short, dense bluish-black pubescence; posterior margin of the second, third, fourth, fifth and sixth segments narrowly ferruginous; legs black, with black hairs; wings black, violaceous, the posterior margin paler.—*St. Furgeau*.

The *female* is similarly colored to the *male*, but is usually more brilliant in color, the abdomen being sometimes of a rich purple, owing to the beautiful iridescence of the short pubescence or pile which clothes it; the red margin of the abdominal segments of the male, as described

by St. Fargeau, is attributable to the iridescence of the pile, and is most observable in sunlight.—*Smith*.

*Hab.*—"Pennsylvania; Georgia." Not seen.

4. *Pepsis cyanea*.

*Sphex cyanea?* Linn., *Amœn. Acad.* vi, p. 412; *Syst. Nat.* i, p. 941.

*Pepsis cyanea*, Fabr., *Ent. Syst.* ii, p. 201; *Syst. Piez.* p. 211. Beauv., *Ins. Afriq. et Amér.* p. 38, pl. 1, fig. 3.

"Body, antennæ and legs nigro-cyaneous; abdomen and wings blue, apex fuscous, somewhat pale."

*Hab.*—"United States."—(*Beauv.*).

Not seen.

5. *Pepsis luteicornis*.

*Pepsis luteicornis*, Fabr., *Syst. Piez.* p. 214. Beauv., *Ins.* p. 39, pl. 1, fig. 5. St. Farg., *Hym.* iii, p. 481.

"*Female*.—Black; antennæ yellow, the two basal segments black; disk of metathorax transversely striated; abdomen black, opaque; wings black, opaque, without any reflection. Length 14 lines."—(*St. Fargeau.*)

*Hab.*—"South Carolina."—(*Beauv.*)

Not seen. This species is generally found in South America, and the locality given by Beauvois may be erroneous. The color appears to be black, without any reflections of blue or purple.

(From the West Indies, Mexico and Panama.)

6. *Pepsis marginata*.

*Pepsis marginata*, Beauv., *Ins. Afriq. et Amér.* p. 94, pl. 2, fig. 2, ♀, 3, ♂. St. Farg. et Serv. *Ency. Méth.* x. 64. St. Farg., *Hym.* iii, p. 470. Guér. LaSagra's *Hist. Cuba, Ins.* p. 761. Cresson, *Proc. Ent. Soc. Phil.* iv, p. 133.

"*Female*.—Black, velvety, with a more or less strong violet or purple reflection over the body and legs; antennæ brown sericeous, black at base; metathorax transversely striated, with a shallow channel down the middle; wings bright fulvo-ferruginous, somewhat golden, the extreme base black, and the apical margin of both anterior and posterior pair fuliginous, violaceous. Length 9—23 lines.

"*Male*.—More slender than the female, with the wings more broadly black at base and at tip. Length 12—16 lines.

*Hab.*—Cuba, (*Coll. Am. Ent. Soc.*).

Five ♀, four ♂ specimens. Easily recognized by the bright golden ferruginous wings broadly margined with blackish. It varies very much in size.

7. *Pepsis Montezuma*.

*Pepsis Montezuma*, Smith, Brit. Mus. Cat. Hym. iii, p. 199, ♂ ♀.

"*Female*. Length 16 lines.—Black; head, thorax, abdomen and legs adorned with a rich blue iridescent pile, most vivid on the abdomen; thorax having shades of metallic-green and black in certain lights; head, thorax and coxæ have a scattered, long, loose, black pubescence; antennæ, mandibles and palpi black; metathorax having a transverse, rugose, waved striation, and a central abbreviated, longitudinal depression, and on each side at base and apex an obtuse tubercle; wings reddish-yellow, having a broad fuscous stain at base, the apical margins having a paler cloud at their apex, not extending to the third submarginal cell in width; abdomen of a splendid blue, the pubescence at the apex black.

"*Male*. Length 12 lines.—In color chiefly resembling the female, but the abdomen is bright violet, and the wings are paler; fourth segment of abdomen beneath has on each side a floccus of long curled hair."

*Hab.*—"Mexico."

Not seen. It must be very closely allied to *marginata*.

8. *Pepsis domingensis*.

*Pepsis Domingensis*, St. Farg., Hym. iii, p. 477, ♂.

"*Male*.—Head black, covered with a bluish-black pubescence; antennæ black; thorax black, covered with a bluish-black pubescence; disk of the metathorax convex; abdomen covered with a bluish-black pubescence; legs bluish-black; wings ferruginous, their base blackish, as well as the apex, which is broadly blackish, with a violaceous reflection; stigma, costa and tegulæ black. Length 15 lines.

*Hab.*—"St. Domingo." Not seen. Also closely allied to *marginata*.

9. *Pepsis Sommeri*.

*Pepsis Sommeri*, Dahlb., Hym. Eur. i, p. 465.

*Female*.—Large, velvety black, with a blue reflection changing to green when viewed in certain lights; antennæ brown-sericeous; disk of the metathorax transversely striated; wings fulvo-ferruginous, the basal third of the anterior pair, the basal half of the posterior pair, and the apical margins of both pairs, black; legs with a strong blue reflection; abdomen smooth and shining, the blue and green reflections more brilliant; the head, metathorax and apex of abdomen clothed with black hairs. Length 21 lines.

*Hab.*—Vera Cruz, Mexico, (Coll. Am. Ent. Soc., from Mr. Chas. Sartorius).



One ♀ specimen. This beautiful species may be at once recognized by the wings being broadly black at base. It is closely allied to *Montezuma* Smith.

10. *Pepsis cœrulea*.

*Sphex cœrulea*, Linn., Syst. Nat. i, p. 947. Fabr. Ent. Syst. ii, p. 219.

*Sphex auripennis*, DeGeer, Ins. iii, p. 585.

*Sphex rubra*, Drury, Ins. ii, p. 75, pl. 39, fig. 6.

*Pepsis cœrulea*, Fabr., Syst. Piez. p. 214. St. Farg., Hym. iii, p. 475.

*Pepsis speciosa*, Beauv., Ins. Afric. et Amér. p. 95, pl. 2, fig. 5.

*Pepsis cœrulea*, Smith, Brit. Mus. Cat. Hym. iii, 190.

"*Female*.—Head covered with a bluish-black pubescence, and with black hairs; antennæ black; thorax with bluish-black pubescence; disk of the metathorax with a longitudinal channel; abdomen with bluish-black pubescence, the anus with black hairs; legs black, the hairs bluish-black, the spines black; wings ferruginous, the tip discolored, a fuscous cloud before the apex; nervures ferruginous. Length 15 lines."—*St. Fargeau*.

*Hab*.—"Mexico, St. Domingo." Not seen. Distinguished from *marginata* by having the tips of the wings clear.

11. *Pepsis sulphureicornis*.

*Pepsis sulphureicornis*, Beauv., Ins. p. 95, pl. 2, fig. 6.

"Blue; antennæ pale yellow; wings ferruginous, apex obscure, sub-fuscous."

*Hab*.—"St. Domingo." Not seen.

12. *Pepsis castanea*.

*Pepsis castanea*, Beauv., Ins. p. 95, pl. 2, fig. 4.

"Black, with a violet reflection; antennæ, except base, tibiæ and tarsi, testaceous; first segment of abdomen with a yellow band; wings rufous."

*Hab*.—"St. Domingo." Not seen.

13. *Pepsis quadrata*.

*Pepsis quadrata*, St. Farg., Hym. iii, p. 478, ♂.

*Male*.—Slender, black, with a beautiful, deep blue iridescent pile; antennæ black; wings black, strongly violaceous, the extreme apex of the anterior pair hyaline; a large, irregular, ferruginous patch in the middle of each anterior wing, and a dot of the same color in the costal middle of the posterior pair; legs blue-black; abdomen slender, sub-petiolate, blue-black. Length  $9\frac{1}{2}$  lines.

*Hab*.—Island of St. Thomas, (Coll. Mr. E. Norton).

One ♂ specimen. This is a beautiful and easily recognized species.

14. *Pepsis ignicornis*.

*Pepsis ignicornis*, Cresson, Proc. Ent. Soc. Phil., iv, p. 134. ♂.

*Male*.—Black; abdomen with a purple-blue reflection; antennæ, except extreme base, fulvo-ferruginous; wings blackish-violaceous, with a large, irregular ferruginous mark about the costal middle. Length  $9\frac{1}{2}$  lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.).

One ♂ specimen. Resembles *quadrata*, but is distinct by the yellow antennæ and by the apex of the wing not being clear.

15. *Pepsis ruficornis*.

*Sphex ruficornis*, Fabr., Ent. Syst. ii, p. 219.

*Pepsis ruficornis*, Fabr., Syst. Piez. p. 215. Beauv., Ins. p. 94, pl. 2, fig. 1. St. Farg. and Serv., Ency. Méth. x, p. 64. Dahlb., Hym. Eur. i, p. 119. St. Farg., Hym. iii, p. 480. Cresson, Proc. Ent. Soc. Phil. iv, p. 134.

♂ ♀.—Black, with a very brilliant purple or violet reflection over the body, legs and wings; antennæ bright orange-yellow, the two basal joints black; metathorax transversely striated, with a finely impressed channel down the middle; wings uniformly blackish-fuscous, with a very brilliant purple or violet reflection. Length 7—14 lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.).

Six ♀, seven ♂ specimens.

16. *Pepsis ornata*.

*Pepsis ornata*, St. Farg., Hym. iii, p. 486. Guér. LaSagra's Hist. Cuba, Ins. p. 761. Cresson, Proc. Ent. Soc. Phil. iv, p. 133.

*Pepsis terminata*, Dahlb., Hym. i, p. 120.

♂ ♀.—Black, velvety, with a rich purple or violet reflection over the body, legs and wings; head and thorax sometimes tinged with greenish; antennæ brown-sericeous, black at base; metathorax transversely striated, channeled down the middle and slightly truncate, the truncation transversely striated; wings dark fuscous or black, purple or violaceous, blackish at base and whitish at tip. Length 12—24 lines.

*Hab*.—Cuba, (Coll. Am. Ent. Soc.).

Four ♀, five ♂ specimens.

17. *Pepsis prismatica*.

*Pepsis prismatica* Smith, Brit. Mus. Cat. Hym. iii, p. 200, ♂.

“*Male*. Length 10 lines.—Black; antennæ of an orange-red, having three or four of the basal and apical joints fuscous; labrum, mandibles and palpi, nigro-fuscous; the entire insect exhibiting in different lights beautiful prismatic colors, of blue, purple and violet; wings

nearly black, with a slight blue and green iridescence; metathorax transversely strigose; abdomen subpetiolate."

*Hab.*—"Mexico." Not seen.

18. *Pepsis amethystina*.

*Sphex amethystina*, Fabr., Ent. Syst. ii, p. 210.

*Pepsis amethystina*, Fabr., Syst. Piez. p. 215. Beauv., Ins. p. 38, pl. 1, fig. 2.

"Obscure blue; head, mandibles, antennæ and legs black; abdomen subsessile."

*Hab.*—"St. Domingo."

Not seen. Mr. Smith (*Brit. Mus. Cat. Hym.* iii, p. 199) gives the above first two references also to a *Pompilus amethystinus* from Brazil, (*ib.* p. 148).

19. *Pepsis saphirus*.

*Pepsis saphirus*, Beauv., Ins. p. 39, pl. 1, fig. 4.

"Blue, antennæ yellow."

*Hab.*—"St. Domingo." Not seen.

20. *Pepsis obscura*.

*Pepsis obscura*, St. Farg., Hym. iii, p. 490. Smith, Trans. Ent. Soc. London, 3d series, i, p. 36.

"*Female.*—Antennæ black, [tips yellow—*Smith*]; head and thorax bluish-black, changing to green on the latter; scutellum strongly elevated; disk of metathorax transversely striated, with a medial impressed line terminated by a transverse carina; abdomen bluish-black, changing to green; legs bluish-black; wings black, violaceous."

"*Male.*—All the parts violaceous-black, changing to obscure green; wings with a golden-green reflection; remainder as in the female."

*Hab.*—"Panama."—(*Smith.*) Not seen.

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Since the description of *Aporus fasciatus* ♂, given above on page 137, was printed, I have discovered what seems to be the female of that species, the characters of which may be thus enumerated:

*Aporus fasciatus*, Smith.

*Female.*—Black, smooth and shining; face, clypeus, base of mandibles, cheeks and occiput, covered with a dense silvery pile; tips of mandibles brownish; antennæ short, black, the scape silvery beneath; prothorax, mesothorax behind, scutellum, metathorax, and the whole thorax on the sides and beneath, covered with a dense silvery pile; a transverse black band on the posterior submargin of the prothorax, the

posterior margin of which is slightly arcuate, nearly transverse; metathorax smooth and subconvex above, broadly emarginate behind, leaving the posterior angles prominent and subacute; wings hyaline, the apical margin of the anterior pair fuliginous; the second submarginal cell is much longer than that represented in Fig. 14, (which represents the anterior wing of *A. dubius* of Europe), being nearly twice longer than broad, and receives both recurrent nervures, one near the base and the other near the apex; the legs covered with silvery pile, the four posterior tibiæ and tarsi strongly spinose; abdomen sessile, convex; first segment entirely silvery; the apical margins of the second, third, fourth and fifth segments, broadly silvery, and dilated anteriorly on the middle and sides; apical segment black. Length  $4\frac{1}{2}$  lines; expanse of wings 7 lines.

*Hab.*—Georgia, (Coll. Am. Ent. Soc.).

One ♀ specimen.

The following species should follow after *Mygymia ustulata*, on page 143:—

3. *Mygymia panamensis*, n. sp.

*Female.*—Dark metallic green; antennæ brown, the apical half pale fulvous; mandibles black; palpi blackish; metathorax opaque black, with dense, deep, transverse striæ, a central channel, and a longitudinal elevation on each side behind the stigmata; wings blackish-fuscous, the apex whitish; legs black, with bluish-green reflections, anterior tibiæ and tarsi brownish, posterior tibiæ serrated on the exterior edge; abdomen shining, green, with a faint bluish reflection at base; apical segment brownish, pilose. Length 14 lines.

*Hab.*—Panama, (Coll. Mr. E. Norton).

One ♀ specimen. This may not belong to *Mygymia*, as the first recurrent nervure does not quite unite with the second transverso-cubital nervure.

Description of a new **PSEUDOMORPHA** from California, with notes on the  
**Pseudomorphidæ.**

BY GEO. H. HORN, M. D.

[Communicated June 10th, 1867.]

The species described in the present paper was found by myself in Owen's Valley, California, on the flowers of the Lupin (*Astragalus*). It was subsequently collected by Dr. Cronkhite, Ass't. Surg. U. S. A., in the same region, and this, with other interesting species, sent me for examination. These insects are not easy to obtain, as they are provokingly agile. The same fact has been noticed in our eastern species by Dr. Zimmerman, of Columbia, S. C., who has occasionally seen a few specimens without being able to catch them.

**PSEUDOMORPHA**, Kirby.

*P. Cronkhitei*, elongato-ovalis, modice depressa, brunneo-castanea, nitida, vix punctata, thorace latitudine duplo longiore, lateribus rotundatis, marginatis et margine parce fimbriolata, angulis posticis obtusis, elytris subparallelis, margine parce fimbriata; subtus ferruginea. Long .35.

This species may be readily known by its smoothness, being almost entirely free from punctures, except near the lateral margin of the thorax, where but few exist. The thorax is scarcely broader than the elytra, slightly emarginate in front, truncate behind, sides ciliate with short hairs, margin broader anteriorly. Elytra impunctured, subparallel, slightly ciliate. Beneath ferruginous. The third, fourth and fifth abdominal segments have each a transverse pilose spot near the middle, which may indicate sexual differences. The specimens in my collection, three in number, are all alike and exhibit among themselves no differences of a sexual nature.

I dedicate the species with great pleasure to Dr. Cronkhite, whose liberality has aided me greatly in the study of the Coleoptera of California and Oregon. The discovery of a species of this genus in California is remarkable and adds another fact to the already inexplicable law of distribution of genera in Australia, South America and California.

There is no group among the Carabidæ, as at present recognized, presenting so many anomalies as that to which this insect belongs;

consequently diverse opinions have been expressed regarding its systematic position. The most striking peculiarity at first sight is their form. They resemble anything else but Geodephagous Adephaga, while on the contrary, without an examination of the legs, any of the species of *Sphallomorpha* or *Silphomorpha* would be considered aquatic entomophaga related to *Gyrinus*. This similarity has been adverted to by Westwood (*Trans. Linn. Soc.* xviii, p. 409), in an interesting paper on relations between various families and orders of insects, in which several new genera and species were described, and those of a form still more removed from the type of Carabidæ than *Pseudomorpha*. *Adelotopus* is, however, the most abnormal, not only in form but also in structure as seen notably in the antennæ. The idea that these insects should constitute a family apart of equal value with Carabidæ, Dytiscidæ and Gyrinidæ, has been put forward by Mr. E. Newman, (*Entomologist*, p. 365, et seq.) without stating any special characters, mentioning only that, as *Pseudomorpha* is the first genus described, its characters should be those of the proposed family. Westwood, Lacordaire and others dissent from the opinion of Newman, and prefer to retain the Pseudomorphidæ among the Carabidæ as a tribe, though equally out of place wherever it may be interpolated.

Certain peculiarities in these insects have been pointed out by Dr. LeConte (*Class. Coleop. N. A.* p. 15), which appear to have been overlooked by the European writers such as the form and position of the eyes and the form of the posterior coxæ. The eyes are more or less irregular in outline, either truncate on one side or angulated. They are really confined to the upper side of the head; for the margin of the head appears to dip down under the eye and form a floor to the eye. The margin of this plate is at times thickened, as in *Adelotopus*, and appears to be a canthus dividing the eyes into two, as in *Gyrinus*. The error of considering the eyes double is still further aided by the smoothness of this portion of the head under the eyes. Lacordaire allowed himself to fall into the error of describing the eyes of *Adelotopus* as being divided into two by a slender canthus.

The posterior coxæ show considerable divergence from the true Carabideous type, being contiguous on the median line and of a form more nearly resembling the Dytiscidæ. The articular lobe is narrow, and the points with which the thighs are articulated are at the tips of these lobes, and more nearly approximated than in the Carabidæ. In the Carabidæ the articular lobe is broader, and permits the femoral articulation rather externally than at the tips.

The very narrow separation of the middle coxæ, and the connate mentum and gula, are characters not without some value in the isolation of the Pseudomorphidæ as a separate family. The narrow separation of the middle coxæ is not however a constant character in this family. In the species just described these coxæ are as widely separated as in many species of *Platynus*.

The form of the antennæ of *Adelotopus*, and the number of abdominal segments in *Hydroporomorpha*, though very anomalous characters, cannot assist materially in the establishment of the family, each character being found singly in the genera named. The principal character, therefore, will be found in the contiguity of the posterior coxæ, and the consequent separation of the metasternum from the abdominal segments.

The relationships of the Pseudomorphidæ with the Carabidæ and Dytiscidæ may be thus tabulated:—

**Legs cursorial.**

Metasternum attaining the abdomen; hind coxæ separated.

Antennæ inserted on the front.....**Cicindelidæ.**

Antennæ inserted under the margin of the front.....**Carabidæ.**

Metasternum not attaining the abdomen; hind coxæ contiguous.

Metasternal parapleuræ attaining the abdomen.....**Pseudomorphidæ.**

Metasternal parapleuræ not attaining the abdomen...**Amphizoidæ.**

**Legs natatorial.**

Eyes two; antennæ filiform.....**Dytiscidæ.**

Eyes four; antennæ irregular.....**Gyrinidæ.**

From the above table it will be seen that the Pseudomorphidæ form a link from the Carabidæ through Amphizoidæ to the Dytiscidæ, with undoubted tendencies toward the Gyrinidæ, and by their removal from the Carabidæ tend to render that great family more homogeneous.

The Pseudomorphidæ are contained at present in five genera, and may be arranged as follows:—

Head horizontal; mouth anterior; antennæ filiform.

Without antennal grooves.....**Pseudomorpha.**

With antennal grooves.

Mentum entire; ventral segments four.....**Hydroporomorpha.**

Mentum emarginate; ventral segments six.

Posterior angles of prothorax distinct.....**Sphallomorpha.**

Posterior angles of prothorax rounded.....**Silphomorpha.**

Head deflexed, front very convex; mouth inferior; antennæ

clavate.....**Adelotopus.**

In the monographic notice of these insects, (*Rev. et Mag. Zool.* 1853, p.395), Westwood unites the first, third and fourth genera, without as-

signing any reason, at the same time describing new species which should not be included in *Pseudomorpha*. The two genera, *Silphomorpha* and *Sphallomorpha*, can hardly be considered as distinct, the characters separating them being hardly of more value than as a means of defining generic groups. The whole subject has yet need of a revision, and it is to be hoped that those entomologists who have a full series of species accessible will determine their synonymy, and relieve them from the partial confusion in which they are at present found.

The habits of these insects are remarkable. Both our North American species live on flowers, and are very agile, while that from South America and those of Australia appear to live under bark.

For an opportunity of examining a small series of these insects, I am indebted to Dr. Leconte, to whom all the species in the Cambridge Museum were sent by Prof. Agassiz for study and identification.

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#### ON AMPHIZOA INSOLENS, Leconte.

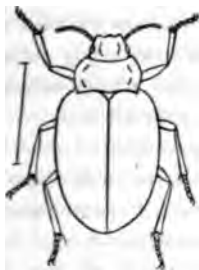
BY GEO. H. HORN, M. D.

It is not expected that anything new will be written in the present paper, as the insect has been fully described by Dr. Leconte, (*Proc. Acad.* vi, p. 227,) and its systematic position ably discussed, while Dr. Schaum (*Insecten Deutschlands*) reviews the work and expresses a different opinion regarding its relationships. As it is very desirable to have all difficulties removed and differences of opinion adjusted, it has been thought advisable to present the subject anew to systematists, in order that the end may be reached. With this view, wood-cuts, carefully drawn, have been prepared, to illustrate the various external parts.

As the habits of this insect have been fully exposed (*Proc. Ent. Soc. Phil.*, Vol. vi, p. 289), it will be unnecessary to reiterate in the present paper, except to state that they live as do the Parnidæ, adhering to stones under running water. They are entirely sub-aquatic, and have never been found on land. It was my good fortune to capture a fine series of this insect while traveling in north-eastern California, among the streams tributary to Pit River, itself the larger fork of the Sacramento. Though still a rare insect in collections, it has been



thought desirable and advantageous to science to dissect a few specimens so that better illustrations could be presented, and its external anatomy fully exposed. In the views of the under side the sutures have been more distinctly drawn than they can be seen in cabinet specimens. These sutures have been rendered thus distinct by macerating the insect in a solution of caustic potassa, a means so well known to Microscopists as to need no further comment.

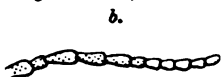


The accompanying outline view (a) will serve to give an idea of the general configuration of the insect. An excellent figure, illustrative of

the sculpture, and from which the above outline was copied, may be found in Vol. ix, of the Pacific Rail Road Explorations and Surveys.

*Head* broad, wider behind the eyes, with a broad longitudinal impression each side, epistoma truncate.

*Eyes* small, round and finely granulate.



*Antennæ* (b) eleven-jointed, inserted under the margin of the front, rather above the base of mandibles, in a manner similar to *Loricera*, glabrous, sparsely punctured on the upper sur-

face, the terminal three joints smooth, entirely destitute of sculpture.

*Labrum* (c) transverse, faintly trilobed in front.

*Mandibles* (d) short, obtuse, with a few small teeth and a slight brush of hair on the inner face.

*Maxillæ* (e) entirely corneous, inner lobe with a slight emargination internally, and ciliate with spinose hairs in front of and behind the emargination. External lobe corneous not bi-articulate. This lobe appears at all times to be articulated beneath the inner lobe, so that from a view in front the insect appears to have double maxillæ.



*Maxillary palpi* short, four-jointed, the first joint very small, the second and third longer and equal, the last joint equal to the two preceding together, and thicker.



*Ligula* (f) quadrate, filling the emargination of the mentum, broader than long, ciliate on its margins, and without paraglossæ. Under surface with a Y-shaped elevated line.

*Labial palpi* short, three-jointed, supports prominent, first and se-

cond joints small, terminal equal to the two preceding. In the accompanying cut the palpi are pushed farther back than in nature, in order that the individual parts might be better represented.

*Mentum* (*g*) large, connate with the gula without trace of suture, <sup>g.</sup> entirely concealing the parts of the mouth above, deeply emarginate, with a broad tooth at the bottom of the emargination, lobes obtusely rounded. Lateral sutures of gula distinct.



In his work on the genera of Coleoptera, Lacordaire commits the curious mistake of ascribing a totally different form to the ligula from that indicated by the above description; he says, "languette en forme de T." This mistake originated from a misinterpretation of the meaning of Dr. Leconte, (*Proc. Ac. l. c.*) in the first description of the insect, as follows:—"The ligula is large, filling the emargination of the chin, truncate at tip and prominent along the middle and apex, so as to present a form like the letter T." The inner lobes of the maxillæ are ciliate internally, and not as Lacordaire says, "lobe interne des machoires non cilié." The above-named author had, however, no opportunity of examining the insect, as no specimens had been sent abroad at the time the above extracts were written.

In the above descriptions of the head and parts of the mouth, hardly anything can be found in which this insect differs from the Carabidæ. The large size of the mentum is remarkable, also the absence of the gular suture, a character found only in a few Pseudomorphides and Siagonides,\* the former being, however, insects of a very anomalous form, and whose claim to rank as members of the family Carabidæ has been doubted by various entomologists. In *Metrius* more particularly, and in other Carabidæ, the mentum is large, broad, and deeply emarginate, though never so entirely hiding all the parts above it, as in *Amphizoa*. The antennæ are also anomalous in being entirely glabrous, without pubescence, and only a few punctures on their upper surface.

*Prothorax* narrower than the elytra and in close contact with them, nearly twice as broad as long, narrower before than behind, sides ob-

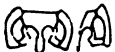
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\*The form of mentum among these insects is very similar to that seen in *Amphizoa*, particularly that of *Encladus*, where the suture is entirely obliterated. In fact, its mentum might well represent an enlarged view of that of *Amphizoa*, excepting in the form of the tooth at the bottom of the excavation. Notwithstanding its large size in the Siagonides and Ditomides, the mentum never hides so completely the other parts of the mouth, as in *Amphizoa*. The mandibles are very prominent in the two tribes mentioned above, and in *Encladus* recalling the form met with among the Scaritides, particularly *Pasinachus*.

tusely rounded. Anteriorly emarginate, posteriorly sinuate, with the angles distinct. Above with a longitudinal impressed line, with vague impressions laterally.

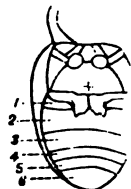
*Prosternum* (*h*, front view; *i*, side view) prolonged, behind the

*h.* *i.* coxæ broader and flattened, received in an excavation of the mesosternum, meeting the prolongation of the metasternum between the middle coxæ.



*Coxal cavities* rounded, open behind closed in front by the sternum and epimera, completed behind by the sternum of the mesothorax.

*Mesosternum* short, separating the middle coxæ, concealed at its middle by the prolongation of the prosternum, side pieces diagonally divided, the epimera alone attaining the coxæ.



*Coxal cavities* rounded, closed in front by the sternum, laterally by the epimera of the mesothorax and the episternum of the metathorax, and behind by the metasternum.

*Metasternum* broad, truncate posteriorly, side pieces simple, consisting of the episterna alone.

*Coxæ* broad, separated from the metathorax by a nearly straight suture, contiguous in the middle and attaining the margin of the body, cutting off all contact between the metathoracic parapleuræ and the abdomen.

*Abdomen* with six ventral segments, the anterior three connate. The first segment is entirely lateral and the second in contact with the coxæ at its middle. The second, third and sixth segments are much longer than the others.

*Elytra* oval, moderately convex, slightly flattened at the sides, humeri rounded. Epipleural fold broad anteriorly, suddenly narrowing opposite the hind coxæ and not reaching the apex of the clytron. Scutellum moderate, triangular. Under wings well developed, though probably never used, as the elytra are in close contact and, it is probable, totally inseparable by the action of the insect.

*Legs* slender, femora slightly thickened, tibiæ with two small terminal spurs. Front and middle tarsi with the first four joints small, sub-

*k.* equal, the terminal joint longer. Posterior tarsi with the first and last joints longer, the intermediate short and equal. Claws small, simple. The joints of the tarsi are rounded beneath, and have (excepting the last joint) a small pubescent spot on each side.



The characters, as above given, drawn from the lower portion of the

body, present but little of special importance, excepting the large size of the posterior coxæ, their contiguity on the median line, and the straight line separating them from the metasternum. It is curious that another error should have crept into the copied description of *Lacordaire*, as he states that these coxæ are not contiguous on the median line of the body.

There would seem to be but little doubt that this insect should occupy the systematic position assigned it by Dr. Leconte, although two eminent entomologists have, the one (Dr. Schaum) called it an aberrant Carabide, the other (Prof. Lacordaire) assigned it a position among the Dytiscidæ, in a subfamily of equal value to Haliplidæ and Pelobiidæ. Both opinions appear untenable by a review of the characters above given.

With the Dytiscidæ, *Amphizoa* has but little in common, excepting the large size of the posterior coxæ. The parts of the mouth, as stated by Schaum, have but little analogy to those of Dytiscidæ. The broad posterior coxæ separate it very easily from the Carabides, while at the same time, they are bounded anteriorly by a straight line, and cut off entirely the metasternum from the abdomen. It is not, however, on one character that the separation of *Amphizoa* from the two named families must depend. The whole conformation presents anomalies found singly in aberrant members of either family; but that the concentration of so many should occur in one insect is remarkable. Either this insect should link the two families into one, or it should form a family apart. The latter course would, therefore, seem the more rational.

Dr. Schaum has seen considerable resemblances to the Tenebrionidæ in its structure. There may be some resemblance in form (as to *Nyctopetus*) or even in its sculpture. *Metrius* has also been said to resemble some of the same family. It is difficult, however, to perceive any real structural similarities.

The antennæ do not resemble those of the Tenebrionidæ as Schaum insists. There is a total absence of pubescence, sensitive pores and spongy patches, such as are found on the terminal joints in that family. Here the case is reversed and the terminal joints are entirely smooth and glabrous. The similarity of the coxæ, particularly the posterior, to those of *Tentyria* is not very evident.

The sexual distinctions are not well marked, the female is broader and rather more robust.

## Notes on the ZOPHERI of the United States.

BY GEO. H. HORN, M. D.

The occurrence of several new species of the genus *Zopherus* has suggested the propriety of bringing into one paper the descriptions of the other species known from the western parts of our territory.

The form of these insects is so well known as hardly to need any general description, and so peculiar as to enable them to be distinguished from any other Tenebrionidæ. They are all of moderate or even of large size, elongate, convex, and furnished with a tegument so hard, as to be with difficulty perforated by the ordinary cabinet pin.

The species from Mexico are whitish above, with elevated subopaque black spots, varying in size according to the species. Those from our own country, (excepting *nodulosus*), are all black, and readily distinguished by the sculpture of the elytra. The last ventral segment is also ornamented with tubercles, though not varying sufficiently among the several species as to be of any value in indicating specific differences. This same style of ornamentation obtains in all the Zopherini, and disappears almost entirely in the next group, Usechini. With one exception (*Jourdanii* Sallé) all the bicolored species have the apices of the elytra quadrituberculate, the black species are bituberculate. The apices of the elytra in all the species have a deep groove on each side, making the suture appear elevated, and bounding the tubercle on the inner side.

**ZOPHERUS, Gray.**

*Z. nodulosus*, elongate, convex. Head black, subopaque, finely and sparsely punctured, and with a triangular, white occipital spot. Thorax convex, nearly as broad as long, anteriorly emarginate, with the angles rounded, posteriorly subtruncate, sides anteriorly scarcely sinuate, posteriorly sinuate and crenulate, much narrower behind than before; above white, with a central black stripe much narrower at its middle, and with a few lateral black spots sparsely placed. Elytra elliptical, convex, sides moderately rounded, base slightly emarginate, with the angles distinct; above white, with elevated, smooth, black spots, arranged as follows;—a sutural row of spots not distinct from each other, a subsutural row of four or five larger spots, two central rows of four or five spots each, and a marginal row, a few very small black spots in rows representing the striae, of which the rows of larger spots mark the interspaces. Apex four-tuberculate. Legs black. Beneath black, coarsely punctured, with the side pieces of the metathorax and the sides of the second and third abdominal segments white. Length .80—1.10 inch.

SOLIER, Ann. Ent. Soc. France, V, 42.

This species is very abundant in western and south-western Texas, whence specimens are sent in every collection made. It resembles closely several Mexican species, though readily distinguished by its less convex form, and the fewer number and less elevation of the black tubercles.

*Z. concolor*, black, moderately shining; head sparsely punctured; thorax moderately convex, sparsely punctured, sides anteriorly rounded, posteriorly crenulate, base subtruncate, much narrower than at apex; elytra elliptical, sides moderately rounded, base slightly emarginate, humeral angles distinct, surface deeply wrinkled, forming very convex tubercles, with a tendency to a longitudinal arrangement; apex of elytra forming two tubercles, separated from the sutural elevation by a deep groove. Beneath black, coarsely and densely punctured. Length .6 inch.

LECONTE, Ann. Lyc. V, 130.

Found near Santa Fé, New Mexico, by Mr. Fendler. This species is at present rare in collections, the type being the only one at present known. Cabinet of Dr. Leconte.

*Z. guttulatus*, black, subopaque; head very sparsely punctured; thorax sparsely punctured, moderately convex, anteriorly emarginate, posterior margin subtruncate; elytra oval, convex; sides rounded, apex bituberculate, tubercles attaining the sutural elevation, groove distinct, surface subopaque, with smooth, elevated spots arranged in eight or more longitudinal rows; spots more or less rounded, distinct from each other. Beneath subopaque, sparsely though rather coarsely punctured. Long .64—.77 inch.

This pretty species occurs in south-western Texas, whence two specimens were brought by Mr. E. T. Cresson, and are now in the Collection of the American Entomological Society. This may be distinguished very readily from all our other species by the peculiar, almost sericeous, appearance of the surface above and below, and by the form and arrangement of the smoother elevated spots. These are more distinct than in *tristis* and more distantly placed, at the same time preserving a nearly rounded form; they are less convex than in *concolor* and not nearly so glossy. The interspaces are distinct, and deep opaque-black in color. On comparison with *tristis*, and which it would be the more readily confounded by descriptions, the thorax will be found much less convex, the sides more distinctly angulate, and with comparatively few punctures on the upper surface. The elytra are more rounded on the sides and more convex above. The apical groove is also much shorter. In outline the elytra more nearly resemble those of *concolor*. From *concolor* this species may be distinguished by the peculiar appearance of its surface, and by the less convex, less shining elevated spots, and by the distance at which they are placed from each other.

***I. tristis***, black, subopaque; head coarsely and sparsely punctured; thorax slightly longer than wide, coarsely and sparsely punctured on the disk, more densely at the sides; sides subangulate before the middle, posteriorly crenulate. Elytra elliptical, moderately convex, base slightly emarginate, angles distinct, surface roughened, with slightly elevated, smoother tubercles, on one side of each a fine puncture, from which arises a minute yellow scale-like hair; apex of elytra bituberculate, suture elevated at apex, groove short. Beneath as in *concolor*. Length .55—.85 inch.

LECONTE, Ann. Lyc. V, 130.

This species resembles *concolor* more decidedly than it does any other species, but may be readily distinguished by the characters above given. The smooth elevated spots have a stronger tendency to a linear arrangement, the interspaces are well marked, and the elevations themselves much less convex than in *concolor*. The humeral angles are more distinct, and the space between them distinctly broader than the base of the thorax. The groove at the apex of the elytra is shortened behind, allowing the tubercles and the sutural elevation to join. In some specimens there is also a slight longitudinal thoracic impression.

This species is not rare in Arizona. In my sojourn in that region, eighteen individuals were found. Those captured at Fort Grant lived under the dead bark of Mesquite, others on the Maricopa desert, were under the dead trunks of *Cereus giganteus*, another was found at Yuma in my tent. A short time since, I received a specimen, from which the larger measurement was taken, from Mr. Wm. M. Gabb, collected from near the upper end of the peninsula of Lower California. This differs in no other particular than size, from the specimens from Yuma and Arizona.

***I. opaca***, black, opaque; head finely and sparsely punctured; thorax longer than broad, sides moderately rounded in front of the middle, posteriorly crenulate, base subtruncate and narrower than the apex; above coarsely and densely punctured; elytra elliptical, moderately convex, with very fine granular elevations arranged in irregular longitudinal series, with a fine puncture at the base of each granule, from which arises a very short scale-like hair. Apex of elytra bituberculate, sutural elevation prolonged, groove deep. Beneath sculptured as in the two preceding species. Length .85 inch.

This species may be readily distinguished from any others of the genus known, by the peculiar sculpture of the elytra. The punctures of the thorax have, in many instances, a slight elevation of their margin on one side, giving a granulated appearance to the surface. The humeral angles of the elytra are less distinct in this than the two preceding species, and the bases of the thorax and elytra are equal.

This species is found in Nevada; probably near the southern boundary. For the specimen in my possession I am indebted to Mr. John Akhurst, of Brooklyn; another remains in his cabinet.

Through the kindness of Mr. Ulke I have been permitted to examine a specimen of this species from his cabinet. It differs from the type only in being smaller, and with the granules less distinctly marked. This obliteration of sculpture is probably the result of age in the specimen. While at Fort Tejon, California, I had abundant opportunity of examining the *Phlæodes* of various ages, and found that while in those of the present season were sharply sculptured, and the granules very distinct, those of the preceding seasons were comparatively smooth. As all these insects live under bark on logs and stumps, it is probable that the smoothness of some is merely the result of mechanical action.

*Z. gracilis*, black, shining; head finely and sparsely punctured; thorax finely and sparsely punctured, sides subangulate, before the middle slightly sinuate, posteriorly finely crenulate; base narrow, subtruncate; elytra elongate, oval, surface very slightly rugose, and with striæ of fine, rather distant punctures, in each of which is a short, scale-like golden hair. Apex bituberculate, groove broad. Prothorax beneath coarsely and densely punctured. Abdomen sparsely punctured. Length .63 inch.

This species may be readily distinguished by its slender form and almost total absence of elytral sculpture. It is more glossy than any of the already described species. The bases of the thorax and elytra are nearly equal in width. In all of the preceding species the basal margin of the thorax is slightly elevated, and with a slight groove in front of the elevation; this totally disappears in the present species.

This species inhabits Arizona, in the neighborhood of Fort Whipple, where it was collected by Dr. Coues, who placed it at the disposal of Mr. Ulke, to whom Dr. Leconte is indebted for the only specimen of this fine species now in his cabinet.

In order to render the species now known, easily determinable, the following synoptic table is added:—

Elytra quadrituberculate at apex.....	<i>nodulosus</i> , Solier.
Elytra bituberculate at apex.	
Elytra with smooth elevated tubercles.	
Tubercles round, very convex, approximate and shining.....	<i>concolor</i> , Lec.
Tubercles round, flattened, distinct and subopaque....	<i>guttulatus</i> , Horn.
Tubercles elongate, flattened, moderately shining.....	<i>tristis</i> , Lec.
Elytra finely granulate.....	<i>opacus</i> , Horn.
Elytra finely punctured.....	<i>gracilis</i> , Horn.



Descriptions of new Genera and Species of Western SCARABÆIDÆ,  
with notes on others already known.

BY GEO. H. HORN, M. D.

**PHÆOCHROUS**, Casteln.

**P?** *Behrensii*, elongate-oval, blackish-brown, moderately convex and shining. Head paler in front, densely and coarsely punctured. Thorax twice broader than long, narrowed in front, above moderately convex, sparsely punctured, anteriorly emarginate, sides margined, moderately rounded, base sinuate, angles obtuse. Elytra oval, convex, margin slightly thickened, above striate, with striæ coarsely and closely punctured, interstices slightly convex, with a single row of minute punctures. Body beneath paler, scarcely punctured. Femora thickened; anterior tibiæ crenulate and with three large teeth on the outer edge; middle and posterior tibiæ thickened at tip, obliquely truncate, and with rows of spinose hairs. Length .4 inch. Breadth .22 inch.

I refer to *Phæochrous* Casteln. (*Silphodes* Westw.) an insect from California, (in the Cabinet of Henry Ulke, of Washington,) though not without suspicion, that it may constitute a distinct genus, differing from the descriptions of *Phæochrous* by such slight characters, that, without reference to specimens, I am unwilling to separate it.

The epistoma is broadly truncate, labrum very short, transverse, slightly emarginate. Mandibles projecting slightly beyond the labrum, giving the front a bilobed appearance. The antennæ are nearly as in *Phæochrous*, with the eighth joint very large and concave, almost entirely hiding the ninth and tenth joints, which are much shorter, and are spongy, except slightly corneous at base; scutellum moderate, apex rounded. The four hinder tibiæ are rather suddenly thickened at apex and obliquely truncate, and with three rows of spinous hairs. The tarsi are somewhat shorter than the tibiæ, the last joint longer, with strongly curved, equal claws.



The discovery of this insect in California is remarkable, as it affords an analogue of the *Hybosorus* of our Eastern States, itself being an emigrant from Europe. It is indeed possible that the insect just described may have been imported from the East Indies to California, as the commerce between the two countries has already assumed some magnitude. I have in my collection also a Cerambycide, found by Mr. Gabb, in the Coast Range south of San Francisco, undoubtedly identical with an Australian species, and with the knowledge of the introduction of this and other insects by transportation in ships, I have supposed that even *P?* *Behrensii* may be really a foreigner to our

shores. The species of *Phæochrous* live on decomposing animal substances, and it is possible that, like some *Dermestes*, it may have found lodgment aboard ship in material suitable for its subsistence.

I dedicate the species to Dr. Jas. Behrens, of San Francisco, in acknowledgement of the interest he has shown in the advancement of entomological science.

#### DASYDERA, Lec.

*D. Cooperi*, brassy-green; head densely and coarsely punctured, front sparsely clothed with erect yellow hairs; thorax subquadrate, sides moderately rounded, anterior margin truncate, posterior slightly rounded, with the angles rounded; above coarsely and densely punctured, with suberect yellow hairs and a slight longitudinal impression. Elytra testaceous, lateral margins converging strongly, contiguous along the first two-thirds of the suture, then dehiscent, apices moderately rounded, above clothed with short, black, recumbent, bristly hairs, arising from rather densely placed punctures. Beneath brassy-green; abdomen paler, clothed with yellowish hairs. Antennal club and tarsal claws testaceous. Length .40 inch.

Readily distinguishable from the other two species of this genus by the characters above given. The elytra extend to the suture between the last and penultimate abdominal segments. The lateral tooth of the anterior tibia is also well marked.

I dedicate this species to Dr. J. G. Cooper, of Santa Cruz, California, to whose liberality I am indebted for this and other valuable species. It is from near Sacramento, California.

#### LICHNANTHE, Burm.

*L. canina*, head obscure, brassy-green, coarsely and confluent punctured, clothed at the middle with yellow, and laterally with shorter black, suberect hairs. Thorax brassy-green, slightly broader than long, narrower anteriorly; sides very slightly rounded; apex truncate, base feebly rounded, posterior angles slightly elevated, above coarsely and densely punctured, with yellow erect hairs. Elytra dark testaceous, with two rows of paler spots; sides slightly convergent, contiguous along the anterior half of the suture, posteriorly strongly divergent, apices rounded, above finely and densely punctured with recumbent black hairs. Margin paler, with short yellow hairs. Beneath obscure brassy-green sparsely clothed with yellow hair; antennal club, tarsi and tip of abdomen obscure testaceous. Length .48 inch.

Readily distinguishable from our other species by the characters above given. The epistoma is also strongly margined on the sides. The front has two elevated lines continuous with the margin of the epistoma, which converge and meet on a line with the eyes. The portion of the head thus enclosed is brassy-green and clothed with yellow hairs, the remainder of the front is covered with shorter black hairs. The thorax is less coarsely punctured than the head, which appears to be almost wrinkled transversely.

The elytra are still more finely punctured, and though somewhat longer in this species than in *vulpina* and yet shorter than in *lupina*, they are also more divergent along the suture than in either of the preceding species. This species is, without doubt, identical with that mentioned by Doubleday as having occurred in Oregon, though probably considered by him as identical with *lupina*. Occurs near Fort Klamath, Oregon. For this interesting addition to our western fauna, I am indebted to Mr. Wm. M. Gabb, Palæontologist Cal. Geolog. Survey, whose kindness in placing his collection at my disposal, has already been acknowledged.

**ACRATUS**, nov. gen.

Head elongate, epistoma trapezoidal, narrower anteriorly, concealing the parts of mouth beneath, separated from the front by a sinuous impressed line, anterior edge margined and notched. Labrum small, transverse, not emarginate. Mandibles short, coriaceous on the inner margins and ciliate internally at apex. Maxillæ elongate, ciliate with curved spinous hairs at apex. Palpi long, last joint fusiform. Mentum trapezoidal, longer than broad, narrower behind, anterior angles rounded. Ligula distinct from the mentum, coriaceous and deeply bilobed. Palpi very small, last joint somewhat longer. Antennæ ten-jointed, first and second thick, third—seventh small, eighth—tenth forming a suboval mass. Abdomen six-jointed, joints, except the last, connate. Pygidium exposed. Tarsi slender, claws small and divided. Anterior tibiæ tridentate externally, with a small spine internally, middle and posterior tibiæ bispinose, the latter broad and triangular, and with one transverse ridge.

The accompanying wood-cuts represent magnified views of the parts of the mouth, an antenna, and an anterior leg and one of the tarsal claws of *Acratus*. The parts have, however, been magnified in different degrees, as will be seen by a comparison of the mentum and the maxilla ad-



joining it. In nature the hairs at the tip of the maxilla are even more curved than represented. Both claws on all the feet are deeply cleft to within a third of the base, the inferior portion being a fourth shorter than the superior.

This genus recalls strikingly the characters of *Chnaunanthus* of the Sericoidini, and from the description, by which it is alone known to

me, resembles it even in specific characters. The connate ventral segments, however, forbid its entrance into the group, unless that character should have escaped notice in the genus above named. The antennæ are ten-jointed in the present genus and but nine-jointed in *Chnau-nanthus*, though this would hardly warrant generic separation without the presence of other characters. I place the genus provisionally among the Oncerini of Leconte, although equally out of place by the presence of the anterior tibial spine. As in *Oncerus* and *Lasiopus* the abdomen is rather small and the segments connate. The position of the Oncerini among the Laparostict Melolonthidæ, seems somewhat objectionable, as the spiracles in *Oncerus* are placed "on the dorsal inflexed portion of the ventral segments," (Lec. *Synopsis Melolonthidæ*, *Jour. Acad.*, 1856.) as in the genuine Melolonthidæ, while the connate abdominal segments of *Oncerus*, *Lasiopus* and *Acratus* is a character at variance with the Glaphyrini, to which the division of Laparostict Melolonthidæ of Leconte, for the most corresponds. These genera may form a sub-tribe of Melolonthidæ near the Sericoidini, in the position originally assigned them in the monograph above cited, or *Acratus* may be placed among the Chasmatopterides after *Chnau-nanthus*.

**A. flavipennis**, black, slightly glossy; head black, rather coarsely and densely punctured, narrowed in front. Thorax black, broader than long, base and sides rounded, anteriorly emarginate, less densely punctured than the head; posterior and lateral margins ciliate with whitish hairs. Head and thorax with short suberect hair. Elytra yellow-testaceous, oval, sparsely punctured, and with a short yellow hair arising from each puncture. Mentum with a brush of yellow erect hair beneath. Feet yellowish. Length .15—.18 inch.

The under surface of the insect varies in color in different individuals, in some being entirely black, in others with the abdomen yellowish.

This insect is found in tolerable abundance in April, on the flowers of *Larrea mexicana*, on the sandy desert east of Antelope peak, and on the banks of the Gila River, Arizona.

#### PLECTRODES, nov. gen.

Head quadrate. Epistome broad, thickened in front, concave above, separated from the front by a slightly raised line. Labrum distinct, emarginate. Mandibles thick, obtuse, not prominent. Maxillæ short, with two or three obtuse teeth at apex. Palpi moderate, first joint small, last joint longer than second and third together, deeply channelled on its outer face. Mentum quadrate, concave, sides rounded. Ligula short, transverse, connate with the mentum, corneous. Palpi short, last joint rather larger. Antennæ ten-jointed, first joint equal

to half the scape, thicker; second joint transverse; third—seventh closely connate; eighth—tenth forming an oval mass. Anterior coxæ moderately prominent, prosternum not prolonged. Metathoracic parapleuræ moderate, epimera triangular. Segments of abdomen distinct, penultimate joint rather longer. Anterior tibiæ tridentate externally, with a spine on the inner side. Middle and posterior tibiæ with a transverse ridge terminating in a slight spine. Posterior femora thickened. Tarsi equal to the tibiæ. Claws dissimilar, the anterior claw armed with a long tooth from near the base, posterior claw with a short slightly emarginate tooth near the base. Penultimate dorsal and ventral segments connate. Spiracle placed on the middle of the line of the suture, and connected by a groove with the suture between the pygidium and propygidium.

Figures 1 and 2 represent respectively the maxilla and palpus and the claws of the tarsi of *Plectrodes*. In the first it will be seen that the palpus is longer than the maxilla, and with the first joint very slender as compared with the others.



Figure 1.



Figure 2.

The last joint is oval, slightly curved, and with the deep groove mentioned in the above diagnosis. The second is a representation of the tarsal claws of the right anterior tarsus, the claws are the same, however, on all the feet and in both sexes. The anterior claw is much larger and with a strong tooth, its outer face is also sulcate in the manner above indicated.

*P. pubescens*, light testaceous brown, slightly shining, robust, convex above; head coarsely and densely punctured, with short, yellow, suberect hairs arising from the punctures. Thorax broader than long, convex, anteriorly emarginate, posteriorly broadly lobed; sides strongly rounded, coarsely punctured above, and clothed with suberect yellow hairs. Scutellum moderate, triangular, with rounded sides. Elytra convex, more finely punctured with very short, recumbent, yellow pubescence. Body beneath clothed with long yellowish-white hairs: abdomen with shorter pubescence. Legs slightly fimbriate with hair. Length .70—.85 inch.

Occurs rather abundantly at Visalia, California, whence specimens were sent me by Mr. S. W. Marple. They fly among the oak trees of that region and are attracted by light at night.

Genus related to *Hypotrachia* Lec., though without any similarity whatever of form. The former resembling *Tanyproctus* somewhat, while the present genus is almost a counterpart of certain species of *Plectris*, in form, color and pubescence. By the peculiar sculpture of the last joint of the maxillary palpi, these two genera seem to be related to the *Tanyproctini*, though in neither do we find the dilatation

of the tarsal joints of the male. The anterior claws of the front and middle tarsi of *Hypotrichia* have a broad tooth, free, except at base. The anterior claw of the posterior tarsi has a slight dilatation at base.

The tribes of Scarabæidæ, in the vicinity of the Sericoidini, have need of a thorough revision. The position of the last spiracle, whether in or out of the line of the suture between the penultimate dorsal and ventral segments, appears to be a character of some value, as also the presence of a groove leading backwards from the spiracle toward the last dorsal suture.

The genus is placed provisionally with *Hypotrichia* among the Sericoidini, with the hope that renewed observations on larger series of genera may afford a better clue to its true relationships.

#### COTALPA, Burm.

For a long time the only known species of this genus was ranked among the Areodæ, Kirby being the first to indicate generic differences. The typical species appears to have an extensive range, being found over nearly the whole region eastward of a line drawn midway between the Rocky Mountains and the Mississippi River. In 1852 Prof. Haldeman described a second species from Utah; lately Dr. Leconte has made known a third, from a point still farther westward, New Mexico, and while in San Francisco, during the first few days of my stay there, I was surprised at receiving a fourth species from the Southern Coast Range. Subsequently other specimens were collected near the base of the South-eastern Sierras, again in Owen's Valley, and finally along the mountainous region between Temescal and the Laguna grande, on the road towards Fort Yuma.

*C. ursina*, bluish-black; head and thorax coarsely and densely punctured; thorax convex, sides strongly rounded, narrower anteriorly, base broadly lobed, elytra broadly oval, brownish testaceous, coarsely punctured. Beneath bluish-black, tibiæ paler. Length .95, ♂; .62, ♀, inch.

The clypeus is parabolic, slightly margined in front. The head and thorax are rather densely clothed with suberect yellowish hairs, the hairs of the elytra are much shorter, recumbent and more sparsely placed. Beneath the body is also densely clothed with long hairs, particularly on the sides of the metasternum. The elytra vary somewhat in color, among the specimens from different localities. Those from the maritime slope of California are brownish testaceous, those from the mountain regions of the south-eastern portion of the State are much lighter in color, while a unique from Owen's Valley is orange-red. The first and last regions furnished specimens with much more

pubescence. Those captured by myself near Temescal were almost entirely deprived of the hair on the thorax and elytra, and are much less densely and coarsely punctured. I can find no differences to warrant specific separation among my specimens, though the extremes differ greatly in size and in sculpture as above indicated.

The genus *Cotalpa* may be separated into two sections, according as the metasternum is produced or not between the middle coxæ.

Metasternum conical, prominent between the middle coxæ.

Thorax scarcely punctured.....*lanigera*, Linn.

Thorax coarsely punctured.....*puncticollis*, Lec.

Metasternum short, obtuse, not produced.

Thorax coarsely not confluent punctured; hairs

yellowish.....*ursina*, Horn.

Thorax coarsely and confluent punctured; hairs

grey.....*granicolis*, Hald.

In the above table it will be seen that two species have the metasternum prolonged forward, so as to be distinctly seen between the middle coxæ and even in front of them, this spine being at the same time in the plane of the rest of the metasternum and without any depression of its point. In the last two, however, this process is reduced to a mere tubercle below the plane of the metasternum, and is not at all prominent, and never projects beyond the coxæ. The species of the first group may be distinguished from those of the second by their greater convexity, more glossy appearance and less elytral punctuation, while from each other no other characters are needed than that given in the table. The epistoma of *puncticollis* is relatively much longer and more convex than *lanigera*. The two species of the second group resemble each other in form. The thorax of *granicolis* is, however, metallic-green and very coarsely and confluent punctured, and clothed with erect whitish or greyish-white hairs. In *ursina* the thorax is much more finely punctured and with the punctures distinct, the hairs are longer and yellowish; the color of the thorax is bluish-black.

#### ERRATUM.

Page 168, line 16, for "appear" read "appears."

## EXPLANATION OF PLATE III.

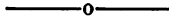


Fig. 1.—*Phæochrous Behrensi*, Horn. San Francisco, Cal.

Fig. 2.—*Acratus flavipennis*, Horn. Arizona.

Fig. 3.—*Lasiopus ferrugineus*, Lec. (Synopsis of the Melolonthidæ of U. S., Jour. Acad. 1856, p. 282.) The ungues of this insect are simple and the tarsi very much longer than the tibix. The anterior tibia is without spine. Antennæ nine-jointed, palpi slender. Clypeus rounded, concave and submarginate at apex. Its surface is moderately glossy and ferruginous in color, coarsely punctured and with sparsely placed short hairs, the margin is fringed and the under surface with longer hairs. Ringgold Barracks, Texas.

Fig. 4.—*Oncerus floralis*, Lec. (Loc. cit. p. 283.) As in the preceding species the anterior tibix are without spine, the tarsi long and the femora thickened. Clypeus flattened, parallel, and with a lateral incisure and transverse suture forming a double clypeus. The claws are deeply cleft as in *Acratus*. The head and thorax are shining black. the elytra brownish testaceous and sparsely clothed with short pale hairs. Vallicito, California.

Fig. 5.—*Hypotrichia spissipes*, Lec. (Class. Col. N. A., 137.)

Fig. 6.—*Plectrodes pubescens*, Horn. Visalia, Cal.

Fig. 7.—*Macropnus crassipes*, Horn. (Proc. Acad. 1866, 397.) Though not mentioned in the preceding Papers, I introduce this insect for the opportunity afforded of figuring it. A view of its upper surface hardly affords any difference of outline from the common *Areodæ*, except in being rather more suddenly broader. Honduras.

Fig. 8.—*Pseudomorpha Cronkhitei*, Horn. Owens' Valley, Cal.











## DESCRIPTIONS OF AMERICAN LEPIDOPTERA.—No. 2.

BY AUG. R. GROTE AND COLEMAN T. ROBINSON.

[Communicated July 8, 1867.]

Family, LYCAENIDAE.

*THECLA*, Fabr.*Thecla lorata*, n. s.

*Male*.—Allied to *Thecla falacer*, *Btlv.* and *Lec.* Head, black; eyes, circled narrowly with white; antennae, black, annulate with white, the "club" entirely black. Body, above, black, the longer scales on thorax and abdomen with a paler somewhat brassy tinge. Beneath, the abdomen is whitish, the under thoracic squamation is blackish-grey; legs mostly whitish, blackish outwardly, subannulate, the tarsi touched with fuscous inwardly.

*Upper surface* of wings of a uniform black or blackish, with a subdued brassy-brown reflection which becomes prominent in certain lights. An ovate sexual spot on the disc of primaries. Secondaries with two very unequal tails, as in *T. falacer*, the lower the longer, fringed with white. Base of the fringes, from anal angle to the lower "tail," white, and at this place is a narrow, white, internal line in one specimen. Between the "tails," the fringes, which elsewhere are dark, are tipped with white.

*Under surface* somewhat paler than upper, brownish-black. An extra basal common streak, composed of powdery dark blue scales, runs across both wings; this is slightly irregular, and is lost inferiorly among the longer scales which clothe the internal margin of the secondaries. Two short white lines on the disc of primaries enclosing an incomplete darker shaded spot or space as in allied species. Beyond, an interrupted, extra discal, semilunated white line, narrowly edged within by blackish scales and preceded by dark interspaceal shadings. An incomplete bluish-white, subparallel, subterminal line, edged outwardly by blackish scales. Secondaries with two short parallel white lines on the disc, enclosing an analogous space to that on disc of primaries. An extra discal semilunated and interrupted white line as on primaries, preceded by dark interspaceal shades; these are faintly edged within in one specimen by white scales, so that here the white line may be said to be geminate, enclosing a dark shade; on the subcostal interspace the series is interrupted, the lines being severed and brought nearer to the base of the wing, a detached spot is thus

formed as is usual. A subterminal bluish-white line, forming prominent lunules on the interspaces inferiorly, edged outwardly with black; along anal angle the black scales are followed by a fulvous streak, this by first white then black scales. Outside of the black scales edging the subterminal line on the next interspace above, is a patch of powdery blue scattered scales extending to the external margin; on the interspace above is a distinct fulvous crescent, succeeded by black scales on the margin; the fulvous scales are faintly continued on the next succeeding interspace, which also shows a few scattered bluish-white scales. A narrow white line lies directly on the margin.

*Expanse*, 1.20 inch. *Length of body*, 0.60 inch.

*Habitat*.—Atlantic District. (Virginia!)

We have two individuals before us, apparently both males, and differing slightly from one another as noticed, and in that the sexual discal spot of the primaries is darker than the ground color of the wing in one specimen, which at first we regarded as the female. Both agree in having the common internal line of dark blue atoms, a character which separates this species at once from *T. falacer*, *Godt. sp.*, and *T. acadica*, *Edw'ds.*, its near allies.

From *THECLA CALANUS*, *Westwood*, (*Rusticus armatus Calanus*, Hübner, Sml., *Thecla Edwardsii*, † Saund.,) this species is equally distinct. Contrary to Boisduval and LeConte, who cite "*Papilio calanus*, Hübner," as a synonym of *T. falacer*, *Godt.*, sp., and to Westwood, who gives precedence to Hübner's name, it seems to us that *T. calanus* and *T. falacer* are distinct species, the former to be distinguished by its slightly greater expanse, its paler more brownish color above, and by the fulvous marks of the upper surface of secondaries near anal angle. The remark: "quelquefois précédée en dedans d'une tache fauve peu marquée," Boisduval and LeConte, p. 92, would then refer to specimens of *T. calanus*, erroneously regarded by these Authors as identical with *T. falacer*. "*T. calanus*" is so referred to by Dr. Morris in the "Synopsis," (p. 95), although still regarded as a synonym of *T. falacer*. In Canada and the New England States, *T. falacer* and *T. acadica* seem to appear together. The latter species is not cited by Mr. Scudder, in his very useful Pamphlet on the Butterflies of New England, but judging by specimens from Cape Cod, which we owe to his kindness, it is probably regarded as a form of Godart's species. It may be quickly separated from *T. falacer*, by the extra discal band of the primaries beneath being composed of a series of rounded, discontinued, dark or black spots, annulate with white. In *T. falacer*, as in *T. calanus*

*Thecla henrici*, n. s.

*Male and Female.*—Size and form of *Thecla augustus*, Kirby. Above, of a uniform dark brown, shaded diffusely over the nervules of primaries, (♂, ♀) and on secondaries before anal angle (♂ ♀) with brighter rusty brown; in the male these latter show a light brassy reflection. The fringes on the primaries are white, interrupted and entirely and very narrowly tipped with blackish. On the secondaries, the fringes are much as on primaries, but more prominently interrupted with black at the extremity of the nervules, where also they are somewhat exerted, especially inferiorly, and most prominently so before anal angle, the latter twisted inwardly, and prominent owing to the excavation of the internal margin within it; the white color is for the most part reduced to a narrow basal line. Beneath: the primaries are of a brighter brown from the base outwardly to the single transverse line at apical third running over the nervules. The "veins" are here obsolete marked with blackish. The single transverse line is straight, once inwardly and slightly notched opposite the disc and, not attaining internal margin, is discontinued at the last branch of median nervure. The internal margin, below median nervure, is of a duller and fainter more obscure brown. Outside of the transverse line, the wing is paler, being of an obscure ochreous, divided centrally by a faint light brown shade, and of a similar hue along internal margin inferiorly, leaving the lighter color to appear as interspaceal blotches; fringes as on upper surface. Secondaries with the base of an intense blackish-brown, paler along the costa, and limited outwardly by the median line; this portion of the wing is sparsely clothed with pale and longer hairs, except on costal region outwardly. The median line is shaped as in *T. augustus*, but is succeeded by white scales. These are very prominent at the inception of the line on costa, before the first outward inflection, are obsolete centrally, but again appear, edging the line externally, before internal margin. Outside the line, the wing is ochreous brown, (nearly as on primaries outside of the transverse line); this color is most evident superiorly, inferiorly it is obscured by the hoary appearance of the wing and obtains here more narrowly. It is succeeded by an undulating series of semilunate, black, interspaceal points edged obsolete inwardly by white scales. Beyond these marks, the terminal space is apically bright intense brown; below this, the wing is entirely hoary, somewhat of a lilac hue. There is a narrow, terminal, interrupted, black line, outside of which the extreme external margin is again entirely clear brownish; fringes much as on upper

surface. Some white scales linearly arranged within the extra anal angle on the margin.

Head and body, above, blackish, with longer and sparsely scattered pale hairs. Antennae, black, prominently annulated with white; club, black, tipped with fulvous. Palpi, black, with some longer whitish hairs beneath. Eyes, very narrowly margined with white behind. Under thoracic surface and legs at base, clothed with long whitish hair. Tarsi, testaceous, with lateral white scales; tibiae marked within with whitish. Abdomen, beneath, obscure whitish.

*Expanse*, 1.10 inch. *Length of body*, 0.40 inch.

*Habitat*.—Atlantic District. (Maine! to Pennsylvania!)

This species is intermediate between *Thecla augustus*, Kirby, (*T. augustinus*, Westw.) and *Thecla irus*, as illustrated by Boisduval and LeConte, and is apparently associated geographically with the former. It differs from *T. augustus*, in the ornamentation of the wings beneath and the brighter colored antennal tips. It is smaller than *T. irus* and, while resembling it in the ornamentation of the wings beneath, is at once distinguished by the absence of the inner purplish basal space circumscribed by the arcuate white line. From *Thecla arsace*, Bdv. and Lec., it differs by the markings of both wings beneath; the shape of the transverse lines is very different, and these are not followed by white scales in LeConte's figures, while *Thecla henrici* has not the brown discal patch and the series of interspaceal, subterminal, brown blotches on the secondaries beneath.

To the kindness of Mr. Scudder we owe a specimen of this species, ticketed as from "Maine" (Smith), which does not differ from a number of specimens from the vicinity of Philadelphia, except in that the secondaries show a very few white scales, very narrowly arranged, edging the secondaries linearly along external margin. There is a variation in the extent of the brown apical space on the secondaries beneath. In some specimens this is encroached on by the hoary shading so that it is nearly lost. On the under surface of the primaries the veins margining the cell are most prominently discolored with blackish. In the males the brighter shadings of the primaries above are obsolete. With reference to *Thecla augustus*, Westw., (*Thecla augustus*, Kirby), it may be remarked, that Fabricius' *Hesperia augustus*, Ent. Syst., 3, p. 275, will very probably be irrecognizable. The description:—"H. R. alis caudatis albis; limbo fusco, subtus ferrugineo flavoque variis, posticis strigis duabus cinereis"—refers to a tailed species, and a reference is made to "Papilio Augustus, Jon. fig. pict. 6, tab. 3,



fig. 1," while the habitat is given of "America" on Drury's authority. The work cited is of very old date and unknown to us; until the species intended is identified, there can be no impropriety in retaining Kirby's name for our common species.

Family, BOMBYCIDAE.

Sub-family, PTILODONTINAE.\*

**DASYLOPHIA**, Packard.

*Dasylophia interna*, Packard. (Plate 4, fig. 31, ♂.)

*Dasylophia interna*, Pack., Syn. U. S. Bombyc., P. E. S. Phil., Vol. iii, p. 363. (Nov., 1864.)

♂. Head, obscure pale ochreous-brown; the vertical tuft, between the antennae, mixed with pale scales. Antennae, lengthily bipectinate for three-fourths of their length from base; the stem, above, dusted with whitish scales. Labial palpi shaded above with darker scales. Prothorax, pale brown, edged behind with a black line, as are the tegulae within. The brown color fades to pale testaceous cinereous over the patagia and hind parts of the thorax, while the abdomen, which is paler beneath, becomes of a more smoky grey above. Legs and thorax, beneath, pale testaceous cinereous; tarsi, subannulate with dark scales.

The anterior wings, within the first median transverse line, are shaded from the base outwardly with pale, bright brown, this color leaving the costal region of a contrasted blackish-brown, spreading outwardly as an obliquely limited, widening shade, to the first median transverse line. This latter is obsolete above the median nervure and hardly to be detected; below, at the point whence the fourth median nervule† is thrown off, the line appears as an inwardly curved, black streak, within which a second more greatly curved and plainly marked, which includes superiorly a distinct black spot formed by slightly raised scales. The space included by the two lines is pale grey. Median space, pale grey; nervules longitudinally marked with dark scales. The transverse posterior (second median) line appears as a pale grey shade, limiting outwardly the median space. It is preceded by a narrow, faint, dark post-median shade-line, which is coincident and approximate with it, especially inferiorly. The t. p. line itself runs down-

\* For the sake of conformity we have adopted the Sub-family termination instead of the usual Ptilodontes, *Hüb.*, a term which has priority over that of *Notodontidae*, Steph., and differing but equivalent names proposed by Duponchel and Herrich-Schaeffer.

† This nervule is perhaps better designated as the third median.

wardly, and somewhat sinuously outwardly obliquely, until over third median nervule, whence it is bent inwardly obliquely, being once inwardly dentated on the submedian fold to internal margin. Below third median nervule it is limited inwardly by a dark coincident line, which is apt here to become confounded with the median shade-line, the latter in reality running very faintly and approximately inside of it. The t. p. line is margined outwardly by a very distinct, bright and deep brown, oblique streak, which becomes broader on submedian fold where it is inwardly dentate, coincident with the line itself and the inner line. There is thus a certain conformity suggested, between the appearance of the two median lines below median nervule, which is strengthened by their juxtaposition and the constriction of the median space at this point. Without the t. p. line the wing is terminally dark brown, and there is a subterminal zig-zag streak or series of streaks of a deep brown color, and followed outwardly by pale scales, which is more or less obsolete, and of which the continued deep brown streak, margining the t. p. line outwardly inferiorly, is perhaps the terminal inflection. Within and over internal angle the wing is pale, and shows a black spot or shade about third median nervule on the margin. The ashén fringes are here clouded and lined with blackish. Secondaries, smoky grey, without markings, a little paler at base. Under surface, smoky grey, the secondaries whitish, without markings on either pair.

*Expanse*, ♂, 1.70 inch. *Length of body*, 0.80 inch.

*Habitat*.—Atlantic District. (Virginia!)

The darker shaded upper surface of the labial palpi, the general light brown color and the grey median space of the primaries, together with the more lengthily pectinated antennae—are characters which separate this species from *Dasylophia anguina*, Pack., (*Phalaena anguina*, Smith; ♀ *Drymonia cucullifera*, H-S.), and which are indicated in the original description. The typical specimen is from New Hampshire, and is preserved in Dr. Harris' Collection, now in possession of the Boston Society of Natural History.

**COELODASYs**, Packard.

*Ceolodasys leptinoides*. (Plate 4, fig. 33, ♂.)

*Heterocampa leptinoides*, Grote, Proc. Ent. Soc. Phil., Vol. iii, p. 323, Plate 4, fig. 2, ♀. (Sept., 1864.)

♂. Blackish cinereous, dusted with light grey. Antennae, testaceous, finely and shortly bipectinate for about two-thirds of their length from base. Thoracic region, above, faintly stained with violaceous. Tegulae, narrowly edged within and behind with black.

Primaries with a longitudinal black streak beneath the median nervure, sometimes subobsolete, and touched with black scales above this on subcostal nervure. Superiorly, from the base outwardly, the wing is dusted with light grey. Transverse anterior line, geminate, broken, irregularly dentate, subobsolete. A black, curved, discal streak, beyond which a diffuse, inwardly oblique, median, dark shade. Transverse posterior line, geminate, regularly interspaceally lunate; its course nowhere prominently bent. Nervules marked with alternate lighter and darker scales. A subterminal interspaceal series of short black dashes. A paler somewhat greyish terminal space extending downwards to extremity of third median nervule, widening to apices. Secondaries, pale smoky grey, darker clouded over anal angle. Beneath, the secondaries are almost white, while the primaries are blackish without markings, shaded with white on costa and diffusely along internal margin.

*Expanse*, ♂, 1.60 inch. *Length of body*, 0.70 inch.

*Habitat*.—Atlantic District. (R. I. ! N. Y. ! Penna. !)

Differs from the female figured and described by Mr. Grote, (l. c.) by the hardly paler terminal space and more distinct ornamentations, in addition to the sexual character afforded by the pectinate antennae. This species is strongly contrasted with the other species of the genus by its blackish cinereous color. Its proper position is with *C. biguttatus*, Pack. The ♂ anal tuft is but slightly bifid.

**HETEROCAMPA**, *Doubleday*.

*Heterocampa obliqua*, Packard. (Plate 4, figs. 26, ♂, 27, ♀.)

*Heterocampa obliqua*, Pack., (♂) Synopsis Bombycidae, U. S. Proc. Ent. Soc. Phil., Vol. 3, p. 368. (November, 1864.)

♀. Head, collar, under thoracic surface and legs, clear cinereous, paler than in the male. The prothoracic squamation wants the darker linear shade which characterizes the male. Antennae, simple, dark testaceous. Eyes, smaller than in the male. Patagia, somewhat glaucous cinereous, with black borders. Centrally, the thorax is clear cinereous, paler than in the opposite sex. Posteriorly, a somewhat glaucous cinereous, triangular patch with black borders. Metathoracic tuft, blackish. The general form is stouter than in the male and the wings are broader.

The primaries resemble the male fore-wings in ornamentation, but the markings are more distinct.

The general color is dark cinereous. Basal half line geminate; the outer of the two lines is straighter and black, more distinct than the inner curved line, and rests inferiorly on a narrow, slightly waved and black streak issuing from the base of the wing, and running outwardly

from the extreme base of the wing below the median nervure. Above this streak, and margined outwardly by the basal half line, the extreme costal base of the wing is pale glaucous cinereous. Between the basal half line and the transverse anterior line the wing is dark cinereous and is traversed by two opposed and subobsolete transverse, waved, shaded lines, becoming tinged with reddish-brown before internal margin, the latter edged within, before the t. a. line, with a distinct black line following the shape of the wing. The t. a. line is geminate, regularly but shallowly waved, the outer of its two component lines the darker, and becoming black below median nervure. Inferiorly, and preceding the t. a. line, the wing is diffusely stained with pale, clear reddish-brown. Costa marked with alternate whitish and dark cinereous streaks, the darker of which seem to form the inception of obsolete transverse shade-lines. Median space, dark cinereous; below the median nervure, an oblique, diffuse, outwardly directed, pale glaucous cinereous shade-patch, which extends across t. p. line, and is limited externally by the black subterminal shade. A narrow black curvilinear streak on the disc; a second, more broadly marked, is continued below the median nervure outwardly to the black subterminal shade. Beyond the discal streak, the wing is stained again with clear pale reddish-brown. The transverse posterior line is geminate, rather faintly marked and very irregular. It margins inwardly and obliquely the costapical whitish patch, as in the male, is medially produced, thence running backwards below the second curvilinear black streak, constricts the median space inferiorly and joins internal margin before the angle. A deep black subterminal shade-line, preceded by a diffuse black shade, which is broadest opposite the disc, and is cut by unequal deep black streaks between the nervules. A slight oblique blackish, apical streak. The conformation of the subterminal shade reminds one of certain species of the genus *Parorgyia*. The narrow terminal space is of an even dark cinereous, the nervules here touched with whitish scales. A narrow terminal line, interrupted at the nervules, lunulated over the interspaces, accompanied with olivaceous scales. The extreme edge shows an obsolete dark line. Fringes, dark cinereous, interrupted with blackish at the extremity of the nervules. Beneath, cinereous, without definite markings; centrally, with longer hair-like scales; at base and along internal margin, whitish; the black subterminal line and shades of the upper surface are here reproduced, accompanied by the apical and interspaceal streaks; terminal space, clear grey. Secondaries, blackish, thus contrasting forcibly with the white hind wings of the

male. At base some longer white scales. Medially, the wing is more or less strikingly paler, while terminally, the blackish color spreads into an even dark border, with subobsolete, blackish, interspaceal streaks between the nervules and becoming faintly paler. Fringes along internal margin longer, and pure white; along external margin shorter and shaded faintly basally with cinereous. Beneath, as above; the fringes are more prominently white; a faint median dark shade-line.

*Expanse*, ♀, 1.90 inch. *Length of body*, 0.90 inch.

*Habitat*.—Atlantic District. (New York! to Pennsylvania!)

The discovery of the female of this fine species is particularly interesting, as illustrating a sexual difference in the color of the secondaries in *Heterocampa*. Thus while in *H. subalbicans*, *Grote*, and certain species hereinafter mentioned, there is no prominent difference in the color of the male and female secondaries, we have in *H. obliqua*, *Pack.*, a great distinction in this respect, so that Dr. Packard's observations, that in *H. trouvelotii*, *Pack.*, "the secondaries are smoky grey, while in *H. obliqua*, they are white," only holds good when the male of the latter species is considered. We have compared six specimens (♂ ♂ ♂ ♀ ♀ ♀) of *H. obliqua*, which were uniform in appearance when the sexes were separately considered.

***Heterocampa brunnea*, n. s.** (Plate 4, fig. 28, ♀.)

♀. Head, above, prothorax and patagia uniform dull and faintly olivaceous cinereous. Patagia with blackish borders. Centrally, the thoracic disc is dull brownish. Posteriorly, an olivaceous cinereous patch, margined and mixed with blackish scales. Antennae, simple, clothed above with cinereous scales, becoming obsolete towards the tips, and narrowly subannulate with dark scales. Outwardly the legs are clothed with cinereous scales; tarsi closely subannulate with black; inwardly the legs and under thoracic surface are clothed with whitish, hair-like scales. Abdomen, exceeding the secondaries; above, dull obscure cinereous, with a dorsal olivaceous tinge. A narrow, very evident, black central line is continued over anal and preanal segments; on either side of this, sublaterally and laterally, are two similar but much fainter lines. Beneath, paler, becoming dirty whitish towards the base.

In the shape and style of ornamentation of the wings, this species imitates *H. obliqua*. Primaries, ashen cinereous. Extreme base, olivaceous cinereous for a short space, traversed outwardly by the dark brown, geminate basal half-line, the latter resting inferiorly on a narrow black furcate streak, which extends from the base of the wing out-

wardly over the submedian fold on to the median space of the wing, its furcation taking place at a point beneath the basal half-line, whence the lower branch is thrown off downwardly obliquely on to the internal nervure. Subterminal space nearly filled with a diffuse deep brownish shade which, below median nervule, is narrowly continued outwardly, where it is slightly waved, to internal margin. Transverse anterior line formed of two distinct, dark brown lines, divaricate on costa, where they are also more faintly expressed, thence running approximately and slightly irregularly to internal margin. Below median nervure and along costa, the median space is shaded with olivaceous. Centrally the costa is free from the alternate dark and whitish cinereous streaks which characterize *H. obliqua*. A distinct, black, transverse discal line, beyond which, the wing is shaded with bright brown below the subcostal nervule to external margin. The black scales are continued below the streak over second median nervule, and there is a second prominent and parallel black streak on the interspace below. The bright brown color suffuses the wing terminally until above third median nervule, below the latter this is again cinereous, dusted with olivaceous, and the lunate transverse lines are brought into relief by pale scales. Surmounting the discal streak is a dark geminate shade which, while distinct on costa, becomes obsolete inferiorly below median nervure. The transverse posterior line is generally indistinct, and consists of a double series of regularly lunate brown lines, apparent over the bright brown terminal shade, but indistinct inferiorly. A diffuse, subterminal, black shade, analogous to that in *H. obliqua*, but less distinctly expressed; there is a series of black, longitudinal, interspaceal dashes, of which the lowest is on the interspace above first median nervule. The nervules are obsoletely picked out by pale scales, and there is a slight aggregation of these latter at apex. An even, distinct, continued, narrow, brown terminal line. Fringes, dark olivaceous cinereous, with a distinct, basal, darker line; at the extremity of the nervules the fringe becomes obsoletely darker colored. Secondaries, smoky grey, with a median pale shade and with longer pale hairs over the base and along internal margin. Terminally the color of the wing is darkest, deepening to a dark, marginal shaded line along the external edge. This marginal line is broader than usual, continued along costal margin, and obsoletely preceded along external margin by a pale shade; it is also slightly lunate on the interspaces. Fringes, cinereous, tipped with a paler shade.

Under surface, cinereous, with obsolete ornamentation. Primaries

covered with long hair-like scales over the disc and base; the subterminal shade and black interspaceal streaks of the upper surface are here reproduced. Secondaries, a little paler, but resembling their upper surface in appearance.

*Expanse*, ♀, 2.00 inch. *Length of body*, 1.10 inch.

*Habitat*.—Atlantic District. (Pennsylvania!)

Closely allied to *H. obliqua*, but differing by the brown terminal shade of the wings, which are dusted with olivaceous atoms over median space inferiorly, the darker fringes, the continued and even terminal lines, and by the distinct ornamentation of the anal segments of the abdomen above.

***Heterocampa tessella*.** (Plate 4, fig. 29, ♂.)

*Lochmaeus tessella*, Pack., Syn. U. S. Bomb., Proc. Ent. Soc. Phil. p. 370. (November, 1864).

♂. Head, whitish cinereous. Antennae, blackish, dusted with pale scales along the stem at base above, bipectinate for fully one-half their length, the pectinations decreasing in length outwardly. "Collar" and tegulae, concolorous, whitish cinereous, with a greenish, pale olivaceous tinge, the former with a central, shaded, obscure greenish line, the latter edged with dark scales and with a terminal dark line. The thorax, between the tegulae, is clothed with mixed obscure olivaceous and dark scales, so as to form a triangulate dark patch, contrasting with the pale prothorax and tegulae, and having its apex centrally, behind the prothoracic pieces. Abdomen, above, obscure and dark cinereous; some longer blackish hairs over basal segment; anal and preanal segments, paler, somewhat olivaceous, the latter with two sub-dorsal dark stains. Beneath, with under thoracic parts, whitish cinereous, shaded with pale olivaceous. Tarsi, annulate with black; legs covered with long, whitish cinereous, hair-like scales; tibial hairs transversely barred outwardly with black lines, most distinct on the fore and obsolete on the hind legs.

Primaries, whitish cinereous, evenly washed with a pale greenish, olivaceous shade. Costa a little depressed centrally; apices produced; external margin, oblique, and somewhat inwardly depressed below first median nervule. Extreme base for a short space, paler colored. A dentate black basal half-line. Sub-basal space evenly shaded with obscure cinereous scales. Transverse anterior line, geminate, black, irregular, dentate. Beyond it the median space is at first whitish, free from dark scales, becoming outwardly delicately tinged with pale greenish olivaceous. A faint, linear discal mark, surmounted on costa

by two faint, darker streaks, the inception of a median, geminate, transverse shade, which runs approximately to the transverse posterior line, but which is very faint and partially obsolete. Transverse posterior line, geminate, arcuate opposite the disc, formed by a double series of dull, pale greenish lunules, which, opposite the disc, are mixed with black scales, the whole faint. Costa with three black, distinct, preapical dots. A faint, subterminal, blackish shade, inwardly dentate, on the interspaces superiorly, medially obsolete, inferiorly appearing as a distinct, black, uneven V-shaped mark. Terminally the wing is obscure olivaceous, this darker color interrupted between first and second median nervules by the paler greenish, olivaceous color of the median space, which here extends to external margin. A terminal interrupted line everywhere preceded by a narrow, coincident, pale shade. Nervules marked with black scales. Fringes, pale olivaceous, interrupted with darker scales at extremity of the nervules. Secondaries, smoky grey. A median undulated line followed by a coincident whitish shade line. Between this latter and external margin the wing is evenly darker colored than elsewhere. Fringes, pale grey, interrupted with dark scales at the nervular extremities. An obscure dark terminal line.

Beneath, with obsolete ornamentation. Primaries, whitish at base and along internal margin, terminally and below costa, dull blackish. The preapical black dots reproduced. Nervules marked with blackish. The subterminal shade of upper surface is here indicated. A very distinct, blackish, even, terminal line. Secondaries almost entirely whitish; fringes, darker, and prominently interrupted with blackish scales.

♀. Resembles the male. Antennae, simple and shorter. Abdomen, plumper, and the preanal subdorsal stains of the male are obsolete. Under surface of secondaries, prominently darker, more dusted with cinereous scales than in the male, while generally more obscurely colored.

*Expanse*, ♂ ♀, 1.80—1.90 inch. *Length of body*, 0.85—0.95 inch.

*Habitat*.—Atlantic District. (New York! to Pennsylvania!)

We have examined four ♂ and one ♀ specimens of this species. The characters to be observed are: The dark thoracic discal squamation; the pale whitish-green primaries, having the median space and the wing generally, outside of the transverse, anterior geminate line, free from any admixture of dark scales in the ground color; the comparatively dark abdomen, and, in the female, the shortish antennae.



Although Dr. Packard's description (l. c.) of the female of this species offers certain differences when compared with our material, yet a comparison with the type of *Lochmaeus tessella*, Pack., in the Coll. of this Society shows our determination to be correct. The ground color of the upper surface of the fore wings should not be characterized as "pale whitish-ashen," since it is tinged with olivaceous, of which latter shade no mention is made in the original description. Perhaps it is as well to mention, that Dr. Packard himself did not recognize our present material as belonging to a species that had been already described by him, while our examination of the before-mentioned typical (♀) specimen has not allowed us to benefit by the circumstance, although the discordant diagnosis might have additionally excused us for so doing.

*Heterocampa elongata*, n. s. (Plate. 4, fig. 30, ♀.)

♀. Head and appendages, dull pale cinereous. Antennae, simple, moderate, testaceous, clothed with pale scales at base above. Prothorax, patagia and thoracic disc, concolorous, pale bluish-green, with an admixture of whitish and dark underlying scales. Sides of the patagia edged with brown scales from beneath. A faint, linear, prothoracic darker shade; patagia with a similar faint shade edging these within. Metathoracic hairs largely mixed with dark scales. Abdomen, rather pale cinereous; basal segment tipped dorsally with dark scales. Beneath, the legs and body parts are pale dull cinereous; tarsi and tibiae, annulated and barred with black outwardly, as in *H. tessella*.

Primaries, cinereous, sprinkled with an admixture of dark scales in the ground color of the wings, and shaded centrally and terminally with olivaceous. A reduced basal space, concolorous with thorax above. A geminate basal half-line resting on a narrow, longitudinal, furcate, black line, running outwardly and downwardly over the sub-basal space. This latter wide and dark, being closely sprinkled with darker scales on an obscure ground. Transverse anterior line, black, distinct, geminate, irregularly dentate. Median space shaded with olivaceous or dull yellowish-green. A black discal streak, succeeded by a faint post-median blackish shade. Transverse posterior line, black, interrupted, geminate, regularly lunulate between the nervules, the enclosed spaces whitish. Nervules interruptedly marked with blackish. A blackish, subterminal shade, dentate and more strongly marked before internal angle, much as in *H. tessella*, but more powdery. A terminal blackish line; fringes, concolorous with the wing, with black scales at the extremity of the nervules. Secondaries, smoky grey. A median, lu-

nate, whitish band. A narrow, terminal, darker shaded line. Nervules marked with darker scales. Fringes, interrupted with black at extremity of nervules.

Beneath, both wings are obscure smoky-grey, sprinkled with dark scales subterminally on the primaries. Nervules marked with dark scales. Fringes prominently interrupted with dark scales. The secondaries are paler, whitish, the dark scales form a faint median shade, and spread over the terminal portion of the wing.

*Expanse*, ♀, 2.20 inch. *Length of body*, 0.95 inch.

*Habitat*.—Atlantic District. (Pennsylvania!)

Allied to *H. tessella*, but to be distinguished by the darker primaries, the more powdery transverse lines, and the concolorous thorax. The primaries are longer and straighter along the costa; the antennae are brighter, testaceous, and longer, compared with the female *H. tessella*. The general shape and proportions are more as in *H. subalbicans*, *Grote*. Compared with *H. tessella*, the abdomen is paler. The contrast between the pale bluish-green thorax and the finely obscure, olivaceous median space of the primaries in *H. elongata*, is an evident character, while there is a similarity between the course of the transverse lines and the style of ornamentation of the two species.

*Heterocampa pulverea*, n. s. (Plate 4, fig. 32, ♀.)

♀. Head, dull ashen; the small palpi marked with black at the sides. Antennae, rather short and stout; beneath, testaceous; above, clothed entirely with ashen scales and finely subannulate with black. Thorax, olivaceous ashen. Prothorax with a linear darker shade. Palpia edged within by a darker linear shade. Metathoracic tuft, prominent, tipped with dark scales. Abdomen, smoky grey, stout; a narrow dorsal black line of slightly raised scales, which are developed on first, fourth, fifth and sixth segments, into prominent blackish tufts. Anal segment somewhat tinged with olivaceous above. Beneath, smoky grey; the thoracic hairs are whitish. Tarsi subannulate with black, and middle and fore tibiae once barred with black.

Primaries, olivaceous ashen. A clear colored, reduced, basal space. A distinct, geminate, blackish half-line, in which the outer line is the more broadly expressed. The prominent sub-basal space is dark olivaceous, obscured by blackish intermixed scales, especially centrally. Median space, paler, olivaceous. Transverse anterior line, black, geminate, dentate; the space included is medially stained with brown, which color extends over the discal cell; the outer line is much fainter than the inner. A narrow, distinct, discal, lunate streak, preceded by

a blackish zig-zag median shade-line most evident on costa, and becoming faint and straighter before internal margin. Fourth median nervule marked with black scales. Beyond the discal streak the wing is clear and whitish, forming an oblique pyriform space, limited outwardly by the subterminal line, and inferiorly by a dark shade below third median nervule, somewhat as in *H. obliqua*, but wider and less prominently contrasted with the rest of the wing. The transverse posterior line traverses this clear space, and is composed of two faint, approximate, lunulate lines, which are hardly apparent and run evenly and straightly across the wing. Subterminal line very oblique and strongly marked, consisting of black, pulverulent, interrupted, broad marks, not apparent at apex, and margining inferiorly outwardly the dark shade above fourth median nervule. Terminally, the wing is evenly sprinkled with olivaceous scales. Centrally, the costa is clear grey; there is a series of preapical black dots. Secondaries, smoky grey, faintly tinged with olivaceous terminally. Nervules marked with darker scales. Base, paler. A median, geminate, black line, enclosing a clear colored linear space. Terminally the wings are most obscurely shaded; a terminal lunulate line; fringes, pale, shortly interrupted with black at the extremity of the nervules.

Beneath, smoky grey; the general appearance of the upper surface is vaguely indicated by powdery and darker scales.

*Expanse*, ♀, 2.10 inch. *Length of body*, 1.00 inch.

*Habitat*.—Atlantic District. (Pennsylvania!)

We have before us a single male specimen from New York, which apparently belongs to this species, but the primaries are too much rubbed to allow of certainty in the reference. This specimen expands 1.90 inch. The antennae are lengthily pectinate for nearly three-quarters from the base. The patagia are mixed with ashen scales. There is a basal black dash, apparently absent in the female. The black, oblique, subterminal line is here as in the female, but reduced. Elsewhere the wings are evenly dusted with olivaceous scales on a paler ground, all the ornamentation being apparently lost. The secondaries are paler than in the female and the shadings are lost. It is probably correctly referred here, since the palpi are also marked laterally with black scales. There is a tendency in this and allied species to have the "veins" marked with dark scales, as an apparently inconstant character.

## Family, NOCTUIDAE.

**HELIOTHIS, Ochs.*****Heliothis phloxiphaga*, n. s.**

*Heliothis umbrosus*, Grote, Riley, Prairie Farmer, (with figs.) 1867.

♂ ♀. Head and thorax, above, olivaceous-ochreous. Beneath, the under thoracic surface and legs are pale ochreous, the latter with a brighter, somewhat pale reddish tinge outwardly; hind tibiae with four slender, subequal spurs. Abdomen, above, ochreous, with an olivaceous shade; beneath of a paler ochreous, shaded with a brighter hue (as on the legs outwardly) laterally, and over the anal segment and tuft. Antennae, simple.

Anterior wings, above, pale ochreous, with an olivaceous tinge. A basal black half-line. On the costa at basal third a black spot, beneath which, on median and internal nervures, are minute black dots not readily perceived. A black dot on the discal cell. A broad, dark olivaceous ochreous band is drawn inwardly obliquely over the wing at about the middle. This is limited on either side superiorly by oppositely arcuate series of black dots where it encloses the reniform spot as a diffuse blackish spot. Its course is here straight, but below the median nervure it runs inwardly obliquely, and is margined on either side by faintly darker lines, widening towards the margin. Between this band and the base, the wing is pale ochreous, but owing to the course of the median band, this paler basal space is wider on costal region above median nervure and narrows to internal margin. The median band is succeeded by the pale ground color, which obtains from the costa downwards, but is encroached on by a second broad shade band analogous to the median band, but paler, more diffuse and longer, and which arises on the costa (where it is darkest and includes two whitish, costal hair dots) at near the apex and, widening as it proceeds, spreads on internal margin from the angle to the first median band, from which latter it is separated by its inner marginal line. This latter line is faint and irregularly and roundedly dentate superiorly on the interspaces; here its outward inflections attain a series of minute, black nervular dots; the two last and most widely separated of these are included in the band since this here widens, and its inner marginal line, attaining the first band, runs more evenly and within them. The pale ground color of the wing obtains beyond the second transverse shade band as a narrow terminal space. A terminal black line, broadly interrupted over the nervules; fringes, glistening, somewhat blackish, darker than the wing. Beneath, pale ochreous. Two large, black, discal spots, of which the first is spherical and smaller,

while the outer limb or third and corresponding sinus only attains the submedian nervule. The transverse anterior line and the above-described inflections are easily lost or overlooked, and are only to be detected in fresh and well marked individuals. There is a distinct, black sinuate median shade line, running from costa to internal nervure over the first sinus of the transverse anterior line, and preceded by a faint blackish discal dot. This line is always to be detected; its most prominent sinuation is on the discal cell, whence it is S-shaped. The costa, over the discal cell, is often touched with cinereous. The transverse posterior line is preceded by a dark shade, distinctly limited inwardly; this limitation appears as a second median shade line, not extending below median nervure, where it joins the upward inflection of the transverse posterior line. The tremulous transverse posterior line above described, is closely followed by a short series of black diffuse dots over the middle of the wing. A very distinct and nearly perpendicular subterminal line, always present, consisting of a series of black nervular spots obsoletely united. A faint, evenly lunulate, terminal line rests on external margin. Fringes, discoloured with the wing, griseous. Secondaries, much as in *D. erichtea*, *Hüb.*, being largely of an obscure smoky testaceous cinereous basally. A median paler and wide band, beyond which a deep colored band, diffusely margined inwardly and distinctly limited externally, where it borders a second very narrow pale shade; beyond this the narrow terminal space is again of an obscure color. The external margin is edged narrowly by a dark line. Fringes, concolorous with the wings, shaded with testaceous at base.

Beneath, both wings are pale ochreous, with a powdery appearance. All markings have vanished, except two faint darker transverse subterminal shades on either wing. Apically the wings tend to be more obscurely shaded.

*Expanse*, ♀, 1.60 inch. *Length of body*, 0.75 inch.

*Habitat*.—Atlantic District. (Massachusetts! to Pennsylvania!)

We have examined a number of ♀ specimens of this species which is subject to variation in the distinctness of the ornamentation of the upper surface of the primaries, but in its characters is very distinct from either *E. erichtea*, *Hüb.*, or *D. erichto*, *Guente*, its congeners, and with which it associates. Its exclusive specific characters are these: the purely brown super-thoracic and alar coloration; the absence of the distinctly expressed inception of the subterminal line which forms in the other species superposed preapical marks. In its

general character it will be known by its evenly colored primaries, destitute of prominent shades and lines, and tending to become of a concolorous brown.

*Drasteria mundula*, n. s. (Plate 4, fig. 35, ♀.)

♀. Obscure olivaceous testaceous cinereous. Head and body parts, concolorous, except that the color is a little deepened over the prothorax, and becomes paler, more testaceous, over the abdomen terminally and beneath. Antennae, simple. Hind tibiae with a middle and terminal pair of spurs.

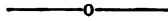
Anterior wings with a faint brownish tinge, but generally concolorous with the body; the squamation is finely intermixed with darker scales. The conformation of the median lines is like that in *D. agricola*, but these are more distinct, dark, and edged externally and incompletely with pale scales, which are tinged with testaceous. A black antemedian discal dot. Median shade line evident, dark, running downwards from costa and apparently joining the upward (second) sinus formed by the union of the median (transverse anterior and posterior) lines, but in reality diverging inwardly and running over the first sinus as in *D. agricola*. The serrate transverse posterior line is succeeded by three or four black shaded points as in *D. agricola*. The evenly dentate, subterminal line is inaugurated below costa subapically by two super-posed, shaded black marks as in *D. erichtea* and *D. erichto*, and is succeeded by a series of continued interspaceal black marks or short dashes. Secondaries, paler, more testaceous than primaries, their ornamentation is as in the before-mentioned species, but the two median dark shade lines are farther apart; towards internal margin this is especially noticeable, since here in *D. erichtea* and *D. erichto* the lines converge, the median line projecting a more prominent inflection downwards on the outer subterminal line, which latter is usually somewhat retired to receive it. Under surface, pale, somewhat ochreous. Common blackish transverse lines cross the wings, more widely separate than usual.

*Expanse*, ♀, 1.85 inch. *Length of body*, 0.75 inch.

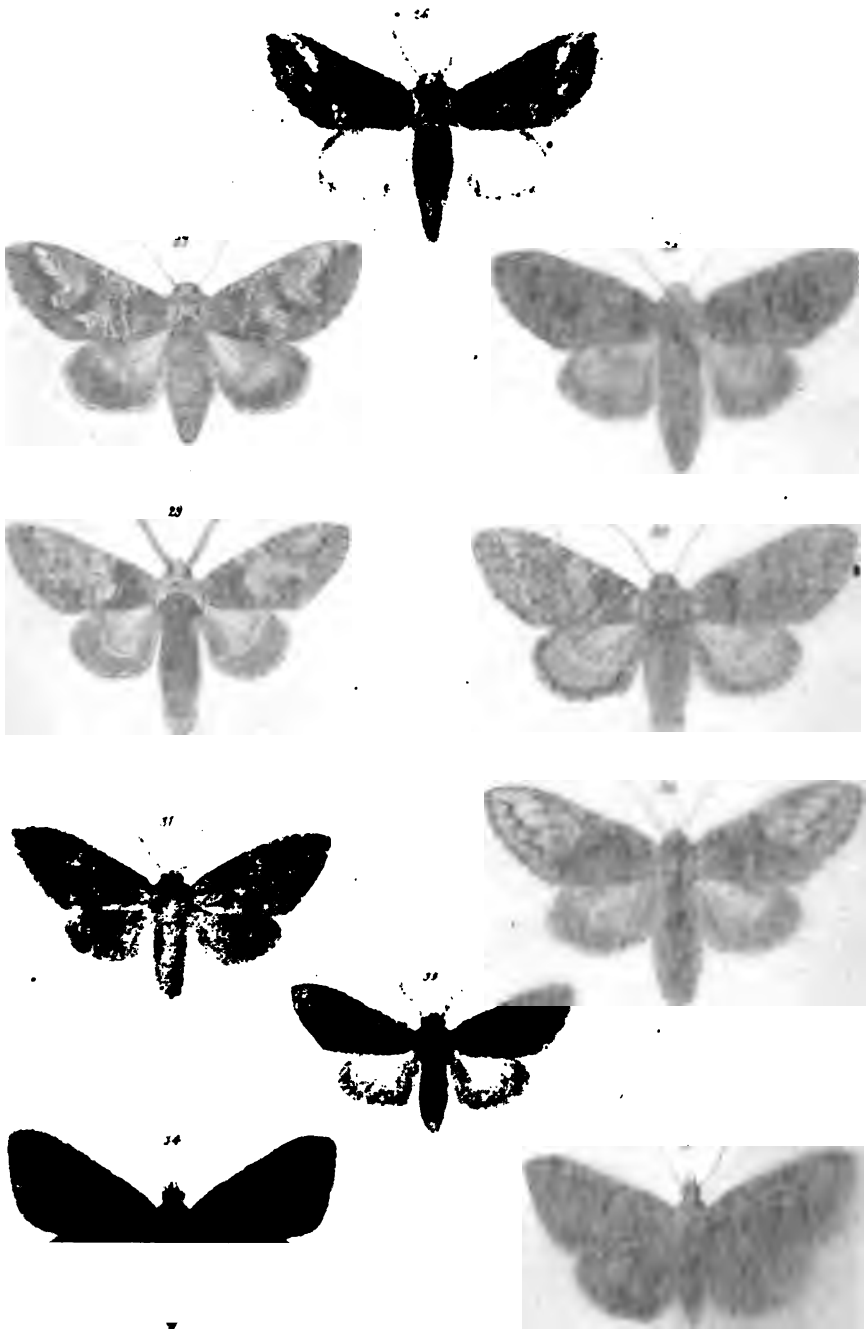
*Habitat*.—Atlantic District. (Pennsylvania!)

A larger species than *D. erichtea*, and differing by the absence of the prominent dark shades accompanying the transverse lines, and the faint purplish hue of the primaries above, which are never lost in that species. From *D. agricola*, it differs by the color of the primaries above and the greater distinctness of the ornamentation.

## EXPLANATION OF PLATE 4.



- Figure 26, ♂ *Heterocampa obliqua*, Packard.  
27, ♀ *Heterocampa obliqua*, Packard.  
28, ♀ *Heterocampa brunnea*, G. & R.  
29, ♂ *Heterocampa tessella*, G. & R.  
30, ♀ *Heterocampa elongata*, G. & R.  
31, ♂ *Dasylophia interna*, Packard.  
32, ♀ *Heterocampa pulverea*, G. & R.  
33, ♂ *Coelodasys leptinoides*, G. & R.  
34, ♀ *Drasteria agricola*, G. & R.  
35, ♀ *Drasteria mundula*, G. & R.



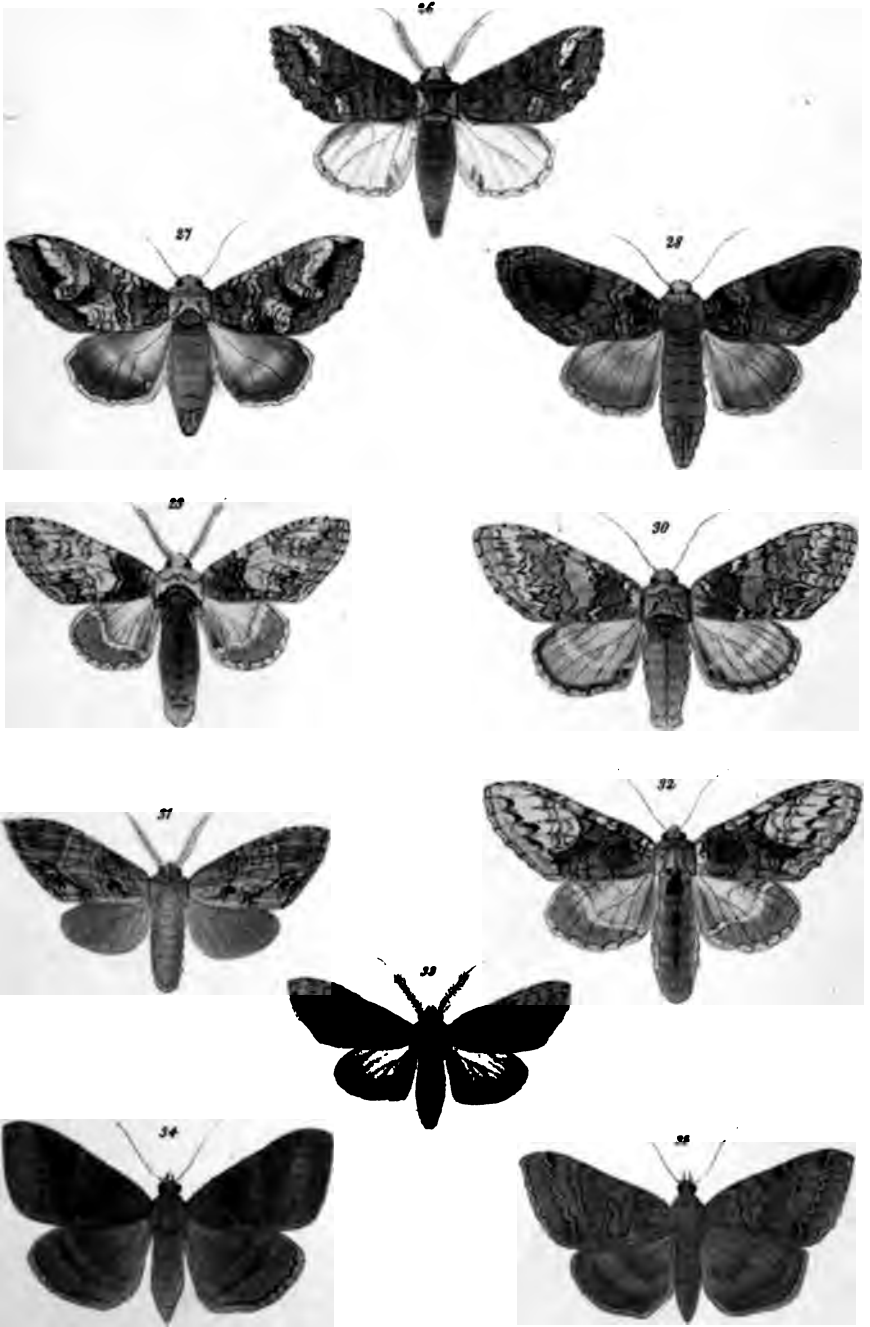


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Drawn by D. Wiest.

Bowen & C<sup>o</sup> Rth. Philada.



Catalogue of the described TENTHREDINIDÆ and URO CERIDÆ of North America.

BY EDWARD NORTON.

[Continued from Page 31.]

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Lanceolate cell closed in middle.

31. **NEMATUS.**

*Nematus*, Jurine, Nouv. Meth. 1807, 59.

Leach, Zool. Misc.

Lepel, Mon. Tenth. †††, 62.

Hartig, Die Blattw. Sec. 2, Tr. 2, 184.

*Wings* ample, one marginal and four submarginal cells, the first and third small, the second large and receiving two recurrent nervures; the first generally rounded, with the dividing nervure sometimes very indistinct, only to be seen by holding up to the light; four submarginal bullæ, viz.: one in middle of each transverse nervure and a long one on the submarginal vein beginning at the first recurrent nervure, and that on the third transverse nervure quite wide; lanceolate cell petiolate; under wings with two middle cells.

*Antennæ* 9-articulate, elongate, slender, simple, third article generally largest, remainder gradually decreasing in length.

*Head* transverse; clypeus emarginate; mandibles with one inner tooth; fourth joint of maxillary palpi not short; the inner lobes of maxillæ with a tooth-like edge or pectination. A suture-like groove generally passes down the face from summit on each side of ocelli, connected back of ocelli by a cross groove, more or less distinct. Between the antennæ a ridge, channeled above, is produced.

*Body* short, subcylindric in the males, broader and depressed in the females.

*Legs* simple; two sharp spines at the apex of tibiæ; claws in general with an inner tooth.

*Larvæ* twenty-footed (six pectoral, twelve abdominal and two caudal). They present quite a variety of habits, as will be seen by the following table. (Dahlbom.)

- a. Feeding upon leaves of plants, gooseberry, willow, &c., resting at the edges or on the surface of leaves.
- b. Feeding upon the leaves of pines, social; resting at the edges of leaflets, forming a simple cocoon.
- c. Living in galls of plants. c. 1.—Gall-makers, Walsh.  
2.—Inquilines, Walsh.

They are generally social in habit and are often very destructive, eating off all the leaves.

The cocoon is simple, egg-shaped. It is sometimes fastened to stems, lies sometimes on the surface of the ground, sometimes in the earth.

Westwood (Mod. Class. of Insects) mentions the European species which attacks the gooseberry (*N. grossulariæ*) as having been seen in as large numbers as a thousand on a single bush. Other species are found upon the cherry, willow and elm.

Westwood refers also to the larvæ of several species which are solitary in their habits, and others which form woody galls upon the stem and also in the spongy rib of the leaf. In some of these galls but one individual resides, and in others more than one in each gall. These galls have mostly been observed upon the willow in Europe. In this country Mr. Walsh has described a number of species bred from various galls, mostly on the willow, and has made the further remarkable discovery, that not only are some of these galls makers but others are parasitical in the galls of other insects. He has found, too, that many of these are so much alike in the imago state, that it is almost impossible to separate them. It is difficult to give a hearty assent to Mr. Walsh's "Inquilines or Guest-flies," without further investigation.

Many species have two broods in a season, of which the first is doubtless the most productive.

This is the most difficult genus of this family, because the species are so numerous, (Hartig enumerates about fifty species in Europe,) and presents so few salient points of difference, either in form or color.

In addition to this, most of the species here named are described from but one or two specimens, so that we have abundant room for future corrections.

Dr. Hartig has joined to this genus several sub-sections, under different titles.\*

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\* Hartig, Die Blattwespen, &c., p. 179.

1. *Nematus*.—Wings, one marginal and three or four submarginal cells.

Subgenus.—1. *Nematus*.—Wings, one marginal and three or four submarginal cells.

Sec. 1.—*Leptopus*. Lanceolate cell closed in middle.

Sec. 2.—*Nematus*. Lanceolate cell petiolate.

Tribe 1.—*Creasus*. The first joint of hinder tarsi as usual.

Tribe 2.—*Nematus*. Last joint of hinder tarsi as usual.

2.—*Cryptocampus*. Wings, one marginal and three submarginal cells.

Sec. 1.—*Cryptocampus*. Body lengthened, cylindrical.

Sec. 2.—*Diphadnus*. Body egg-shaped, short.

*Tabular Synopsis to assist in finding the species.*

1. Head above the antennæ black.	
A. Body and legs black.....	1, concolor.
B. Thorax black.	
a. Abdomen black.	
1. Tegulæ and trochanters black.....	2, Labradoris.
2. Tegulæ and trochanters pale.....	3, malacus.
b. Venter more or less pale.	
1. Tegulæ and trochanters black.....	4, extensicornis.
	5, marylandicus.
	6, fallax.
2. Tegulæ and trochanters pale.....	7, suratus.
	8, winnipeg.
	30, ventricosus.
	9, monela.
	10, subalbatus.
	11, corniger.
	12, luteolus.
c. Abdomen banded with rufous. ....	24, erythrogaster.
C. Thorax black, pectus pale.....	13, Saskatchewan.
D. Thorax pale, a black spot on pectus.....	44, bivittatus.
2. Head above antennæ more or less pale.	
E. Thorax black.	
a. Venter more or less pale.	
Trochanters black.....	14, violaceipennis.
	15, nigrinus.
Trochanters pale.....	16, ventralis.
	17, longicornis.
	18, proximatus.
	11, corniger ♀.
	19, pallicornis.
	20, obscurus.
	21, S. pisum.
b. Abdomen banded with red or yellow.....	22, brunneus.
	23, rufofasciatus.
	25, luteotergum.
	26, fur.
	27, Hudsonicus.
F. Thorax black, pleura pale.....	28, sumptus.
	29, pleuricus.
	30, ventricosus, ♀.
	31, lateralis.
	32, desmodioides.
	33, fulvipes.
G. Thorax mostly pale.....	34, crassus.
a. Pectus black, a pale spot in middle.....	35, placentus.
b. Pectus pale.	
Thorax trilineate with black, pleura with two spots...36, inquilinus.	
pleura with one spot.....37, longulicornis.	
scutel black.....38, trilineatus.	

Thorax trilineate with black, scutel pale.....	39, <i>vertebratus</i> .
	40, <i>integer</i> .
	41, <i>S. pomum</i> .
	42, <i>hospes</i> .
	43, <i>trivittatus</i> .
Thorax bilineate with black.....	45, <i>aureopectus</i> .
	46, <i>mendicus</i> .
Metathorax and part of tergum black.....	47, <i>chloreus</i> .
	48, <i>stigmatus</i> .
H. Thorax and abdomen pale.....	49, <i>monochroma</i> .

1. *Nematus concolor*, n. sp.

Wholly black; wings subhyaline, with a violaceous tinge. Length .24. Br. wings 0.54 inch.

♀. Black; antennæ rather stout; head rather coarsely punctured; thorax with shallow, confluent punctures; nasus smooth, with rounded notch before, its edge and the labrum reddish-white; abdomen ovate, short; legs black, anterior tibiæ and tarsi dull piceous, inner claws large; wings with a violaceous tinge, nervures piceous, second submarginal with two angles beneath, widest at the first, a bulla covering most of first submarginal cross line and another at the reception of the first recurrent nervure or submarginal nerve extending along the nerve.

♂. Antennæ long and slender.

Connecticut; Albany, N. Y., Dr. Peck. (One ♀, one ♂.)

2. *Nematus Labradoris*, n. sp.

Shining black; tibiæ pale; wings hyaline. Length 0.24—0.32. Br. wings 0.56—0.76 inch.

♀. Black; body stout, as in *Selandria*. Antennæ moderate, flattened; all the joints of nearly equal length; nasus moderately emarginate, face black; labrum piceous; tegulæ black; abdomen ridged down the back, apex pale; legs black; apical half of anterior femora beneath and all the tibiæ, except tips of hinder pair dull white; inner spur of anterior tibiæ large and blunt, tibiæ pilose; second tooth of claws as large as first; wings ample, hyaline, nerves brown, stigma and costa pale greenish; second submarginal with two angles beneath, widest at first; the second recurrent nervure received very near the second submarginal nervure.

♂. The male is quite slender and the antennæ longer and more slender.

Labrador, (A. S. Packard, Jr.) Two ♀, one ♂.

One of the females is not more than half the size of the other, but preserves the same characteristics.

3. *Nematus malacus*, n. sp.

Black; tegulæ, trochanters and legs below knees pale. Length 0.28. Br. wings 0.60 inch.

♀. Shining black; body short and stout; antennæ slender; joints of nearly equal length; lower ocellus in a shallow basin; nasus hardly incurved; tegulæ and collar whitish; coxæ, femora, tips of posterior tibiæ and of all the tarsi black; claws slightly dentate within; trochanters, anterior femora before, tibiæ and tarsi, except at tip, white; wings hyaline, stigma and costa pale greenish, second submarginal widest at first recurrent nervure.

Labrador, (A. S. Packard, Jr.) Three ♀.

4. *N. extensicornis*.

*Nematus extensicornis*, Norton, Proc. Bost. Soc. viii, 1861, 159, ♂.

Black; tip of venter yellow-red; knees and tibiæ pale. Length 0.27. Br. wings 0.60 inch.

♂. Shining black. Antennæ as long as body, slender, cylindrical, punctured, pilose with upright hair, joints slightly globose at tip, third hardly as long as fourth; lower ocellus in a basin; nasus retracted, with a shallow, wrinkled notch in the middle; apical third of venter and anal styles pale fulvous; legs black; the knees, tibiæ and tarsi reddish-white, the latter darker above, claws yellowish, with a very short inner tooth (slightly dentate). Wings hyaline, stigma and costa pale, second submarginal widest at first recurrent nervure; second recurrent nervure received at or very near the intersection of second and third cells.

♀. Antennæ about two-thirds the length of body, tips of joints not so much enlarged, third and fourth joints of equal length, edge of nasus and labrum yellowish; legs below the knees darker, stigma and costa white.

Mt. Washington, N. H. Summit. One ♂, one ♀. (S. H. Scudder and Baron Osten Sacken).

5. *N. marylandicus*.

*Nematus marylandicus*, Norton, Proc. Ent. Soc. iii, 1864, 7, ♂.

Black; apex of abdomen rufous, knees and part of tibiæ whitish; wings hyaline. Length 0.28. Br. wings 0.60 inch.

♂. Black; body long and not stout; antennæ as long as body, slender, cylindrical; joints not so much enlarged at tips as in *N. extensicornis*, pilose; head and thorax with short whitish hair, that on labrum longer, brownish; lower ocellus in a basin, which is open at top and bottom; nasus with a deep, angulate notch; apical segment of abdomen yellowish piceous, most apparent beneath; legs black, their four anterior knees, tibiæ and tarsi beneath and at base above, and basal half of posterior tibiæ whitish; nails piceous, tips red. Wings hyaline, stigma and costa pale; second submarginal widest at



angle receiving first recurrent nervure; second recurrent nervure received just within third submarginal cell.

Maryland. One ♂. (Coll. Am. Ent. Soc.).

6. *Nematus fallax*, n. sp.

Black; mouth, cheeks, apex of venter and tibiæ in part, reddish-white; a black line down the tibiæ above, body slender. Length 0.18—0.20. Br. wings 0.44—0.48 inch.

♂. Shining black; body slender; antennæ rather long and slender, ferruginous beneath; nasus hardly incurved and with mouth below, lower half of cheeks and apex of venter yellow-red. Legs at base black, below the base of femora yellow-red, with a blackish line down their upper side; inner anterior tibial spur stout; inner tooth of claw nearly as large as outer. Wings perfectly hyaline, iridescent; stigma somewhat rounded above and with the costa pale greenish.

Labrador, (A. S. Packard, Jr.) Two ♂.

7. *N. suratus*.

*Nematus suratus*, Fitch, Third Rep. N. Y. State Agr. Soc., 1859, 94.

Fitch, Nox. Ins., p. 68, 94.

"Black, with four transparent, slightly smoky wings; mouth, cloud-like spot on the shoulders, edges of abdominal segments and legs livid white; the four anterior thighs being black upon their under sides and the hinder pair wholly black, except at their base. Length 0.25 inch, to the tip of wing 0.30 inch."

New York. Not seen.

8. *Nematus winnipeg*, n. sp.

Black; abdomen at sides and apex beneath and the legs piceous; hinder femora and ends of their tibiæ blackish. Length 0.22. Br. wings 0.48 inch.

♀. Black; body short and stout. Antennæ about half the length of body, stout, a little flattened, third and fourth joints equal; head dull with coarse punctures, no distinct sutures or depressions about the ocelli; nasus not emarginate, labrum slightly indented before; edge of nasus, labrum, tegulæ and two edges of anterior angle yellowish; sides and apex of venter, ovipositor and the legs yellowish piceous; the coxæ, the four anterior femora at base and beneath, posterior femora and apical third of tibiæ blackish, inner claw-tooth blunt and widely separated from outer. Wings yellowish hyaline, stigma and costa yellow; second submarginal wide.

Lake Winnipeg, (R. Kennicott, Smiths. Inst.) Two ♂. This is much like *N. suratus*.

9. *Nematus monela*, n. sp.

Black; mouth, spot on cheeks, tegulæ, collar and venter pale; base of coxæ and of femora and tips of hinder tibiæ black. Length 0.20. Br. wings 0.48 inch.

♂. Black; body slender; antennæ slightly compressed, third joint hardly as long as fourth; lower ocellus in a small basin; nasus not emarginate; edge of nasus, labrum and spot at base of mandibles white; tegulæ, two edges of anterior angle and apex of venter yellow-red; legs yellow-red, trochanters white; base of coxæ, base of femora and a line beneath, extending nearly to tip, apex of posterior tibiæ and their tarsi black; inner apical tarsal spur blunt, inner claw tooth small and widely separated from outer. Wings hyaline, stigma and costa pale waxen color.

Labrador. Two ♂. (Mr. Packard).

10. *N. subalbatus*.

*Nematus subalbatus*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 7, 10, ♀.

Length 0.28. Br. wings 0.62 inch.

♀. Black; body short and not very stout. Antennæ two-thirds the length of body, flattened, covered with a short hairy pile; third joint longer than fourth; lower ocellus in a shallow basin; nasus slightly emarginate; its edges, labrum and base of mandibles white; tegulæ, anterior angle, venter and legs (in part) white; base of coxæ, a band on all the femora, apex of posterior tibiæ, posterior tarsi and apical joints of all the tarsi black. Wings hyaline, apex and base of costa pale; second recurrent nervure coinciding with intersection of second and third submarginal cells.

Pennsylvania, (Coll. Am. Ent. Soc.) One ♀.

11. *N. corniger*.

*Nematus corniger*, Norton, Bost. Proc. viii, 1861, 159, 7, ♂.

Black; mouth, tegulæ, venter, bands on tergum and legs (in part) black.

♂. Length 0.17. Br. wings 0.40 inch.

♀. Length 0.25. Br. wings 0.58 inch.

♀. Black; body short and stout; antennæ more than two-thirds the length of body, slightly flattened and enlarged at joints, third joint longer than fourth; no distinct sutures about ocelli, the lower ocellus in a shallow depression; a faint piceous line on outer orbits; nasus slightly emarginate; edge of nasus and below and base of mandibles white; tegulæ, upper half of anterior angles, edges of tergum and obsolete bands at most of the joints and venter, except at tip, white; legs wholly yellow-red, with the tips of hinder femora and apical half of their tibiæ black; tarsi black, trochanters white; inner tooth of claw blunt and widely separated from outer. Wings hyaline, nervures and stigma piceous, costa at tip and base pale; submarginal nerve curved at second cell, hardly angulate, second recurrent nervure received near the intersection of second and third cells.

*Var. a.* ♀. The white markings reddish-yellow; antennæ at tip beneath piceous; coxæ white; legs below trochanters honey-yellow; tibial spurs very long and with the claws rufous. (Ct., N. Y.)

♂. Antennæ more flattened, fulvous beneath, third and fourth joints of equal length; a spot below antennæ and all the anterior angle white; the whole tergum black. (Conn., N. Y.)

*Var. b.* ♂. Colors reddish-yellow like *Var. a.*; lower half of anterior angle brighter reddish than the upper, with a marked dividing line; bands on tergum as in ♀; base of all the coxæ black. (Conn.)

*Var. c.* Tegulæ and upper half of anterior angle white, lower half black. (New Jersey.)

*Var. d.* Tegulæ and upper half of anterior angle rufous, lower half black; apical half of venter blackish; nasus emarginate; antennæ shorter. (New Jersey.)

Maine, Connecticut, New York, New Jersey, Pennsylvania, Illinois. None of the males have any orbital spots.

12. *Nematus luteolus*, n. sp.

Black; mouth, tegulæ, anterior angle, apex of venter and legs (in part) rufous; coxæ and trochanters pale. Length 0.18. Br. wings 0.40 inch.

♂. Antennæ more than half the length of body, flattened, third and fourth joints of equal length; head coarsely pitted, no distinct sutures about ocelli; edge of nasus and mouth beneath, tegulæ, anterior angle, (the latter with a darker centre,) whitish or honey-yellow; apex of venter ferruginous; legs honey-yellow, part of coxæ and trochanters paler; basal half of coxæ, tips of hinder tibiæ and their tarsi black; basal joint of tarsi pale; inner tooth of claws hardly as large as outer and near it. Wings hyaline, costa at base pale.

Maine, Massachusetts, Connecticut, Illinois, English River, (Smiths. Inst.) Eleven ♂.

13. *Nematus sathkatchewan*, n. sp.

Black; tegulæ black; breast rufous; legs mostly yellow-red; wings hyaline. Length 0.38. Br. wings 0.76 inch.

♀. Shining black; body long; antennæ long and slender, apical joint shorter than the preceding; the ocelli, seen from before, are each in a separate basin; nasus incurved; fourth joint of palpi short, fifth and sixth longer and very slender; thorax polished; labrum piceous; a large chestnut-red spot on pectus; legs same color; the trochanters and anterior tarsi whitish; posterior tibiæ, except at their base, and their tarsi black; anterior tibial inner spur stout, blunt, pilose so as to appear bifid; inner claw tooth large. Wings hyaline, stigma black.

Lake Sathkatchewan, (Smiths. Inst.) One ♀.

**14. *Nematus violaceipennis*, n. sp.**

Black; orbits piceous; mouth, tegulæ, anterior angle and venter reddish-white; legs beneath piceous; wings semi-obscure, with a violaceous tinge. Length 0.32. Br. wings 0.64 inch.

♀. Black; body long and slender; antennæ about half the length of body, slightly flattened and enlarged at tip of joints, third joint not so long as fourth; lower ocellus in a heart-shaped depression; nasus angulate, emarginate; outer orbits indistinctly piceous, paler toward the cheeks; an arc-shaped spot below the antennæ, nasus, labrum and base of mandibles, anterior angle, edges of abdomen, and all but the two apical segments of venter whitish; legs black above, knees and anterior tibiæ before piceous; inner tooth of claws large and near the tip. Wings subviolaceous, nervures dark, stigma somewhat bent above.

♂. Above. the male is wholly black, nearly as long as female, slender; third joint of antennæ thicker than fourth; labrum, anterior tibiæ and tarsi indistinctly piceous. Wings slender toward tip.

Farmington, Conn., April 24. Massachusetts, (Coll. Am. Ent. Soc.) Three ♀, three ♂.

**15. *N. nigrinus*.**

*Nematus nigrinus*, Norton, Bost. Proc. viii. 1861, 159, 9, ♂.

Black; outer orbits and mouth, tegulæ, apex of abdomen and legs in part, pale. Length 0.21. Br. wings 0.48 inch.

♂. Black; body slender; antennæ two-thirds the length of body, slightly flattened and enlarged at joints, third joint shorter than fourth; nasus hardly emarginate; an outer orbital line as high as suture, edge of nasus and beneath pale piceous; tegulæ and apex of abdomen and several apical segments of vertex yellowish; trochanters, apical half of femora, tibiæ, except tips of hinder pair, and base of tarsi reddish-white, remainder black; inner tooth of claw very short, blunt and distinct from outer tooth. Wings hyaline, nervures piceous, middle of stigma and base of costa paler; second submarginal cell with one angle below, the second recurrent nervure coinciding with second dividing nervure.

Connecticut. Two ♂. This may be the male of *N. subalbatus*.

**16. *N. ventralis*.**

*Nematus ventralis*, Say, Long's Second Exp. ii. 1824, 315, ♂ ♀.

Norton, Bost. Proc. viii, 158, 5.

Black; mouth, tegulæ, anterior angle and venter pale; femora black banded; wings hyaline.

Length ♂, 0.25. Br. wings 0.54 inch.

Length ♀, 0.30. Br. wings 0.68 inch.

♀. Black; body short and stout; antennæ about half the length of body, rather stout, third and fourth joints equal length, third thicker

than fourth; sutures at sides of ocelli deep; lower ocellus in a distinctly triangular space; nasus with a shallow notch; outer and inner orbits, space about antennæ and beneath, tegulæ, anterior angle, edges of abdomen, incomplete or obsolete bands between segments and the venter pale yellow; legs of the same color; coxæ, a band covering most part of femora and the apical end of posterior tibiæ black; posterior tarsi blackish; inner tooth of claw large and near the end of claw. Wings hyaline, nervures dark, base of costa whitish.

♂. The male has the "hypostoma, palpi and mandibles at base whitish; orbits above and behind piceous; thorax dilated; triangular line before the wing and wing-scale whitish, wings slightly dusky, nervures fuscous; feet honey-yellow, posterior tarsi black-brown; tergum black, segments each with a yellow band, of which the four terminal ones are interrupted in the middle; venter pale honey-yellow."

Maine, Connecticut, New York, Pennsylvania.

A male from Connecticut agrees entirely with the description by Say, but I do not feel certain that it is the male of *N. ventralis*.

Several ♀ from Pennsylvania have shorter antennæ, and the second recurrent nervure received very near the intersection of second and third cells.

17. *N. longicornis*.

*Nematus longicornis*, Escholz, Entomogr. 1822, 98, 66.

"Black, with the margin of tergum fuscous, the venter and legs pale; posterior femora black; costa of wings pale, stigma brown. Head black, labrum yellowish; eyes clear gray; length  $2\frac{1}{2}$  lines; antennæ longer than the moiety of body, setaceous, black; corselet black, its anterior border forming a yellowish collar; abdomen wide, flat; back brownish; lateral margins of a clear yellow; venter yellow; wings longer than the body, narrow, transparent, costa yellow, stigma and nervures brown; three discoidal cells; legs yellow; posterior femora black-brown in the middle."

Isle of Unalaska, Rus. America.

18. *N. proximatus*.

*Nematus proximatus*, Norton, Bost. Proc. viii, 1861, 12. ♀.

Black; outer orbits, mouth, tegulæ, apex of venter and legs, in part, reddish-yellow. Length 0.22. Br. wings 0.50 inch.

♂. Shining black; body slender; antennæ two-thirds the length of body, flattened, third joint shorter than fourth; lower ocellus in a wide, flattened basin; the whole outer orbit to suture, and a very narrow inner orbital line, base of antennæ and face below. (palpi dark.) tegulæ, upper and hinder edge of anterior angle, apex of abdomen, and

two or three apical segments of venter pale reddish-yellow; legs same color; basal half of coxæ, a slender, rather obsolete line on femora above and beneath nearly to tip, black; the posterior tarsi blackish; inner claw-tooth large, near to outer tooth; wings hyaline, stigma and costa pale.

♀. Antennæ hardly half the length of body, scarcely flattened, third and fourth joints equal, sutures distinct, more of black upon the femora at base than in the males; body slender.

Maine, Massachusetts, Connecticut. Six ♂, seven ♀. The antennæ of this species are of equal size to the fourth joint, each joint a little globose in the middle.

#### 19. *N. pallicornis*.

*Nematus pallicornis*, Harris, Cat. Norton, Bost. Proc. viii, 1861, 160, 11, ♀.

Black; antennæ fuscous; body at times with a ferruginous tinge; labrum; tegulæ, anterior angle, vertex more or less pale reddish-yellow. Length 0.16—0.20. Br. wings 0.36—0.44 inch.

♀. Black; body short and rather stout; antennæ moderate, slender, third joint longer than fourth, the basal joint black, the remainder ferruginous, darkest above; lower ocellus in a large basin, nasus emarginate; orbits and spot about antennæ reddish, nasus and mouth beneath white; tegulæ, anterior angle and venter reddish-yellow, the base of coxæ black, remainder of coxæ and trochanters white, remainder of legs yellow-red, paler before; at times the hinder tarsi are fuscous, and the hinder femora and apex of tibiæ obscure; inner tooth of claws large and near the tip. Wings hyaline, stigma at base and apex and base of costa white.

♂. The male has the antennæ paler and the whole venter yellowish.

*Var. a. ♂*. A triangular, dark rufous spot on the pleura. (Illinois.)  
Massachusetts, Maine, Illinois.

This is very much like *N. proximatus*, but differs in the form of the antennæ.

#### 20. *N. obscurus*.

*Nematus obscurus*, Norton, Bost. Proc. viii, 1861, 160, 13, ♀.

Dull black; tegulæ, base of abdomen and knees indistinctly ferruginous. Length 0.25. Br. wings 0.58 inch.

♀. Black, pubescent; third joint of antennæ a little longer than fourth; clypeus crenate, labrum brownish-red, shining; mandibles rufous at tip; palpi pale; a longitudinal groove upon scutellum; basal membrane, sides of tergum, knees and front of tibiæ indistinctly ferruginous; abdomen stout; wings faintly clouded; stigma dull fuscous, costa black.

Massachusetts.

21. *N. s. pisum*.

*Nematus s. pisum*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 259.

Length ♀, 0.11—.14; ♂, 0.22—.26 inch. Br. wing ♀, 0.13—.17; ♂, 0.13—.14 inch.

“♀. Shining greenish-white. A quadrate spot enclosing the ocelli, and extending behind onto the disk of the occiput, but not reaching the antennæ nor the eyes, a dot above the origin of the antennæ and tips of the mandibles black. Clypeus deeply emarginate. Labrum rounded at tip. Antennæ three-fifths as long as body; joints 3—5 subequal, the scape black, the flagellum brown-black. Thorax black, with the tegulæ, and anterior angle, except its lower angle, greenish-white. Abdomen black, with the venter and the tip of dorsal segment 8, and its side-plates indistinctly pale. Cerci whitish, dark-tipped. Legs pale greenish-white, the tarsal tips, especially in the hinder legs, and the tips of their tibiæ fuscous. Wings hyaline, veins black, stigma fuscous.

♂. Differs only from female in having larger black spots upon the venter and occiput and only two edges of anterior angle pale. The antennæ are four-fifths the length of body, the scape black, the flagellum brown-black above, palpi dull green beneath, upper and hind margin of collar pale.

The gall made by it is found on *Salix discolor*. A subspherical, pea-like, hollow, pale yellowish-green gall, always growing on the under side of the leaf and almost always from one of the side-veins, in one case from the main rib, and attached to the leaf by only a minute portion of its surface, 0.18—.28 inch in diameter, and a few, immature, only .08 in diameter. Almost invariably there is but one gall to the leaf, but on four leaves there were two, and occasionally two are confluent. Surface in some smooth and even, without pubescence, in others a little shrivelled, generally studded in the medium-sized ones with four to twelve small, robustly conical nipples, which in the larger ones have burst into a scabrous brown scar. Only in three out of sixty-two was there any rosy cheek, as in *S. pomum*. The point of attachment is marked on the upper side of the leaf by a brown sub-hemispherical depression.

*Larva*.—August 25th, apparently eighteen-footed, no anal prolegs being visible. When at rest it elevated its entire abdomen behind the true legs in the air. Length 0.17—.23 inch; color whitish hyaline; head slightly dusky; mouth dusky; eye spots circular and black; anal segment equal in length to two of the others and apparently divided in two by a transverse medial suture. The larva goes under ground to

transform, for out of fifty galls all but three were bored, and in those, when opened, larvæ which had perished when immature were found."

Rock Island, Ill.

Two ♂, three ♀. April 27—June 9. This is apparently the same with a species from Connecticut and Illinois previously named by me *N. infimus* but the description not published.

**22. *N. brunneus*.**

*Nematus brunneus*, Norton, Proc. Ent. Soc. Phil. iv, 1864, 8, 10, ♀.

Head and thorax brown; abdomen and legs yellowish, wings hyaline. Long 0.26. Br. wings 0.62 inch.

♀. Color ochre-brown; antennæ black, about half the length of body, second joint a little longer than fourth; a sort of W-shaped depression above ocelli; lower ocellus in a flat, distinctly enclosed, obovate space, separated from the groove on ridge between antennæ, which is slender; nasus incurved, edge of labrum almost square; head and thorax dark ochre brown; mouth, tegulæ, anterior angle, basal plates, abdomen and most part of legs yellowish; tips of posterior tibiæ and their tarsi fuscous; wings faintly smoky; stigma and costa pale; second submarginal with two angles beneath.

Rocky Mountains, Colorado, (Coll. Am. Ent. Soc.) One specimen.

**23. *Nematus rufo-fasciatus*, n. sp.**

Black; a band on middle of abdomen and most part of legs rufous; wings smoky-hyaline. Length 0.34. Br. wings 0.70 inch.

♀. Black; body long and moderately stout; antennæ about two-thirds the length of body, slender, cylindrical, third joint but little longer than fourth; head dull, with coarse, confluent punctures; nasus coarsely punctured, deeply channelled across the middle, angulate, emarginate; edge of labrum incurved; outer orbit and a spot opposite ocelli on each side, labrum and palpi rufous; upper half of anterior angle and basin on each side of scutellum rufous; abdomen, except the basal plates and three apical segments, chestnut-red; legs the same color; coxæ, except at tip, black; anterior inner tibial spur stout, apparently bifid; inner claw tooth large. Wings smoky-hyaline, nervures piceous, stigma and costa pale.

Mackenzie River, Hudson's Bay Territory, (R. Kennicott).

**24. *N. erythrogaster*.**

*Nematus erythrogaster*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 8, 12, ♀.

Black; the collar and abdomen, except at base, rufous; wings hyaline. Length 0.28. Br. wings 0.60 inch.

♀. Body moderately stout; antennæ more than half the length of body, slender, joints not enlarged at tips, third longer than fourth; head rugose, with a trilobate basin, enclosing ocelli; nasus moderately



incurved; labrum piceous; tegulæ, anterior angle and the abdomen, except the two basal segments, rufous; legs varied; the coxæ, trochanters, intermediate tibiæ and tarsi, and a band at base of the hinder tibiæ white; the four hinder femora and apex of intermediate tibiæ rufous; apex of hinder femora and apical two-thirds of their tibiæ and the tarsi black. Wings perfectly clear, stigma fuscous, costa pale.

Massachusetts, (Coll. Am. Ent. Soc.) One ♀.

25. *N. luteo-tergum*.

*Nematus luteo-tergum*, Norton, Bost. Proc. viii, 1861, 161, 14, ♂.

Black; mouth whitish, an orbital line, the abdomen and anterior legs rufous, wings subviolaceous.

Length ♂, 0.24. Br. wings 0.50 inch.

Length ♀, 0.32. Br. wings 0.66 inch.

♀. Body long and not very stout; antennæ about half the length of body, flattened, third joint shorter than fourth; lower ocellus in a basin; head dull, with coarse, confluent punctures; nasus wide and distinctly notched; mandibles with a strong inner tooth; an axe-shaped spot beneath the antennæ; nasus, labrum, base of mandibles and the anterior angle whitish, (the latter with a black, round central spot); orbits without and a separate spot opposite ocelli within, reddish; tegulæ dark; basal membrane and abdomen chestnut-red, at the basal segment blackish; legs black; the two anterior pair in front, below the middle of femora and the base of posterior coxæ varying from reddish-white to piceous; inner anterior tarsal spur bifid; inner tooth of claws large; wings with a violaceous tinge; nervures piceous.

♂. The antennæ of male are longer, the axe-shaped spot below antennæ, most of the outer orbital mark, and the pale anterior angle are wanting and the legs are more varied with piceous; wings almost hyaline.

Maine; Connecticut. Two ♀, two ♂.

26. *N. fur*.

*Nematus fur*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 263, ♂.

Length ♂, 0.39 inch. Br. wing, ♂, 0.38 inch.

“♂. Black; head opaque, very minutely and closely punctate, rugose. Clypeus, labrum, the extreme tip of the cheek and the base of the mandibles all dull greenish-white. Clypeus emarginate in a circular arc of about 45°, with a small tubercle in the middle of its anterior margin. Labrum full as long as wide, its tip rounded. Antennæ black, four-fifths as long as body, rather more compressed than is usual in ♂, fourth and fifth joints equal in length, third shorter by one-fourth. Thorax opaque, very minutely rugose, subpolished on the pectus; a pale subtriangular tubercle on the lateral margin of the black,

subpolished, basal plate. Abdomen subpolished, bright fulvo-rufous, the basal edge of joint one, next the basal membrane, which is whitish, clouded with black. Genitals obfuscated. Legs black. Wings subhyaline, slightly tinged with fuliginous, veins and stigma black.

Rock Island, Ill.

One ♂ bred March 29, from an old subpeduncled spherical gall of *Cecidomyia s. batalis*, Walsh, on *S. humilis*. ♀ unknown. As the mother Sawfly must have deposited her egg in this gall after the gall-maker had quit it, or not long before, it is a question if this species can be considered an Inquiline."

There is very little doubt but this is the same with *N. luteo-tergum* ♂, which only differs in having the legs in part piceous and in being somewhat smaller.

27. *Nematus Hudsonius*, n. sp.

Black; orbits, mouth, tegulæ, anterior angle, venter and legs, except a black line on two posterior pair, white. Length 0.38. Br. wings 0.76 inch.

♀. Antennæ less than half as long as body, joints cylindrical, somewhat enlarged at tip, third and fourth of equal length; sutures at sides of ocelli deep; ocelli in a triangular basin; nasus very slightly emarginate; orbits, space about antennæ and mouth beneath, tegulæ, anterior angle (a black line in middle) and the venter whitish; the latter with a row of black spots on each side forming an interrupted black line; scutel large, produced behind to a slightly raised angle; legs dull white, with the basal upper half of anterior femora, a line down the upper side of posterior femora and tibiæ and their tarsi black; anterior inner spur of tibiæ blunt, bifid, inner tooth of claw large. Wings hyaline, stigma and costa brown, emargination of stigma distinct.

Fort Good Hope, Mackenzie River, Hudson's Bay Territory, (R. Kennicott.) One ♀.

28. *Nematus sumptus*, n. sp.

Black; mouth, orbits and tegulæ white, basal half of abdomen, spot on pleura and most part of legs rufous. Length 0.28. Br. wings 0.62 inch.

♂. Body long; head large; mouth below antennæ, the outer orbits extending over the back of head and a narrow inner orbital line interrupted opposite ocelli yellow; nasus emarginate; tegulæ and anterior angle whitish; abdomen chestnut-red, the two apical segments blackish; an indistinct, piceous, perpendicular spot on pleura near breast; coxæ and trochanters whitish, remainder of legs rufous, paler before, except the posterior tibiæ and tarsi, which are blackish; hinder tibiæ somewhat swelled; inner tooth of claws very obtuse, hardly visible. Wings hyaline, faintly smoky, stigma dark brown.

Maine. (A. S. Packard.) One ♂.

29. *Nematus pleuricus*, n. sp.

Black; orbits, mouth, pleura, venter and legs whitish. Length 0.36. Br. wings 0.72 inch.

♀. Antennæ about half the length of body, fuscous beneath, joints cylindrical, slightly enlarged at tips, third and fourth joints equal; sutures deep, lower ocellus in a circular depression; nasus hardly incurved; a wide orbital line (interrupted opposite ocelli), space between and all beneath antennæ, tegulæ, anterior angle. (with a black spot in middle), breast before anterior coxæ, pleura, (lower edge straight and sharply defined), a spot on each side of scutel, and a narrow line on sinus between scutel and wings, forming an interrupted band from wing to wing, reddish-yellow; apex of abdomen and venter the same color, the latter blackish toward base; legs of same color, basal half of coxæ and base of femora black; posterior tibiæ at tip and the tarsi fuscous; inner tooth of claw obtuse, distinct from tip; wings hyaline, stigma and costa white, an emargination at base of stigma.

Fort Resolution, Great Slave Lake, (R. Kennicott, Smiths. Inst.)

One ♀.

30. *N. ventricosus*.\*

*Nematus (tenthredo) ventricosus*, Klug, Berl. Mag. 1819.

Bouché., Nat. Ins. 1834, 140. Larva on currant and gooseberry.

Hartig, Aderf. Deutsch. 1837, 196.

*Nematus (tenthredo) affinis*, Lepel, ♂, Mon. Tenth. 1823, 69.

*Nematus (tenthredo) 3-maculatus*, Lepel, ♀, Mon. Tenth. 1823, 69.

*Nematus (tenthredo) grossulariæ*, Dahlb., 1835. Gooseberry.

*Nematus (tenthredo) grossulariatus*, Dahlb., 1835. Gooseberry.

*Nematus ribesii*, Stephens, Ill. Brit. Ins. Mand. vii, 1835, p. 32. Red currant.

*Nematus ribis*, Leduc., Mem. Soc. Sc. Natur. Seine et Oise ii, 1846. White and red currants.

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\* Having been absent from the time Mr. Walsh published his description until now, and having no perfect American specimens in my collection, and no time to examine authorities, I give Mr. Walsh's descriptions and conclusions as fully as the space will allow.

Several specimens, injured on the way, from Prof. Winchell, agree in the main, but I note several points. In the ♀ there is a rufous spot above the eye, prolonged down the inner orbit. The antennæ have little if any rufous color, the third joint longest, and a wide semi-obscure band across most of the segment of tergum. In the male the spots above the eyes are very obscure and the thorax wholly black, except the tegulæ and anterior angle, shaded into very obscure ferruginous, where it is palest in the ♀. The inner claw tooth is large and near the tip.

There is very little doubt that this is a European importation which has thriven, as is not uncommon, even more in this country than at home, in wide sections destroying the currant and gooseberry bushes so as to render them useless.

*Nematus (selandria) ribis*, Winchell, Am. Jour. Sc. and Arts, 1864, 291. Red currant.

*Nematus ventricosus*, Walsh, Prac. Ent. I, 1866, 124.

Length ♀, 0.22—.28; ♂, 0.20—.22. Br. wings, ♀, 0.53—.64; ♂, .44—.51 inch.

“♀. Bright honey-yellow. Head black; parts between and below the origin of the antennæ, except tip of mandibles, dull honey-yellow. Antennæ brown-black, often tinged with rufous above toward apex and dull rufous beneath, except the two basal joints, four-fifths as long as body, third joint, viewed laterally, four times as long as wide, joints 3—5 equal in length. In two females the antennæ are ten-jointed, the tenth slender and as long as ninth. Thorax, with the anterior lobe above, a wide stripe on the disk of each lateral lobe, which is rarely reduced to a mere dot on the whole of each lateral lobe, a spot at the base and tip of scutel, the two sometimes confluent or subobsolete, a small spot at the outer end of each cenchrus and a transverse geminate spot between them, the tip of metathoracic scutel, the front and hind edge of basal plates or rarely its whole surface above, the whole surface of the breast between the front and middle legs, or rarely two large spots arranged crossways on that surface, all black. Abdomen, with segments one and two, rarely edged at tip with black. Sheath of ovipositor tipped more or less with black, the surrounding parts sometimes more or less tinged with dusky. Legs bright honey-yellow; all the coxæ and trochanters whitish; the extreme tip of the hind shanks and the whole of the hind tarsi brown-black. Wings glassy, veins and stigma brown-black, the latter as well as the costa marked with dull honey-yellow. In one female the three submarginal cross-veins in one wing are wanting and the first only is present in the other. In others several of these are absent.

♂. Differs from ♀ in having the antennæ with not so much of rufous, as long as the body, vertically more dilated. Thorax (black,) with the wing-scales and entire collar honey-yellow. Abdomen with more or less of its sides, the extreme tip above and its entire inner surface honey-yellow. In two ♂ the middle submarginal cross-vein is wanting, so that they might be mistaken for *Euura*.”

Western New York; Michigan.

Described from twenty-two ♂ and thirteen ♀, by Mr. Walsh. He describes the larva as follows: The eggs are laid on the ribs of the under side of the leaf, and the larvæ when hatched begin by eating little circular holes directly through the leaf. “Length  $\frac{1}{2}$  inch. Pale green, verging on yellow toward the tail. Head black, polished, with numerous short hairs proceeding from minute tubercles. Mouth, except the

mandibles, pale green. Joints of the body above with rows of small, shining black tubercles placed crossways, in the mature specimens having no hairs, except in the larger tubercles on the sides. First joint behind the head with a single row of dorsal tubercles; joints two and three each with a double row; joints 4—12 with a treble row; the anal plate black, polished, and prolonged at each posterior angle in a slender, acute thorn, and hairy, beside the triple row of tubercles before it, a group of six or eight on each side and directly before it. A longitudinal row of larger lateral black tubercles on joints 2—12, one on each joint, beneath which is a geminate black tubercle above each proleg, all of these bearing many hairs. Legs black, the sutures pale green. Prolegs fourteen, pale green, all but the two anal ones with a few minute black dots toward their tip in front. Joints 4—11 without prolegs."

Prof. Winchell describes the larvæ and its habits as follows:

The larvæ feed on the leaf of the red currant. They are twenty-footed, (six pectoral, twelve abdominal and two caudal). First seen by him May 23d. "The full-grown larva is three-fourths of an inch in length, color pale green; head, tail and feet black, with numerous black spots regularly arranged around the body, from the summit of each of which proceeds one, two or more short stiff hairs." They begin upon the leaves near the ground, eating all the tissue of the leaf, and working upward destroy all the leaves. They passed into the ground and all disappeared about the 23d of June. On the 16th of June a swarm was seen under the currant bushes, mostly males, generally sluggish, but at intervals excited, especially when a female appeared. The female proceeded at once to deposit her eggs, which were cylindrical, whitish and transparent, in regular rows along the underside of the nerves of the leaves, at the rate of about one in 45 seconds. The embryo escaped from the egg in *four days*. When it first escaped it was one-tenth of an inch long. It became one-third longer in twenty-four hours. It attained its full growth by June 25th. It then moulted and descended into the ground.

*Summary.*—"First brood May 17th. First larvæ May 21st. Moulting and burrowing June 3d.

Second brood June 16th. Second larvæ June 25th. Moulting and burrowing June 28th.

Incubation of ovum three or four days; feeding, moulting and burrowing eight days. Time in ground of first brood 13 days, life of fly 9 days."

Prof. Winchell thinks that the larva changed its skin but once.

These insects appear in great numbers, and for several years have almost destroyed the crop of currants in parts of New York and Michigan.

31. *Nematus lateralis*, n. sp.

Black; orbits, face below antennæ, pleura, body beneath, (except breast,) and legs, pale. Length 0.38. Br. wings 0.76 inch.

♀. Antennæ half the length of body, joints cylindrical, 3d and 4th equal, slightly enlarged at tips; suture at sides of ocelli deep, lower ocellus in a shallow circular space which has a distinct ridge around its upper half; nasus produced, distinctly emarginate in middle and at sides; tongue and palpi dark, last joint of maxillary palpi shorter than the preceding; the whole orbits as far as sutures, two spots behind ocelli, a spot above antennæ, space around and face below, reddish-white; sutures of metathorax and a bent line between upper wings crossing upper half of scutel, rufous; tegulæ, anterior angle, pleura and body beneath, except a black spot on breast, reddish-white; legs the same color; tarsi fuscous, a slender black line on the upper and lower side of femora and less distinctly on the posterior tibiæ; anterior inner tibial spur bifid, inner claw tooth large and near the tip; wings hyaline, nervures black, stigma pale, with little or no emargination above; second recurrent nervure received at a distance from the intersection of second and third cells.

Var. Abdomen almost entirely pale.

Three ♀. Brunswick, Me., (A. S. Packard.) Albany, N. Y., (Dr. Peck).

32. *N. desmodioides*.

*Nematus desmodioides*, Walsh, Proc. Ent. Soc. Phil., vi, 1866, 257, ♀ ♂.

Length ♀, 0.15—0.19, ♂, 0.11—0.13. Br. wing ♀, 0.17—0.20, ♂, 0.17.

♀. Shining greenish-white. A quadrate spot enclosing ocelli nearly reaching to antennæ, never touching the eyes, and tips of mandibles, black. Clypeus emarginate in an arc of about 90°. Labrum rounded at tip. Occiput with a more or less dark black cloud on its upper disk confluent with ocellar spot, and generally concealing the sutural black lines. Antennæ one-half as long as body, joints 3—5 subequal, 9 sometimes as long as 8, the scape black, flagellum brown-black. Thorax black, with the tegulæ, anterior angle, except a lateral black spot, a pair of transverse spots on the scutel and sometimes contiguous, and a large, obscurely defined, triangular spot on the pleura, greenish-white. Rarely (2 ♀ out of 8 ♀) the mesonotum is dull rufous, with a broad black vitta reaching from the collare to the scutel, and

the extreme tip of scutel black, as in many *S. pomum* ♀. Abdomen, except generally the extreme tip, black above, in lateral plates black toward the base of the abdomen, greenish-white toward its tip. Cerci usually greenish-white. Ovipositor greenish-white, sheaths black. Venter always immaculate, tinged more or less with honey-yellow. Legs greenish-white, the hinder pair tinged with honey-yellow; tips of hinder tibiæ and of all the tarsi more or less dusky. Wings hyaline, veins black; costa and stigma pale dusky; basal half of stigma greenish-white. In one wing of one ♀ and also of one ♂ the third sub-marginal cell is wanting.

♂. Differs from ♀ in having the ocellar spot and that on the occiput larger, the first sometimes touching the eyes. Antennæ two-thirds as long as body. Thorax black, except the tegulæ and two edges of anterior angle, and the venter greenish-white, lateral plates black, their terminal joints obscure. The legs not tinged with yellow.

The gall is found on *S. humilis*. It is smooth, flattish, fleshy, sessile, yellowish-green, monothalamous, semicircular, in general shape like the seed of a *Desmodium* or the quarter of an orange. It is about equally divided between the two surfaces of the leaf; no rosy cheek. Generally there is but one gall on a leaf; one leaf was seen with three upon it. Length 0.23—.50 inch. 131 specimens. Gall mature July 30th.

*Larva*. Three or four of these July 30th, did not apparently differ from those of *S. pomum* examined the same day. When the larva quits feeding in the gall there remains nothing of it but a shell as thin as paper. All the imagos bred pupized inside the gall, but there was no earth within the breeding-vase.

Two ♂, eight ♀, bred April 2—15. At times this is much like *S. pomum*, but differs in having the breast black. It is very much like *N. lateralis*, Norton, but is much smaller and has the femora of one color.

### 33. *N. fulvipes*.

*Nematus fulvipes*, Harris' Cat.

Norton, Bost. Proc. viii, 1861, 159, 10, ♂.

Black; orbits, mouth, tegulæ, anterior angle, pleura, venter and most of legs yellow-red. Length 0.22. Br. wings 0.44 inch.

♂ ♀. Body slender. Antennæ moderate, very slender; head roughened above; nasus deeply emarginate; the orbits, interrupted opposite ocelli, face below antennæ, tegulæ, anterior angle, pleura (pleura with a waxen appearance), apex of abdomen, and venter yellow-red, breast black; legs fulvous, paler before; trochanters white; posterior tarsi

black; inner tooth of claw large and near to tip. Wings hyaline, stigma and costa pale.

Mass., Conn., Fabr. Two ♂, one ♀.

34. *N. crassus*.

*Nematus crassus*, Escholz., Entomog. 1822, 97, 65.

"Black; sides of the head, lines on the thorax, scutellum and pleura, chestnut: tibiæ pale. Length 4 lines.

Body thick. Head black in the middle, of a nut-brown on the sides; parts of the mouth yellow. Antennæ longer than the moiety of the body, filiform, black; border of the corselet brown; two longitudinal lines on the thorax, scutel and the greater part of the sides of the thorax of a chestnut-brown; abdomen convex, shining black; wings longer than the body, wide, transparent, stigma and costa yellow, nervures brown; marginal cell simple, extending almost to the tip; three discoidal cells; legs yellow; a long black spot under the anterior femora; posterior femora black, at the extremity yellow.

Isle of Unalashka, Russ. Am." Not seen.

35. *Nematus placentus*, n. sp.

Black: thorax trilineate with black; most part of head, prothorax, sutures of metathorax, scutel, pleura, a spot on breast, edges of tergum and venter yellow-white. Length 0.28. Br. wings 0.68 inch.

♀. Body stout. Antennæ moderate, slender, final joint very slender; head pale; a spot about ocelli, two longitudinal oval spots below and back of head black; tegulæ and prothorax, metathorax, (with three black vittæ on the lobes), scutel, sides and apex of tergum, venter, pleura varying from ochraceous to whitish, and pectus black, with a large pale spot in its centre; coxæ, trochanters, the four anterior legs, except a black line on the upper side of femora, ochraceous; posterior legs black, with both ends of femora and the basal half of tibiæ beneath pale. Wings hyaline, stigma pale in middle.

♂. The male differs in having the legs entirely pale below the coxæ.

Var. ♂. The mesothorax wholly black. (Canada.)

Labrador, (A. S. Packard,) Canada. One ♀, two ♂.

This seems allied to *N. lateralis*.

36. *N. inquilinus*.

*Nematus inquilinus*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 260, ♀ ♂.

Length ♀ 0.22—0.26, ♂ 0.20 inch. Br. wing ♀ 0.24—0.27, ♂ 0.42 inch.

"♀. Shining honey-yellow. A quadrate spot enclosing the ocelli, not reaching antennæ nor touching orbit, and the tips of mandibles black. Clypeus emarginate in an arc of about 120°. Labrum promi-



ment and rounded at tip. Occiput generally with a discoidal black cloud. Antennæ full one-half as long as body, the scape black, flagellum brown-black. A broad vitta on the anterior two-thirds of the anterior mesothoracic lobe, sometimes reaching to the scutel, the whole of the lateral lobes or sometimes only the interior third of each, the extreme base and tip of scutel, sometimes connected by a black line, the entire pectus and part of the pleura, so as to leave above a large, triangular, honey-yellow spot of variable size, and a cloud on lower corner of anterior angle, black. Metathorax black, the basal plates occasionally with a discoidal honey-yellow cloud on each side. Tergum black, sometimes on all but the last segment, sometimes on one or two or three basal segments, with several of the following sutures dusky; venter and side plates honey-yellow, also the cerci, with dusky tips. Ovipositor greenish-white, its sheaths black. Legs greenish-white, the hinder pair sometimes pale honey-yellow, the tips of hinder tibiae and all the tips of tarsi dusky. Wings hyaline, veins black; costa and stigma pale dusky, sometimes the costa and basal half of stigma dull greenish-white.

♂. Differs from ♀ only in having the ocellar spot much larger and the disk of the occiput black, the antennæ two-thirds as long as the body, the meso- and metathorax entirely black, lateral plates basally black, the whole of the hind tarsi dusky, the costa and stigma black.

Rock Island, Ill.

One ♂, three ♀. April 17—18 from the Cecidomyioid galls *S. rhodoides*, Walsh. It is much like the pale variety of *Nematus s. desmodioides*, Walsh. It may be the same with *N. placentus*, n. sp., which is, however, larger and with different shades of color. In a specimen received from Mr. Walsh I find a central pale spot in middle of pectus, which is not noted by him in his description.

37. *N. longicornis*.\*

*Nematus longicornis*, Say, Bost. Jour. i, 1835, 219, 3.

Norton, Proc. Bost. Soc. viii, 158, 4, ♀.

Black; orbits, face below antennæ, tegulæ, anterior angle, pleura, (except a black spot,) the whole body beneath and legs whitish. Length 0.26. Br. wings 0.54 inch.

♀. Body rather long. Antennæ black, more than two-thirds the length of body, slender, third and fourth joints equal; head rather smooth, sutures at sides of ocelli distinct; lower ocellus in a basin, which is smooth and shining, obovate, with distinct edges; nasus angulate emarginate; labrum emarginate; a spot on vertex, from anten-

\* Escholtz named a *Nematus longicornis* in 1822.

næ to summit, and the back of head black; remainder pale; a slender ridge runs through the groove on anterior lobe of thorax; the tegulæ, anterior angle, pleura and whole body beneath whitish, except two black spots on pleura, the anterior one large and lunulate; scutel black, sutures of abdomen indistinctly pale; legs pale, with the apical half of hinder femora and tibiæ and their tarsi blackish; inner tooth of claws large and near the tip; wings hyaline, stigma full, nervures and stigma piceous, base of stigma and costa pale.

♂. Antennæ fulvous beneath, third joint shorter than fourth, curved at base; a straight black line under the anterior wings, tips of posterior tibiæ blackish, their femora pale, stigma color of costa.

Ia.. (Say,) Conn., New York, Penn. Great Slave Lake, Hudson's Bay Territory.

38. *Nematus trilineatus*, n. sp.

Testaceous; spot on vertex, three vittæ on thorax, spot on pleura, bands on tergum, hinder tibiæ and tarsi black. Length 0.26. Br. wings 0.56 inch.

♀. Resembles *N. longulicornis*. Body long and not very stout. Antennæ long and slender; head testaceous, with a black spot about ocelli and the enclosed square behind it; back of head pale. Body testaceous; scutel pale, its hinder third black; three vittæ on mesothorax; part of metathorax, basal plates, a band covering most of each segment of tergum, and a small spot on pleura below the anterior wings black; a large, clear waxen spot covering pleura; breast testaceous; venter almost white; coxæ, trochanters and base of femora white, the tarsi of four anterior legs above, the hinder tibiæ and tarsi wholly black; remainder of legs testaceous; inner claw tooth large and near the tip. Wings hyaline, stigma testaceous, costa and nervures blackish.

Canada, (Coll. Am. Ent. Soc.) Newburgh, N. Y., (W. H. Edwards). Three ♀.

39. *N. vertebratus*.

*Nematus vertebratus*, Say, Bost. Jour. i, 1835, 218, ♀.  
Norton, Bost. Proc. viii, 158, 1.

"Green; antennæ and spots above blackish. Length one-quarter of an inch.

♀. Body pale green; vertex with a black spot; antennæ black, fuscous toward the tip; second and third joints subequal; nasus white, somewhat bilobate; labrum not very obtusely rounded before, a little indented on the disk, white; mandibles piceous at the tip; thorax trilineate with black, scutel black; wings hyaline, nervures blackish, costal nervure and carpus pale greenish; tergum with a vitta of blackish spots, almost obsolete toward the tip, tarsi dusky."

Indiana.

A specimen from Connecticut has the antennæ hardly half the length of body; distinctly fuscous beneath; the spots on the thorax covering most of the lobes, scutel black; legs entirely of one color, tarsi fuscous; inner tooth of claw large and near the tip; wings perfectly clear, costal edge hardly, if at all emarginate. It is smaller than *N. integer*, from which it does not differ much. An individual from Pennsylvania has but little black upon the vertex, the vittæ on the mesothorax small and but one or two on the abdomen, the basal half only of scutel black; costa bright green, but three submarginal cells, the second cross nervure being incomplete.

40. *N. integer*.

*Nematus integer*, Say, Bost. Jour. i, 1835, 219, 2, ♀.

Norton, Bost. Proc. viii, 158, 2.

Green or reddish-yellow; three vittæ on thorax; the tergum, posterior tibiæ and tarsi black. Length 0.27. Br. wings 0.56 inch.

♀. Greenish-yellow; body rather short and stout; antennæ black, a little more than half the length of body, slender, third and fourth joints of equal length, sutures about ocelli distinct; lower ocellus in an obovate basin, edges sharply defined, ridged above; nasus hardly emarginate; head whitish behind; a spot on vertex, three vittæ on the lobes of thorax, an oblique spot behind scutel, covering metathorax and basal plates, and most of the tergum black; scutel pale; edges of tergum and some of the sutures between its segments whitish; posterior tibiæ and tarsi black; inner tooth of claws large and near to tip. Wings hyaline, stigma and costa dull waxen.

*Var. a.* ♀. Spot on vertex varying in size; the lower half of scutel is black; only the tip of posterior tibiæ is black; the abdomen is somewhat flattened; the emargination at stigma is more distinct in some than in others.

Maine, Mass., Conn., N. Y., Penna. Indiana, (Say).

Say remarks that this has "no obvious emargination in the costal edge," but all the specimens examined have this place more or less emarginate. They also present variations in the extent of black upon the tergum. A specimen from New York is reddish-yellow rather than greenish in color. The black vertical spot extends back over the occiput.

41. *N. s. pomum*.

*Nematus s. pomum*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 255.

Length ♀ 0.12—0.22 inch, ♂ 0.17—0.20 inch. Br. wing ♀ 0.14—0.25, ♂ 0.18—0.20 inch.

♀. Shining honey-yellow. Head: a quadrate spot about ocelli of variable size, but separated from the eyes, and the tips of the mandi-

bles, black. Clypeus emarginate in an arc of about  $90^{\circ}$ . Labrum rounded at tip. The sutures of occiput back of ocelli black, the elevated trapezoidal space rarely occupied by a black cloud. Antennæ one-half as long as the body, joints 3—5 subequal, 9th generally as long as 8th, the scape black, the flagellum brown-black, its terminal half often tinged beneath with rufous. Mesothorax always with an obscure subquadrate spot at the intersection of its sutures, and a more definite longer one on the anterior half of the anterior lobe, the two often confluent; the tip of scutel sometimes and always the entire metathorax, including the basal plates, black, very rarely the entire mesothorax is black. Pectus immaculate, except in one dark ♀, is slightly obfuscated. Tergum, with sometimes the basal edge of first segment only, black, and all the sutures toward the base dusky; usually with more or less of its basal half black, rarely with the whole or nearly its whole surface black or blackish; venter always immaculate, lateral plates very rarely (♀) basally black. Ovipositor honey-yellow, its sheaths black. Legs honey-yellow; coxæ and trochanters of the two anterior pair more or less whitish, tips of all six tarsi lightly obfuscated and sometimes the extreme tips of hinder tibiæ. Wings hyaline, veins black, costa honey-yellow, base of stigma honey-yellow. Third submarginal cell usually longer than wide, sometimes equal, very rarely or only in a single wing three or four times wider than long or obsolete.

♂. Differs from ♀ only as follows: The quadrate spot on vertex is larger and often more or less confluent with the eyes, and never separated but by a capillary orbit. The occiput, except a narrow orbit, black. Antennæ two-thirds as long as body, almost invariably dull rufous above, or bright rufous or pale green beneath, except toward the base, very rarely as in ♀. The entire thorax black, except the tegulæ and two edges of anterior angle. Tergum black, sometimes 1, or 1 and 5, or two or three terminal segments slightly tipped with yellow; lateral plates clouded, especially towards base, venter immaculate. Costa scarcely pale, only extreme base of stigma whitish.

Twenty-six ♂ and forty-six ♀ bred April 16—25. The gall *S. pomum* found on *Salix cordata* and very rarely on *S. discolor*. A smooth, fleshy, sessile, globular or slightly oval monothalamous gall, like a miniature apple, 0.30—.55 inch diameter, growing on one side of the midrib of a leaf, and extending to its edge or beyond it. The principal part of the gall projects from the under side of the leaf; very rarely it is bisected by the leaf. Color greenish-yellow, sometimes with a rosy cheek, especially the upper surface, and often with little

dots. Fully mature July 31st. An analagous gall is formed in Europe on various willows by *Nematus gallicola*, Westw.

*Larva.* May 24th it is only about 0.10 long. June 11 it is white, 0.10—0.13 long. July 24 0.15 long. July 30 0.15—0.20 long, pale greenish-white; head pale brown. Legs freely moveable. There was no earth in the jar in which the galls were placed, and most of the cocoons were spun in the galls and a few between them."

Sept. 9th Mr. Walsh noticed three larvæ creeping about in the jar, 0.35—0.40 in length, pale cinereous, with pale dusky markings, which he thought belonged to the Inquilinous genus *N. mendicus*, one of which was bred in the spring from the same lot of galls.

Rock Island, Ill.

42. *N. hospes*.

*Nematus hospes*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 261, ♀ ♂.

"Absolutely indistinguishable from the normal type of the gall-making *N. s. pomum* ♂ ♀, except that in ♂ the lateral plates of the abdomen are blacker and, as in some ♂ *S. pomum*, the first dorsal segment in ♂ is lightly tipped with yellow. Length ♀ 0.18—0.19, ♂ 0.17 inch. Br. wings ♀ 0.40—0.42, ♂ 0.36 inch."

Rock Island, Ill.

One ♂, two ♀ bred from Cecidomyioidous gall *S. strobiloides*, O. S., April 7—8, and consequently they appear to be inquilinous.

43. *Nematus trivittatus*, n. sp.

Color greenish-white; a spot on vertex, and three vittæ on thorax black; antennæ long and slender. Length 0.28. Br. wings 0.62 inch.

♀. Body stout; antennæ black above, pale beneath, nearly as long as body, slender, cylindrical, slightly enlarged at tips, third and fourth joints equal; head as in *N. integer*; nasus with a wide emargination; a spot on vertex, and three vittæ on the lobes of mesothorax black; a deep groove on anterior lobe; scutel and abdomen pale greenish (sometimes reddish-yellow); legs pale, apical joints of tarsi fuscous; inner claw tooth large and near the tip. Wings perfectly hyaline, stigma, costa and nervures of apical half greenish or brownish, of basal half blackish.

Mackenzie River and Great Slave Lake, Hudson's Bay Territory, (Kennicott, Smiths. Inst.) Illinois, (Coll. Am. Ent. Soc.).

Three specimens. One from Fort Resolution, Great Slave Lake, has the antennæ a little shorter and two or three small black spots at the base of the abdomen.

44. *N. bivittatus*.

*Nematus bivittatus*, Norton, Bost. Proc. viii, 158, 3, ♀.

Orange-yellow; head, two vittæ on mesothorax, base of scutel, metathorax, a spot on breast, and spots on abdomen, black. Length 0.18—0.22. Br. wings 0.45 inch.

♀. Body stout; antennæ black, more than half the length of body, third, fourth and fifth joints equal, rather stout; head above antennæ entirely black, rugose below summit, sutures indistinct; lower ocellus in a kind of depression, from which (generally) radiates three channels downward; nasus not emarginate; clypeus notched before; a space between antennæ and the mouth beneath whitish; two vittæ on the side lobes of mesothorax, basal half of scutel, metathorax and basal plates, a spot on pectus, sides of second segment, and a spot in middle of most of the following segments of tergum black; pleura waxen above, its lower third and most of the pectus deep orange; legs the color of body, with the trochanters whitish, tips of posterior tibiæ and their tarsi black; inner claw tooth large and near tip; wings hyaline; stigma and costa blackish, the latter paler at base; first submarginal cross line sometimes obsolete.

Mass., Conn. Four ♀.

45. *Nematus aureopectus*, n. sp.

Ochraceous; antennæ, two vittæ on mesothorax, the metathorax and tergum black. Length 0.34. Br. wings 0.64 inch.

♀. Short and stout; antennæ black, over half the length of body, third and fourth joints equal; head smooth above, face below ocelli rugose, sutures obsolete; nasus wide, with a moderate semicircular notch; head pale, with a small dusky or blackish spot about ocelli; two vittæ on side lobes of mesothorax, with an indistinct line down the groove of forward lobe; lower half of scutel, metathorax and tergum black; edges of tergum color of body; upper part of pleura waxen, its lower third and pectus orange colored and pilose; legs color of body, the base of posterior coxæ, tips of their tibiæ and tarsi blackish-brown; inner claw tooth obtuse and removed from the tip; wings hyaline, stigma and costa pale; second submarginal cell with one angle beneath, the second recurrent nervure coinciding with intersection of second and third cells.

Mass., (S. H. Scudder); New York, (J. Akhurst); Penn., (Smiths. Inst.)

The head is wider and the body stouter than in the preceding species, and the inner spur of anterior tibiæ is apparently bifid.

46. *N. mendicus*.

*Nematus mendicus*, Walsh, Proc. Ent. Soc. Phil. vi, 1866, 261, ♀ ♂.

Length ♀ 0.22—.24, ♂ 0.18 inch. Br. wing ♀ 0.23—.25, ♂ 0.19 inch.

“♀. Pale grass-green. Head rufous around the ocelli, sometimes tinged with rufous throughout. Eyes, ocelli, a dot behind, and generally one at each end of a transverse carina half way between the anterior ocellus and the antennæ, sometimes a dot outside of each antennæ and always the tips of the mandibles, black. Clypeus emarginate in a circular arc of 90°—120°. Antennæ slender, as long as body; joints 3—5 subequal, 4th sometimes a trifle longer than either; the scape black, with joint 2 sometimes pale rufous below, the flagellum brown-black, generally dull rufous or reddish-brown above, except toward the base, and always bright rufous beneath, except at extreme base. Thorax tinged with rufous, especially above; a coarse longitudinal line on the disk of each lateral lobe, sometimes with a dot inside its posterior end, and sometimes a slenderer longitudinal line on the front of the anterior lobe, a band near the tip of the scutel, a pair of transverse dots in the hollow behind it, an abbreviated band on the succeeding carina, generally in the hollow between the carina and the basal plate an abbreviated transverse line, and sometimes the edges of the basal plate bordering the basal membrane, all black. Abdomen sometimes tinged with rufous; segment 1 sometimes with the edge bordering the basal membrane and an obscure dot on its dorsal tip black. Ovipositor sheaths tipped with fuscous. Legs greenish-white; tip of hinder tibiæ and all the tarsi more or less fuscous. Wings hyaline, veins black; costa and stigma pale green.

♂. Differs from the normal ♀ only as follows: The body is slenderer in proportion than usual, general color whitish. A quadrate black spot encloses the ocelli, includes the dot on the occiput and the two behind the antennæ. The antennæ are one-fourth longer than body, the scape black, the first joint basally green, the flagellum rufous above, bright rufous beneath. The entire meso- and metathorax is black. On the tergum the basal  $\frac{1}{2}$ — $\frac{1}{3}$  of segments 1—6, nearly the whole of 7, and a dorsal line on 8 are all superiorly black; lateral plates all whitish; basal membrane whitish.”

Rock Island, Ill.

One ♀, three ♂, Inquilinous. “One ♀ bred from the Tenthredinoidous gall *S. pomum* of the preceding year's growth, May 2d. Another ♀ from the Cecidomyioidous gall *S. brassicoides*, Walsh, August 5th, of the same year's growth. In this the transverse carina behind

the antennæ is straight or nearly straight, while in *vertebratus* ♀ it is in the form of a widely truncate angle of 60°, and in *integer* ♀ it forms an angle of about 90°—100°, with its apex a little rounded. *Vertebratus* also has the clypeus emarginate in a circular arc of 45°."

This may prove to be the same with my *N. aureopectus*, n. sp.

47. *Nematus ochroleus*, n. sp.

Color greenish-ochreous; lower half of scutel, metathorax and part of tergum black. Length 0.30. Br. wings 0.64 inch.

♀. Greenish-ochreous; body short and stout; antennæ black, hardly half as long as body, third joint shorter than fourth; head pale, sutures large; lower ocellus in a basin, deep, wide, irregular, with rounded edges; nasus apparently bilobed; labrum blackish, tegulæ and anterior angle whitish; lower third of pleura and the pectus orange; basal half of scutel, middle of metathorax, and a wide stripe on the tergum partly interrupted at sutures, black; ovipositor delicate grass-green; legs the color of body, tips of posterior tibiæ and part of the tarsi blackish; inner claw tooth large and near the tip; wings hyaline; nervures brown, stigma greenish, second submarginal cell with two angles beneath.

Connecticut. One ♀.

Two ♀ specimens from English River, H. B. T. seem to belong to this species, but have the antennæ longer, no black on the scutellum, and less upon the tergum than in this.

48. *N. stigmatus*.

*Nematus stigmatus*, Harris' Cat.

Norton, Bost. Proc. viii, 1861, 161, 16, ♀.

Greenish-luteous; thorax and tergum black. Length 0.30. Br. wings 0.60 inch.

♀. Color greenish-luteous; body short and stout; antennæ moderate, the two basal joints black; a small black spot about each of ocelli; clypeus hardly emarginate; labrum angulate, hairy; part of mesothorax, the metathorax, the first seven segments of tergum and ovipositor sheaths, and a spot on pleura below wings, black; legs pale, tips of tarsi and claws blackish; wings hyaline, stigma and costa pale green.

Mass., (Harris' Coll.) One ♀.

It has the size and form of *N. monochroma*.

49. *N. monochroma*.

*Nematus monochroma*, Harris' Cat.

Norton, Bost. Proc. viii, 1861, 161, 15, ♀.

Honey-yellow; pleura piceous. Length 0.30. Br. wings 0.60 inch.

♀. Color honey-yellow; body stout; antennæ wanting, except two basal joints, which are color of body; ocelli black, set in an irregular



depression; clypeus retracted, crenate; labrum angulate; face immaculate; tegulæ, collar, venter and coxæ paler than rest of body; pleura dark, almost piceous; legs color of body; wings hyaline, stigma and costa pale yellow.

Mass., (Harris' Coll.) One ♀.

Resembles *N. luteus* of Europe.

Four submarginal cells. The second recurrent nervure received at junction of second and third cells.

32. **MESSA**, Leach.

*Messa*, Leach, Zool. Misc. 1814.

*Fenusa*, Hartig, Die Blattw. 256.

*Tenthredo*, Klug, Fam. viii.

*Wings*—One marginal and four submarginal cells, the second elongate and receiving two recurrent nervures, the second at the intersection of second and third cells. Lanceolate cell petiolate.

*Antennæ* 9-articulate, the third article longest, remainder beyond the fourth decreasing gradually to the apex.

*Body* short and stout.

*Legs* slender, simple; tibiæ with two short acute spurs at the tip.

Authors differ in opinion as to this genus. It is allied to *Nematus* in its neuration, and to the following genera in the form of its antennæ. Leach put it in his Stirps VI. with *Selandria* and *Athalia*. 1.—*Messa*. 2. *Athalia*. 3. *Selandria*. 4. *Fenusa*. Hartig considers it the same with *Fenusa*, which he makes a subgenus of *Athalia*. Lepel calls it a subgenus of *Nematus*, with which it is here classed.

1. **M. hyalina**.

*Messa hyalina*, Norton, Proc. Ent. Soc. Phil. iv, 1864, 8, 13, ♀.

Black, with white tegulæ and legs, and clear wings. Length 0.16. Br. wings 0.36 inch.

♀. Shining black; body stout; antennæ slender, longer than to base of abdomen, setaceous, first joint longer than second, third longer than fourth. Head polished, rounded, almost smooth about the ocelli; nasus slightly incurved; labrum wide, rounded and, with the mandibles at base and the tegulæ, white; abdomen somewhat stout and acute; legs white, the coxæ black, except at tip, posterior femora with a reddish tinge, tips of their tibiæ blackish. Wings perfectly hyaline, stigma almost wholly white, first submarginal cell somewhat rounded, third almost square; second recurrent nervure almost coinciding with second submarginal cross nervure; lanceolate cell petiolate; under wings with two middle cells.

New Jersey, (Coll. Am. Ent. Soc.) One ♀.

33. **PERREYIA**, Brullé.

*Perreyia*, Brullé, Hist. Nat. Hym. iv, 1846, 661.

*Wings*—One marginal, appendiculate, and four submarginal cells, of which the second receives two recurrent nervures.

*Antennæ* 13-articulate, almost moniliform, a little thicker in the middle than at the sides.

1. *Perreyia comptus*, n. sp.

Black, with rufous abdomen and subviolaceous wings. Length 0.28. Br. wings 0.60 inch.

♂. Body stout. Antennæ black, thirteen-jointed, filiform and diminishing in thickness, joints rather cuneiform than moniliform, third joint nearly as long as fourth and fifth; apical joint short, obtusely rounded; head nearly as wide as thorax, polished; nasus emarginate, scutell large, and produced behind as in *Hylotoma*. Head, thorax, basal plates, and apical segment of abdomen black; abdomen yellow-red; legs black, tibial spurs short, not very sharp, claws large, without inner tooth. Wings obscure blackish, of one color; first recurrent nervure received near base of second cell, the second in the third cell, near the intersection of second and third cells; the second a little shorter than the third cell; lanceolate cell petiolate; under wings appendiculate, and with one middle cell.

Mexico. Two specimens. (H. de Saussure.)

The second recurrent nervure is received within the third submarginal, thus differing from the diagnosis of Brullé. The antennæ are formed as in the figure given by Brullé of the antenna of *P. lepida*. The submarginal bullæ in this and the following species are as in *Nematus*.

2. *Perreyia capitulum*.

Testaceous; head and legs black, wings obscure.

Length ♂ 0.28. Br. wings 0.64 inch. Length ♀ 0.44. Br. wings 1.04 inch.

♀. Shining yellow-red; body stout; antennæ 12-jointed, formed as in last species, black; head black; a black spot on the apex of abdomen; legs black, the coxæ, trochanters and anterior femora above, yellow-red; spurs short, obtuse; claws simple; wings blackish obscure; a darker spot covering marginal and upper half of submarginal cells, as in *Hylotoma*; first submarginal cell oval; the second recurrent nervure received at intersection of second and third submarginal cell; lanceolate cell petiolate; under wings appendiculate, and with one middle cell.

♀. The female is much larger and the wings more obscure on basal half. The marginal cell is obscure as in *Hylotoma scapularis*.

Mexico. Two ♂, one ♀. (H. de Saussure).

The legs are quite pilose and the tibiæ enlarged at apex. The head is quite small. The submarginal bullæ as in the last species.

2. *P. lepida*.

*Perregia lepida*, Brullé, Hym. iv, 1846, 661, pl. 46, fig. 2.—South America.

34. **CAMPTOPRIUM**, Spin.

*Camptoprium*, Spinola, Am. Soc. Ent. ix, 184, pl. 7, fig. 2.

Brullé, Hym. iv, 663.

*Wings*—One marginal, appendiculate, and four submarginal cells, of which the three first are of equal size.

*Antennæ* 11-articulate, having the third the longest, the remainder diminishing successively.

The prothorax forms before the mesothorax a slightly arcuate elevation.

Guiana.

35. **DICTYNNA**, Westw.

*Dictynna*, Westwood, Arc. Entomol. i, 1845, 24, pl. 7, 4, ♂.

Brullé, Hym. iv, 662, pl. 46, fig. 5.

*Wings*—One marginal, not appendiculate, and four submarginal cells, of which the second and third each receive a recurrent nervure. The first submarginal cell is hardly indicated.

*Antennæ* 10-articulate; articles a little larger in the middle than at the extremities.

Westwood describes a specimen from Van Dieman's Land, which he says is in fact an *Athalia* with the wings of a *Hylotoma*.

1. *D. Westwoodi*, Brullé, Hym. iv, 1846, 662, pl. 46, fig. 5.—Brazil.

36. **AULACOMERUS**, Spin.

*Aulacomerus*, Spinola, Am. Soc. Ent. ix, 1840, 137, pl. 7, fig. 1.

*Wings*—One marginal, appendiculate, and four submarginal cells, of which the second and third each receive a recurrent nervure; the first and second small.

*Antennæ* 9-articulate and setaceous, as in most of the Tenthredinides.

*Legs*.—The posterior pair have the coxæ very long, the femora bent and grooved beneath so as to receive the tibiæ, which also are a little arcuate.

Guiana.

*H. Wings with two marginal and three submarginal cells.*

37. **DRUIDA**, Newm.

*Druida*, Newman, Ent. Mag. iv, 1837, 261. Vol. v, 1838. 484.

*Wings*—Two marginal and three submarginal cells, the first and second each receiving a recurrent nervure.

*Antennæ* 10-articulate, piliform, third article long, remainder gradually diminishing.

Europe.

38. **FENUSA**, Leach.

*Fenusa*, Leach, Zool. Misc. 1814.

Hartig, Die Blattw. 256, Sec. 3.

Westw. Int. App. 54.

*Tenthredo* (*Emphytus*), Klug, Fam. viii.

*Wings*—Two marginal and three nearly equal submarginal cells, the first and second each receiving a recurrent nervure; lanceolate cell petiolate; under wings without middle cell.

*Antennæ* 9-articulate, the third joint longest, remainder gradually diminishing in length, apical joint obtuse.

*Head* broad, transverse; mandibles with one and two inner teeth; maxillary palpi, first joint short, third minute, remainder long and slender.

*Body* short and stout.

*Legs* simple; tibiæ with two short acute apical spurs.

The species of this genus are among the smallest included in this family.

1. **F. curtus**.

*Fenusa curtus*, Norton, Proc. Ent. Soc. Phil. i, 1861, 199, ♀.

Black; abdomen piceous; legs ochraceous, with black femora. Length 0.14. Br. wings 0.32 inch.

♀. Body stout; antennæ toward the tip, labrum and mandibles piceous; a smooth fovea between antennæ; tegulæ and abdomen piceous; thorax black, polished; each segment of abdomen depressed toward apex; legs ochraceous, their coxæ and femora, except at tip, black; apical joints of tarsi blackish; wings semi-transparent, stigma and costa dark, nervures black.

Penn., (Coll. Am. Ent. Soc.).

2. **Fenusa ambiguus**, n. sp.

Black; middle of tergum, venter and legs yellow-red. Length 0.14. Br. wings 0.32 inch.

♂. Body short and stout; antennæ piceous at base beneath; tegulæ and edge of collar whitish, spurs sharp; claws simple; wings hyaline, stigma fuscous at base, also most of costa.

Penn. One ♂. (Smith. Inst.)

39. **FENELLA**, Westw.

*Fenella*, Westwood, Mod. Class. ii, 1840, App. 54.

Brullè, Hym. iv, 662.

*Wings*—Two marginal and three equal-sized submarginal cells, the first and second each with a recurrent nervure.

*Antennæ* 11-articulate, slender.

Europe.

*Wings with four submarginal cells.*

40. **HETERARTHUS**, Stephens.

*Heterarthrus*, Stephens, Brit. Ent. Mand. vii, 1835, 94.

Westw., Mod. Class. 2, App. 54.

*Phyllotoma*, Fallen, Mon. Tenth. Suec. 1829.

Hartig, (*Emphytus*) ii, Die Blattw. 254.

*Decatria!* Westw., Lardner, Cyc.

*Tenthredo* (*Emph.*), Klug, Fam. viii.

*Wings*—Two marginal and three submarginal cells, the first and second each containing a recurrent nervure. The first having an incomplete cell at its base; lanceolate cell with oblique cross line; underwings without any or with one middle cell.

*Antennæ* 12—15 articulate, the third nearly twice as long as the fourth, remainder short.

Europe.

*Wings with three submarginal cells.*

41. **MELICERTA**, Stephens.

*Melicerta*, Stephens, Brit. Ent. Mand. vii, 1835, 94.

*Wings*—Two marginal cells, the basal one smallest, and three submarginal ones, the first longest, second shorter, each with a recurrent nervure.

*Antennæ* 9-articulate, third nearly twice as long as the fourth.

*Head* broader than thorax, thorax somewhat globose.

England.

42. **EMPHYTUS**, Leach.

*Tenthredo* (*Emphytus*), Klug, Fam. iv, Berl. Mag. 1814, Vol. viii, 284.

*Emphytus*, Leach, Zool. Misc.

Hartig, Die Blattw. 245, Div. I.

Stephens, Brit. Ent. Mand, vi.

*Dolerus*, II. Jurine, &c.

*Wings* short; two marginal and three submarginal cells, the first and second each with a recurrent nervure; the first longest, bent, its hinder corners angular and rounded; lanceolate cell contracted, and either with or without oblique cross line; under wings without any middle cell or with one or two.

*Antennæ* 9-jointed, filiform, third, fourth and fifth joints of nearly equal length.

*Head* transverse, eyes prominent, nasus incurved, wide; mandibles short and wide, with one inner tooth; maxillary palpi long and slender, first joint minute, apical joint shorter than those before it; first and second joints of labial palpi shortest.

*Abdomen* rather long, cylindrical in males, broad and carinate in females.

*Legs* slender; tibiæ with two short apical spurs.

*Larvæ* with twenty-two legs. They feed upon the leaves of plants. The habits of a species which feeds upon the rose have been noted by DeGeer, Bouché and Hartig. That of *Emph. cinctus* is said to pass its pupa state in the stem of the rose, into which the larva burrows. Nothing is known about our own species as yet.

*Table to assist in finding the Species.*

Section I.—(*Emphytus*), Hartig.

- Lanceolate cell with oblique cross line; hinder wing with no middle cell.  
 Color black—a white spot on pleura.....1, **inornatus**.  
 Color black—middle of abdomen rufous.....2, **apertus**.  
 Color black—a white band on tergum; femora yellow-red.....3, **mellipes**.  
 Color black—a white band on tergum; femora black...4, **cinctipes**.

Section II.—(*Harpiphorus*), Hartig.

- Lanceolate cell with oblique cross line; hinder wings with one middle cell.
- a. Abdomen long; first tarsal joint as long as all the remainder.  
 Color testaceous, thorax black, scutel pale.....5, **varianus**.  
 Color testaceous, thorax black, scutel black.....6, **versicolor**.  
 Color testaceous, two black vittæ on mesothorax.....7, **testaceus**.  
 Color testaceous, tips of antennæ black.....8, **semicornis**.  
 Color black, scutel pale.....9, **tarsatus**.
- b. Abdomen short; first tarsal joint not as long as all the remainder  
 Color black; brownish spots on each segment of tergum .....10, **maculatus**.  
 Color black, tergum black, tibiæ and tarsi white. ....11, **recens**.  
 tibiæ and tarsi white before.....12, **articulata**.  
 Color black, tergum at base white.....13, **platycerus**.

Section III.—(*Aneugmenus*), Hartig.

Lanceolate cell with no cross line; hinder wings with two middle cells.

Section I.—(*Emphytus*), Hartig.

Lanceolate cell with oblique cross line; under wings without middle cell. Body lengthened.

1. ***E. inornatus***.

*Dolerus inornatus*, Say, Long's Second Exp. II, 1824, 319, 1. ♀.

*Emphytus inornatus*, Norton, Bost. Proc. viii, 155, 1. ♀ ♂

“Body black, polished; feet white; tarsi dusky. Length ♂ ♀ 0.25. Br. wings 0.52 inch.

♀. Body slender; antennæ hardly longer than to base of thorax, third, fourth and fifth joints cylindrical, not very distinctly separated,

third largest; remainder shorter and compressed at ends beneath; head finely punctured, a deep suture extending from base of each antennæ to occiput, the ridge between produced between antennæ in a sort of blunt, rounded prominence; nasus incurved, with a short spine at each corner; labrum, palpi, tegulæ, collar, a short line on pleura above intermediate coxæ, and the legs, white; a band near apex of posterior femora, the ends of their tibiæ and their tarsi blackish, claws with an inner tooth, distinct from tip; wings with a violaceous tinge, nervures blackish.

♂. The body of the male is quite slender, the apex of the four hinder femora and their tibiæ above, black.

New England and Middle States, Virginia. Common.

2. *E. apertus*.

*Emphytus aperta*, Harris' Cat.

*Emphytus apertus*, Norton, Bost. Proc. viii, 1861, 155, 2. ♀ ♂.

Black; tergum with rufous spots, venter and legs white. Length 0.19—0.25. Br. wings 0.36—0.44 inch.

♀. Body long and slender, shining black; antennæ as in *E. inornatus*. Head with a depression at sides of venter and a sinus behind ocelli, ridged on each side; nasus slightly incurved, and with the labrum, base of mandibles, palpi, tegulæ, two sides of anterior angle and a line above intermediate coxæ, white; tergum with reddish connected spots on each segment; venter paler, at apex black; legs reddish-white, apical medial tarsi and tip of posterior tibiæ and their tarsi black; spurs long, inner anterior tibial spur bifid, inner tooth of claw large and near the tip. Wings hyaline, nervures blackish, junction of stigma and costa white.

♂. The male has the antennæ ferruginous beneath, apex of venter pale, base black.

Mass., Conn., Pa., Va., Ill.

3. *E. mellipes*.

*Emphytus mellipes*, Harris' Cat.

Norton, Bost. Proc. viii, 1861, 155, 3. ♀.

Black, slender; a white band around the fifth abdominal segment; legs whitish. Length 0.34. Br. wings 0.58 inch.

♀. Body long and slender, shining black, polished; antennæ rather stout, not extending beyond base of abdomen, slightly ferruginous at tip beneath, the four apical joints compressed at their base; channels forming a sort of W behind ocelli; a sinus below lower ocellus and a process between antennæ; nasus ridged in middle, deeply notched, with sharp angles before; the three apical joints of palpi, tegulæ, a spot on basal plates and a band on fourth segment of abdomen white;

legs honey-yellow, base of coxæ black; their apex, trochanters and base of femora white; tarsi fuscous above; inner tooth of claw large; wings faintly smoky; base of stigma and the costa pale.

♂. No white spot on the tergum or basal plates; tarsi blackish.

Maine, N. H., Mass., Conn., N. Y., Penna.

4. *Emphytus cinotipes*, n. sp.

Black; a white band on the fifth segment of abdomen and on the base of all the tibiæ; femora black. ♂ ♀. Length 0.34. Br. wings 0.58.

♀. Body formed as in *E. mellipes*; tegulæ, a spot on basal plates and band on fourth segment of abdomen, interrupted in middle beneath, white; coxæ and femora black; tips of coxæ, trochanters and base of femora white; a white band at base of all the tibiæ; tibiæ ferruginous, tarsi blackish; inner claw tooth large; wings hyaline, base of stigma white.

♂. Resembles female; no white band on abdomen.

Var. Tibiæ all blackish toward apex.

Maine, New York. Eight ♀, four ♂.

This is closely allied to *E. mellipes*. Klug mentions the *Tenthredo* (*Emphytus*) *grossulariæ* as having been found in Baltimore. (Berl. Mag. 1814, 8, 288.)

Section 2.—(*Harpiphorus*), Hartig.

Lanceolate cell with oblique cross line; hinder wings with one middle cell.

a. Abdomen long as in *Tenthredo*, cylindrical in ♂, flattened and rather acute in ♀. The first joint of hinder tarsi as long as all the remainder.

5. *E. varians*.

*Emphytus varians*, Norton, Bost. Proc. viii, 1861, 156, 4, ♂ ♀.

Testaceous; thorax black; antennæ with the three basal joints red, the fourth and fifth black, remainder white.

Length ♂ 0.38. Br. wings 0.70 inch. Length ♀ 0.45. Br. wings 0.90 inch.

♀. Body long and rather stout, color testaceous; antennæ longer than base of thorax, stout, serrate beneath, third joint longer than fourth, the three basal joints rufous, the fourth and fifth black, and the four apical joints white; head polished, quite thick behind the eyes; deep sutures from nasus to summit on each side of ocelli, forming a bilobed enclosed space behind; a deep basin below lower ocellus; nasus deeply notched; a spot about ocelli, and behind to the neck, and one below each of antennæ, black; labrum whitish; thorax rather sparsely and coarsely punctured, black; the tegulæ, scutel and ridge behind whitish; sutures of mesothorax, part of metathorax and the abdomen reddish-testaceous; abdomen flattened, edges of each segment blackish; legs reddish-yellow; coxæ, middle of four anterior femora, and apical half of posterior femora and of tibiæ black; apex of coxæ,



trochanters, base of femora and the tibiæ white; inner claw tooth large; wings long, outer half smoky, basal half of stigma pale; second recurrent nervure received near intersection of first and second submarginal cells.

♂. Face mostly black; labrum white; abdomen paler, the four anterior femora without black bands.

Conn., N. Y., Va., Ill.

6. *Emphytus versicolor*, n. sp.

Chestnut-red; thorax black; four apical joints of antennæ and the tarsi white. Length 0.40. Br. wings 0.80 inch.

♀. Body long and not very stout, color chestnut-red; antennæ not longer than base of thorax, thick, serrate beneath, third joint but little longer than fourth, the two basal joints piceous, the three next black, remainder white; face as in *E. varianus*, not so much depressed below antennæ; clypeus not deeply notched; a black spot from below antennæ to summit; labrum and tegulæ white; thorax black, scutel black, basal plates rufous, legs rufous, trochanters and tarsi white; coxæ, basal tip of the four anterior femora and the apex of posterior tibiæ blackish; wings smoky, base of stigma white; second recurrent nervure a little removed from junction of first and second submarginal cells.

Illinois, (P. H. Uhler). One ♀.

The abdomen is more slender than that of *E. varianus*.

7. *E. testaceus*.

*Emphytus testaceus*, Norton, Bost. Proc. viii, 1861, 156, 5, ♀.

Testaceous; the two basal joints of antennæ rufous, the three next black, remainder white. Length 0.40. Br. wings 0.80 inch.

♀. Color paler than in the preceding species; antennæ but little longer than to base of thorax, stout, serrate, third joint longest, fourth longer than fifth; the two basal joints testaceous, the three next black, remainder white, extreme tip black; head as in last species; a small black spot above ocelli; labrum and tegulæ pure white; a vitta on each side lobe of mesothorax, and a spot on pectus, enlarged before each pair of coxæ, black, scutel pale; legs testaceous; coxæ and tips of posterior tibiæ black; a spot on hinder coxæ, trochanters and tarsi white. Wings yellowish-smoky, darkest toward apex, base of stigma white; second recurrent nervure a little removed from base of second submarginal.

Penn., Virginia.

The abdomen is nearly cylindrical.

8. *E. semicornis*.

*Emphytus semicornis*, Say, Bost. Jour. I, 1835, 220, 2, ♀.

Norton, Bost. Proc. viii, 156, 6.

"Honey-yellow; tip of the antennæ and disk of the pectus black. Length over three-tenths of an inch.

"Body honey-yellow; antennæ, the four terminal joints black, nasus deeply emarginate; labrum and mouth pale yellowish, the former rounded at tip; stemmata black; thorax with a dusky line on the two middle lobes; scutel dusky on the posterior edge; metathorax dusky near the scutel; abdomen immaculate, rather paler at base and beneath; wings hyaline, nervures blackish; base of the carpus yellowish-white; pectus before and on the middle black; coxæ whitish, tarsi pale, posterior thighs and tibiæ blackish at their tips."

Indiana, (Say). Connecticut.

The only important difference between this and the preceding species appears to be in the color of the apical joints of the antennæ. A single ♂ taken in Farmington, Conn., has the five apical joints of antennæ black, the head wholly rufous, except a large spot about the ocelli, and the back of head black. The scutellum is wholly rufous.

9. *E. tarsatus*.

*Emphytus tarsatus*, Say, Bost. Jour. I, 1835, 219, 1, ♀.

Norton, Bost. Proc. viii, 157, 7, ♀.

Black; the four apical joints of antennæ, trochanters and tarsi white.

Length ♂ 0.32. Br. wings 0.52 inch. Length ♀ 0.60. Br. wings 1.12 inch.

♀ ♂. Body long and stout; antennæ longer than base of thorax, stout, flattened, serrate, black, with the four apical joints white; head as in *E. varianus*, with the sutures at sides of ocelli widened below and enclosing the base of antennæ; nasus deeply incurved, rugose; labrum white, its edge rufous; tegulæ piceous or yellow; scutel in middle white; legs black; all the trochanters, the apical half of four anterior tibiæ and their tarsi and the posterior tarsi, except first joint, white, (sometimes the first joint also). Wings smoky hyaline, base of stigma white; second recurrent nervure a little removed from intersection of second and third submarginals.

Indiana, (Say), Mass., Conn., West Va.

The species embraced in this section resemble the genus *Tenthredo* at first sight.

♂. Abdomen short; second recurrent nervure received in middle of second submarginal cell; first joint of hinder tarsi not as long as all the remainder.

10. *E. maculatus*.

*Emphytus maculatus*, Norton, Bost. Proc. viii, 1861, 157, 8, ♀ ♂.

Black, with an interrupted brownish band on each segment of abdomen. Length 0.20—0.22. Br. wings 0.42—0.47 inch.

♀. Body short, flattened; apex of abdomen suddenly compressed; antennæ as long as to base of thorax, rather stout, slightly serrate, and somewhat ferruginous beneath, third joint longest, fourth and fifth equal; head (not so thick as in div. *a*), finely punctured, widely but not deeply channeled at sides of ocelli from nasus to summit; a ridge down the middle of nasus, its edge moderately crenate; nasus, labrum, tegulæ and edge of collar whitish; a brownish interrupted band on each segment of tergum; legs varying from reddish-brown to white, their coxæ, except at tip, the four anterior femora beneath, apical joints of their tarsi, the posterior femora, apical half of tibiæ and their tarsi, except base of basal joints, black; inner claw tooth short; wings hyaline, faintly clouded.

♂. The male has the antennæ much flattened and brown beneath; the bands on abdomen whitish; legs with less of black, coxæ and posterior femora above, black.

Maine, Conn., New York.

The position of the three following species is not known, but they are likely to belong to this section.

11. *E. platycerus*.

*Emphytus platycerus*, Say, Bost. Jour. I. 1835, 220, 3, ♂.

Norton, Bost. Proc. viii, 157, 10.

"Black; tibiæ and tarsi white; first and second joints of the antennæ short, equal." Length less than three-twentieths of an inch,

♂. Body short, robust, black, polished; antennæ rather stout, compressed, first and second joints remarkably short, when taken together less than half the length of either of the others; remaining joints subequal, the third hardly longest; mouth dull piceous; wing-scale dull piceous; wings fuliginous, with a violaceous tinge, feet white; thighs in the middle and coxæ black."

Indiana. Not seen.

This bears a resemblance to the male of *E. maculatus*, but has no bands on the tergum, which Say could hardly have overlooked.

12. *E. recens*.

*Emphytus recens*, Say, Bost. Jour. I, 1835, 221, 4, ♂.

Norton, Bost. Proc. viii, 157, 9.

"Antennæ, basal joint white; pectus and feet white. Length one-fifth of an inch.

♂. Head black; basal joint of antennæ, nasus, labrum and mouth white; thorax black, with a white collar and wing-scale; wings hya-

deeply notched, labrum small; mandibles sharp, with three or four inner teeth.

*Thorax* punctured. Abdomen smooth and shining, stout, carinated and acute in the females, obtuse in the males.

*Legs* short; tibiæ with two short spurs, the inner spur of anterior pair bifurcate; claws with an inner tooth.

*Larvæ* twenty-two-footed, (six pectoral, fourteen abdominal and two caudal), not ejecting a fluid from the sides of the body. Little is known of their habits.

Leach separated, under the name of *Dosytheus*, all those species having the third joint of antennæ longer than the fourth, while his *Dolerus* has the third and fourth joints of equal length. Stephens adds that *Dosythei* invariably have bright colors on the abdomen, while the *Doleri* are of one color—blue and black.

Hartig does not consider this, with minor details, a sufficient generic distinction, and his view has been adopted in the following list. In all of our species, the third joint is longer than the fourth, although the difference is less marked in the dark-colored species.

*Table to assist in finding the Species.*

- A. Violaceous.
- a. Wholly of one color.....unicolor.
  - b. Thorax partly rufous.....arvensis.
- B. Black.
- a. Wholly black.....sericeus.
  - b. Thorax partly rufous, abdomen black.....collaris.
  - c. Thorax black.
    - 1. Abdomen red banded.
      - 1. Femora black.....aprilis.
      - 2. Femora rufous.....apricus.
      - 3. Femora rufous, mouth and tægulae white.....albifrons.
    - 2. Abdomen wholly rufous.....abdominalis.
  - d. Thorax partly rufous.
    - 1. Abdomen red banded.....similis.
    - 2. Tergum red banded.....maculicollis.
- C. Rufous.
- e. Thorax partly rufous, abdomen rufous.....bicolor.
  - versa.
  - f. Thorax, except the pectus, rufous, abdomen rufous.....Tejoniensis.

Section 1.—*Dolerus*.

Lanceolate cell with oblique cross line.

1. **D. unicolor.**

*Tenthredo unicolor*, Beauv., Ins. Afr. et Am. 1805, 97. Hym. Tab. ix, 2, ♂.

*Dolerus unicolor*, Lepel, Mon. Tenth. 125, 373.

Norton, Bost. Proc. viii, 154, ♀.

Blue-black, with metallic reflections on the thorax. Length 0.28. Br. wings 0.60 inch.

♂. Body stout, violaceous. Antennæ black, long, third and fourth joints equal, apical joint slender and as long as the preceding; head and pleura granulated; thorax above coarsely punctured; tergum and legs smooth and shining, tibiæ pilose, nasus with a deep and angular notch, tarsi stout, densely covered with black setaceous hair; inner claw tooth obtuse, removed from the tip; wings violaceous subhyaline, stigma and costa black.

New England, Middle States, Md., Mo. Common.

2. *D. arvensis*.

*Dolerus arvensis*, Say, Long's Second Exp. II, 1824, 319, 2, ♀.

*Dosytheus arvensis*, Norton, Bost. Proc. viii, 151, 1.

Blue-black; the prothorax and mesothorax rufous, with a black vitta on anterior lobe. Length 0.32—0.36. Br. wings 0.66—0.74 inch.

♀. Rather long and stout, color violaceous; antennæ black, third joint longer than fourth, apical joint shorter and more slender than the preceding; head and body punctured as in *D. unicolor*; a yellowish rufous spot covers the prothorax and mesothorax; a vitta on the anterior lobe of mesothorax black; scutel violaceous; legs the color of body; formed as in *D. unicolor*. Wings subviolaceous, nervures black.

*Var. a.* The vitta on the mesothorax extends across the side lobes, forming a three-lobed spot.

New England, Middle States, Fla., Mo. Very common.

Taken in April, on willows. No males. The ground color is precisely the same with that of *D. unicolor*, of which no females have yet been taken. The formation of the tarsi is also similar, being shorter than in the following species, and the apical joint shorter.

3. *D. sericeus*.

*Dolerus sericeus*, Say, Long's Second Exp. II, 1824, 320, 3, ♂ ♀.

Norton, Bost. Proc. viii, 151, 1.

"Entirely black, immaculate." Length 0.32—0.40. Br. wings 0.64—0.80 inch.

♂. Body long and rather slender, color shining black; antennæ long, third joint rather longer than fourth, final joint but little shorter than the preceding; abdomen rather longer than in *D. unicolor* and more rounded at the apex; rather more of white hair upon the face and legs; posterior tibiæ at tip stout; tarsi long and slender, less pilose, apical joint long; inner claw tooth obtuse; wings subviolaceous, nervures black.

♀. The female is larger and the abdomen stouter; antennæ shorter, not extending beyond base of abdomen, third joint longer than fourth.

The males are very abundant, the females rare.

A single specimen (♂) from Massachusetts, in the Collection of the American Entomological Society, has four submarginal wing-cells, the

second and third each with a recurrent nervure as in *Strongylogaster*, but in other respects it does not vary from the above.

4. *D. collaris*.

*Dolerus collaris*, Say, West. Quart. Rep. II, 1823, 72, ♀.

*Dosytheus collaris*, Norton, Bost. Proc. viii, 151, 2.

"Black; thorax rufous before." Length 0.32—0.36. Br. wings 0.66—0.74 inch.

♀. Abdomen stout, flattened, acuminate; antennæ short, as in *D. sericeus*, as also the punctures; color shining black; the tegulæ, anterior lobe of mesothorax, anterior angle, more or less of breast before anterior legs and a triangle on upper corner of pleura yellow-red; legs the color of body; wings varying from subviolaceous to hyaline.

*Var. a.* The whole upper half of pleura and sutures near the scutellum rufous.

*Var. b.* Pleura almost entirely black.

Maine, Connecticut, Illinois, Missouri, (Say). April 24th.

No males taken. (22 ♀).

5. *D. aprilis*.

*Dosytheus aprilis*, Norton, Bost. Proc. viii, 1861, 152, 4, ♀ ♂.

Black; a wide rufous band on abdomen. Length 0.30—0.38. Br. wings 0.60—0.70 inch.

♀. Body rather stout; antennæ moderate, third joint nearly as long as fourth and fifth together; fourth, fifth and sixth nearly equal; head nearly as wide as thorax; nasus deeply notched; abdomen rufous, the basal plates, apical half of sixth and the two apical segments black; legs black, the anterior pair of tibiæ and all the tarsi more or less ferruginous; lower half of face, and of pleura and tibiæ covered with white hair; claws with an obtuse inner tooth; wings faintly clouded, nervures blackish.

♂. The male has more pubescence upon the face and pleura; the third joint of antennæ not so long as in ♀ and sometimes more than the three apical segments of abdomen black, especially beneath.

Maine, Connecticut, New Jersey, New York, Maryland, Mackenzie River, Hudson's Bay Territory.

A great many specimens taken in April on the *Salix vitellina*.

6. *D. apricus*.

*Dolerus apricus*, Say, Harris' Cat.

*Dosytheus apricus*, Norton, Bost. Proc. viii, 1861, 152, 3, ♀ ♂.

Black; a wide band on femora and most part of legs rufous. Length 0.25—0.30. Br. wings 0.50—0.60 inch.

♀. Not so large as *D. aprilis*, body stout; antennæ moderate, third joint one-third longer than fourth, punctures of head and body not so

coarse as in *D. aprilis*, vertex not coriaceous; abdomen rufous, the basal plates and three apical segments black; legs black at base, the anterior femora, their tibiæ beneath, and the four posterior femora, except at tip, yellow-red; tarsi fuscous; remainder black; inner claw tooth obtuse; wings hyaline, faintly clouded toward tips, nervures blackish, lower half of stigma piceous.

♂. The male has all the femora rufous, except the posterior pair at tip, the four anterior tibiæ rufous, posterior tibiæ and all the tarsi fuscous; face below the antennæ whitish.

New England, N. Y., N. J., Md., Ill., Mackenzie River, II. B. T.

#### 7. *D. albifrons*.

*Dosytheus apricus*, var. *albifrons*, Norton, Bost. Proc. viii, 1861, 152, 3, ♀ ♂.

Black; a wide band on abdomen and most part of the legs rufous; mouth and tegulæ white. Length 0.19—0.26. Br. wings 0.38—0.52 inch.

♀. Smaller than the preceding; antennæ and punctures as in *D. apricus*; more of white hair about the orbits and pleura; edge of nasus, labrum, tegulæ, the six basal segments of abdomen and the legs rufous; tips of posterior femora, of the four anterior tibiæ, more or less of posterior tibiæ and all the tarsi blackish; all the trochanters and a band at base of posterior tibiæ whitish; no perceptible inner claw tooth; wings hyaline, nervures black.

*Var. a.* All the coxæ and trochanters black; all of legs darker.

*Var. b.* Only the tip of posterior tibiæ black.

♂. The male has the basal joints of antennæ reddish beneath; a spot between antennæ, the face beneath and the tegulæ white.

Maine, Conn., N. Y. June. (15 ♀, 34 ♂).

This is small, and can readily be distinguished from *D. apricus* by its white mouth and tegulæ, and whitish trochanters and band on femora.

#### 8. *D. abdominalis*.

*Dosytheus abdominalis*, Norton, Bost. Proc. viii, 1861, 153, 8, ♀ ♂.

Black; abdomen wholly rufous. Length 0.28—0.33. Br. wings 0.56—0.66 inch.

♀. Abdomen compressed, not very long; antennæ moderate, third joint a little longer than fourth; fourth, fifth and sixth each a little shorter than the one preceding; head and pleura coriaceous, the cross suture back of ocelli distinct; nasus deeply incurved; basal plates and abdomen rufous; ovipositor sheath and legs black; hinder coxæ rufous at base; inner tooth of claw very obtuse and short; wings violaceous subhyaline, nervures black.

♂. Antennæ longer, stoutest toward the base; abdomen slender, basal plates black; tibiæ and tarsi indistinctly piceous.

Connecticut, Massachusetts.

But one female and a great many males taken on the willow.

9. *D. similis*.

*Dosytheus similis*, Norton, Bost. Proc. viii, 1861, 153, 5, ♀.

Black; the prothorax, tegulæ and a wide band on abdomen rufous. Length 0.33. Br. wings 0.62 inch.

♀. Abdomen moderately long and stout; antennæ rather enlarged in middle, third joint one-half longer than fourth, fourth and fifth equal, sixth shorter; head moderately rugose; pleura very coarsely pitted; lower half of the face, base of pleura and the tibiæ with abundant white hair; the prothorax, anterior lobe of mesothorax, tegulæ and abdomen, except the two apical segments, rufous, remainder of body black; anterior knees rufous, their tibiæ and tarsi fuscous; inner tooth of claw obtuse; wings hyaline, apical half faintly smoky.

*Var. a.* A broad black vitta on anterior lobe of thorax. (Illinois).

*Var. b.* a rufous line on each side of mesothorax from tegulæ to scutel; anterior tibiæ rufous. (Illinois).

Maine, Conn., Md., Ill.

10. *D. maculicollis*.

*Dosytheus maculicollis*, Norton, Bost. Proc. viii, 1861, 153, 6, ♀.

Black; thorax rufous before; abdomen ferruginous, venter black. Long 0.35. Br. wings 0.70 inch.

♀. Quite stout; antennæ moderate, third joint a little longer than fourth; fourth, fifth and sixth of equal length; head and pleura coriaceous; nasus incurved, not deeply notched, sericeous; tegulæ, apical half of anterior lobe, prothorax and upper anterior third of pleura rufous; basal plates, tergum, except apex, and sides beneath ferruginous, venter black; legs black, tarsi piceous; inner claw tooth obtuse, not very small; wings clouded.

Brooklyn, N. Y. (One ♀.)

11. *D. bicolor*.

*Tenthredo bicolor*, Beauv., Ins. Afr. et Am. 1805, 96. Hym. Tab. 9, fig. 1.

*Dolerus bicolor*, Lepel, Mon. Tenth. 122, 360.

*Dosytheus bicolor* Norton, Bost. Proc. viii, 1861, 153, 7, ♂.

"Yellow; antennæ, head and spots on thorax, breast, scutellum, feet, oviduct and veins of the wings black." Length 0.30. Br. wings 0.60 inch.

♀. Abdomen short and stout; antennæ hardly longer than to base of abdomen, third joint one-third longer than fourth; nasus deeply incurved; labrum smooth, piceous; head, side lobes of mesothorax, scutel and post-scutel, spots at sides and on basal plates, breast, a spot at base of ovipositor and the legs black, remainder of body yellow rufous; wings tinged with violaceous, nervures black.



*Var. a.* Scutel pale.

*Var. b.* A large black spot on venter.

Maine, Mass., Conn., N. Y., Md., Ill.

Taken April 24th, on the willow.

12. *Dolerus versa*, n. sp.

Rufous: the head, anterior lobe of thorax, scutel and behind, breast, ovipositor and legs black; wings violaceous. Length 0.42. Br. wings 0.88 inch.

♀. Body large and very stout; abdomen much flattened; antennæ rather long, third joint longer than fourth, color of body yellow-red; head black; anterior lobe of mesothorax, scutel and behind, pectus and ovipositor sheath black; basal plates rufous; legs black; inner tooth of claws strong; wings obscure violaceous, nervures black.

Mass., (Am. Ent. Soc.) Maryland, (T. Glover). Two ♀.

This resembles *D. bicolor* in form and punctures, but is very much larger.

13. *D. Tejoniensis*.

*Dosytheus Tejoniensis*, Norton, Bost. Proc. viii, 1861, 154, ♀, ♀.

Testaceous, with the head and breast black; wings violaceous. Length 0.48. Br. wings 0.90 inch.

♀. Body large and stout; abdomen long; antennæ large, third joint but little longer than fourth; fourth, fifth and sixth each diminishing in length; head black, polished above ocelli, roughened below, a U-shaped sinus back of ocelli; nasus but little incurved, body stout, thorax polished; pleura with scattered pits, shining; pectus, ovipositor sheath and legs black; inner claw tooth large, removed from tip; wings violaceous, subopaque, nervures black.

Ft. Tejon, Cal., (Smiths. Inst.) Two ♀.

Section 2.—(*Pelmatopus*,) Hartig.

Lanceolate cell closed. Under wings with two middle cells.

Inhabits Europe.

*Wings with two marginal and four submarginal cells.*

44. *DINEURA*, Dahlb.

*Dineura*, Dahlb., Consp. Tenth. 1835.

Hartig, Die Blattw. 226.

*Tenthredo*, Sec. B. Klug.

Sec. b. Stephens.

*Wings*—Two marginal and four submarginal cells, the second submarginal receiving two recurrent nervures; the third submarginal almost equal sided; lanceolate cell petiolate; four submarginal bullæ, viz.: one on each transverse nervure, one on the submarginal nerve at reception of second recurrent nervure. Under wings with two middle cells.

*Antennæ* 9-jointed, mostly slender and bristle-shaped.

*Body* as in *Nematus*.

1. *Dineura linitus*, n. sp.

Black; prothorax, side lobes of mesothorax, pleura and legs yellow-red. Length 0.18. Br. wings 0.40 inch.

♀. Body rather slender, shining black; antennæ slender, about two-thirds the length of body, third joint a little longer than fourth; head polished, rounded, with little or no depressions about ocelli; nasus slightly incurved, edge of labrum rufous; tegulæ, prothorax, the two side lobes of mesothorax, pleura and apex of abdomen yellow-red; middle of pectus black; legs paler than thorax, apical tarsi fuscous; claws apparently with no inner tooth. Wings hyaline, ample; stigma pale, marginal nervure received in middle of third submarginal cell, which is small and square.

Brunswick, Me., (A. S. Packard, Jr.) One ♀.

2. *Dineura lateralis*, n. sp.

Black; the pleura, venter (in part) and legs rufous. Length 0.16. Br. wings 0.36 inch.

♀. Body short and stout, shining black; antennæ slender, more than half the length of body, joints decreasing very gradually in length; head polished, no depressions about ocelli; nasus not deeply emarginate, labrum piceous; tegulæ, collar, a large spot on pleura, apical segment of tergum, apical two-thirds of venter and legs yellow rufous, basal half of stigma whitish; second recurrent nervure received very near the junction of second and third submarginals; third submarginal longer than wide; lower under wing middle cell much the largest.

Brunswick, Me., (A. S. Packard, Jr.) One ♀.

3. *D. litura*.

*Tenthredo* (all) *litura*, Klug, Berl. Mag. vii, 1814, 2d Fam. 83, 73.

"Luteous. The head and a longitudinal dorsal vitta black. Length 2½ lines. Br. wings 5½ lines.

Antennæ bristle-shaped, somewhat longer than thorax, black; clypeus truncate, on the edge red-yellow; the tips and mandibles are likewise red-yellow, the latter brown at tip; mouth yellowish; a broad black vitta extends over the back of thorax as far as the scutel; the abdomen and legs are of one color; wings perfectly clear; nerves and costa yellow-brown, costal space not filled up; the third cubital space which receives no recurrent nervure is unusually small and pentagonal."

Not seen, and hence the section to which it belongs is not certain.

Section 2.—(*Hemichroa*,) Stephens.*Hemichroa*, Steph., Mand. vii, 1835.*Leptocerca*, Hartig, Die Blattw. 228. *Dineura*, Sec. 2.

*Wings*—Two marginal and four submarginal cells, the second submarginal receiving two recurrent nervures, the third submarginal widened toward the end; lanceolate cell contracted; under wings with two middle cells.

*Antennæ* 9-articulate, long, setaceous.

*Body* as in *Selandria*; hinder tibial spurs long.

Europe.

Section 3.—(*Mesoncura*,) Hartig.*Mesoncura*, Hartig, Die Blattw. 228, Sec. 3.*Præstis*, Lepel, Brullé, Hym. v, 665.

*Wings*—Two marginal and four submarginal cells, the second receiving two recurrent nervures, the second being received at the intersection of the second and third submarginals; lanceolate cell petiolate; under wings with two middle cells.

*Antennæ* 9-articulate, formed as in *Selandria*.

*Body* as in *Selandria*; hinder spurs short.

4. *Dineura parvus*, n. sp.

Black; the apex of venter and the legs rufous. Length 0.14. Br. wings 0.30 in ch.

♂. Body short and stout; antennæ moderate, filiform, not slender, third and fourth joints equal, apical joints piceous; head coriaceous, without depressions about ocelli; nasus truncate; tegulæ and apex of venter piceous; legs yellow rufous; wings hyaline, nervures brown, marginal cross nervure curved, received beyond middle of third submarginal cell, which is a little longer than wide.

Farmington, Conn. One ♂.

45. *SCIAPTERYX*, Stephens,*Sciapteryx*, Stephens, Brit. Ent. Mand. vii, 1835, 56.

*Wings* short and broad, two marginals, divided by a curved vein, and four submarginal cells, of which the second and third each receive a recurrent nervure.

*Antennæ* 9-articulate, short, irregular, third as long as fourth and fifth together, remainder gradually diminishing in length.

*Head* broad, large, rough; eyes small; clypeus and labrum emarginate

*Abdomen* short, stout, depressed, acute at the tips.

*Legs* short, simple, tibial spurs short, obtuse.

1. *Sciapteryx rotundus*, n. sp.

Shining black; legs white, the posterior femora and tibiæ tipped with black. Length 0.33. Br. wings 0.70 inch.

♀. Body polished, short and quite stout; antennæ short, a little longer than base of thorax, rather compressed in middle, irregular; first and second joints ovate, longer than usual, third curved, enlarging toward apex; fourth and fifth semi-ovate, contracted at base; head wide, polished, coarsely punctured near inner orbits; lower ocellus in a large heart-shaped basin; nasus emarginate, pleura coarsely punctured; abdomen very short and wide; legs white; coxæ, except at tips, a line on the first and second pair of femora above, apical half of posterior femora and of tibiæ and their apical tarsi black; inner spur of anterior tibiæ very long, bifid; inner tooth of claws large and near the tip; wings hyaline, nervures blackish; lanceolate cell with oblique cross line, remainder with two middle cells.

Farmington, Conn.

One specimen. The wings are not unusually short or stout. The second submarginal is widest at the angle receiving the first recurrent nervure, the third a little longer than the second.

46. **WALDHEIMIA**, Lepel.

*Waldheimia*, Lepel, MSS.

Brullé, Hym. iv, 1846, 665.

*Wings*—Two marginal and four submarginal cells, the second and third each with a recurrent nervure; lanceolate cell contracted; under wings with two middle cells.

*Antennæ* 9-jointed, somewhat thickened in middle, the middle articles longer than the others.

Type.—*Tenth. Brasiliensis*.

1. **W. Brasiliensis**.

*Tenthredo Brasiliensis*, Lepel, Mon. Tenth. 1823, 95, 270.

*Waldheimia Brasiliensis*, Brullé, Hym. iv, 665.

Brazil.

2. **W. Orbignyana**, Brullé, Hym. iv, 1846, 665, pl. 46, fig. 8, ♀.

Bolivia, S. Am. Not seen, but from the species figured by Brullé, this genus would appear to be the same with *Macrophya*.

47. **ATHALIA**, Leach.

*Athalia*, Leach, Zool. Misc. 1814.

Lepel, Mon. Tenth. 21.

Stephens, Brit. Ent. Mand. vii.

Brullé, Hym. iv.

Hartig, Die Blattw. I.

*Hylotoma*, Spec. \*\*\*, Fab. Syst. Piez.

*Tenthredo*, (All) Fam. 1, Klug, &c.

*Wings* ample, two marginal and four submarginal cells, second and third each receiving a recurrent nervure, the second small, rather quadrate, the third rather long, lanceolate cell with oblique cross line; under wings with two middle cells.

*Antennæ* 10-articulate, short, a little thickened toward the end, articulations rather indistinct, third joint largest, the apical joint rather obtuse, with an obscure suture.

*Head* transverse, labrum generally rounded in front; mandibles bidentate; body short, acute.

*Legs* slender, simple, tibiæ with two acute spurs.

*Larvæ* with six pectoral, fourteen abdominal and two anal feet.

The larvæ of *A. spinarum* of Europe is said to be exceedingly destructive to the turnips, eating the leaves and leaving only the fibres. They come forth in a constant succession, from August till near November. They do not touch the Swedish turnips. (Curtis, viii, 617).

#### **A. A. proxima.**

*Tenthredo* (*All*) *proxima*, Klug, Berl. Mag. vii, 1814, 130, 5, ♀ ♂.

"Luteous; metathorax, wings, tibiæ and tarsi black. Length 3 lines. Br. wings 6½ lines.

Head and antennæ black; clypeus and tip yellow-white, mandibles brown, at end black; scutel yellow-red, except the hinder half, which, together with the metathorax, is black; abdomen of one color, red-yellow, ends of ovipositor sheath blackish; legs reddish-yellow, except the tibiæ and tarsi, which are black; wings almost transparent, blackish; anterior darker, nerves black.

♂. In the male the basal joints of antennæ beneath are whitish-yellow, the hinder half only of metathorax is black."

Baltimore. Not seen. This is not to be found in any collection in this country.

*Wings with two marginal and four submarginal cells.*

#### 48. **SELANDRIA**, Leach.

*Selandria*, Leach, Zool. Misc. 1814.

Stephens, Brit. Ent. Mand. vii, 44, xvii.

Brullé, Hym. iv, 665.

Hartig, Die Blattw. 263, Sec. 1.

*Tenthredo*, Fam. II, Klug, Berl. Mag. vii, 1814.

Sec. †††, Lepel, Mon. Tenth.

*Wings*—Two marginal, divided by a straight, oblique nervure, and four submarginal cells, first small, rounded, second and third of equal size, each with a recurrent nervure. The submarginal bullæ in all the species examined are alike. A bulla in the middle of the first cross nervure, from which a clear line joins a prolonged bulla at the first re-

current nervure, thence to one on the lower third of the second nervure, and thence to a wide bulla in the middle of the third nervure, from which two distinct lines radiate to the margin; a second line can sometimes be discerned across the lower part of the third submarginal.

*Antennæ* 9-articulate, the two basal joints distinct, rather globose, remainder sometimes less distinct, third often as long as both fourth and fifth, the remainder gradually diminishing in length and thickness; terminal joint short, somewhat conic. *Antennæ* seldom longer than head and thorax.

*Head* broad, rugose, generally polished and shining, with a suture more or less deep on each side of ocelli from the antennæ to summit, and an enclosed basin below the lower ocellus; *nasus* deeply notched; *mandibles* bidentate; joints of *maxillary palpi* somewhat equal in length, third joint of *labial palpi* short.

*Body* short and stout; *abdomen* broad, hardly longer than thorax.

*Legs* simple, with two short unequal spines at apex of *tibiæ*, the anterior pair bifid.

The larvæ are generally twenty-two-footed. They are slug-like in appearance and are often covered with a viscid slime. They are all naked, but some are covered with whorls of spines, some with whorls of fine hair, and some cover themselves with patches of white woolly matter. They generally undergo their transformations in the earth, but in some cases form a double cocoon, which remains in the ground.

Hartig has formed the genus into four sub-sections, which are given below, with the addition of another section which seems called for by a species of this country. The names which he gave to these sub-sections, founded on the form and habit of their larvæ, do not all seem to correspond with their larva characters in this country, and have not been adopted.

The species of this genus are small and are mostly of inconspicuous colors, and in many cases are so much alike that it is difficult to distinguish them. Fortunately they seem to vary little from their types.

*Table to assist in finding the Species.*

Section I. Lanceolate cell petiolate.

Tribe I. Under wings without middle cell.

Color black, shoulders and back red, inner claw tooth

large.....1, *vitis*.

Color black, shoulders and back red, inner claw tooth

minute.....2, *inhabilis*.

Color rufous, head and pleura black.....3, *capitalis*.

Tribe 2. Under wings one middle cell.

Div. A. Antennæ filiform, short.

- Black, thorax before and pleural spot rufous.....4, *barda*.
- 5, *dubia*.
- 6, *mexicana*.
- Ochre-yellow, pleura black.....7, *marginicollis*.
- " " pale.....8, *ochrea*.
- Black, collar and legs yellow rufous.....9, *rubi*.
- " tegulæ, collar and legs white.....10, *medius*.
- " " " black, apex of femora and legs white.....11, *tillæ*.

B. Antennæ bristle-shaped, long.

- Black, thorax mostly rufous.....12, *rudis*.
- " tegulæ and collar rufous.....13, *rufula*.
- Wholly black, anterior tibiæ obscure, inner claw tooth large.....14, *fumipennis*.
- Wholly black, anterior tibiæ obscure, inner claw tooth minute.....15, *nubilipennis*.

Section II. Lanceolate cell contracted in middle.

- Testaceous, tergum black .....16, *halcyon*.
- " thorax and tergum black...17, *montana*.

Section III. Lanceolate cell with straight cross nervure.....18, *nova*.

Section IV. Lanceolate cell with oblique cross nervure.

Tribe 1. Under wings with no middle cell.....19, *obsoletum*.

Tribe 2. " " " two " cells.

- Black; a round spot below stigma.....20, *cerasi*.
- Black; a clear fascia at apex of wings.....21, *fasciatus*.

Tribe 3. Under wings with one middle cell.

- Black; tegulæ and collar black.....22, *rossæ*.
- " " " " white, legs below the knees mostly white.....23, *ignotus*.
- Black; tegulæ and collar white, legs below the knees mostly white.....24, *q. alba*.

Section V. Lanceolate cell without cross nervure.

- Black, with white collar and legs.....25, *flavipes*.
- " " rufous collar.....26, *ruficollis*.

- Not known.....27, *obtusa*.
- 28, *labiata*.

Section 1. (*Blennocampa*), Hartig.

Lanceolate cell petiolate. Antennæ filiform, not thickened in middle.

Tribe 1. (*Blennocampa*), Hartig.

Under wings without middle cell.

1. *S. vitis*.

*Tetrachredo pygmaea*, Say, Long's Second Exp. II, 1824, 318, 5, ♀ ♂.

*Scandria vitis*, Harris' Cat. 1833.

Inj. Ins., p. 413.

Norton, Bost. Proc. viii, 219, ♀ ♂.

Shining black, with red shoulders. Length 0.24. Br. wings 0.40 inch.

♀ ♂. Body short and stout, shining black; antennæ filiform above

the fourth joint, enlarged in middle, third and fourth joints largest toward apex, at apex cup-shaped, apical joint short; each of the three ocelli in a large, shallow, separate, pentangular basin, extending from the upper ocelli toward the eyes; nasus hardly emarginate, mandibles stout, second tooth prominent, with several projections beneath; nasus and labrum white; prothorax, mesothorax and tegulæ rufous; the four anterior legs pale beneath, with more or less of black above; posterior coxæ and femora somewhat pale beneath; inner claw tooth large and near the tip; upper wings clouded, marginal dividing nervure received in middle of third submarginal cell, which also receives the second recurrent nervure near its base; under wings appendiculate, or with the outer submarginal partially closed at margin.

*Var.* The depressions about the ocelli indistinct; a deep mitre-shaped sinus above the antennæ; most of scutel rufous.

Mass., Conn. U. S.. (Say).

The larvæ are 22-footed; skin smooth, body somewhat enlarged in middle and slender toward the tail. While growing, their color is light green above, with two transverse rows of black thorn-like points, alternately six and four in number across each ring, body yellow back of the head, beneath, and the third segment from the tail, with head and tip of tail, black. They live upon vine-leaves and are very destructive, feeding in companies, often of 20 or 30, on the lower side of the leaf, and eating it all as they go, from the edge inward. They undergo their transformation in the ground.

Two broods appear in a season. The young of the second brood remain beneath the ground during the winter.

These insects are very destructive to the vines, often completely stripping them of their leaves. I first saw them about ten years ago on vines about five miles from my home, but my own vines have never been attacked until this year, 1867, when the larvæ appeared in great numbers August 6th. I bred from one of the pupæ, Sept 23d, the *Bassus linutaris*, Say, ♀.

I have retained the name of *S. vitis*, because it seems more appropriate to the insect, although the name given by Say has the priority.

## 2. *S. inhabilis*.

*Selandria inhabilis*, Harris' MSS.

Norton, Bost. Proc. viii, 1861, 220, 2, ♀.

Shining black, anterior half of thorax rufous. Length 0.16. Br. wings 0.40 inch.

♀. Black; antennæ short, filiform, second joint half as long as first, apical joint short; face below the ocelli roughened and dull; labrum



dull white at tip; the tegulæ, prothorax, mesothorax and forward half of pleura rufous; abdomen short, nearly as wide as long; tips of femora and the tibiæ pale, with more or less black upon the tips of tibiæ; wings ample, fuliginous; marginal nervure somewhat bent and received near the third submarginal nervure.

♂. A male has the medial and posterior tibiæ black.

*Var!* ♂. The prothorax, mesothorax and scutellum rufous. Anterior femora and tibiæ reddish; inner claw tooth large; wings obscure, darkest at base; under wings with all the outer cells wholly closed, the outer nervure not touching the margin. (Mexico, 1 ♂, Coll. of H. de Saussure).

Massachusetts.

3. *Selandria capitalis*, n. sp.

Color yellow-red, the head and pleura black. Length 0.14. Br. wings 0.36 inch.

♀. Shining yellowish-red; antennæ moderate, first joint but little longer than second, third but little longer than fourth, the whole filiform, of equal size to apex, pubescent; the two basal joints white, remainder blackish; head polished; a lunate series behind ocelli and a mitre-shaped basin below; nasus hardly incurved; labrum reddish; the pleura, the breast between first and second pair of legs and the apex of venter black; legs white, inner claw tooth removed from tip. Wings hyaline, nervures brownish; marginal dividing nervure curved and received beyond the middle of cell; first submarginal almost square, third narrowed at base and widened at apex.

Brooklyn, N. Y., (J. Akhurst). One ♀.

In the form of the antennæ this differs much from the type species.

Tribe 2. (*Monophadnus*), Hartig.

Under wings with one middle cell.

Sub-Tribe A. (*Monophadnus*), Hartig.

Antennæ filiform, short.

4. *S. barda*.

*Allantus barda*, Say, Bost. Jour. i, 1835, 218, 7, ♀.

*Selandria barda*, Norton, Bost. Proc. viii, 220, 3.

Proc. Ent. Soc. Phil. iii, 9, 14, ♂.

Cresson, Proc. Ent. Soc. Phil. iv, 224.

Black; thorax and anterior upper angle of the pleura rufous. Length 0.28. Br. wings 0.64 inch.

“♀. Body short, dilated, black; antennæ, the second joint nearly as long as the first, but less dilated; front and vertex with impressed lines; nasus not deeply emarginate, labrum rounded before, mandibles piceous at tip, thorax and humeral portion of the pleura honey-yellow; wings tinged with blackish-purple.”

Indiana, (Say).

The antennæ are stout, filiform, largest in middle, third joint much larger than fourth. The extent of rufous on the thorax is quite variable, sometimes covering mesothorax and half or the whole of scutellum and sometimes only a spot on each lobe; in all cases the prothorax and the anterior half of pleura are rufous; the legs are black and the anterior femora and tibiæ before rufous. The upper wings are violaceous at base, clearer toward apex; lower wings faintly clouded if at all. The claws have a very minute, obtuse inner tooth, distant from the tip. Massachusetts, Pennsylvania, Colorado.

5. *S. dubia*.

*Selandria dubia*, Cresson, Proc. Ent. Soc. Phil. iv, 1865, 244.

"Black; most of thorax yellowish-rufous; wings fuliginous, apical third and posterior pair smoky hyaline. Length  $3\frac{1}{2}$  lines. Exp. wings 9 lines.

"♀. Shining black, robust; head with scattered punctures, the labrum and base of mandibles clothed with pale pubescence; antennæ about as long as the head and mesothorax together, stout, first joint subglobose, second a little shorter than the first, third half as long again as the first and second together, remaining joints subequal, subserrate beneath, the terminal joint the shortest. Thorax rufo-ferruginous, polished; pleura protuberant, the posterior portion on the sides and beneath black; metathorax black; tegulæ rufo-ferruginous; wings ample, smoky hyaline, faintly iridescent; the basal two-thirds of the anterior pair fuliginous, darker at base; nervures and stigma black; anal angle of the posterior wings pure hyaline, beautifully iridescent; the left wing with one middle cell, but none on the right wing, the outer nervure being entirely obliterated. Legs entirely black, slightly sericeous. Abdomen short, almost as broad as long, depressed, entirely shining black, the extreme apex fringed with pale pubescence."

Colorado. One ♀.

This seems to be a variety of *S. barda*, Say, from which it differs very little, except that it is larger. The inner claw tooth is very minute as in that.

6. *Selandria mexicana*, n. sp.

Black; the tegulæ, prothorax and mesothorax yellow-red; apex of coxæ and trochanters white, wings subviolaceous. Length 0.25. Br. wings 0.56 inch.

♀. Body stout. Antennæ as in *S. barda*; head wide and not thick, polished; nasus rounded before, with a small notch in the middle, edge of nasus and labrum whitish; tegulæ, prothorax, mesothorax and scutellum testaceous; emargination below basal plates large; legs black, the apex of all the coxæ, the trochanters and base of femora,

the anterior femora and tibiæ before, and two-thirds of the posterior femora below, white; basal joint of hinder tarsi nearly as long as all the rest together; inner tooth of claw rather larger than outer and very near to it. Wings violaceous sub-obscure, color equally distributed; first submarginal nearly round, outer under-wing cells open, the marginal cell with a short appendiculate nervure.

Tampico, Mexico, (H. de Saussure). One ♀.

Much like *S. barda* in appearance.

7. *S. marginicollis*.

*Allantus marginicollis*, Harris' Cat.

*Selandria marginicollis*, Norton, Bost. Proc. viii, 1861, 220, 4, ♀.

Dull ochre-yellow; head, spots on thorax, pleura and second segment of tergum black. Length 0.20. Br. wings 0.52 inch.

♀. Body stout; antennæ black, rather slender; head black, nasus and labrum pale; front of prothorax, middle of mesothorax, the metathorax, first segment of tergum and the pectus black; collar, tegulæ and legs paler than the rest of body; wings hyaline, stigma and costa pale; marginal cross nervure received in middle of third submarginal cell.

Mass., (Harris' Coll.) Albany, N. Y., Dr. Peck. (2 ♀.)

8. *Selandria ochra*, n. sp.

Testaceous; head and legs below the knees black, wings obscure. Length 0.25. Br. wings 0.56 inch.

♂. Body stout, abdomen wide; antennæ black, densely pilose; head black, nasus and mouth below, white; mandibles each with one strong inner tooth; body all of one color, paler beneath; legs pale, all the tibiæ and tarsi (except the anterior pair, which are pale before,) black; inner claw tooth as large as outer and very near it; wings blackish obscure, darkest at base, nervures and stigma black; first submarginal cell pyriform, angulate at base; marginal under-wing cells with an appendiculate nervure.

Cordova, Mexico, (H. de Saussure). One ♂.

9. *S. rubi*.

*S. (Hoplocampa) rubi*, Harris, Address of N. Darling, New Haven, 1845, 13.

N. E. Farmer I. 164, II, p. 33.

Proc. Bost. Soc. vii, 235.

Norton, Proc. Bost. Soc. viii, 221, 5, ♀.

"Black; a spot on each side of the collar, middle of the dorsum and legs dirty yellow, wings smoky." Length 0.28. Br. wings 0.55 inch.

♀. Color black; head rather rugose, nasus somewhat incurved; head pubescent, except about ocelli; mandibles with two stout inner teeth; tegulæ, most of anterior angle, the third, fourth, fifth and part of sixth segments of tergum yellowish-white, venter ferruginous; legs

paler, their coxæ and the basal half of femora and tips of posterior tibiæ blackish; inner claw tooth large. Wings smoky hyaline, nervures brownish; marginal cross nervure curved and received near apex of third cell.

Conn., Mass., Ohio.

*Larvæ* green, not viscid; six dorsal rows of tubercles having two black bristles and four lateral ones on each side bearing white bristles.

They appear in May and feed on the raspberry. In 1862 I received from Mr. Arthur Robinson, of New Haven, specimens of these larvæ, with leaves, from which they had eaten irregular holes in the middle and on the edges. Mr. J. Kirkpatrick, (*Ohio Farmer*, June 16th, 1860,) mentions a larva which "eats longitudinal blotches out of the leaves of the raspberry and seems to be partly gregarious," which is probably this. The larvæ feed at night or early in the morning, and conceal themselves during the day, and are, therefore, very difficult to find.

10. *S. medius*.

*Selandria medius*, Norton, Proc. Ent. Soc. Phil., iii, 1864, 9, 15, ♀ ♂.

Black; with white tegulæ, collar and legs. Length 0.20. Br. wings 0.45 inch.

♀. Short and stout, color shining black; antennæ as in *S. tilix*, (No. 11). Sutures at sides of sides of ocelli not extending to summit, lower ocellus in an oval basin; tegulæ and most part of anterior angle white; legs below trochanters reddish-white, base of femora darker; wings hyaline, marginal cross nervure curved, received near middle of third submarginal cell; second recurrent nervure almost coinciding with the junction of the second and third cells; first submarginal oval.

♂. Antennæ more compressed, more of black on the base of femora; second recurrent nervure received nearer to middle of cell.

New Jersey, (Coll. Am. Ent. Soc.).

Two specimens. It resembles *S. flavipes*.

11. *S. tilix*.

*Selandria tilix*, Norton, Bost. Proc. viii, 221, 6, ♀.

Shining black; apex of femora and legs below, white. Length 0.24. Br. wings 0.56 inch.

♀. Body stout, black, polished; antennæ enlarged in middle; three large shallow depressions radiating from ocelli as in *S. vitis*; a deep sinus above the space between antennæ; nasus slightly incurved; inner tooth of mandibles retracted, a smaller blunt tooth behind; the whole face black; legs black above the apex of the femora, remainder white, tips of the posterior tibiæ and the tarsi fuscous; claws very short and sharp, no inner tooth perceptible; wings hyaline, faintly

clouded at base of upper pair; marginal cross nervure straight, received between the middle and apex of cell; a faint dot in middle of first brachial as well as in the second submarginal cell.

♂. Resembles female, except the tegulæ and edge of collar are whitish.

Farmington, Conn., Canada, Illinois. (41 ♀, 2 ♂).

Taken in June for several years, on the Linden (*Tilia americana*).

Larvæ not known, but I have often noticed the leaves eaten with irregular holes, as in the case of *S. rubi*. Doubtless, like it, they feed in the night or early morning only.

Sub-Tribe B. (*Phymatocera*), Dahlb.

Antennæ bristle-shaped, long.

12. *S. rudis*.

*Selandria rudis*, Norton, Bost. Proc. viii, 221, 7, ♀.

Black; thorax mostly rufous. Length 0.20. Br. wings 0.44 inch.

♀. Body short. Antennæ longer than to base of thorax, slender, ends of joints not enlarged, third joint hardly longer than fourth; the first and second joints, nasus and labrum pale rufous; head apparently striate and finely and sparsely punctured; a wide channel on each side of ocelli from summit to mouth, and a shallow shield-like basin below ocelli; edge of nasus straight; tegulæ, prothorax, mesothorax and the anterior half of pleura orange-red; legs black, tips of the femora, the anterior tibiæ beneath, and the tips of tarsi pale rufous; tibiæ and tarsi fuscous, pilose; claws with no perceptible inner tooth. Wings hyaline; marginal cross nervure curved, and received at junction of third and fourth submarginal, second submarginal but little longer than first; third cell nearly twice as long.

♂. The male has more of white upon the four anterior legs.

Maine, Conn., N. Y.

In one specimen the marginal nervure is received within the third submarginal cell.

13. *S. rufula*.

*Selandria rufula*, Norton, Bost. Proc. viii, 1861, 221, 8, ♂.

Black; tegulæ and edge of collar reddish-yellow. Length 0.18. Br. wings 0.40 inch.

♂. Not very stout. Antennæ nearly as long as body, second joint half as long as first, third joint compressed, third, fourth and fifth equal length, remainder nearly as long, apical joint as long as preceding; head polished, nasus slightly incurved, and with the labrum, tegulæ, and edge of collar dull honey-yellow; legs black, tips of the four anterior femora and their tibiæ whitish; wings hyaline; marginal nervure

curved, received between middle and apex of third submarginal, second submarginal twice as long as first.

Farmington, Conn. One ♂.

14. *S. fumipennis*.

*Selandria fumipennis*, Norton, Bost. Proc. viii, 1861, 222, 9. ♀ ♂.

Black, with long subviolaceous wings. Length 0.24—0.28. Br. wings 0.56—0.68 inch.

♀ ♂. Shining black; abdomen of ♀ much compressed, at the apex acute; antennæ nearly as long as body, somewhat resembling those of *Cladius*, all the joints of nearly equal length, suddenly enlarged at tips and contracted at base and flattened; labrum slightly incurved, mandibles large, the second tooth widely separated from the first; legs black; anterior tibiæ faintly whitish; inner tooth of claw large; wings very long, subopaque, violaceous, color equally distributed, nerves and stigma black.

Farmington, Conn.

15. *Selandria nubilipennis*, n. sp.

Black, a pale stripe down the anterior legs; wings violaceous, subhyaline at apex. Length 0.22—0.24. Br. wings 0.44—0.50 inch.

♀. Body not so stout as *S. fumipennis*, abdomen flattened. Antennæ not two-thirds the length of body, third joint longer than fourth, apical joint as long as preceding, nasus hardly incurved; palpi black; legs black; anterior legs before and all the knees whitish; claws with no perceptible inner tooth; wings subviolaceous, growing clearer toward apex.

♂. The male has the flagellum in some lights piceous; the four anterior legs and posterior femora at tip ferruginous.

Maine, (A. S. Packard.) Mass., (Coll. Am. Ent. Soc.) Two ♀, one ♂.

This appears much like *S. fumipennis*, but the wings are not so obscure, the antennæ are shorter, the body smaller and the claws simple.

Section 2. (*Hoplocampa*), Hartig.

Lanceolate cell contracted in the middle. Antennæ short, the third joint hardly longer than the fourth and the end joint frequently thickened. Under wings with two middle cells.

16. *S. halcyon*.

*Selandria halcyon*, Harris' Cat.

Norton, Bost. Proc. viii, 1861, 222, 10, ♀ ♂.

Ochre-yellow; a large black spot on tergum. Length 0.16—.18. Br. wings 0.48—.54 inch.

♀ ♂. Short, moderately stout, abdomen acute, color ochre-yellow; antennæ, third joint longer than fourth, apical joint a little longer than the preceding, obtuse and as thick as the other joints, color pale, the joints tipped with black above, apex black, nasus not emarginate; man-

dibles slender, second tooth retracted, with a smaller tooth below; a small spot about the ocelli, the metathorax and a large spot upon the tergum, black; (the male has all the thorax above and all the tergum, except the apex, blackish); legs of one color, the posterior tibiæ and tarsi fuscous; inner tooth of claw minute, rather sharp, near middle of claw. Wings hyaline, stigma and costa pale; marginal cross nervure straight, second recurrent nervure received between the middle and base of third submarginal cell.

*Var.* Color almost entirely ochraceous. (Mass.)

Maine, Mass., Md., Satkatchewan, (Smiths. Inst.)

Taken in April for successive years in Baltimore, by Mr. Uhler, on *Amelanchier canadensis*. The antennæ are much like those of *Athalia*.

#### 17. *S. montana*.

*Selandria montana*, Cresson, Proc. Ent. Soc. Phil. iv, 244, 3, ♀.

"Whitish; vertex and mesothorax brownish; antennæ piceous, dorsal surface of abdomen shining black; wings tinged with yellowish fuscous; legs pale blackish at tips. Length  $3\frac{1}{2}$  lines. Br. wings  $7\frac{1}{2}$  lines.

♀. Head whitish, finely pubescent; the vertex, occiput and stains on the cheeks pale brownish; tips of mandibles piceous; antennæ short, piceous, proportions as in *S. dubia*. Thorax whitish, minutely punctured, finely pubescent; mesothorax, scutellum, part of metathorax, a stain on each side of the pleura beneath and another just beneath the wings, brown; tegulæ whitish. Wings ample, subhyaline, iridescent, the anterior pair uniformly tinged with pale yellowish fuscous, the posterior pair hyaline, faintly dusky at tips; nervures fuscous, the costal nervure, except the outer margins, the stigma, except a spot in its middle, and the nervures at the base of the wings, pale; posterior wings with two middle cells. Legs whitish, their femora tinged with fulvous; the four anterior tibiæ behind (slightly interrupted in the middle), base and apex of the posterior tibiæ within and most of the tarsi blackish. Abdomen shining black above; the extreme sides, apex and the venter entirely whitish."

Colorado. One ♀. (Coll. Am. Ent. Soc.).

The breast is white. The apical joint of the antennæ is more slender than the preceding, the three apical joints of palpi clavate, the final joint the longest, the inner tooth of claw large and very near the tip.

## Section 3.

Lanceolate cell with straight cross line as in *Tenthredo*. Antennæ short, filiform, subserrate beneath.

18. *Selandria nova*, n. sp.

Shining black; tegulæ and legs, in part, white, wings faintly clouded, very long. Length 0.16. Br. wings 0.48 inch.

♀. Body short; antennæ moderate, filiform to tip, subserrate beneath, apical joint as long or longer than the preceding, obtuse, somewhat clavate; sutures at sides of ocelli wide and large, basin of lower ocellus small; legs black; apex of femora and all the tibiæ reddish-white, blacker toward tips of tibiæ, tarsi fuscous; claws without inner tooth. Wings very long, hyaline, faintly dusky toward base, nervures blackish; first submarginal larger than usual, not rounded behind and with a sharp angle on its lower side, near the costa, marginal cross nervure bent.

Maine. One ♀. (A. S. Packard).

Section 4. (*Eriocampa*), Hartig.

Lanceolate cell with oblique cross line, antennæ enlarged in middle.

## Tribe 1.

Under wings without middle cell.

19. *Selandria obsoletum*, n. sp.

Black; the four anterior legs below the knees pale, wings hyaline. Length 0.20. Br. wings 0.44 inch.

♀. Short and stout; antennæ, the first and second joints nearly equal, third one-half longer than fourth. Head polished; an oval basin below lower ocellus, ending in a sinus, on each side of which is a separated pit; body wholly black; legs black, below the knee joints white; the lower half of posterior tibiæ and their tarsi blackish, tips of medial tibiæ brown; claws short and sharp, their inner tooth near the base, difficult to see. Wings hyaline, faintly clouded in middle, cross nervure as in *S. rosæ*; first submarginal rounded at base, cross nervure in some cases apparently obsolete, (but a faint, clear whitish line can in some lights be discovered in both sexes).

Mass., (Harris' Coll.) (Coll. Am. Ent. Soc.) Three ♀, one ♂.

## Tribe 2. Hartig.

Under wings with two middle cells.

20. *S. cerasi*.

*Selandria cerasi*, Peck, Nat. Hist. Slug worm, 1799.

Harris, Inj. Ins. 419.

Norton, Bost. Proc. viii, 222. 11, ♀.

Winchell, Bost. Proc. ix, 321.

Black; legs below knee joints white, a clouded spot in middle of wings. Length 0.20. Br. wings 0.44 inch.

♀. Body very short and stout; antennæ, third joint nearly as long as fourth and fifth, the joints beyond rapidly decreasing in size and



length, apical joint slender and pointed; head polished; lower ocellus in an ovate basin, with a sinus beneath; mandibles stout, second tooth nearly as long as first, with three irregularities beneath; body wholly black; tips of the four anterior femora, with the tibiæ and tarsi more or less dull white; claws short and sharp, with no inner tooth near the tip. Wings hyaline, a large clouded spot below stigma; marginal dividing nervure oblique, almost touching the third submarginal nervure.

New England, Pennsylvania, Michigan.

The larva is twenty-footed, is larger before than behind, and is covered with an olive-colored, sticky slime (like a slug.) There are two broods, in June, July and in September, of which the first is the most numerous and destructive. Prof. Peck, in a paper published in Boston, by the Mass. Ag. Soc. 1799, makes the following statements with regard to it: On the 6th of June he saw a female depositing an egg under the "upper membrane of a cherry leaf, but on the under side of the leaf," first making a circular incision about half a line in diameter, then withdrawing the ovipositor a little and forcing an egg into the aperture. It was first a long oval, and from day to day became more spherical in shape. On the tenth day the eyes of the larva became visible through the membranes of the leaf and egg, and on the fourteenth day the larva came forth and began to feed. On first quitting the egg the larva is nearly white, the head brown and large. In the course of twenty days it throws off four skins, each of which it generally eats at once; it remains in the fifth viscous skin six days and acquires its full growth, and then quits the skin, leaving it adhering to the leaf, and appears in a clear yellow skin, not viscous. Soon after, it descends to the earth, which it penetrates to the depth of from one to four inches, forming little cells of hardened earth, smooth within. On the 12th of July he collected about 170 of these larvæ in the mature state and placed them in a vessel filled with light earth, from which they began to rise in the imago state in eighteen days, but continued to appear for some time, and some remained in the pupa state until the following spring. The second brood of larvæ appeared in August, and individuals came forth as late as September and October, but not in so great numbers as in the first brood. Of these he collected about 190, which remained in the pupa case during the winter, but did not change from the larva into the pupa state until May. On the 21st of May they began to appear in the imago state and lay their eggs, but did not all come forth at once, many being several weeks later. The larva when of full size is about 0.45 inch in length. It feeds up-

on the upper side of the leaves of the cherry (both wild and cultivated) and the pear, eating only the epidermis, never eating through the leaf, and leaving the veins and skeleton. Generally but two or three are found upon a leaf, but when they are in great numbers there are sometimes twenty or thirty. In such cases when they are very numerous a disagreeable odor is given forth. At times they have been very destructive to these fruit trees. Dr. Harris asserts and confirms these statements, with additional remarks. Prof. Peck has illustrated his remarks by a series of careful drawings, which proves his insect to be the same which is found here now.

Prof. Winchell has also published some interesting observations on the same insect, which cannot here be copied for want of space. He states that the incisions are straight and not semicircular, are made and the ova deposited on the upper side of the leaf, the ovipositor going entirely through the leaf, and that the larva appears on the eighth or ninth day. It was very abundant, and in some instances attacked not only the cherry and pear but the mountain ash and plum.

21. *S. fasciatus*.

*Selandria fasciatus*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 9, 16, ♀.

Black; legs below the knees, except the hinder tibiæ, white, basal half of inner wings blackish. Length 0.20. Br. wings 0.50 inch.

♀. Color shining black, third joint of antennæ nearly as long as fourth and fifth; head polished, lower ocellus in a heart-shaped basin; a sinus beneath, with another on each side; legs black, their tibiæ and tarsi, except the tips of apical joints, pure white; the apex of posterior tibiæ black; inner claw tooth obtuse, of moderate size near the base; wings ample, their basal half two-thirds blackish, their apical third hyaline; marginal dividing nervure received at intersection of third and fourth cells.

♂. The male has no inner under-wing cells. (Illinois).

Massachusetts, Illinois. Two ♀, three ♂.

Tribe 3. Hartig.

Under wings with one middle cell.

22. *S. roseæ*.

*Selandria roseæ*, Harris' Cat. 1835, and Inj. Ins. 416, ♀ ♂.

Norton, Bost. Proc. viii, 223, 13.

Black; legs below the knees, in part, white, wings tinged with blackish violaceous, darkest at base. Length 0.20. Br. wings 0.44 inch.

♀ ♂. Body stout, shining black; antennæ short, filiform, third joint one-half longer than fourth, fourth longer than fifth, apical joint shorter than the one preceding and more slender; channels on each side of ocelli, wide, shallow, irregular, and not extending to edge of

occiput; inner tooth of mandibles retracted, no irregularities below; tips of mandibles red; body wholly black; legs black, the two anterior pair dull white below the knee joints, with fuscous tarsi; the middle tibiæ are sometimes black on the upper side, and the posterior tibiæ whitish at base and tip, remainder with the tarsi blackish; claws with a moderately large inner tooth near the base. Wings tinged with blackish violaceous, darkest toward the base; under wings sometimes hyaline; marginal cross nervure straight and received in middle of third submarginal cell.

Northern States.

*Larvæ* 22-footed, slug-like, not slimy, not enlarged toward the head, although they have the power of retracting the head partly within or beneath the following segments. Color pale green, beneath yellowish; head yellowish, with a black dot or "triple-pointed wart" on each side. To the eye it appears soft and velvety, but free from hairs. It has two broods, coming forth in June and August, and feeds on the leaves of the rose, on the epidemis of the upper side of the leaf, not eating the vines or the under skin. There are seldom more than two or three on a leaf. Their transformations are much like those of *S. cerasi*. When disturbed the imagos often sluggishly drop from the leaf of the bush upon the ground. They are most active in the morning and evening. When the larva is mature it passes into the ground and forms an oval cell below the surface, smoothed within and cemented by gummy silk. The second brood is not so numerous as the first.

This is the most destructive insect of this genus, as it infests the rose bushes, and in their most beautiful season, causes the rose leaves of whole gardens to look as if burned by fire. And as the life of the leaf is not wholly destroyed, the effect is perceived for a long time after the damage is done. It continues to remain for years about the same locality.

23. *Selandria ignotus*, n. sp.

Black, with the tegulæ, collar, the four anterior tibiæ and base of posterior tibiæ white. Length 0.20. Br. wings 0.44 inch.

♀. Body stout, shining; antennæ as in *S. rosæ*; head below the occiput dull, with close punctures; nasus irregularly notched; tegulæ, edge of collar, all the knee joints, the four anterior tibiæ, base of posterior tibiæ and of 1st joint of tarsi whitish, remainder of legs black; tarsi obscure; inner tooth of claws minute, below the middle; wings slightly clouded, dividing marginal nervure received between middle and apex of third submarginal; second recurrent nervure received between middle and base of the same cell; base of first submarginal not

rounded, but protracted to a sharp angle as in *Emphytus*. One specimen has bands on the abdomen as in *E. maculatus*.

Maine, (A. S. Packard.) Illinois, (Coll. Am. Ent. Soc.). Conn.

A specimen from Illinois has the anterior tibiæ fuscous and the first submarginal obsolete.

24. *Selandria quercus alba*, n. sp.

Black, with the four anterior legs pure white below the middle of femora, and a white band on posterior tibiæ. Length 0.20. Br. wings 0.40 inch.

♂ ♀. Shining black, short and compressed; antennæ slightly enlarged in middle, third joint nearly as long as fourth and fifth; head polished; lower ocellus in an oval basin, with three pits beneath; body wholly black; legs black, the two anterior pair clear white below the middle of femora; tips of their tibiæ waxen; the basal two-thirds of posterior tibiæ and of first tarsal joint white; tarsi fuscous, apical joint of all the tarsi waxen-white; inner tooth of claws minute, beneath the middle. Wings hyaline, iridescent, nervures blackish, first submarginal cell rounded at base.

Farmington, Conn.

This appears much like *S. rosæ*, but the wings of this are clear and the hinder tibiæ have a distinct white band.

The larvæ feed on our white oak. I find them in abundance upon some English oaks, (*Quercus robur*). They are naked, slimy slugs, like those of *S. cerasi*, 22-footed; color pale green, at times almost white, enlarged near head. Head white, the six anterior legs amethystine brown, tail segment constricted, rather sharp. They feed in companies when young, sometimes twelve on a leaf, head outward, devouring the epidermis of the under side of the leaf, and not eating holes through. The eggs are not laid in the ribs of the leaf, but in the smooth surface between the upper and lower skin near the tip of the leaf, where whitish, irregular blotches are soon formed, visible only beneath, from the centre of which the larva comes forth. I have bred many specimens, coming forth in twelve or fourteen days.

Section 5.—(*Selandria*), Hartig.

Lanceolate cell open at the shoulder, without cross line; under wings with two middle cells.

25. *S. flavipes*.

*Selandria flavipes*, Norton, Bost. Proc. viii, 1861, 222, 12, ♀ ♂.

Black, with the tegulæ, collar and legs yellow-white. Length 0.22. Br. wings 0.46 inch.

♀ ♂. Shining black; antennæ somewhat enlarged in middle, third joint longest, remaining decreasing rapidly in size and length; apical joint pointed, color toward apex pale; head polished, with three de-

pressions about ocelli as in *S. vitis*, the lower one very distinct; between this and antennæ is a deep, recurved cross channel almost extending to eyes; nasus wide, its edge straight, tips of mandibles sharp, its inner tooth retracted; tegulæ, collar and legs straw-yellow; inner claw tooth small, near the base; abdomen compressed; wings faintly clouded, marginal cross nervure curved, and touching the third submarginal beyond the middle; first submarginal rounded at base.

Connecticut, New York, New Jersey.

Common. By an error this was originally placed in Tribe 2 of Section 3.

**26. *Selandria ruficollis*, n. sp.**

Black; the tegulæ, prothorax and mesothorax rufous; wings fuliginous.

Length 0.24—0.28. Br. wings 0.50—0.56 inch.

♂. Not very stout, compressed, apex of abdomen rounded; first and second joint of antennæ cup-shaped, remainder enlarged in middle; the third joint long; head polished, lower ocellus in a basin; nasus hardly emarginate; mouth black, palpi piceous; tegulæ, prothorax, mesothorax and scutellum rufous, the lower half of prothorax black; legs black, the anterior femora and tibiæ yellow; base of femora and apex of tibiæ black; apical half of medial femora and tibiæ obscure reddish. Wings blackish subhyaline.

Var. Venter at base pale, legs black, trochanters pale, base of first joint of tarsi white.

Mexico. (2 ♂.) Saussure.

*Species not known.*

**27. *S. obtusa*.**

*Tenthredo (All) obtusa*, Klug, Berl. Mag. viii, 1814, 55, 20, Tr. II, A. †.

"Body black fuscous; clypeus, collar, base of abdomen, legs before, and posterior tibiæ testaceous, wings hyaline, stigma yellowish. Length 4 lines. Exp. wings 8½ lines.

The abdomen thickens itself obtusely. Antennæ of equal thickness throughout. The anterior part of body is light pubescent whitish; mandibles black, inner part of mouth yellowish. The back plates of metathorax are white; upon the abdomen the first and second segments are dirty white-yellow, the portions of the anus beneath are of the same color; on the middle legs the under side of the shanks are brownish; on the under legs the shanks, spurs of tibiæ and tarsi are blackish; wings hyaline, with brown nerves, yellow costa and reddish outer nerves; the second submarginal receives two recurrent nerves, of which the second enters close to the third, wing scales yellow."

Georgia.

This may belong to one of the sections of *Dineura*, although in Klug's paper it is associated with *Selandria*.

28. *S. labiata*.

*Tenthredo* (*All*) *labiata*, Klug, Berl. Mag. viii, 1814, 56. Tribe II, A. †.

"Antennæ the length of thorax; body elongate, black; abdomen pubescent at apex, collar on each side, with the wing scales, pale; labrum and legs testaceous, wings hyaline. Length 3 lines. Exp. 6 lines.

Mandibles brown, at tip black, the labrum fringed with fine hair, the back plates like the wing scale, white; the segments of abdomen shining on hinder edge, pitchy. On each side of the spurs projects backward pale spiny hair; the hinder portion of the anterior legs fades into white; in the middle the color is rather dirty red-yellow. The hinder coxæ are at the base yellowish. The wing-nerve and costa dark brown-black.

Georgia. Not seen.

This is also placed by Klug in his Fam. 2. (Antennæ 9-jointed.)  
Sec. 1. Wings with two marginal and four submarginal cells. Div. A.  
Body oval. †. Antennæ filiform.

49. **ALLANTUS**, Panz. (as restricted by Hartig.)

*Allantus*, Panz.

Jurine, Nov. meth. 1807, 52.

*Allantus*, Leach.

Stephens, Brit. Ent. Mand. vii.

Hartig, Die Blattw. 285,

*Wings*—Two marginal and four submarginal cells, the second and third each receiving a recurrent nervure. *Lanceolate cell always with a straight cross line*; bullæ as in *Selandria*, that on the third transverse nervure wide and often indistinct, but most distinct at the ends; under wings with two inner cells.

*Antennæ* (with one exception) 9-articulate, scarcely longer than the thorax, mostly thickened toward the end, with stout basal joints, third joint longer than fourth.

*Body* cylindrical, clypeus hardly emarginate, labrum rounded, mandibles with obtuse teeth.

*Legs* simple; *coxæ reaching as far as the edge of the third abdominal segment*; anterior inner spur bifid, inner claw tooth large.

*Larva* twenty-two-footed, solitary, and feeds upon the leaves of various plants. It is generally found rolled up in a spiral form. It performs its transformations in the earth. July and August.

Leach divided the genus *Tenthredo* into two Sections. *Allantus*: Antennæ generally somewhat clavate, third joint longer than fourth; and *Tenthredo*: Antennæ slender, third and fourth joints equal. The

arrangement of Hartig is here followed, although the divisions cannot be considered more than sub-genera.

Division 1. Antennæ 8-jointed! clavate.

1. *Allantus originalis*, n. sp.

Black; the mouth, collar, scutel, basal plates, and band on each segment of abdomen yellow; wings hyaline. Length 0.50. Br. wings 1.00 inch.

♀. Body long, abdomen somewhat compressed; antennæ short, 8-jointed, clavate, first joint large, more than twice as long as second, third nearly as long as fourth and fifth together, apical joint rather obtuse, rounded; color black, with a pale spot on the outside of basal joint; head and thorax dull, with coarse pits; nasus incurved, produced, labrum rather pointed; the apical joint of palpi shorter than either of the two preceding; nasus and mouth beneath, pale; tegulæ piceous; a broad band on collar, scutel, (scutel rather prominent), basal plates, an interrupted band on the apical edge of second and third and a band on remaining segments of abdomen dull yellow, inclining to piceous on the venter; a yellow spot above hinder coxæ; legs black, trochanters black, the anterior femora before, and all their tibiæ and tarsi, the medial knee joints, tibiæ (their tips blackish) and tarsi, (apical joints black), posterior knee joints, tibiæ (their apex and apex of tarsi black) and tarsi yellowish. Wings smoky hyaline, stigma and costa ferruginous, nervures yellowish.

Carabou Island, Sts. of Belle Isle, Labrador. (A. S. Packard, Jr.)

One specimen. It somewhat resembles *All. arcuatus*, of Europe, but the head is smaller and the abdomen longer. The antennæ are more clavate than any North American species yet seen. In other respects it resembles *Allantus*.

Division 2. Antennæ 9-jointed; not clavate.

2. *A. basilaris*.

*Tenthredo basilaris*, Say, Long's Second Exp. II, 1824, 316, ♀ ♂.

*Allantus coronatus*, Harris' Cat. ♂.

*Allantus basilaris*, Norton, Bost. Jour. vii, 1860, 240, 9.

Proc. Ent. Soc. Phil. iii, 10, 18, Var. ♂.

Black; the basal joint of antennæ, face below, cheeks, tegulæ, collar, scutel, basal plates, spots on pleura, and fasciæ on the five apical segments of abdomen of ♀ straw-yellow; abdomen of ♂ wholly pale. Length 0.44—0.48. Br. wings 0.80—0.86 inch.

♀. Abdomen long, cylindrical; antennæ short, stoutest in middle, apical joint pointed, basal joint more than twice as long as the next, third long, basal joint pale; head wide as thorax, polished, having very shallow punctures, deeply channeled on each side of ocelli, with a cross channel behind; lower ocellus in a basin, which extends down between

antennæ; nasus deeply notched, labrum rounded before; a dot above each eye within, a spot on cheeks, mouth below antennæ, tegulæ, and an angle before. scutel, basal plates, a triangular spot on pleura, and a smaller spot above hinder coxæ, the fourth, an interrupted band on the fifth, the band on the sixth and seventh segments and the apex of tergum straw-yellow, the band on the fourth segment encircling the abdomen; legs yellowish, the coxæ, except at tips, a line on the apex of medial femora above, the apical half of posterior femora and apex of their tibiæ blackish, their tarsi fuscous; inner spur of anterior tibiæ bifid, inner tooth of claws large and near the tip. Wings smoky yellowish, transparent, apical half darkest, stigma and costa yellowish.

♂. The male has the abdomen shorter, more slender; the cheeks, pleura and abdomen beyond middle of first segment straw-yellow; legs yellow, except a spot on posterior coxæ, a line down the four posterior femora and tibiæ and the hinder tarsi black.

Var. *a.* ♂. Resembles the female, except that only the second, third and fourth segments of abdomen are yellow, the remainder black; the posterior tarsi are pale beneath.

New England, N. Y., Pa., Ill., N. W. Ter.

The bands upon the abdomen, especially that on the fourth segment, have a rufous tinge, but are not distinctly red as described by Say.

### 3. *A. dubius.*

*Allantus dubius*, Harris' Cat.

Norton, Bost. Jour. vii, 1860, 240, 10, ♀.

Black; antennæ piceous, basal joints yellow, the fifth and the three apical segments of tergum yellow. Length 0.45. Br. wings 0.90 inch.

♀. Color black; antennæ piceous, the basal joint pale; head wide, indistinctly piceous about the orbits; clypeus produced, angulate; labrum rounded; clypeus and beneath; scutellum, edge and sides of basal plates, a spot above posterior coxæ, the fourth and the three apical segments of tergum yellow; tegulæ piceous; legs piceous yellow, darkest (in one case black) on femora above and on base of tibiæ; coxæ black, at tip yellow; trochanters yellow; wings clouded, nervures and apex of stigma blackish; basal half of stigma and costa piceous yellow.

Mass., (Harris' Coll.)

This may be a variety of *A. basilaris*.

### 4. *Allantus annularis*, n. sp.

Black; base of antennæ, mouth, cheeks, tegulæ, anterior angle, two spots on pleura, scutel and post-scutel, basal plates and a band or fascia on each segment of abdomen yellow. Length 0.40. Br. wings 0.80 inch.

♀. Shining black; abdomen shorter and more cylindrical than in



*A. basilaris*; antennæ short and stout as in *Selandria*; head polished; basal joint of antennæ and second joint beneath, two oval spots above their base, nasus and mouth beneath, lower half of cheeks, tegulæ, anterior angle, a large triangular spot on pleura, a round spot above posterior coxæ, scutel and post-scutel, basal plates, an interrupted fascia on first and second segments of tergum, an irregular band on fourth and fifth, the whole of fourth, sixth and seventh segments and apex of tergum, and the fourth segment of venter straw-yellow, those on the tergum having a rufous tinge; legs yellowish; the basal half of coxæ, the upper apical half of posterior femora, the tips of all the tibiæ and tarsi black; patellæ black. Wings slightly clouded, nervures black, base of stigma and costa ferruginous.

♂. The male has the basal half of the first and second segments, most of the third, and all the fourth segments of tergum and all but the two apical segments of venter pale yellow, remainder black.

Cape Mendocino, Cal., (Cambr. Mus.) Collected by A. Agassiz, Jr.

This is much like *A. basilaris*, but is smaller, the abdomen shorter and less compressed, &c.

5. *Allantus interruptus*, n. sp.

Black; two dots above antennæ, the mouth below, cheeks, tegulæ, collar, a spot above hinder coxæ, scutel, basal plates, and an interrupted band on all but the three apical segments of tergum yellowish. Length 0.40. Br. wings 0.80 inch.

♀. Quite short and compressed, shining black; antennæ moderate, of one color; head polished; two oval dots above antennæ, nasus and mouth below, cheeks, tegulæ, collar, a spot above hinder coxæ, scutel, basal plates, a slender line on each side above, a fascia, interrupted in middle, on the first, second, third, fourth and fifth segments of tergum, the sixth, seventh and apex above and beneath straw-yellow; legs yellowish; the coxæ, a line down the upper side of all the femora and the upper and lower tips of tibiæ black; wings hyaline, slightly clouded, nervures black, base of stigma pale.

Cape Mendocino, Cal., (Cambr. Museum. Coll. by A. Agassiz, Jr.)

One ♀.

The abdomen is quite short and stout.

6. *Allantus maximus*, n. sp.

Black: the mouth, collar, scutel, spot above the four hinder coxæ, and a band on the fourth and fifth segments of abdomen yellowish. Length 0.54. Br. wings 1.08 inch.

♀. Thorax and abdomen very wide. Antennæ short, stout, tinged with ferruginous near the middle; head very large, as wide as thorax,

polished, the space above ocelli punctured; thorax dull, with dense punctures; nasus deeply emarginate, mandibles very wide and strong, mostly white, apex black; nasus, labrum, collar, (tegulæ black) scutel, a spot above each of the four hinder coxæ, and a band covering the third and fourth segments of abdomen, yellow, (on the abdomen tinged with orange); legs black at base, the anterior femora before, the upper half of intermediate femora and the parts beneath, yellowish; tips of posterior tibiæ black; wings smoky yellowish, stigma, costa and basal nervures black.

Washington Territory, (Baron Osten Sacken).

One ♀. The abdomen is very long and stout, making this much larger than any other of our species.

7. *A. uncinatus*.

*Allantus uncinatus*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 9 17, ♀ ♂.

Black; a wide annulus on antennæ, mouth, collar, scutel, third and fourth segments of abdomen and lower half of legs white. Length 0.47. Br. wings 0.92 inch.

♀. Body long, cylindrical; antennæ not as long as thorax, third joint nearly as long as fourth and fifth, color black, the fourth to the eighth inclusive, white, apical joint brownish; head rugose; clypeus notched, labrum conic; both, with the base of mandibles, a wide mark on collar, upper half of scutel, a spot on each side of basal plates and an adjacent spot at base of posterior coxæ, the third and fourth segments of abdomen pale straw-yellow; thorax dull, with fine, separated punctures; legs black above the knee joints, the whole apical half of anterior femora, apical half of medial femora above and the tibiæ and tarsi pale yellow; the tips of posterior tibiæ blackish; tips of the four anterior tibiæ, and all the tarsi reddish. Wings clouded, apical half darkest, nervures black, stigma and costa brown.

♂. The male has the fourth and fifth joints of antennæ black above, spot on collar small, the sides of first and second and all of the third segments of abdomen, except a spot on its apex above, yellowish.

Rocky Mts., Colorado, ((Coll. Am. Ent. Soc.) Three ♀, three ♂.

*Species not determined.*

8. *A. obesus*.

*Allantus obesus*, Say, Harris' Cat.

Norton, Bost. Jour. vii, 1860, 260, ♂.

Black; body stout; wings fasciate. Length about 0.35. Br. wings 0.74 inch.

♂. Shining black; thorax wide; abdomen short and stout; head narrower than thorax, coarsely punctured; vertex surrounded by an oval ridge, inclosing the anterior ocellus; antennæ moderate, third

joint long; ocelli pale; face immaculate; palpi piceous at tip; clypeus moderately emarginate; thorax rough, immaculate; two pale dots behind scutellum; legs yellow; intermediate femora at tip above, posterior coxæ at base, apical half of femora and tibiæ and all the nails black; wings hyaline; nervures dark brown; stigma inflated, black; a broad, brownish fascia upon superior pair crossing the second and the second and third submarginal cellules.

Massachusetts, (Harris' Coll.)

One imperfect specimen, the upper half of abdomen being wanting.

Not seen since first described. It probably belongs to *Dineura* or *Sciapteryx*.

50. **MACROPHYA**, Dahlb.

*Macrophya*, Dahlb.

Hartig, Die Blattw. 290, iv.

*Tenthredo* (*All*), Fam. III, Klug, Berl. Mag. vii.

Wings with two marginal and four submarginal cells, the second and third each with a recurrent nervure; bullæ as in *Allantus*; under wings with two middle cells.

Antennæ 9-jointed, either shorter than beyond base of abdomen, somewhat thickened in middle or longer than base of abdomen, setaceous.

Body as in *Allantus*.

Legs as in *Allantus*, except the hinder coxæ, which are unusually large, reaching as far as the edge of the fourth abdominal segment.

Table to assist in determining the Species.

Section 1.

Antennæ hardly longer than to base of abdomen, somewhat thickened in the middle.

Tribe 1.

Lanceolate cell with oblique cross line.....1, **excavatus**.

Tribe 2.

Lanceolate cell with very short, straight cross line or closed in middle.

A. Antennæ wholly black.

a. Scutellum pale.

X. Abdomen black, posterior tibiæ banded.....3, **epinotus**.

Spot on pleura .....4, **pulchella**.

b. Scutellum black.

Abdomen black, posterior tibiæ banded.

1. Spot on pleura.....5, **lineata**.

2. All the coxæ pale, tarsi pale.....2, **incertus**, ♀.

3. Hinder coxæ pale, tarsi pale.....6, **flavicoxæ**.

4. " " mostly pale, tarsi black.....8, **pannosus**.

5. " " black, " " .....9, **proximata**.

- ††. Posterior tibiæ with an outer pale line or spot.
6. Hinder coxæ black.....10, **externus**.
7. All the coxæ with a white spot.....11, **tibiator**.
- †††. Posterior tibiæ black.
8. All the coxæ with a white spot, hinder tarsi black.....12, **albomaculatus**.
9. Hinder coxæ with a white spot, hinder tarsi black.....7, **incertus**, ♂.
10. Hinder coxæ black above.....13, **pumilus**.
11. " legs black.....14, **fuliginus**.
- XX. Abdomen rufous or banded with rufous.
1. Wings hyaline.....15, **dejectus**.
2. " obscure.....29, **fumator**.
5. Spot on pleura; legs black and yellow.....28, **troculus**.
- XXX. Abdomen banded with white.....2, **pluricinctus**.
- B. Antennæ pale beneath.
1. Abdomen white banded.....18, **zonalis**.
2. " " beneath.....19, **californicus**.
- C. Antennæ at tip pale.
- a. Scutellum pale.....16, **niger**.
- b. " black.....17, **trisyllabus**.
- D. Antennæ at tip and base pale.
1. Abdomen rufous.....20, **varius**.
2. " " black and white.....21, **eurythmia**.
3. " " a white spot on pleura.....22, **fascialis**.
- E. Antennæ pale at base.
1. Abdomen banded with rufous on 4th segment....23, **bifasciatus**.
2. " " " " " and 5th " ....24, **formosus**.
3. " " " " " or rufous, legs rufous and yellow, spot on pleura.....27, **goniphorus**.
4. Abdomen black, femora black banded.....26, **intermedius**.
5. " " " pale .....25, **cestus**.

## Section 2.

Antennæ longer than to base of abdomen, setaceous.....30, **omega**.

Section I.—(*Macrophya*), Hartig.

Antennæ hardly longer than base of abdomen, thickened in middle.

## Tribe 1. Hartig.

Lanceolate cell open at the shoulder, with oblique cross line.

1. **M. excavatus**.

*Allantus excavatus*, Norton, Proc. Ent. Soc. Phil. i, 1861, 143. ♀.  
Bost. Proc. 18, 118.

Black; base of antennæ, collar, basal plates and hinder tibiæ, except at apex, straw-yellow. Length 0.39. Br. wings 0.79 inch.

♂. Body short and stout; thorax wide; antennæ rather enlarged in middle, diminishing toward apex, first joint nearly twice as long as second, obliquely truncate, third nearly as long as fourth and fifth; head and thorax wide and large, covered with deep pits, as in *Dolerus*, third joint of maxillary palpi short; a whitish spot in middle of lab-

rum; collar, a spot below, basal plates, apex of abdomen and (sometimes) extreme edges of four apical segments yellowish; abdomen short, cylindrical, a rufous spot on each side of first segment; legs black; tips of coxæ, trochanters, base and apex of four anterior femora, their tibiæ, posterior tibiæ, except at apex, and base of first tarsal joint pale yellow; tips of the four anterior tibiæ and the tarsi brown; inner claw tooth not as large as outer; apical half of wings clouded, changing into smoky yellow, basal half of stigma pale. Under wings with one middle cell, the lower nerve of lanceolate cell of under wing coinciding with cross nervure above.

*Var. a.* No bands upon edges of segments of tergum.

Mass., Penn., Md., Ill.

This was first described as an *Allantus*, because its femora are shorter than is usual in *Macrophya*, but they are quite stout, and in form and general appearance this approaches nearer to *Macrophya* than *Allantus*.

Tribe 2.\*

Tribes 2 and 3. Hartig.

Lanceolate cell open at shoulder, with short, straight cross line, or rarely closed or closed with a separation between the two areas.

2. *M. pluricinctus*.

*Macrophya pluricinctus*, Norton, Bost. Proc. ix, 1862, 118. ♀ ♂,

Black; edge of collar, scutellum and bands on abdomen white. Length 0.28. Br. wings 0.60 inch.

♀. Body short and stout, black; antennæ stout, as in *Allantus*; clypeus hardly emarginate; face black, palpi partly white, tegulæ, edge of collar, spot on the front of scutellum, edge of basal plates and a band at edge of each segment of abdomen white; tips of all the femora, the four anterior tibiæ and tarsi beneath, tips of coxæ and the upper side of posterior legs white; the middle of four posterior tibiæ encircled with white, extreme tips black; tarsi partly black. Wings hyaline, stigma white at base; lanceolate cell with short, straight cross line.

♂. The male differs only in having the bands interrupted on the middle of tergum, and the posterior femora with a white line above and beneath.

San. Mat., Cal. (Cambr. Mus.)

Two specimens. The abdomen is short, as in *Selandria*.

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\* Hartig here makes two tribes. The second having a straight cross line in the lanceolate cell—the third having the lanceolate cell closed in middle. But some of our species present both peculiarities in different individuals, and others differ in different sexes. The two tribes are here united, but the form of the lanceolate cell is generally specified in the description.

3. *M. epinotus*.

*Allantus epinotus*, Say, Bost. Jour. i, 1835, 215, 1. ♀ ♂.

Norton, Bost. Jour. vii, 257, 42.

*Allantus sambucci*, Harris' Cat.

*Macrophya epinotus*, Norton, Bost. Proc. ix, 118.

Black; mouth, collar, scutel and basal plates white, posterior tibiæ banded.

Length ♂ 0.28. Br. wings 0.64 inch. Length ♀ 0.36. Br. wings 0.70 inch.

♀. Body short, thorax enlarged, as in *M. excavatus*; antennæ black, stout, as in *Selandria*, enlarged toward base; head and thorax dull, with close punctures, coarsest on pleura; nasus wide, deeply notched; labrum truncate; both, with a spot on mandibles, two dots, sometimes minute, on edge of occiput back of ocelli, a spot on tegulæ, collar, most part of scutel and of basal plates, a spot on hinder coxæ. white; abdomen short, cylindrical; legs black; all the trochanters, the anterior femora beneath, their tibiæ, except at tip, the medial femora at base and tip beneath, and their tibiæ, except at tip, the knee joint of posterior femora, (a line beneath these femora sometimes white or rufous or obsolete), a band on their tibiæ and all the tarsi yellowish; each tarsal joint tipped with black.

*Var. a.* ♀ ♂. Scutel black, a black line down the four anterior tibiæ above. The male has the spots back of ocelli wanting. (Conn.)

*Var. b.* ♀ ♂. Scutel pale, spots back of ocelli wanting, a black line down the four anterior tibiæ above, a dot on pleura. (Colorado.)

Maine, Massachusetts, Connecticut, New York, Illinois, Colorado.

4. *M. pulchella*.

*Tenthredo (All) pulchella*, Klug, Berl. Mag. viii, 1814, 121, 89.

*Allantus flavolineatus*, Norton, Bost. Jour. vii, 259, 45.

*Macrophya pulchella*, Norton, Bost. Proc. ix, 118.

Black; mouth, collar, scutel, a stripe on pleura, part of legs, and a band on posterior tibiæ yellow. Length ♂ 0.25. Br. wings 0.55 inch. Length ♀ 0.32. Br. wings 0.65 inch.

♀. Body short, not so stout as in *M. epinotus*; antennæ longer than base of abdomen, not very stout; nasus incurved; labrum truncate, punctured as in last species; mouth, tegulæ, collar, apex of scutel, a broad stripe across pleura, extreme edge of basal plates and tip of anal segment pale yellow; legs pale yellow; coxæ yellow, a black line down the four anterior femora and tibiæ above; posterior pair black below the middle of femora, with a yellow band on tibiæ. Wings faintly smoky, nervures dark, stigma pale at base; lanceolate cell with short, straight cross line.

♂. Legs paler; only a slender black line down the four anterior tibiæ above, sometimes obsolete. The spot on scutel is sometimes wanting and the band on hinder tibiæ incomplete.

*Var. a. ♂*. The posterior tibiæ black.  
Connecticut, Illinois, Georgia, (Klug).

**5. *Macrophya lineata*, n. sp.**

Black; mouth, tegulæ, collar, stripe on pleura, legs (in part) and a band on hinder tibiæ yellow. Length 0.30. Br. wings 0.60 inch.

♀. Body short, moderately stout; antennæ as in *M. pulchella*; head as wide as thorax; mouth, tegulæ, collar and stripe across pleura straw-white; legs black; tips of coxæ, trochanters, the anterior pair before, the intermediate tibiæ, except at tip, base of hinder femora, a band in middle of their tibiæ, and all the tibiæ, except at tip, yellow; wings faintly clouded, stigma and costa black; lanceolate cell closed.

Farmington, Conn. One ♀.

**6. *M. flavicoxæ*.**

*Allantus flavicoxæ*, Norton, Bost. Jour. vii, 1860, 258, 43. ♀.

*Macrophya flavicoxæ*, Norton, Bost. Proc. ix, 118.

Black; mouth, tegulæ, collar, coxæ, and a band on posterior tibiæ yellow. Length 0.32. Br. wings 0.65 inch.

♀. Body moderately stout; antennæ as long as to base of thorax, compressed in middle; head wide, polished, punctured, as in *M. pulchella*; nasus incurved, labrum rounded, both, with tegulæ and collar, yellow; legs mostly pale yellow; a band on the four anterior femora, a slender line down the tibiæ above, (sometimes wanting on medial pair), their tips and tips of their tarsi, apical half of posterior femora, base and apex of their tibiæ, base of their first tarsal joint and apex of the last, black; lower half of hinder coxæ waxen, hinder tibial spurs very long, claws large, inner tooth near the tip; wings faintly clouded, nervures blackish; lanceolate cell closed.

♂. All the legs mostly pale yellow; apex of posterior femora and their tibiæ black.

Me., Conn., N. Y., N. J., Va., Ill.

Common. All the specimens examined but one, are females.

**7. *M. incertus*.**

*Allantus incertus*, Norton, Bost. Jour. vii, 1860, 258, 44, ♂.

*Macrophya incertus*, Norton, Bost. Proc. ix, 118.

Black; mouth, tegulæ, collar and legs pale yellow, apex of posterior femora and their tibiæ black. Length 0.30. Br. wings 0.60 inch.

♂. Body rather slender, apex of abdomen rounded; antennæ and punctures as in *M. flavicoxæ*; clypeus deeply incurved, enclosing labrum; both, with the tegulæ, collar and legs pale yellow; a white spot on hinder coxæ near the apex; a slender line down the anterior tibiæ and tips of their tarsi; most of basal half of hinder coxæ, apical half of their femora, their tibiæ, base of first tarsal joint and apex of the

last black; hinder spurs long; wings very faintly clouded; lanceolate cell closed.

♀. The female resembles the male in every respect, except that the hinder tibiæ are banded with yellow in the middle.

Connecticut, New York, Illinois.

About fifty males and one female.

8. *M. pannosus*.

*Allantus pannosus*, Say, Bost. Jour. I, 1835, 217, 6.

Norton, Bost. Jour. vii, 257, 40.

*Macrophya pannosus*, Norton, Bost. Proc. ix, 118.

Black; mouth, collar, coxæ and most of legs white, with a black line down four anterior legs; hinder legs black, with a spot on coxæ, trochanters and a band on tibiæ white. Length 0.40. Br. wings 0.70 inch.

♂. Body black; nasus deeply emarginate, white; labrum sub-orbicular, truncate, sub-emarginate before, blackish on the disk or within the emargination of the nasus; mandibles black at tip; maxillary palpi dusky in the middle of the basal joint; thorax and posterior edge of the collar white; wing scale blackish; wings hyaline, nervures black; carpus on the inner half dull wax-yellow; pleura immaculate; feet, anterior pairs white before, with a black line behind; coxæ white; tarsi white, with dusky incisures; posterior pair black, incisures of the thighs, band on the tibiæ and base of the ultimate joints of the tarsi white; coxæ white, with a black spot above and beneath. Length one-fourth of an inch.

♀. Coxæ with a large black spot; posterior tibiæ with a white longitudinal line. Length three-tenths of an inch."

Var. ♀. The basal plates white.

Maine, New York, Maryland. Indiana, (Say.)

All the specimens examined have the hinder coxæ black, with a large white spot above and beneath. The posterior tibiæ have not a "white longitudinal line," but a whitish band, almost interrupted behind.

9. *Macrophya proximata*, n. sp.

Black; mouth, tegulæ, edge of collar and of basal plates, anterior legs beneath and a band on posterior tibiæ yellow-white. Length 0.39. Br. wings 0.76 inch.

♀. Body short, cylindrical; head and pleura with dense punctures; antennæ as in *M. flavicoxæ*; nasus deeply incurved, and with the mouth beneath, tegulæ, collar and basal plates straw-yellow; legs black; tips of coxæ, trochanters and base of femora, anterior legs beneath, medial knee joints, and tibiæ (except at apex) and tarsi (except their



tips) and a band in middle of hinder tibiæ yellow; hinder tarsi black; wings hyaline, nervures black; lanceolate cell closed.

Connecticut. One ♀.

This resembles *M. lineata*, but has no stripe across pleura, and its hinder tarsi are black.

10. *M. externus*.

*Allantus externus*, Say, West. Quart. Rep. II, 1823, 72, ♀.  
Norton, Bost. Jour. vii, 257, 41.

*Tenthredo externus*, Norton, Bost. Proc. ix, 121.

"Black; tibiæ white on the exterior side. Length nine-twentieths of an inch.

Body deep black; head with a spot each side on the nasus and base of mandibles, white; wings fuliginous; nervures black; thighs at tip above, incisures of the coxæ, exterior side of the tibiæ and tarsi white, posterior feet robust."

Missouri.

This is like the *M. tibiator*, having the mouth, edge of collar, edge of basal plates, trochanters, four anterior tibiæ and tarsi below yellow-white, and a line on the hinder tibiæ about two-thirds as long as tibia; hinder tarsi white above, tips of all the other tarsi black, first joint of hinder tarsi as long as all the rest. The head is quite wide. The specimens examined are not all as large as that of Say, being about 0.35—0.45 inch in length. Wings almost hyaline, lanceolate cell closed.

A variety has a short line in middle of hinder tibiæ and the hinder tarsi black.

Massachusetts, Connecticut.

11. *M. tibiator*.

*Macrophya epinotus*, Var. *b*, Norton, Bost. Jour. vii, 257, 42.

*Macrophya tibiator*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 10, 20.

Black; two dots back of ocelli, obsolete spots on nasus; edge of collar and of basal plates, a line down all the coxæ, and legs below knees, interrupted on every joint of hinder pair. Length 0.28 Br. wings 0.66 inch.

♀. Body short and stout; head wide as thorax, densely punctured; antennæ moderate, compressed in middle; two minute dots on edge of occiput back of ocelli, an indistinct spot on each side of both nasus and labrum, spot on mandibles, a slender line around the edge of collar and basal plates white; a slender line down each of the coxæ, forming a spot on hinder pair, joints of trochanters, (hinder trochanter entirely), a line down the anterior legs and down the medial pair below the knees white, with the tips of the tibiæ and tarsi black; a short oblique line in middle of hinder tibiæ and spot on each joint of tarsi white; tarsal claws apparently bifid; apical half of wing fuliginous; lanceolate cell closed.

♂. The male has the abdomen slender and longer.

*Var. a.* ♀ ♂. The dots back of ocelli wanting; mouth mostly white. Four ♀, five ♂.

Maine, Massachusetts, New Jersey, Maryland, Virginia, Illinois, Colorado.

This is smaller than *M. externus*, and differs in having a white line down all the coxæ and a short oblique line on the hinder tibiæ. A specimen from Illinois has the spot on hinder tibiæ extending around it. It is possible that this species is a variation from *M. epinotus*, Say.

12. *M. albomaculatus*.

*Allantus albomaculatus*, Norton, Bost. Jour. vii, 1860, 256, 39. ♀ ♂.

*Macrophya albomaculatus*, Norton, Bost. Proc. ix, 118.

Black; edge of collar, a spot on all the coxæ, trochanters and a line down anterior legs before, white. Length 0.35—0.37. Br. wings 0.65—0.70 inch.

♀. Body stout; abdomen not very short; head wide, closely punctured; antennæ as long as to base of abdomen; nasus deeply incurved, color white, edged with black; labrum, base of mandibles, edge of tegulæ and of collar yellow-white, sometimes tinged with rufous; legs black; a large white spot on hinder coxæ above and a more slender line on both the anterior pair; all the trochanters, anterior legs before, (sometimes also the medial), tips of medial femora reddish-white; hinder tibiæ and tarsi black, spurs of hinder tibiæ long, claws apparently bifid; wings faintly obscured.

♂. Body slender; the four apical joints of antennæ dimly ferruginous beneath; nasus not deeply emarginate, black; labrum piceous; the four anterior legs white beneath, their tarsi white, tipped with black; no white spot on the four anterior coxæ; lanceolate cell closed.

Canada, Maine, Connecticut, Maryland.

13. *Macrophya pumilus*, n. sp.

Black; the four anterior legs white, varied with black, hinder trochanters and coxæ white. Length 0.28. Br. wings 0.54 inch.

♂. Black; antennæ short and stout, as in *Allantus*; head without obvious depressions about ocelli; vertex punctured, below ocelli rugose; nasus but slightly incurved; labrum wide, truncate; color of both waxen; all the coxæ, a wide line on the four anterior femora and a slender line on the anterior tibiæ above, the apex of medial tibiæ and of all the anterior tarsi, hinder coxæ above and the hinder legs below trochanters, black, remainder white; wings hyaline, apical half faintly clouded, nervures blackish; lanceolate cell closed.

Cape Mendocino, Cal., (Cambr. Mus. Coll. by A. Agassiz, Jr.)

This has shorter and stouter antennæ than *M. albomaculatus*, and its hinder coxæ are black above, &c.

14. *Macrophya fuliginosa*, n. sp.

Black; anterior legs pale; wings obscure, their basal third clear. Length 0.48. Br. wings 0.94 inch.

♀. Body stout; abdomen long and cylindrical; head and thorax dull, with dense punctures; scutellum coarsely pitted; antennæ thickened in middle, compressed; nasus coarsely pitted; mouth and palpi black; a white spot on mandibles; a slender white line across tegulæ, remainder of body black; legs black, the anterior femora and tibiæ with a white line before; tips of hinder trochanters and base of final joint of all the tarsi white; wings blackish subhyaline, with clear spot at the base; the basal half of under wings hyaline, stigma and costa brownish; lanceolate cell with short, straight cross line.

Illinois, (Coll. Am. Ent. Soc.) One specimen.

The coxæ are large, but hardly longer than in some species of *Tenthredo*.

15. *M. dejectus*.

*Allantus dejectus*, Norton, Bost. Jour. vii, 1860, 249, 27, ♂.

*Macrophya dejectus*, Norton, Bost. Proc. ix, 118.

Black; a piceous band at base of abdomen. Length 0.43. Br. wings 0.80 inch.

Body moderately stout, abdomen quite long; antennæ moderate, compressed in middle; nasus deeply incurved; edge of labrum, the palpi and the three basal segments of abdomen piceous, the latter most distinct at sides; legs black, with the four anterior tibiæ beneath and the tarsi dull piceous; wings faintly clouded, nervures black, stigma piceous, second submarginal cell receiving the recurrent nervure nearer the third cell than usual; lanceolate cell with short, straight cross line.

Brooklyn, N. Y., (J. Akhurst.)

16. *M. niger*.

*Allantus niger*, Norton, Bost. Jour. vii, 1860, 239, 6, ♀.

*Macrophya niger*, Norton, Bost. Proc. ix, 118.

Black; antennæ semi-annulate with white near the tip; scutel black, coxæ white spotted. Length 0.37. Br. wings 0.75 inch.

♀. Body long, shining black; antennæ rather long, apical half of the fifth, sixth, seventh, eighth and base of ninth articles white on upper side; nasus deeply incurved, labrum truncate; disk of labrum, a spot on mandibles and a large spot on posterior coxæ white; a pale yellow line on anterior legs before; on the apical half of medial femora and (indistinctly) down their tibiæ and tarsi and the hinder trochanters white; wings hyaline, nervures dark, stigma brown; lanceolate cell closed.

Farmington, Conn.

About twenty females. No males taken.

17. *M. trisyllabus*.

*Allantus trisyllabus*, Say, Harris' Cat.

Norton, Bost. Jour. vii, 1860, 238, 5, ♀.

*Macrophya trisyllabus*, Norton, Bost Proc. ix, 118.

Black; a band on antennæ, collar, V-spot, scutel and spot on coxæ white. Length 0.40. Br. wings 0.80 inch.

♀. Body long, abdomen cylindrical; antennæ rather long, apex of fifth, the sixth, seventh, eighth and base of ninth articles white; nasus produced and not deeply notched; edge of nasus, disk of labrum, a spot at base of mandibles, palpi, edge of collar, V on anterior lobe, scutel, a line at apex of metathorax, edge of basal plates and of first four segments of tergum pale yellow; legs black, a large spot on posterior coxæ white; a narrow line on most of four anterior legs beneath, all the trochanters, and (in some cases) the joints of the tarsi yellowish; wings slightly clouded, nerves black; lanceolate cell closed.

♂. The male has the venter more or less white; the four anterior legs beneath and the posterior legs below femora white; all the trochanters and anterior legs above, yellowish.

Canada, Mass., Conn., N., Y., Ill., English River, Saskatchewan, (Smiths. Inst.) Mexico.

Common. The females are abundant, the males rare. In some cases the V-spots and all marks back of the scutellum are indistinct or wanting; sometimes the ventral segments are tipped with white.

18. *M. zonalis*.

*Macrophya zonalis*, Norton, Proc. Ent. Soc. Phil. iii, 1864, 11, 21. ♀.

Black; the tips of antennæ, mouth, collar, V-spot, scutel, three-spots on pleura and a band on each segment of abdomen white. Length 0.44. Br. wings 0.92 inch.

♀. Body long, shining black; antennæ long, apex of fifth and the fourth apical joints white, tip brown; head polished, having obsolete punctures; nasus slightly incurved; labrum almost truncate; a spot above ocelli, a dot below antennæ, nasus and mouth, collar, V-spot, scutel, a band at base of each segment of abdomen, enlarged at sides and beneath, a spot below the anterior wings, a cross stripe below the posterior wings and a triangular spot in middle of pleura, white; legs black, the two anterior pair and the posterior femora white beneath, and a large white spot on posterior coxæ; the four apical tarsi of four anterior legs white, their tips black; posterior tarsi black, their first joint nearly as long as all the rest; wings faintly clouded on their apical half, nervures blackish.

Massachusetts, (Coll. Am. Ent. Soc.) One specimen.

19. *M. californicus*.

*Tenthredo californicus*, Norton, Proc. Ent. Soc. Phil. i, 1862, 198. ♀.

Greenish-white; base of antennæ, six lines on thorax and scutel white; antennæ, head, and middle of thorax and abdomen black. Length 0.36. Br. wings 0.68 inch.

♀ ♂. Body long, as in *Tenthredo*; color greenish-white; antennæ moderate, slender, as in *Tenthredo*, third joint longer than fourth; color black above, basal joint pale, with a large black spot above; flagellum pale beneath; head as wide as thorax; eyes widely separated; nasus wide, slightly incurved; a large black spot on vertex extending nearly to antennæ, enclosing two oval white dots about lower ocellus, back of head black; remainder of head of one color; thorax black above, with two lines on front lobe, one on the front of each side lobe and one on the back of each, diverging from scutel, the scutel and post-scutel white; a wide black stripe, sub-interrupted at joints, runs down the middle of tergum; the whole body beneath immaculate; legs of same color, a black spot on hinder coxæ and a slender line down all the legs above, black; tarsi pale, tipped with black; wings hyaline, apical half clouded, nervures black, stigma and costa green; lanceolate cell with straight cross line.

California, (Coll. Am. Ent. Soc.); English River, Lake Satkatchewan, (Smiths. Inst.) 3 ♀, 1 ♂.

The coxæ are those of *Macrophya*, the antennæ and form of abdomen that of *Tenthredo*.

20. *M. varius*.

*Allantus varius*, Norton, Bost. Jour. vii, 1860, 240, 8.

*Macrophya varius*, Norton, Bost. Proc. ix, 118.

Black; antennæ at base rufous, their apex, mouth, tegulæ, collar, V-spot, scutel and post-scutel and a spot on coxæ yellow, abdomen rufous. Length 0.37. Br. wings 0.75 inch.

♀. Body rather long, abdomen cylindrical; antennæ rather long, the two basal joints rufous, the four apical joints yellowish; a double spot back of ocelli, spot between antennæ, mouth below antennæ, collar, V-spot, scutel, post-scutel, a spot behind and a spot on hinder coxæ white, tegulæ rufous; basal plates and abdomen dark chestnut; legs yellowish rufous; the trochanters, base of femora, anterior pair before and the middle of all the tarsi whitish; apex of all the tibiæ and the claws blackish; basal joint of hinder tarsi very long; wings faintly smoky; lanceolate cell closed.

*Var. ♀*. A dot at summit of inner orbits and the basal plates black. Farmington, Conn. Two specimens.

21. *Macrophya eurythmia*, n. sp.

Black; base of antennæ rufous, their tips, mouth, dots back of ocelli, collar, V-spot, scutel and behind, spot on coxæ and sides of abdomen white. A rufous band on abdomen. Length 0.40—0.44. Br. wings 0.80—0.84 inch.

♀. Body rather long, compressed; antennæ long, basal joint rufous, the four apical joints white, the apex black; two dots back of ocelli, nasus and beneath, yellow, tegulæ, collar, V-spot, scutel, post-scutel and cross line behind, a large spot on hinder coxæ pale yellow; edges of second, third and fourth segments of venter and of tergum at sides white; the second, third and fourth segments of abdomen and tip of anal segment brownish rufous, remainder black; base of all the coxæ black, their tips, trochanters and basal third of femora, the anterior, and most of medial legs before, yellow, tarsi pale yellow, tipped with rufous; the four anterior femora and tibiæ above, and tips of their tibiæ, apical two-thirds of hinder femora, their tibiæ and base of first tarsal joint brownish-red, sometimes blackish; a small white dot near outer tip of the hinder tibiæ; wings smoky yellow, stigma piceous, nervures brownish; lanceolate cell closed.

♂. The male has the rufous band upon tergum almost obsolete, a black line down the four anterior femora, and the apical third of hinder femora and most of tibiæ reddish-black, the white dot near the tip, as in female.

English River, H. B. T., (Smiths. Inst., R. Kennicott.) 5 ♀, 1 ♂.

This is much like *M. varius*. The antennæ are sometimes black at base and the white marks upon venter very indistinct.

22. *Macrophya fascialis*, n. sp.

Black; antennæ at base and tip, orbits, mouth, collar, V-spot, scutel and behind, spots on pleura and coxæ white, abdomen in part dark rufous. Length 0.36. Br. wings 0.78 inch.

♀. Body rather long, black; antennæ long, the first and the four apical joints of antennæ yellow; a spot back of ocelli, the orbits and cheeks, space about and beneath antennæ, anterior angle, V-spot, scutel, post-scutel and a line behind, edge of basal membrane, a large spot on pleura and a smaller one behind, the four anterior coxæ and a spot on hinder coxæ white; tegulæ and abdomen dark rufous; legs yellowish rufous; the posterior femora and tibiæ black at apex; wings hyaline, apical half of stigma waxen.

Farmington, Conn. One specimen.

**23. *M. bifasciatus*.**

*Allantus bifasciatus*, Say, West. Quart. Rep. II, 1823, 72,  
Norton, Bost. Jour. vii, 251, 30.

*Allantus medius*, Harris' Cat.

*Macrophya medius*, Norton, Bost. Proc. ix, 113.

*Macrophya bifasciatus*, Norton, Bost. Proc. ix, 118.

"Black; tergum with a white band at base and a rufous one in the middle. Length seven-twentieths of an inch.

♀. Body black, nasus white; labrum and palpi dull whitish; thorax with a yellow line before each wing; scutel yellowish; wings dusky; nervures brown; feet white; tips of the posterior thighs and their tibiæ black; tergum with a white band at base and a rufous one in the middle," ("on the fourth segment. Long's Exp.")

Arkansas.

Say does not mention the pale basal joint of antennæ, but as this is common to all the species of this class, it is to be presumed that this is at least pale beneath.

**24. *M. formosus*.**

*Allantus formosa*, Klug, Berl. Mag. viii, 1814, 115, 82. ♀.

*Allantus bicinctus*, Norton, Bost. Jour. vii, 241, 11. ♀ ♂.

*Macrophya bicinctus*, Norton, Bost. Proc. ix, 118.

Black; base of antennæ, mouth, collar, V-spot, scutel and basal plates yellow, the fourth and fifth segments of tergum rufous. Length 0.35—0.40. Br. wings 0.70—0.80 inch.

♀. Body long, somewhat flattened; antennæ rather long, compressed in middle, slightly serrate; face coarsely punctured; nasus deeply arcuate, labrum almost truncate; the basal joint of antennæ, a spot between antennæ, face beneath, tegulæ, anterior angle, V-spot, scutel and post-scutel, basal plates, a spot on pleura and line from base of hinder wings straw-yellow; a rufous band on third, fourth and part of fifth segments of tergum; legs yellow, the base of posterior coxæ, apex of their femora and of their tibiæ and the claws black; wings smoky yellowish, stigma waxen; lanceolate cell with short cross line or closed.

♂. The rufous band on the tergum is wanting in the male.

Var. All the apical segments of the abdomen rufous beyond the third. (Mass.)

Maine, Mass., Conn., N. Y., Pa., Md., Ga., (Klug.) Florida.

**25. *M. cestus*.**

*Allantus cestus*, Say, Bost. Jour. i, 1835, 217, 5.

Norton, Bost. Jour. vii, 243, 13.

*Macrophya cestus*, Norton, Bost. Proc. ix, 118.

Black; base of antennæ, scutellum, basal plates, spot on pleura and most part of legs straw colored. Length 0.36. Br. wings 0.72 inch.

“♂ : Body black, with large crowded punctures; antennæ, first and second joints yellow; nasus hardly emarginate, with a lateral whitish spot; thorax, with the posterior margin of the collar, white; pleura with a white spot on the anterior upper part; wings tinted with fuliginous, nervures black; carpal spot waxen-yellow, tergum with a dilated white band extending to the lateral sutures; feet white, a little varied with yellowish at the tips of the joints, thighs black at base beneath.

♀. Anal segments white; posterior coxæ at base black; posterior thighs in the middle and their tibiæ at tip black.”

United States.

The male not seen.

One female from Maine agrees with the above description. The scutellum is yellow; there is an indistinct pale band on the edge of each segment of tergum, a black band in the middle of all the femora, interrupted in the anterior pair before; the coxæ, apex of hinder tibiæ and of each tarsal joint black.

26. *M. intermedius*.

*Allantus intermedius*, Norton, Bost. Jour. vii, 1860, 242, 12.

*Macrophya intermedius*, Norton, Bost. Proc. ix, 118.

Black; base of antennæ, mouth, tegulæ, collar, scutel, basal plates, spot on pleura and legs mostly yellow, sometimes a rufous band on fourth segment of tergum. Length 0.30. Br. wings 0.60 inch.

♀. Body shorter than *M. cestus*, stout, black; head wide, densely punctured, eyes separated; antennæ short, compressed, the two basal joints pale beneath; nasus wide, incurved; nasus and mouth beneath, tegulæ, collar, scutel, basal plates and a spot on pleura yellow-white; a rufous band (sometimes wanting) on third segment of tergum; legs yellow, coxæ all yellow, the apex of hinder femora, of their tibiæ and of all their tarsi black; wings faintly clouded toward apex; lanceolate cell with short cross line or closed.

♂. The male exactly resembles female, except that the coxæ are mostly black. The antennæ are stouter and more compressed, tergum of one color.

Connecticut, Massachusetts, Kansas.

This differs from *M. cestus* in its white coxæ and femora without bands. Those with a rufous band on abdomen probably belong to next species.



27. *M. goniphorus*.

*Allantus goniphorus*, Say, Bost. Jour. i, 1835, 215, 2.

Norton, Bost. Jour. vii, 243, 14.

*Macrophya goniphorus*, Norton, Bost. Proc. ix, 118.

Black; abdomen rufous; base of antennæ, mouth, collar, V-spot, scutel and spot on pleura yellow. Length 0.30. Br. wings 0.66 inch.

♀ ♂. Short, abdomen cylindrical; head and thorax black; antennæ longer than to base of thorax, enlarged in middle, the two basal joints yellow, with a black spot on upper side of each; head as wide as thorax; nasus deeply arcuate; labrum produced, truncate, both pale yellow; tegulæ, collar, V-spot, scutel, post-scutel, stripe on pleura and spot above, pale yellow; basal plates and abdomen rufous; the four anterior legs yellow, with a black line above; the hinder coxæ, except a black spot above, trochanters, a small oblique spot in middle of tibiæ and the tarsi yellow, their femora, tibiæ and basal half of first tarsal joint rufous, tips of anterior tarsi fuscous, claws apparently bifid; wings hyaline, nervures black, stigma and costa red-yellow; lanceolate cell closed.

Connecticut, Pennsylvania, Indiana, (Say.)

28. *M. trosulus*.

*Allantus trosulus*, Say, MS. Harris' Cat.

Norton, Bost. Jour. vii, 1860, 244, 18.

*Macrophya trosulus*, Norton, Bost. Proc. ix, 118.

Black; mouth, tegulæ, collar, scutel and spot on pleura yellow; abdomen rufous; the two basal segments black. Length 0.30. Br. wings 0.60 inch.

♀. Body short; abdomen short, cylindrical; antennæ rather long, enlarged in middle; nasus deeply incurved, labrum truncate, both yellow; tegulæ, collar, scutel and stripe across pleura pale yellow; the basal plates and the first and second segments of abdomen black, remainder chestnut-red; legs pale yellow, sometimes reddish, the trochanters and spot on hinder coxæ white; a black line from middle of anterior tibiæ to feet; apical half of posterior femora, the tibiæ, except a yellow band in middle, and base of basal tarsus and claws black; wings faintly clouded toward apex; lanceolate cell closed.

Connecticut, Massachusetts.

A specimen in the Harris' Collection has the abdomen wholly rufous.

29. *Macrophya fumator*, n. sp.

Black; apical two-thirds of abdomen rufous; wings sub-violaceous. Length 0.30. Br. wings 0.60 inch.

♀. Dull black; antennæ stout; body stout; head wide; face shagreened below ocelli, crossed by a wavy ridge above antennæ; edge of nasus wide and truncate; abdomen dark rufous, its two basal segments

and apex black; coxæ half the length of abdomen, spurs of posterior tibiæ very long, legs black, anterior pair before and a spot on posterior tibiæ whitish; posterior tarsi ferruginous in part; wings subviolaceous, nervures black, lanceolate cell closed.

Cape Mendocino, Cal., (Cambr. Mus. Coll. by A. Agrssiz, Jr.)

It will doubtless be thought that, in this genus and in *Tenthredo*, an unnecessary number of species has been formed, especially as some of the variations seem very slight. But they are very distinct and appear to be permanent. At some future time, when our species are better known, they can probably be grouped to advantage by certain affinities of form and color, which are not so easy to define at present.

Section 2. (*Pachyprotasis*), Hartig.

*Tenthredo* (*All*), Fam. IV, Klug.

Antennæ longer than to base of abdomen, setaceous. Lanceolate cell with short, straight cross line or closed.

30. **M. (*Pachyprotasis*) Omega**, n. sp.

Black; two lines enclosing ocelli, mouth, cheeks, tegulæ, V-spot, scutel, three spots on pleura, a spot on pectus and most of venter white. Length 0.26. Br. wings 0.56 inch.

♀. Body rather stout, cylindrical, shining black; antennæ two-thirds the length of body, slender, third joint scarcely longer than 4th, the basal joint white beneath; two lines extending from sutures of vertex near occiput down inner orbits to mouth, two lines above antennæ, face below and cheeks, straw-white; tegulæ, hinder and lower edge of anterior angle, V-spot, scutel, a large irregular spot like an  $\omega$  on pleura, spot on breast and part of venter straw-white; all the coxæ (except a slender line on hinder pair and their base above), the trochanters, the four anterior legs (with a black line above) and basal half of posterior femora whitish, remainder black; wings faintly clouded, lanceolate cell rather widely closed in middle.

♂. The male has the antennæ very long and slender, basal half white beneath, abdomen slender.

Massachusetts, (Coll. Am. Ent. Soc.); Connecticut, Labrador, (A. S. Packard, Jr.); Wisconsin and Lake Saskatchewan, (Smiths. Inst.)

Five specimens.

[TO BE CONTINUED.]

## Description of a new species of ALEYRODES.

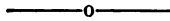
BY HENRY SHIMER, A. M., M. D.

## ALEYRODES ASARUMIS, n. sp.

Whitish, farinose, downy, especially on the wings. Head, thorax and abdomen pale yellowish-white. Wings laid flat on the back in repose, short and broadly rounded at the apex; near the extremity, where the strong central vein branches, a dark macula in the form of an obtuse angle, opening posteriorly towards the apex of the wing. The posterior wing has a similar but fainter spot. Antennæ six-jointed, first thick, clavate. Eyes brown, two-parted. Tarsi long, exceeding two-thirds the tibiæ.

I find these insects during the entire summer, on the under side of *Asarum Canadense* (Wild Ginger) in September.\* I have seen them very numerous in all stages, the larva and pupa presenting the usual scale-like form of this family; at this time the under side of the leaf, that has reared a good colony, is covered with a white downy secretion. The imago when slightly disturbed flies away, acting not much unlike small *Tineina*, hence it may often be found on trees, &c., but I have only observed the larva on the above-named plant, and believe it to be entirely confined to it.

\* Mt. CARROLL, Ill., August 24, 1867.



## Description of a new species of CECIDOMYIA.

BY HENRY SHIMER, A. M., M. D.

## CECIDOMYIA ACERIS, n. sp.

Antennæ brown, ♀ fifteen-jointed, joints sessile, first campanulate, second globular, others ovoidal, subsessile, all verticillate hairy; ♂ fifteen-jointed, joints pedicelled, the pedicel being about equal to the joint, verticillate hairy, the hairs more numerous and much longer than in the female. Head and thorax black. Abdomen brown, darker in the male. Legs drab-grey, feet reddish-brown. Wings hairy, the hairs

\* On the 1st of October, after the above was in type, while I was on a botanical excursion, I found a solitary specimen of *Actara alba*, Mich. (White Cohish) growing in the midst of a patch of Wild Ginger, with probably a hundred of the above-named insect, in various stages of development, on the under side of the leaves.

longest on the veins, appressed on the membranes. Length of body .03—.05 inch. Alar expanse .08—.10 inch.

Larva on the surface of the leaves of *Acer dasycarpum*, Ehrhart, (White or Silver Maple), pale or whitish, the alimentary canal appears through the translucent integument as a greenish stripe; often single specimens on the leaf, more frequently in scattering groups of three to a dozen on the same leaf; the leaves become curled and irregularly contorted, but there are no galls; at length, after the maturity of the insect, the leaves become dry and black.

I have seen this insect in former years, but did not then study its natural history. This year I first observed it on the Maple leaves, about the 7th of July; they may still be found, and have produced at least three generations during this time; from the 20th to 30th of July I observed them most numerous, in all stages; the cocoons are whitish and are formed on the surface of the leaf, where the larva lived in some angle of the contortions. The pupa seen through the cocoon is pale yellowish, but the empty cocoon is quite white.

That these pupa tenements are real spun cocoons, there no longer remains a doubt, notwithstanding the opposite opinion of Entomologists who jump to conclusions without observations, wishing to be considered masters of their business, and wise to perfection in Entomology.\*

I observed these cocoons in various stages of their construction; some just commencing, had thrown out stays in some angle of the crooked leaf, precisely in the same manner as do the lepidopterous larvæ; others partially completed, still showed the strands of silk; when entirely complete they appear much like fine tissue paper. Is it not probable that the whole web is cemented together with a gummy fluid after being constructed, for the purpose of excluding water, and preventing evaporation during dry weather, more especially the latter? On the leaf of the tree, in midsummer, the insect is not so likely to be damaged by excessive moisture as by excessive evaporation during the period of its transformation. The silken threads of these cocoons are very fine, but can be plainly seen with a good eye-glass of high power; the thread was plainly seen also, by other eyes besides my own. With a microscope the threads of the cocoon can be seen at the torn edges, as

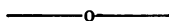
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\* Mr. Walsh's views on this matter are wild as well as amusing, and entirely profitless; wherein he maintains (Proc. Ent. Soc. Vol. iii, No. 3,) that the cocoon is extruded from the body of the larva, and afterwards inflated with gas like a bubble. He has been properly reviewed by Dr. Packard, (Proc. Ent. Soc. Vol. vi, No. 2).

well as in the outer stays. The outer stay threads are positively demonstrative of the structure of the cocoon, even when not seen until after completion.

Among these Cecidomyian larvæ I observed the larvæ of two species of Chalcididæ (probably undescribed); subsequently I found the pupæ attached by their abdominal extremity to the leaf; they are of a pale yellow color; the imago develops a week or two after the *Cecidomyia*.

MT. CARROLL, Ill., August 24, 1867.



On a new Genus of **APHIDÆ**.

BY HENRY SHIMER, A. M., M. D.

**HAMAMELISTES**, nov. gen.

Anterior wing with two discoidal veins, the first one branched, the second simple. Posterior wing with one simple discoidal vein. Wings laid flat on the back in repose, extending much beyond the body. Body short. Honey-tubes small or obsolete. Antennæ short, three to five-



jointed.

**HAMAMELISTES CORNU**, n. sp.\*

*Imago*. Usually entirely black, abdomen sometimes brownish, especially beneath. Honey-tubes obsolete or not visible. Wings hyaline. Anterior wing rounded at the apex, first vein forked near the middle, bearing a long branch about parallel with the second vein; second vein aborted at its origin; stigma not very conspicuous, being a faint shade darker than the pale dusky intercostal space; costal vein heavy until

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\* Since the description of this species was in type, I observe, from the *Proceedings* of the Entomological Society, Vol. I, p. 305, that in the *N. Y. Cat. Homop.* Dr. Fitch has an Aphid, found in conical follicles on the upper surface of the Witch-hazel leaves, which he names *Byrsocrypta hamamelidis*. I have not been able to see a description of his insect, and it is not impossible that my *cornu* may be synonymous with his *hamamelidis*; but it appears improbable, as his species is placed under *Byrsocrypta*—a genus in which the front wing has three simple discoidals and the hind wing two discoidals, and the antennæ six-jointed, all of which characters do not accord with my insect. It appears to me that his insect, if it has a distinct existence, must accord with the characters he thus gives it, and the bare fact that it, like mine, inhabits a conical follicle on the upper side of the Witch-hazel leaf, is not, if I understand the rules of science, sufficient\* to induce me to withhold my description until perchance I might see his.

it attains the stigma, whence it is slender to the apex; subcostal or rib-vein very heavy during its entire length, slightly bent posteriorly at its junction with the first discoidal and stigmatic veins; stigmatic vein almost straight, slightly concave. Posterior wing with rib-vein strong; discoidal very slender, hook prominent, a faint dark spot at the termination of the rib-vein. Wings in repose extending one-half beyond the body. Antennæ three-jointed, first and second very short and globular; third five times as long as the other two, (under the microscope is seen to be composed of about 36 plainly visible, subequal, flat, appressed rings), apex abruptly pointed; the entire antennæ, in the several specimens examined, appear, under the microscope, to be quite smooth and free from hairs or spines, except the apex. Legs black or dark colored, almost entirely devoid of hairs or spines, a few hairs on the feet and tibiæ, especially the tarsal joints. Ocelli present.

*Larva* and *pupa*. Sub-ellipsoidal; colors light brown to black; some sugary dust and liquid globules in the galls among the inhabitants. But I could not discover the honey-tubes.

Measurements of imago—length to tip of wings .10 inch. Wings .07 inch. Antennæ about .02 inch.

These insects inhabit obliquely conical or horn-like galls on the upper side of the leaf of *Hamamelis Virginica* (Witch Hazel), opening on the under side of the leaf; these galls are of a yellow or yellowish-white color at the present time, and of a firm leather-like consistency, the base standing anywhere in the parenchyma of the leaf; they are quite numerous, but I seldom find two on one leaf; usually not tapering below the middle, sometimes slightly contracted towards the base. These galls present quite a novel appearance on the leaves when numerous. Gall measurements—length  $\frac{1}{4}$ — $\frac{1}{3}$  inch; diameter at the base  $\frac{1}{4}$ — $\frac{1}{2}$  in.

#### HAMAMELISTES SPINOSUS, n. sp.

*Imago*. Body and members usually all entirely black in well matured specimens, in others sometimes brownish. Antennæ linear, smooth, five-jointed, the two basal joints subglobular, the other joints on short pedicles, third equal to the fourth and fifth, the last slightly shorter than the fourth. Wings horizontally folded in repose, hyaline when matured, when first developed silvery-white; stigma large, one-fourth the length of the wing, smoky-cinereous, veins greyish-black; the branch of the first vein rises at its lower third, rarely lower down, second vein variable, mostly abortive at its origin for more than one-third of its length, sometimes fully developed when it usually arises from the

angle of the rib-vein and the first discoidal, or a very short distance from the angle on the first discoidal, as I have observed in a good number of specimens, (in one specimen I observed it to rise from the stigmatic vein near its basal origin, and pass back with a short, paraboloid curve to its normal position); stigmatic vein nearly straight or slightly sinuous. Posterior wing comparatively large, the discoidal quite oblique and consequently long. Honey-tubes not seen. Legs with a few short hairs. Length of body .05—.06 inch; of wings .07—.10 inch; of antennæ .02—.025 inch.

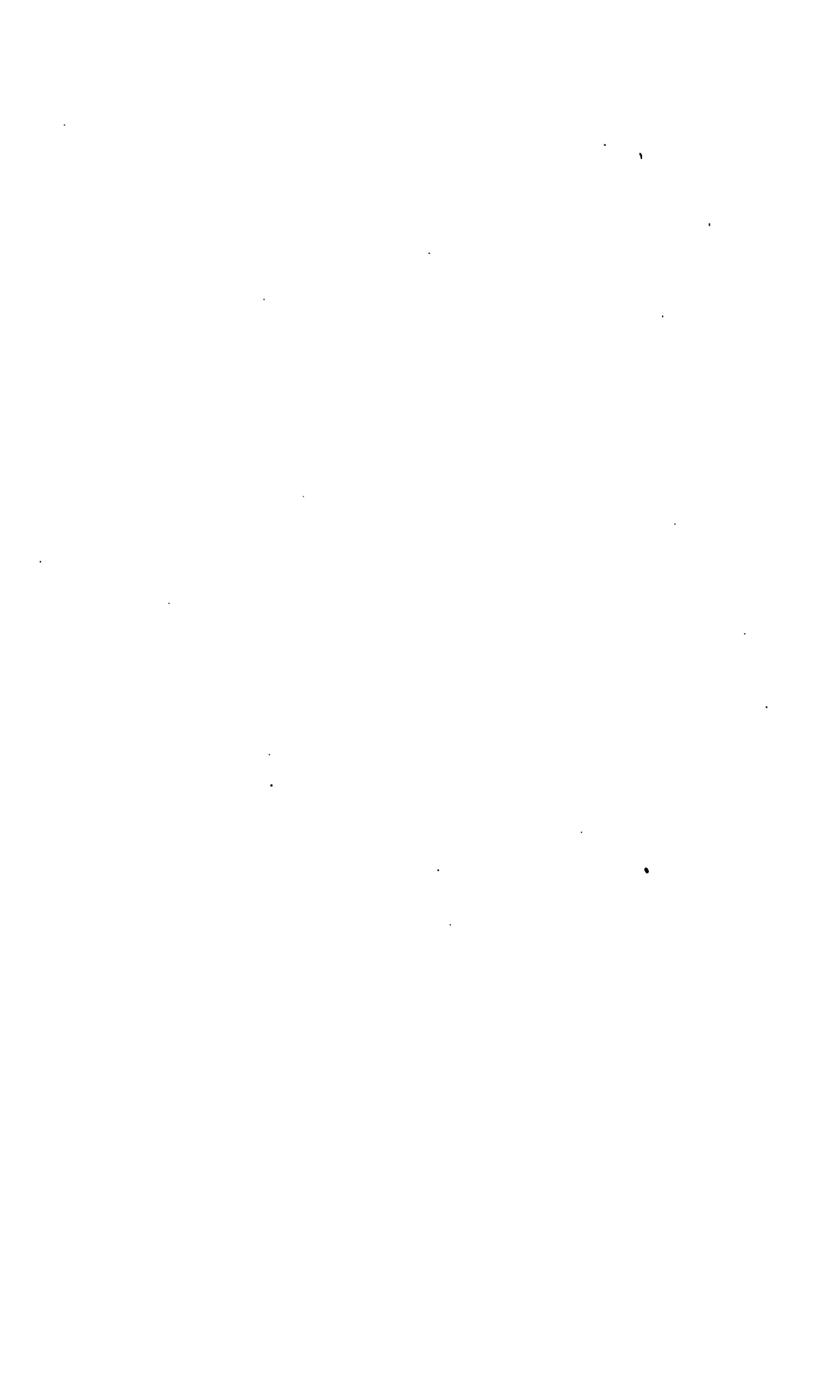
*Larva* at first reddish, eventually brown and darker purplish, &c. Eggs reddish-brown.

Inhabits spiny galls, at the present time, on *Hamamelis Virginica* (Witch Hazel), from half to an inch long, of a sub-conoid or ellipsoidal form, narrowest at the base, very rough on the outside, and covered with numerous somewhat thorny spines, of frequently one-fourth of an inch in length; color leaf-green, thickly studded with small, reddish-brown glandular spots, inside smooth, greenish, and filled with numerous (a hundred or more) larvæ and imago, and a large quantity of whitish sugary dust and liquid secretions.

These galls are the transformed fruit; they open with a circular mouth and widening beveled or funnel-like exit of about one-fourteenth of an inch in diameter, in the conical base beside the stem. The Aphis in these galls are just beginning to develop into the winged state; while those in the above-named species, on the leaf, disappeared about a month ago; both are black. The most material difference noted is in the antennæ.

In this species I observed the second discoidal vein, in several specimens, developed to the basal origin; in the former species none; this second discoidal arising, as it does, from the first, as above noted, might almost, without impropriety, be considered a branch of the first discoidal. Moreover, between the galls of these two species, on the Witch Hazel, there is a marked difference, but if that could be explained on account of locality, from the other characters, I am still induced to believe that this is entitled to specific rank.

MT. CARROLL, Ill., August 24, 1867.







Drawn by Mary Peart

Bowen & Co. Lith. Phil.

LIMENITIS PROSERPINA. ♂

Descriptions of certain species of DIURNAL LEPIDOPTERA found in the  
United States.

BY WM. H. EDWARDS, NEWBURGH, N. Y.

- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| 1. <i>Limenitis Proserpina</i> , Edw. | 4. <i>Hesperia Nortonii</i> , n. sp. |
| 2. <i>Lycæna Violacea</i> , Edw. ♀.   | 5. <i>Hesperia Oxyka</i> , n. sp.    |
| 3. <i>Hesperia Pilatka</i> , n. sp.   | 6. <i>Hesperia Logan</i> , Edw. ♀.   |

LIMENITIS PROSERPINA, Edw. (Proc. Ent. Soc. 1865). Plate V.

*Male.* Upper side black, secondaries only having a slight bluish (occasionally greenish) tinge; hind margins of secondaries bordered by a double row of blue (or green) crescents; the submarginal row is continued on primaries, but is indistinct, almost obsolete; beyond the crescents, on secondaries, is a row of russet spots surmounted by blue (or green) scales, which are more or less conspicuous; in some specimens the russet spots are distinct across the whole wing, in others two or three only are seen, and in others they are altogether wanting; the blue scales or spots make a circular band across secondaries, and are continued across primaries with more or less distinctness (often becoming whitish) to the costa, and correspond with the white band of under surface; the contour of this band above is like that of *Arthemis*, and it terminates on the costa in a white streak; there is also a white sub-apical spot divided into two or three by the nervules, emarginations white.

Under side brown, varying in shade from blackish to russet, and in this respect and in markings remarkably like *Arthemis*, except that the white band of the latter is here always slight and sometimes partly wanting; both wings have a double row of blue (or green) crescents, preceded by a row of rounded russet spots, large on secondaries, and on these, edged above and below with black; the spot at inner angle of primaries is wanting; above the russet spots is a curved whitish band or streak, common to both wings, sometimes half the width of the band of *Arthemis*, but sometimes indicated by a few scales only above the russet spots; the subapical spot and costal streak of upper side repeated conspicuously; base of wings marked by russet spots edged with black; between these are metallic blue (or green) patches as in *Arthemis*.

Body below white; fore legs white, palpi white, edged with black; antennæ and club black, tipped with ferruginous.

Redescribed from six males taken in Stoney Clove, Catskills, on the 2d and 4th of July, 1867. The species was abundant, and all taken were fresh from chrysalis. The female I have not yet seen.

Although the color of upper side of *Proserpina* is much like that of *Ursula*, in all other respects it is more closely allied to *Arthemis*, curiously imitating that species in the color and markings of the under side.

1891



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Drawn by Mary Peart.

Bowen & Co. Lith. Phila.

LIMENITIS PROSERPINA. ♂



On the same days I took about fifty *Arthemis*, all except two or three being males, and just from chrysalis. I have never known *Arthemis* so abundant in that locality. The variation among so many was remarkable, particularly in the width of the white band and size of the russet spots above and below; in half the specimens these spots were wanting above, in others there were two or three and from that up to a complete series of large rounded spots; the color of under side ran through all shades, from blackish to brown, cinnamon and russet.

LYCÆNA VIOLACEA, Edw. (Proc. Ent. Soc. 1866).

*Female.* Upper side uniform slate-color. Under side similar to male.

This species was exceedingly abundant on the Kanawha in April and May of the present year (1867), and I took at least one hundred females, all but six of which were as described above. These six were of the more usual type of the female *Lycænida*, that is, blue, with a broad black border to the hind margins.

HESPERIA PILATKA, n. sp.

*Male.* Expands  $1\frac{7}{10}$  inch. Upper side. Primaries honey-yellow in the disk, with a very broad, black hind margin, the edge of which is irregular within, and with a slight sinus opposite the stigma; at the base a few black scales along the nervures; the stigma is narrow and straight, but broken, the anterior half above the line of the other and resting upon it at the fracture.

Secondaries have the costal and hind margins as broadly edged with blackish; the disk more obscure, much covered with brown hairs, and the nervules black.

Under side of secondaries uniform brown, immaculate; of primaries a shade lighter, with a ferruginous patch on the disk, inclining to yellow next hind margin; a black patch at base joined to the stigma; inner margin deeper brown; legs brown; palpi soiled-white; antennæ brown above, pale ferruginous below; club ferruginous.

From one male, taken at St. Augustine, Florida.

This distinct species is allied to *H. Bulenta*, judging from the plate in Boisduval and LeConte, and the description of Godart given by Morris, a species I have not yet seen.

HESPERIA NORTONII, n. sp.

*Male.* Expands  $1\frac{5}{10}$  inch. Upper side uniform glossy brown; primaries have three minute semi-transparent spots on the costa near apex, a similar spot at the extremity of the cell and another near the end of the stigma; the stigma is long, convex without, while the inner edge is nearly straight, giving it a crescent shape.

Secondaries immaculate; fringes on both wings long, cinereous.

Under side chestnut-brown, with purple tinge to the apical half of hind margins, and to the hind margin and basal half of secondaries; spots as above, but more distinct.

Body above, brown, beneath cinereous, palpi cinereous, antennæ brown, delicately annulated with white; club black, tipped with ferruginous.

*Female.* Same size and color; the spots are larger, and in addition to those of the male are two others upon the disk, making a line of three at an obtuse angle with the costal spots.

From 2 ♀, 1 ♂, from New Orleans, by Mr. Norton.

In the perfect specimens the purple is bright, and with the rich brown makes this a noticeable species.

*HESPERIA OSYKA*, n. sp.

*Male.* Expands  $1\frac{1}{10}$  inch. Upper side uniform brown, with a slight green tinge, immaculate; stigma long, broadest at upper part, depressed at middle. Under side brown; body beneath grey; palpi greenish-white.

*Female.* Same size and color above; beneath clear cinereous, except on inner margin of primaries, which is brown; on costa of primaries are three minute, semi-transparent spots, and on disk two at an obtuse angle with the others; palpi white.

From 1 ♂, 2 ♀, from vicinity of New Orleans, by Mr. Norton.

*H. LOGAN*, Edw.

The description of this species in Proceedings for 1866, with annexed figures, is of the male instead of the female, as there stated.

The female is much like the male, but is lighter colored; the marginal band is broader and not so distinctly defined within; the base of primaries is also more blackish.

This fine species is hitherto rare. A few specimens of both sexes have been taken on the Kanawha this year (1867), in July, and occasionally I have received it from Michigan.

*H. NEMORIS*, Edw., (Proc. Ent. Soc. 1865,) = *Samoset* Scudder.

This species is not uncommon on the Kanawha in the months of May and June, and is to be met in paths in the woods, in company with *Juvenalis* and *Brizo*.

*H. RUREA*, Edw. = *Metacomet* Harris.

At the time I described this species in Proc. Acad. Nat. Sci., Phil., 1866, I had not seen the description of *Metacomet*, soon after published in the second edition of Harris' Insects. His name will of course have the priority. The species is wide spread, nowhere common, so far as known. I have taken it on the Kanawha, and received it from Illinois.



**A LIST OF THE ICHNEUMONIDÆ OF NORTH AMERICA,  
with descriptions of new species.**

BY E. T. CRESSON.

PART I.

The preparation, at this time, of a List of so extensive and difficult a family of insects as the Ichneumonidæ, cannot but be a very imperfect work; but as a beginning must be made sometime, there seems to be no good reason why it should not be made now. The extensive material contained in the Collection of the American Entomological Society, together with the fine Collection of Mr. Edward Norton, kindly loaned by that gentleman for the purposes of this List, warrant this attempt to catalogue the species, and shows that in the number of species, this Family is second to none, if not the largest, in any Order of insects. The great variation in the coloring of many species, especially of the genus *Ichneumon*, render the separation of the species often difficult and uncertain; and there is no doubt whatever that some of the species described here will eventually prove to be nothing but varieties. Many species are known of one sex only; in some cases only males, in others only females, and occasionally one or the other of them in plenty; this is owing to the dissimilarity between the sexes, especially observable in the genera *Ichneumon* and *Cryptus*.

The classification of the genera adopted here, is much the same as that given by Prof. Gravenhorst, in his *Ichneumonologia Europæa*.

At the end of each Part, the descriptions of species supposed to be new, and notes on those already described, will be given.

To save space, references to original descriptions of the species will be omitted in this List. References to all the species described up to the year 1862, have already been given in the *Proceedings Ent. Soc. Phil.*, Vol. I, p. 205—211; those described since, will be found in that and the subsequent volumes of the same work. After the name of the species and its author, will follow the sex in which it is known or described, and then the habitat. For the Eastern, Middle, Southern and Western States, the abbreviations E. S., M. S., S. S., and W. S., are used when certain species have been found in many States. The abbreviations of the various States will be understood without further explanation. A — after the species indicates that it is unknown to me; a = denotes that the species, although known to me, is not represented in the Collection of this Society.

## Family ICHNEUMONIDÆ.

## Sub-fam. ICHNEUMONIDES.

## ICHNEUMON, Linn.

<i>maurus</i> , Cresson, ♀.	W. Va.	<i>agnitus</i> , Cresson, ♀.	Del., Ills.
<i>Orpheus</i> , Cresson, ♀.	Ct., Pa.	<i>Asotus</i> , Cresson, ♂.	Del., W. Va.
<i>viola</i> , Cresson, ♀.	Pa., W. Va.	<i>infidelis</i> , Cresson, n. sp., ♂.	= Ct.
<i>galenus</i> , Cresson, n. sp., ♂.	W. Va., Ill.	<i>improvisus</i> , Cresson, n. sp., ♂.	= N. J.
<i>torvinus</i> , Cresson, n. sp., ♂.	Ill.	<i>scolestus</i> , Cresson, ♀.	Ills.
<i>malaous</i> , Say, ♀.	Can., E. M. & W. S.	<i>brevioinctor</i> , Say, ♂ ♀.	Can., E. M. & W. S.
<i>afer</i> , Cresson, ♀.	Ct., Ills.	<i>extrematatis</i> , Cress., ♂ ♀.	E. M. & W. S.
<i>saucius</i> , Cresson, ♀.	Pa., Ills.	<i>sævus</i> , Cresson, n. sp., ♀.	Ills.
<i>cinoticornis</i> , Cress., ♂ ♀.	E. M. & W. S.	<i>helvipes</i> , Cress., n. sp., ♂ ♀.	E. & W. S.
<i>exultus</i> , Cresson, n. sp., ♀.	N. J.	<i>breviventris</i> , Cresson, ♂.	= Cuba.
<i>ater</i> , Cresson, ♀.	N. Y.	<i>apicalis</i> , Cresson, ♂.	Col. Ter.
<i>apertus</i> , Cresson, n. sp., ♀.	E. M. & W. S.	<i>ventralis</i> , Cresson, ♂.	Col. Ter.
<i>acerbus</i> , Cresson, n. sp., ♂.	Mass., Ills.	<i>centrator</i> , Say, ♀.	E. M. & W. S.
<i>flavicornis</i> , Cress., ♂.	Can., E. M. & W. S.	<i>montanus</i> , Cresson, ♂ ♀.	W. Va., Col.
<i>macilentus</i> , Cresson, ♂.	Col. Ter.	<i>olarus</i> , Cresson, n. sp., ♀.	Mass.
<i>pedalis</i> , Cresson, ♂ ♀.	Col. Ter.	<i>pulcher</i> , Brullé, ♀.	= N. Y., La.
<i>Ormenus</i> , Cresson, ♀.	Pa.	<i>cæruleus</i> , Cresson, ♂ ♀.	E. M. & W. S.
<i>semilævus</i> , Cresson, ♀.	Col. Ter.	<i>albmarginatus</i> , Cress., n. sp., ♂.	= Miss.
<i>caliginosus</i> , Cress., ♀.	Ct., W. Va., Col.	<i>consignatus</i> , Cresson, n. sp., ♂.	W. Va.
<i>nigratorius</i> , Fabr., Brullé.—	Carolina.	<i>Blandii</i> , Cresson, ♂.	Pa.
<i>subcyaneus</i> , Cresson, ♀.	E. M. & W. S.	<i>Ischnus Blandii</i> , Cresson.	
<i>vittifrons</i> , Cresson, ♂.	E. & M. S.	<i>juvundus</i> , Brullé, ♀.	Can., E. M. & W. S.
<i>histrionicus</i> , Cresson, n. sp., ♀.	W. Va.	<i>robustus</i> , Cresson, n. sp., ♀.	Can.
<i>pullatus</i> , Cresson, ♂.	E. M. & W. S.	<i>subdolos</i> , Cresson, n. sp., ♀.	E. & M. S.
<i>ornatipes</i> , Cresson, n. sp., ♂.	W. Va.	<i>Grotei</i> , Cresson, ♂.	Ills., Col. Ter.
<i>jejunus</i> , Cresson, ♂.	N. Y., Ills.	<i>creperus</i> , Cresson, n. sp., ♂.	Can., E., M. S.
<i>Ischnus jeji</i> , Cresson.		<i>variegatus</i> , Cresson, ♂.	Col. Ter.
<i>cordatus</i> , Cresson, ♂.	Col. Ter.	<i>delicatulus</i> , Cresson, ♂.	Col. Ter.
<i>expunctus</i> , Cresson, ♂.	Col. Ter.	<i>comptus</i> , Say, ♂.	E. M. & W. S.
<i>obliteratus</i> , Cress. (nec Wesm.)		<i>atrifrons</i> , Cresson, ♀.	E. M. & W. S.
<i>sagus</i> , Cress., n. sp., ♂ ♀.	Mass., N. Y., Ill.	<i>flavovarius</i> , Cresson, ♂.	Cuba.
<i>navus</i> , Say, ♀. (♂ —).	M. & W. S.	<i>zebratus</i> , Cresson, n. sp., ♀.	Ills.
<i>audax</i> , Cresson, ♂.	Col. Ter.	<i>flavizonatus</i> , Cresson, ♂.	M. & W. S.
<i>Bronteus</i> , Cresson, ♂.	Pa.	<i>multor</i> , Harris, ♂.	Can., Mass.
<i>ultus</i> , Cresson, n. sp., ♂.	Ct., W. Va.	<i>zelotypus</i> , Cresson, n. sp., ♂.	Ct., W. V.
<i>rogalis</i> , Cresson, n. sp., ♂.	Ct., W. Va.	<i>calitergus</i> , Harris, ♀.	= Me.
<i>sublatus</i> , Cresson, ♂.	E. M. & W. S.	<i>magniceps</i> , Cresson, n. sp., ♂ ♀.	= Cuba.
<i>Ischnus subl.</i> , Cresson.		<i>paratus</i> , Say, ♂.	E. M. & W. S.
<i>Isch. proximus</i> , Cress., ♂ var.		<i>Ich. parata</i> , Say, (1828).	
<i>mellipes</i> , Cresson, n. sp., ♂.	Can., Me.	<i>Ischnus par.</i> , Cresson.	
<i>luctus</i> , Cresson, ♂.	Col. Ter.	<i>vinnulus</i> , Cresson, ♂.	Pa., W. Va.
<i>tenebrosus</i> , Cress. (nec Wesm.)		<i>Ischnus vin.</i> , Cresson.	
<i>puerilis</i> , Cresson, n. sp., ♂.	Can.	<i>contiguus</i> , Cresson, ♂.	Can., E. & M. S.
<i>unifasciatorius</i> , Say, ♂ ♀.		<i>Ischnus contig.</i> , Cresson.	
<i>niger</i> , Brullé.	Can., E. M. & W. S.	<i>munificus</i> , Cresson, ♂.	E. M. & W. S.
<i>otiosus</i> , Say, ♀.	E. M. & W. S.	<i>nobilis</i> , Cresson, (nec Wesm.)	

<i>latus</i> , Brullé, ♂.	Can., E. M. & W. S.	<i>milvus</i> , Harris, ♂.	E. S.
<i>parata</i> , Say, (1835), ♂.		<i>involutus</i> , Cresson, ♀.	Col. Ter.
<i>mimicus</i> , Cresson, n. sp., ♂.	Mass., Ct.	<i>hariolus</i> , Cresson, n. sp. ♀.	Mass.
<i>parvus</i> , Cresson, ♂.	E. M. & W. S.	<i>hebrus</i> , Cresson, n. sp. ♂ ♀.	Ct., Ills.
<i>infucatus</i> , Cresson, ♂.	Col. Ter.	<i>Hebe</i> , Cresson, n. sp. ♂ ♀.	Ct., Ills.
<i>inconstans</i> , Cresson, ♂.	Col. Ter.	<i>fungor</i> , Norton, ♂.	E. M. & W. S.
<i>bipunctatus</i> , Cresson, ♂.	Col. Ter.	<i>vultus</i> , Cresson, ♂.	Col. Ter.
<i>festus</i> , Cresson, ♂ var.		<i>limbifrons</i> , Cresson, ♂.	Col. Ter.
<i>comes</i> , Cresson, ♂.	Can., E. M. & W. S.	<i>exiguus</i> , Cresson, ♀.	Col. Ter.
<i>pietifrons</i> , Cresson, ♂.	Col. Ter.	<i>hospitus</i> , Cresson, n. sp. ♀.	Can.
<i>Wilsoni</i> , Cresson, ♂.	N. J., Del., W. Va.	<i>citrifrons</i> , Cresson, n. sp. ♂.	Ct., Pa.
<i>Ischnus Wilsoni</i> , Cresson.		<i>† trogiformis</i> , Cresson, ♂ ♀.	M. & S. S.
<i>bisonatus</i> , Cresson, ♀.	Col. Ter.	<i>dorsalis</i> , Cresson, ♀.	Col. Ter.
<i>fatalis</i> , Cresson, n. sp., ♀.	Can., Mass.	<i>Lewisii</i> , Cresson, ♀.	E. M. & W. S.
<i>Dakota</i> , Cresson, n. sp., ♂.	Dak. Ter.	<i>sandix</i> , Cresson, ♀.	N. Y.
<i>grandis</i> , Brullé, ♂ ♀.	E. M. & W. S.	<i>velox</i> , Cresson, ♀.	Ct., Pa., Ills.
<i>regnatricis</i> , Cresson, ♀ var.		<i>maius</i> , Cresson, n. sp. ♀.	Mass.
<i>ambiguus</i> , Cresson, ♂ var.		<i>fuscifrons</i> , Cresson, ♀.	Ills.
<i>rufiventris</i> , Brullé, ♂ ♀.	Can., E. M. &	<i>disparilis</i> , Cresson, n. sp. ♀. =	Ct.
<i>incertus</i> , Cresson, ♀ var.	W. S.	<i>cubensis</i> , Cresson, ♂. =	Cuba.
<i>semicoccineus</i> , Cresson, ♂.		<i>Lariæ</i> , Curtis, ♀. —	Arc. Am.
<i>californicus</i> , Cresson, ♂.	Cal.	<i>subrufus</i> , Cresson, ♀.	Can., E. M. & W. S.
<i>inurbanus</i> , Cresson, n. sp. ♀.	W. Va.	<i>funestus</i> , Cress., ♀.	Can., E. M. & W. S.
<i>ferrugator</i> , Kirby. —	Arc. Am.	<i>canadensis</i> , Cresson, n. sp. ♀.	Can., N. Y.
<i>insolens</i> , Cresson, n. sp. ♂ ♀.	S. S.	<i>ventralis</i> , Cresson, n. sp. ♀. =	H. B. T.
<i>meridionalis</i> , Cresson, ♀.	Cuba.	<i>signatipes</i> , Cresson, n. sp. ♀.	Ct., Pa.
<i>detritus</i> , Brullé, ♀.	E. & M. S.	<i>seminiger</i> , Cresson, ♀.	Can., E. M. & W. S.
<i>Syphax</i> , Cresson, ♀.		<i>vicinus</i> , Cresson, ♀.	Ills.
<i>semicæruleus</i> , Cresson, n. sp. ♀.	W. Va.	<i>suturalis</i> , Say, ♀.	Can., E. M. & W. S.
<i>virginicus</i> , Cresson, ♀.	W. Va.	<i>propinguus</i> , Cresson, ♀ var.	
<i>devinctor</i> , Say, ♀.	E. M. & W. S.	<i>† longulus</i> , Cresson, ♂.	
<i>tibialis</i> , Brullé, ♀.		<i>subfulvus</i> , Cresson, ♀.	Col. Ter.
<i>montivagus</i> , Cresson, ♂.	Col. Ter.	<i>subfuscus</i> , Cresson, ♀.	Col. Ter.
<i>vinctus</i> , Say, ♀. —	Ind.	<i>volens</i> , Cresson, ♂.	Can., E. M. & W. S.
<i>vinulentus</i> , Cresson, ♂.	Col. Ter.	<i>Ischnus vol.</i> , Cresson.	
<i>nubivagus</i> , Cresson, ♂.	Me., Pa., Col.	<i>anceps</i> , Cresson, n. sp., ♂ ♀.	Ct., Del.
<i>consimilis</i> , Cresson, (nec Wesm.)		<i>† pennator</i> , Fabr. —	Ga.
<i>jurtus</i> , Cresson, ♂ var.		<i>duplicatus</i> , Say, ♂.	E. M. & W. S.
<i>allapsus</i> , Cresson, ♂.	Col. Ter.	<i>W-album</i> , Cresson, ♂ ♀.	E. & M. S.
<i>animosus</i> , Cresson, ♂.	Col. Ter.	<i>Ischnus W-album</i> , Cresson.	
<i>rubellus</i> , Cresson, ♂ var.		<i>lascivus</i> , Cresson, n. sp., ♂.	Ills.
<i>succinctus</i> , Brullé, ♂.	E. M. & W. S.	<i>honestus</i> , Cresson, n. sp., ♂.	W. Va.
<i>disens</i> , Cresson, ♂.	Col. Ter.	<i>uxorius</i> , Cresson, n. sp., ♀ =	Cuba.
<i>instabilis</i> , Cresson, n. sp. ♂ ♀.	E. & M. S.	<i>serricornis</i> , Cresson, ♂.	Cuba.
<i>magnus</i> , Cresson, ♂.	Col. Ter.	<i>albipectus</i> , Brullé, ♂.	Cuba.
<i>rufizonatus</i> , Cresson, ♀.	Ct., N. J.	<i>burrus</i> , Cresson, ♀.	Cuba.
<i>electus</i> , Cresson, n. sp. ♂. =	Ct.	<i>pectoralis</i> , Say. —	Ind.
<i>volesus</i> , Cresson, n. sp. ♀.	Mass.	<i>scitulus</i> , Cresson, ♂.	Ct., W. Va.
<i>Hortonii</i> , Cresson, n. sp. ♀. =	Ct.	<i>Ischnus scit.</i> , Cresson.	
<i>terminalis</i> , Cresson, ♀.	Del.	<i>iridescens</i> , Cresson, ♂.	Del.
<i>finitimus</i> , Cresson, n. sp. ♂.	Ct., Pa., Ills.	<i>Ischnus irid.</i> , Cresson.	

<i>facetus</i> , Cresson, n. sp., ♂.	W. Va.	<i>annulipes</i> , Cresson, ♀.	E. M. & W. S.
<i>utilis</i> , Cresson, n. sp., ♂.	Mass., Ct.	<i>pusillus</i> , Cresson, ♀.	Del.
? <i>hilaris</i> , Say.—	Ind.	<i>tumidifrons</i> , Cresson, n. sp., ♀.	Ills.
<i>laevigatus</i> , Cresson, ♀.	Col. Ter.	<i>quadriceps</i> , Cresson, n. sp. ♂ ♀.	Can., Ct.
<i>rubicundus</i> , Cresson, ♂ ♀.	Ills.	<i>helvus</i> , Cresson, n. sp., ♀.	E. M. & W. S.
<i>soror</i> , Cresson, ♀.	Del.	<i>helvolus</i> , Cresson, n. sp., ♀.	Ct., Pa.
<i>residuus</i> , Say, ♀.	Mass., Ct.	<i>vincibilis</i> , Cresson, n. sp., ♀.	Ills.

## NOTES AND DESCRIPTIONS.

*Ichneumon viola*.—Mr. Walsh (*Proc.*, &c., v, p. 210) considers *maurus* and *Orpheus* identical with this species. They are certainly closely allied to each other, but their general appearance and style of sculpture are so different, that it would be quite as proper to consider these three species identical with *malaucus* Say, as to consider *maurus* and *Orpheus* identical with *viola*. *Maurus* is an opaque black species, with the head narrowed beneath, the wings dark purple, the metathorax coarsely sculptured and opaque, the elevated lines sharp, and the central area subquadrate. *Orpheus* has the body shining black, with a bluish tinge, especially on the abdomen, the head broad and not narrowed beneath, by reason of the more convex cheeks, the wings much clearer than in *maurus* or *viola*, the metathorax not roughly sculptured, but shining, with the elevated lines flattened and polished, and the central area quadrate. *Viola* is more shining than *Orpheus* having also a bluish tinge on the abdomen, the wings fuscous or black, with a very brilliant purple or violet reflection, the metathorax similarly sculptured to that of *Orpheus*, except that the central area is always (in nine specimens) small and somewhat conical, and often indistinctly defined. The length of this species varies from  $5\frac{1}{2}$  to  $8\frac{1}{2}$  lines.

*I. galenus*.—♂. Long, slender, black, opaque; antennæ long, slender, with a broad yellow annulus about the middle; mesothorax very densely and finely punctured, the punctures indistinct; scutellum convex and densely punctured, as well as the metathorax, which has the elevated lines sharply defined, and the central area rather large and quadrate; wings uniformly fusco-hyaline, with a purplish gloss; tips of the anterior femora and their tibiæ within, palish; abdomen long, slender, opaque, except towards the tip, which is a little shining; basal segment bilineated, as usual, the basal foveæ of the second segment deep, transverse and somewhat oblique. Length  $8\frac{1}{2}$  lines.

*Hab.*—West Virginia, (Ridings); Illinois, (Dr. Lewis). Three ♂ specimens. This and *torvinus* may be the males of some species already described, but at present it is impossible to determine to what species they belong.

*I. torvinus*.—♂. Long, slender, deep black, shining; head large, not narrowed beneath; anterior orbits—narrow above and broad beneath the antennæ—a short line on the lower posterior orbits and a spot on each side of the clypeus, obscure whitish; antennæ long, rather slender, with a narrow white annulus about the middle; mesothorax densely and finely, but distinctly punctured; a spot on the tegulæ anteriorly and another in front of each anterior wing, obscure whitish; scutellum convex, polished, sparsely punctured; metathorax densely punctured, shining, the elevated lines well defined and the central

area rather large, subquadrate; wings uniformly pale fusco-hyaline, with a strong purple reflection; tibiæ with a whitish annulus at base, nearly obsolete on the posterior pair; abdomen long, basal segment bilineated and aciculate, the basal foveæ of the second segment deep, neither transverse or oblique. Length 9 lines.

*Hab.*—Illinois, (Dr. Lewis). One ♂ specimen.

*I. saucius.*—I cannot agree with Mr. Walsh (l. c.) in considering *ater* identical with this species. The two agree well in the antennæ and in the sculpture of the metathorax; but the head of *saucius* is unusually large in proportion to the size of the insect, the wings dark, the abdomen long, narrow, convex above, smooth and shining; while *ater* has a smaller head, the wings clear, the abdomen shorter, subdepressed and less shining, by reason of the surface being more closely punctured. The general appearance of the two species is totally different, and they are undoubtedly distinct.

*I. excultus.*—♀. Black, shining, abdomen with a rather strong blue reflection; head slightly narrowed beneath, immaculate; antennæ rather stout, as long as head and thorax, black, with a broad whitish annulus about the middle, third joint longer than fourth, which with the fifth is long and subequal; thorax shining, very finely punctured, immaculate; scutellum polished, impunctured, slightly convex; metathorax rugulose, the elevated lines tolerably well defined, the central area quadrate; wings uniformly pale fuliginous, nervures and stigma black; legs black, anterior pair pale in front; abdomen elongate, immaculate, with a more or less obvious blue tinge; first segment longitudinally aciculate, second densely punctured, aciculate on the basal middle, third delicately punctured, the punctures becoming obsolete at tip, remaining segments smooth, polished and impunctured. Length 6½—7 lines.

*Hab.*—New Jersey, (Cresson). Three ♀ specimens.

*I. apertus.*—♀. Black; head and thorax thinly clothed with a very short, fine, pale pubescence; head large, broad, not narrowed beneath, deeply punctured upper half of anterior and posterior orbits narrowly white; antennæ moderately slender, longer than head and thorax, black, with a more or less broad white annulus a little beyond the middle; thorax shining, a spot before the anterior wing and another beneath, white, these are sometimes obsolete or wanting; scutellum flat, sometimes with a white spot at tip; metathorax densely punctured, disk nearly smooth and shining, central area subquadrate, not well defined; wings vary from hyaline to dusky; legs black, the anterior pair pale in front; abdomen elongate, often tinged with blue; first segment gradually dilated at tip, which is convex and closely punctured; second and third segments closely punctured, apical segments smooth, shining and almost without punctures. Length 5½—7 lines.

*Hab.*—Connecticut, New York, Illinois. Twelve ♀ specimens. Closely allied to *excultus* and *ater*. From the former it is at once distinguished by the third to sixth joints of the antennæ being oblong and subequal, and by the basal segment of the abdomen being punctured and not aciculate; and from *ater* by the much longer antennæ and its longer basal joints.

*I. acerbus.*—♂. Slender, black, shining, closely and finely punctured; head, thorax and legs clothed with a very short, yellowish-sericeous pile; head small, narrowed beneath, eyes large; a more or less distinct yellowish line on each side of the face, wanting in two specimens; antennæ long, slender, subserrate,

black, with a rather narrow white or yellowish annulus about the middle; metathorax with the elevated lines sharply defined, the central area quadrate, rather large; wings hyaline, subiridescent, nervures brown; legs black or brown-black, strongly sericeous at base beneath, tips of the four anterior femora, and their tibiæ within, luteous, their tarsi brown; abdomen long, narrow, shining, basal segment very slender, not rough at tip. Length 4—5½ lines.

*Hab.*—Massachusetts, (Ridings); Illinois, (Dr. Lewis). Five ♂ specimens. This resembles *ater*, and may be the ♂ of it.

**I. histrius.**—♂. Large, dull black; face white, with a broad black stripe down the middle; narrow anterior orbits, dot at summit of each eye, spot on mandibles and palpi, except base, white; antennæ more than half the length of the body, very slender at tips, black, an imperfect yellowish annulus about the middle, the basal joint white beneath; thorax opaque, densely punctured; a sutural line in front of wing and a short line beneath, white; scutellum flat, white; metathorax rugose, the elevated lines prominent, the central area transverse; wings uniformly dark fuscous, with a strong purple reflection, nervures and stigma black, areolet subtriangular; legs black, the two anterior pair pale in front; abdomen elongate, depressed, opaque, very densely and finely punctured, less distinctly so at tip, first segment bicarinate, minutely aciculate; basal foveæ of second segment very deep. Length 9 lines.

*Hab.*—West Virginia, (Ridings). Allied to *vittifrons*, but quite distinct.

**I. pullatus** may be the ♂ of *subcyanus*.

**I. ornatipes.**—♂. Shape and size of *pullatus*; black; orbits, face, clypeus, mandibles and palpi yellowish-white; head not narrowed beneath; antennæ black, longer than head and thorax, basal joint whitish beneath; mesothorax shining; tegulæ, broad sutural line before and short line beneath each anterior wing, scutellum and post-scutellum yellowish-white; metathorax confluent punctured, the elevated lines well defined, the central area sublunate; wings hyaline, nervures black; four anterior coxæ white beneath, posterior pair black, with a large white wedge-shaped spot beneath; four anterior legs white, their trochanters, femora and tibiæ black behind; posterior legs black, the femora with a broad white stripe beneath at base, their tibiæ with a white stripe beneath; tips of anterior tarsi black; abdomen elongate, convex, dull black, first segment shining, feebly sculptured. Length 6½ lines.

*Hab.*—West Virginia, (Ridings). Allied to *pullatus*, but easily separated by the entirely whitish face and differently ornamented legs.

**I. sagus.**—♀. Robust, deep black, shining; face broad, a narrow white line on the upper half of the posterior orbits; antennæ robust, with a rather broad white or yellowish annulus about the middle; mesothorax and scutellum polished, with scattered deep punctures, scutellum with a white spot at tip, sometimes a white dot before the wings; metathorax confluent punctured, the central area subrotund; wings hyaline; legs robust, black, the tibiæ with a broad exterior white stripe, tarsi brownish; abdomen short, robust, oblong-ovate, shining; first segment slender at base, dilated at tip, which is sparsely punctured, but not rough; second segment densely punctured, almost smooth at tip; remaining segments impunctured, except the base of the third segment, which is sometimes sparsely punctured. Length 6 lines.

♂. Long, slender, deep black, sometimes shining; face and clypeus white or yellowish-white, a narrow white line on the upper half of the posterior orbits;

antennæ long, slender, brownish beneath, with a narrow yellowish annulus beyond the middle, sometimes subobsolete; a short, narrow line before each anterior wing and another beneath, the scutellum, and sometimes a line on the post-scutellum, white; metathorax subrugose, with the elevated lines sharply defined, the central area transversely subrotund; wings hyaline, slightly tinged with fuscous at tip; tips of the four anterior femora, their tibiæ more or less, and the basal half of the posterior tibiæ white or whitish; abdomen slender, subcylindric, shining at tip. Length 6—7 lines.

*Hab.*—Mass., Conn., N. Y., D. C., Ill. Six ♀, three ♂ specimens. The ♀ has much the form of *subcyaneus*, but is readily distinguished from that species by the striped tibiæ. The ♂ specimens may not belong to this species, although they closely resemble the ♀ in the markings.

**I. ultus.**—♂. Black, opaque; face, clypeus and palpi, in part, yellowish-white; antennæ long, slender, subserrate, the scape whitish beneath; tegulæ, a sutural line in front, and a short line beneath each anterior wing, scutellum and post-scutellum, white or yellowish white; metathorax confluent punctured, the elevated lines sharply defined, the central area moderate, quadrate, its posterior margin, and sometimes a spot on anterior margin, whitish; wings hyaline, sometimes with a slight yellowish tinge: all the coxæ white, except the posterior pair at base beneath; tips of the four anterior femora and a stripe within, their tibiæ and tarsi entirely, and the posterior tibiæ, except the apical third, also white; posterior femora black, their tarsi black in one specimen and white in another; abdomen densely punctured, the first segment suddenly dilated at tip. Length 7½ lines.

*Hab.*—Connecticut, (Coll. Mr. Norton); West Virginia, (Ridings). One ♂ specimen. The almost entirely white coxæ will distinguish this species from *audax* and *Bronteus*, to which it is closely allied.

**I. rogalis.**—♂. Black, opaque; antennæ long, moderately slender, subserrate; sides of the face, a transverse lunate mark on the clypeus, (sometimes the face and clypeus entirely,) spot on scape of antennæ beneath, tegulæ, a line before and a short one beneath each anterior wing, scutellum and post-scutellum, a spot on the four anterior coxæ beneath, a line on the posterior pair exteriorly, as well as its tip beneath, tips of the four anterior femora or a line within, the four anterior tibiæ and tarsi, and the basal half of the posterior tibiæ, all white or yellowish-white; sometimes the two or three basal joints of the posterior tarsi are yellowish, and a single specimen has the posterior tibiæ black, except a short exterior white line; wings subhyaline, more or less tinged with fuscous; metathorax with sharply defined elevated lines and a rather large, quadrate central area; abdomen elongate, depressed; first segment rather broadly dilated at tip, and strongly bicarinate. Length 6—8½ lines.

*Hab.*—Connecticut, New York, (Coll. Mr. Norton); West Virginia, (Ridings). Fifteen ♂ specimens. Easily distinguished from its allies by the markings of the face.

**I. mollipes.**—♂. Long, slender, dull black, the abdomen with a faint purplish tinge; antennæ long, black, the basal joint yellow beneath; narrow anterior orbits, face, clypeus, mandibles and palpi, and sometimes a spot on the cheeks beneath the eyes, bright yellow; thorax shining; tegulæ, a short sutural line before each anterior wing, a short, narrow line beneath, and the scutellum, bright yellow; metathorax subrugose, slightly shining, the elevated lines

sharply defined, the central area small, subrotund; wings yellowish-hyaline, nervures and stigma testaceous; legs bright honey-yellow, approaching orange, the four anterior coxæ whitish, the posterior pair black, more or less yellow at tips; tips of posterior tibiæ, and sometimes the apex of their tarsi, dusky; abdomen long and narrow, opaque, except at tip which is smoother and slightly shining; basal segment slender and but slightly dilated at tip, which is bicarinate and finely striated longitudinally. Length  $7\frac{1}{2}$  lines.

*Hab.*—Canada, (Saunders); Maine, (Harris' Collection). Two ♂ specimens.

**I. puerilis.**—♂. Very slender, black, shining; face, clypeus, mandibles and palpi, white; a dusky spot beneath antennæ and a larger one on middle of clypeus; antennæ very long, slender, filiform, brown above, fulvous beneath, the basal joint white beneath; tegulæ and a spot on scutellum, fulvous; the post-scutellum has two large, deep foveæ at base; metathorax shining, the elevated lines well defined, the central area moderate, quadrate; wings hyaline, iridescent, nervures and stigma brown, areolet triangular; legs, including all the coxæ, bright honey-yellow, tips of posterior femora, their tibiæ and tarsi blackish; abdomen slender, the apical half polished. Length 5 lines.

*Hab.*—Canada, (Billings). One ♂ specimen. This is a very slender species, with very long, filiform antennæ. It may not belong to this genus.

**I. infidelis.**—♂. Black; face, orbits, spot on each side of clypeus, and palpi, whitish; antennæ long, slender, subserrate, entirely black; tegulæ, broad sutural line before, and a short line beneath each anterior wing, most of scutellum, post-scutellum, and two spots on each side of the pleura, the anterior one the larger and transverse, all white; scutellum slightly convex; metathorax confluent punctured, the elevated lines sharply defined, the central area large, lunate, and on each extreme side there is a very obscure pale mark; tegulæ dull whitish; wings hyaline, nervures and stigma black; legs black, the four anterior coxæ more or less whitish beneath, the posterior with a white spot behind; tips of the four anterior femora and within, their tibiæ and most of tarsi, extreme tips of posterior femora, the exterior edge of their tibiæ and most of their tarsi, whitish; abdomen robust, opaque at base, shining at tip; apex of first segment white, apical margin of second segment stained with dull testaceous. Length 7 lines.

*Hab.*—Connecticut, (Coll. Mr. Norton). One ♂ specimen.

**I. improvisus.**—♂. Black, subopaque; face and clypeus white, both with a broad black stripe down the middle; antennæ long, slender, black, with a broad white annulus a little before the middle, the basal joint beneath is spotted with white; spot on tegulæ, another in front, a short line beneath, and the scutellum, also white; central area of metathorax subquadrate, shining; wings subhyaline; legs black, tips of anterior femora, their tibiæ and tarsi, basal half of intermediate tibiæ and of their tarsi, and a narrow band near the base of posterior tibiæ, white; abdomen elongate, narrow, opaque shining at tip, apical margin of sixth and a large spot on the seventh segment, white. Length  $6\frac{1}{2}$  lines.

*Hab.*—New Jersey, (Coll. Mr. E. Norton). One ♂ specimen.

**I. sævus.**—♀. Robust, deep black, shining, closely and distinctly punctured antennæ with a broad yellowish annulus; head and thorax immaculate, except the posterior margin of the scutellum, which is obscurely palish; metathorax shining, sparsely punctured, central area large, rounded in front and emar-



ginate behind; wings hyaline; anterior legs palish in front; basal segment of abdomen polished, with a few large scattered punctures; apical segment polished, the two last each with a central white spot. Length 6 lines.

*Hab.*—Illinois, (Dr. Lewis). One ♀ specimen.

**I. helvipes.**—♀. Small, robust, polished; narrow frontal orbits, interrupted on each side of antennæ, white; mouth testaceous; palpi pale; antennæ short, subserrate, brown-black above, dull testaceous beneath, brown-black at base; a line on the collar, sutural line on each side of thorax before the wing, spot on the tegulæ anteriorly, a short line beneath each anterior wing and the lateral margins of the scutellum confluent at tip, all whitish; the elevated lines of the metathorax sharply defined, with the central area moderate and transversely subquadrate; wings hyaline; legs short, robust, especially the posterior femora, rufous, coxæ black, tips of posterior tibiæ and their tarsi blackish; abdomen robust, posterior margin of the fifth segment, and the two following segments entirely, yellowish-white. Length 4 lines.

♂. More slender than the ♀, which it otherwise closely resembles; in one specimen the areolet of the anterior wing is triangular, with an additional, rudimental nervure at tip. Length 4 lines.

*Hab.*—Mass., Conn., (Coll. Mr. E. Norton); Ills., (Dr. Lewis). One ♀, three ♂ specimens. Easily recognized by the small size and short, thick red legs.

**I. clarus.**—♀. Entirely bright blue, shining; narrow anterior orbits, and a line on the posterior orbits, white; head much narrowed beneath; antennæ long, slightly thickened near the tips, with a broad white annulus a little beyond the middle; a short line before and another beneath the tegulæ, white; scutellum with a white spot at tip; metathorax with a short spine on each side behind, the central area large, quadrate; wings hyaline, slightly yellowish, areolet triangular; legs blue, the anterior pair whitish in front; abdomen rather short, slightly dilated beyond the first segment, which is slender at base and suddenly dilated at tip, the upper surface of which is polished, but rather uneven; tip of abdomen polished. Length 6 lines.

*Hab.*—Massachusetts, (Ridings). One ♀ specimen. A very pretty species, with the blue color quite bright.

**I. albomarginatus.**—♂. Black; face, orbits, broad on the lower posterior half, clypeus, mandibles and palpi pale yellow; antennæ black, basal joint beneath yellow; tegulæ, sutural line before and short line beneath each anterior wing, square spot on disk of mesothorax, scutellum, post-scutellum, two square marks on metathorax behind, anterior margin of prothorax, and an irregular mark on each side of pleura, just behind anterior coxæ, dull yellowish; wings hyaline, very faintly tinged with dusky, nervures and stigma brown, areolet triangular; legs black, four anterior coxæ, trochanters and femora white beneath, their tibiæ, tarsi, apical half of posterior trochanters and their tibiæ at base, also white; abdomen elongate, narrow, tip of first segment, and narrow posterior margins of remaining segments, white; on the third and following segments the fasciæ do not extend entirely to the sides, but become gradually shorter, so that the two apical segments have only a white central spot instead of a fascia. Length 6 lines.

*Hab.*—Mississippi, (Coll. Mr. E. Norton). One ♂ specimen.

**I. consignatus.**—♂. Black, opaque; head narrowed beneath; anterior orbits, face, except a narrow black line down the middle, a spot on each side of the clypeus, and a spot on the lower part of the cheeks, white; palpi pale; antennæ long, subserrate, slender at tips, black, with a white or yellowish-white annulus about the middle; tegulæ, a sutural line before and a spot beneath, and the scutellum, white; metathorax immaculate, central area moderate, quadrate; wings hyaline, faintly dusky; legs black, tips of four anterior femora, the anterior pair within, and their tibiæ and tarsi at base, whitish; posterior tibiæ palish at base; abdomen long, narrow; a wavy line on each side of second segment, a spot on each side of third, sometimes its posterior margin, and the posterior margin of the remaining segments, whitish. Length 7 lines.

*Hab.*—West Virginia, (Ridings). Two ♂ specimens.

**I. robustus.**—♀. Large, robust, black; anterior orbits, dilated on each side of the face, yellow; middle of face brownish; clypeus ferruginous, brownish at tip; mandibles brownish; antennæ rather long, stout at base, slender at tips, reddish-brown at base, yellow in the middle and black at tips; tegulæ and a line beneath, yellow; scutellum flat, polished, yellow; metathorax finely rugose, with a large subrotund central area; wings yellowish-hyaline, nervures and stigma ferruginous; coxæ black, the two anterior pairs spotted beneath with yellow; trochanters yellow; four anterior femora ferruginous, yellow at tips, their tibiæ and tarsi yellow; posterior femora and tips of their tibiæ black, rest of their tibiæ and their tarsi yellow; abdomen robust, convex, tip compressed; first segment broadly dilated at tip, black, second and third with the anterior half yellow, the posterior half brown-ferruginous, remaining segments black, with their posterior margin yellow. Length 7½ lines.

*Hab.*—Canada, (Billings.) One ♀ specimen. Allied to *jucundus*, but very distinct.

**I. subdolosus.**—♀. Robust, ferruginous or brown-ferruginous, face and cheeks stained with black; antennæ stout, joints thick set, ferruginous, blackish at base and tip, yellowish or whitish in the middle; thorax on the sides and beneath black; mesothorax shining; scutellum yellow, the region on each side black; metathorax deeply excavated behind, central area large, subquadrate; wings uniformly fusco-hyaline; legs ferruginous, coxæ, four anterior femora behind, and the posterior pair, except base, black; abdomen robust, ovate, ferruginous; second and third segments with a yellow band at tip, sometimes obsolete on the third segment; base of second, third and fourth segments more or less black, generally the tip of first segment has a yellow spot on each side, sometimes confluent; apical segment entirely ferruginous. Length 5½—6 lines.

*Hab.*—Maine, Massachusetts. Four ♀ specimens.

**I. creperus.**—♂. Differs from *Grote* by the thorax being always black, not varied with fulvous; by the posterior femora, except base, the tips of their tibiæ, and the posterior coxæ, being black; and by the second and following segments of the abdomen being fulvo-ferruginous, black at base, without any yellowish shade at the tip of the segments, except that of the first, which is always yellow. Length 6½—7½ lines.

*Hab.*—Canada, West Virginia, Illinois. Sixteen ♂ specimens.

**I. atrifrons** is probably the ♀ of *comptus*. It varies in the width of the abdominal fasciæ and also in the markings of the metathorax. The lines on the mesothorax are sometimes obsolete or wanting.

**I. zebratus.**—♀. Rather robust, closely punctured but shining, head narrowed beneath, yellow, middle of the vertex, from the base of antennæ to occiput, and the occiput behind, black; antennæ slender, black, with a broad white annulus, basal joint beneath yellow; a large square mark on posterior middle of mesothorax, a sutural line on each side in front, a line on collar, tegulæ, a line beneath, a large mark on each side of pleura, scutellum, post-scutellum, and two large spots on metathorax, confluent anteriorly, all yellow; central area of metathorax large, subquadrate; wings pale yellowish-hyaline, nervures and stigma pale luteous; legs ferruginous, the four anterior coxæ beneath, the posterior pair behind, and at tips beneath, all the trochanters, the anterior legs in front and base of posterior tibiæ, yellow; abdomen with a broad, apical, yellow band on the four basal segments, and a transverse apical spot on each of the remaining segments. Length 5 lines.

*Hab.*—Illinois, (Dr. Lewis). One ♀ specimen. A very pretty and distinct species.

**I. multor,** (Harris' Catal.)—♂. Very near to *fluvizonatus*, but differs by the face being black, with a yellow stripe on each side, and two approximate spots beneath the antennæ; by the immaculate metathorax and first abdominal segment, and by the second segment having a fulvous band at both base and apex; the third, fourth, sixth and seventh segments have each a narrow, pale yellow fascia, broadest on the third segment; the legs are colored as in *fluvizonatus*, except that the femora are pale fulvous. Length 6½ lines.

*Hab.*—Canada, Massachusetts. Two ♂ specimens.

**I. solotypus.**—♂. Black, subopaque; face and clypeus pale ferruginous, shading into yellow on the sides; palpi yellow; antennæ long, black, basal joint yellow beneath; tegulæ, a short line in front and another beneath, yellowish; scutellum and post-scutellum polished, dull ferruginous; metathorax rugose, the elevated lines well defined, the central area large, quadrate; wings yellowish-hyaline, dusky at tips; legs yellow, the four anterior coxæ at base beneath, the posterior pair entirely, the four anterior femora at base behind, the posterior pair except base, and the tips of their tibiæ, black, tips of tarsi dusky; abdomen long, rather broad, flattened: first segment slender, broadly dilated at tip, which is uneven, black, with a yellow apical band; second and third segments black, with a broad yellow band at tip, remaining segments ferruginous or brown, beneath dull ferruginous. Length 6½—9 lines.

*Hab.*—West Virginia, (Ridings). Two ♂ specimens.

**I. callitergus,** (Harris' Catal.)—♀. Rather robust, black; head tinged with dull rufous, the anterior orbits dull ferruginous; antennæ stout, brown-black, with a broad yellowish annulus; thorax entirely black, except the scutellum, which is yellow and polished; wings yellowish-hyaline, nervures brown, stigma fulvous; legs black, the tibiæ with a broad yellowish annulus at base, tarsi brownish-fulvous; abdomen black, with a yellow apical band on the three basal segments, and a central yellow spot on the sixth and seventh segments. Length 6 lines.

*Hab.*—Maine, (Harris' Collection). One ♀ specimen.

**I. magnicoeps.**—♀. Black, head and thorax shining, abdomen opaque; head unusually large, quadrate, not narrowed beneath, white, the middle of the vertex, from the insertion of the antennæ to the ocelli, the posterior part of the occiput, and the tips of mandibles, black; antennæ rather short, not robust, black,

with a broad white annulus beyond the middle; thorax black above, white beneath, shining; collar, two lines on disk of mesothorax, a broad sutural line on each side, tegulæ, a spot beneath, scutellum and post-scutellum, all white; metathorax coarsely and confluent punctured, white, with a large, oblong, black spot on each side of the middle, confluent with a blackish stain on the lateral sutures, and a square blackish mark on the apical middle, the elevated lines obsolete defined; wings hyaline, faintly yellowish, slightly dusky at tips; areolet small and triangular; legs rather slender, entirely pale honey-yellow, except the four anterior coxæ beneath, which are whitish; abdomen narrow, depressed, opaque, the punctures being dense and linear, making the surface appear almost striate; first segment slender, reddish at base, dilated at tip, which is confluent punctured; all the segments with a white band at tip, dilated on the extreme sides. Length 8 lines.

♂.—Marked like the ♀, but the form is more slender, the antennæ very long and subserrate, the basal joint spotted beneath with white, and the legs brighter colored and more slender. Length  $7\frac{1}{2}$  lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach, No. 528 ♀, 538 ♂.) One ♂, one ♀, specimens.

*I. lætus*.—This species is easily recognized by having the *posterior* portion of the four basal segments of the abdomen more or less yellow; generally the second, third and fourth segments are yellow, with merely the basal margins black; the dilated tip of the first segment is yellow, and occasionally, in specimens where the markings are unusually well developed, the whole of this segment is yellow; the yellow band on the fourth segment is sometimes constricted in the middle, in two specimens dividing the band into two spots; the fifth and remaining segments are always black; the mesothorax has occasionally a spot or two short lines on the disk; the scutellum and post-scutellum are always yellow; the metathorax varies from being entirely yellow to entirely black, sometimes yellow with a black stripe down the middle, or black with a broad yellow stripe down each side; the wings vary from hyaline to dusky; the legs are yellow, including the four anterior coxæ; the posterior coxæ—sometimes varied with yellow—their femora more or less, and the apical third of their tibiæ, are black; sometimes the four anterior femora are more or less black behind, sometimes more or less tinged with reddish; tarsi dusky at tips; the pleura is occasionally varied with yellowish. Length  $6\frac{1}{2}$ —7 lines. Forty-two specimens examined.

I have been told that this cannot be the *lætus* of Brullé, because the colors of the posterior legs are *exactly the opposite* of what is described by him. But I am very much inclined to believe that Brullé meant exactly contrary to what the types made him say; for I know of no species of *Ichneumon*, either domestic or foreign, that has the posterior legs *yellow* with the trochanters, base of the femora and the basal two-thirds of the tibiæ *black*, and I do not believe that any species can be found as having the legs with the colors so arranged.

*I. mimicus*.—♂. Black; the orbits, broad on the cheeks, and all beneath the antennæ, yellow, brown above, dull red beneath; tegulæ, sutural line before and a short line beneath anterior wing, scutellum, post-scutellum, a large mark occupying most of the metathorax, sometimes reduced to two small spots, yellow; wings hyaline or subhyaline; the two anterior pairs of legs, including their coxæ, yellow, sometimes the femora are slightly blackish behind; posterior legs yellow, their coxæ, femora and tips of tibiæ, black, their tarsi more

or less dusky at tips; abdomen convex, the basal segment broadly dilated at tip, subconvex, shining, not rough; apical half of all the segments yellow; the apical segments are often indistinctly banded. Length 5—5½ lines.

*Hab.*—Mass., Conn. Fifteen ♂ specimens. Very much like *latus* Brullé, but is smaller and more convex.

*I. comes.*—This species is distinguished by the anterior part of the second and third segments of the abdomen being more or less yellow. The type specimen is larger and more robust than usual and is the only specimen out of 35 that has the yellow longitudinal lines fully developed, i. e. extending to the anterior margin and joining the sutural line on each side; generally the mesothorax is immaculate and the lateral sutural lines more or less distinct, often reduced to a mere dot just before the tegulæ; some specimens have a yellow spot on the disk of the mesothorax and others two short lines. The scutellum is always yellow, but the post-scutellum is occasionally black. The metathorax varies from immaculate to more or less yellow; the four anterior femora are often more or less black behind; the posterior coxæ are sometimes varied with yellow, while in other specimens the four anterior coxæ are more or less black. The basal segment of the abdomen is always black, sometimes with a yellow dot on each side of the dilated tip; the second segment generally has its anterior one-half or two-thirds yellow, with the posterior margin of the yellow band often undulate or uneven, occasionally the yellow extends almost to the tip of the segment, which is more or less unevenly marked with black; the third segment is sometimes entirely yellow, sometimes with the posterior margin narrowly black, sometimes with only a black dot on each side, sometimes the posterior one-third to one-half is black; four specimens from West Virginia have the yellow bands on the second and third segments narrow and more or less obscure; the fourth and following segments are generally entirely black, but in two or three specimens the sides of the fourth segment are more or less distinctly marked with yellow, and three specimens, identical with the *alcatorius* of Harris' Catalogue, have a triangular yellow mark on each side of the fourth segment, almost contiguous in one specimen; occasionally the pleura has a more or less developed yellow spot on each side; the wings vary from hyaline to dusky. Length 7—8½ lines. Thirty-five ♂ specimens from Can., Mass., Del., W. Va. and Ills.

*I. feralis.*—♀. Black, head quadrate, not narrowed beneath; face sometimes more or less brownish; antennæ short, robust, joints thick-set, black, a rather broad white or yellowish annulus about the middle; mesothorax flattened, shining, coarsely punctured; scutellum flat, polished, white; metathorax rugulose, the central area large, quadrate; tegulæ brownish; wings subhyaline, uniformly tinged with pale fuscous, stigma and nervures brown; legs black, tips of anterior femora, the four anterior tibiæ, except tips which are brown, and a broad annulus on posterior tibiæ, white; tarsi brownish; abdomen white, second segment with a broad apical white band, and the two terminal segments with a white spot on their apical middle; sometimes all the markings are yellow and the third segment has a narrow apical band or a central spot, and the fifth segment an apical spot, like those on the two following segments; in one specimen the second and third segments are tinged with brownish. Length 4½—5 lines.

*Hab.*—Canada, Massachusetts. Four ♀ specimens.

**I. Dakota.**—♂. Black, opaque: face, orbits, clypeus, mandibles and palpi lemon-yellow; antennæ long, blackish above, fulvous beneath, the basal joint yellow beneath: two short lines on disk of mesothorax, tegulæ, sutural line before, a short line beneath, scutellum, post-scutellum, and posterior half of metathorax, lemon-yellow; elevated lines of metathorax sharply defined, central area large, open behind; wings hyaline, faintly tinged with yellowish, nervures brown, stigma fulvous; legs yellow, the four anterior femora behind fuscous: posterior coxæ, except tips, their femora, except extreme tips and base within, and the apical third of their tibiæ, black: abdomen flattened, opaque black, third segment with a broad yellow band, shaded behind with fulvous, lateral margins of the fourth and fifth segments marked with fulvous; apical segment tinged with brownish; beneath yellow, darker laterally. Length 6 lines.

*Hab.*—Dakota Territory, (Ulke). One ♂ specimen.

**I. inurbanus.**—♀. Robust, black, shining; head robust, not narrowed beneath; antennæ short, robust, joints short and thick, black, with a pale annulus about the middle; mesothorax polished, finely punctured; scutellum flat, polished; metathorax opaque, rugose, central area oblong-quadrate; tegulæ piceous; wings violaceous-black; legs shining black, the anterior pair palish in front; tarsi tinged with brown; abdomen robust, ovate, finely and closely punctured, brown-ferruginous, basal segment black. Length 6 lines.

*Hab.*—West Virginia, (Ridings). One ♀ specimen. Closely allied to *I. rufiventris*, but distinct by the shorter, stouter antennæ and finer sculpture of the body.

**I. insolens.**—♂ ♀. Rather large, head and thorax robust, abdomen long and narrow, black, densely punctured, somewhat shining; head scarcely narrowed beneath, anterior orbits beneath antennæ and a dot on each side of anterior ocellus white; antennæ short in ♀, longer in ♂, slender at tips, subserrate in ♂, black, with a white annulus about the middle, obsolete beneath; thorax gibbous, immaculate; scutellum long, convex, coarsely punctured and clothed with short black hair; metathorax coarsely punctured, except the quadrate central area which is smooth and polished, as well as the carinæ that bound it; wings broad, not long, violaceous-black; nervures and stigma black; arcolelet large, quadrate, very slightly oblique, the second recurrent nervure straight; legs slender, black, the posterior pair long; anterior legs before, tips of middle femora, and the posterior femora entirely, rufous; abdomen long, narrow, entirely dull rufous, densely and coarsely punctured; venter yellow. Length 6½—7 lines.

*Hab.*—Georgia, Florida, Mississippi, Louisiana. Two ♀, fifteen ♂ specimens. Probably not a true *Ichneumon*. Closely allied and congeneric with *I. meridionalis*, from Cuba.

**I. semicæruleus.**—♀. Robust; head, thorax and base of abdomen deep blue, shining, clothed with a fine, short, pale pubescence anterior orbits subobsoletely pale; antennæ with the basal third black, middle white and the apical third brown; tegulæ black, with a white dot in front; scutellum polished, with a round white central spot; metathorax rugulose, central area large, quadrate, not well defined; wings pale yellowish-hyaline, nervures and stigma black; legs blue, anterior pair pale in front, tips of posterior femora and their tarsi ferruginous; abdomen oblong-ovate, first segment deep blue, remaining segments rufo-ferruginous, polished towards the apex; beneath as above. Length

*Hab.*—West Virginia, (Jas. Ridings). One ♀ specimen. A beautiful species, allied to *I. detritus*.

**I. instabilis.**—♀. Black or ferruginous, rather robust: head slightly narrowed beneath, the anterior orbits more or less red or yellowish, sometimes the head is entirely red or the face and clypeus are varied with brown and yellowish or reddish; antennæ moderately long, not robust, generally fulvous at base, yellow in middle and black at tips, sometimes only fulvous with tips black, or black at base, then fulvous, yellow and black; third joint elongate, longer than the fourth which is subequal with the fifth; thorax often entirely ferruginous or more or less varied with ferruginous, sometimes black immaculate, except the scutellum, which is always yellow and polished; tegulæ ferruginous, often with a reddish spot in front and another beneath; post-scutellum sometimes reddish; metathorax rugulose, the central area large and subquadrate; wings subhyaline, more or less stained with yellow, nervures brown, stigma pale honey-yellow; legs honey-yellow or ferruginous; the coxæ, tips of posterior femora, of their tibiæ and most of their tarsi black, sometimes the most part of the posterior legs is black; abdomen oblong-ovate, subconvex, slender at base, generally entirely ferruginous, sometimes the fourth and fifth segments above are black or fuscous, sometimes the second and third segments only are ferruginous, and sometimes the incisures of the segments are more or less blackish; beneath ferruginous or yellowish-ferruginous, dusky or black at tip. Length  $5\frac{1}{2}$ —6 lines.

♂. This sex is exceedingly variable in color, some examples being almost entirely yellowish-ferruginous, and others almost entirely black. Head black, with the anterior orbits and all beneath the antennæ yellow; antennæ long, slender, black above and brownish or fulvous beneath, the basal joint yellow beneath; thorax generally black, sometimes more or less varied with ferruginous, and in one specimen the mesothorax has four abbreviated pale vittæ; sometimes the thorax is black, immaculate, except the scutellum which is always yellow; generally, there is a spot or a sutural line before the wings and a spot or line beneath; the post-scutellum is often reddish; legs honey-yellow; the four anterior coxæ often more or less yellow or honey-yellow, sometimes black spotted with yellowish beneath; the posterior coxæ are generally black, sometimes more or less ferruginous, their trochanters generally half black and half honey-yellow, sometimes their femora are entirely black or half black, generally only tipped with black, rarely entirely honey-yellow, their tibiæ tipped with black; the general color of the legs varies from lemon-yellow to ferruginous; abdomen depressed, opaque, sometimes entirely yellowish-ferruginous, but generally black, with the second and third, and sometimes part of the fourth segments ferruginous or yellowish-ferruginous; the first segment is either entirely ferruginous or black tipped with ferruginous, or with two apical yellow spots; the second and third segments are entirely ferruginous, or yellow stained with ferruginous; the fourth is either entirely black, or black spotted with ferruginous, or entirely ferruginous, the remaining segments are generally black or brown, often more or less varied with ferruginous; several specimens have the second and third segments bright yellow and the rest black. Length 5—7 lines.

*Hab.*—Me., Conn., N. Y., N. J., W. Va. Twenty-seven ♀, forty-four ♂ specimens.

**I. electus.**—♂. Black; face white, with a median black spot or line on the sutures; clypeus entirely white or with two white spots; palpi pale, black at base; antennæ long, slender, much attenuated at tips, serrate, black, the basal joint white beneath; tegulæ, a sutural line before and a short line beneath, scutellum and post-scutellum white; in one specimen the posterior margin of the central area of metathorax is white; wings hyaline, nervures black; legs black, varied with white; in one specimen all the coxæ are white, black at base beneath; in the other specimen they are black, the two anterior pairs spotted beneath with white; anterior femora in front, the four anterior tibiæ and tarsi, the posterior tibiæ, except tips, and their tarsi more or less, also white; in one specimen the intermediate tibiæ has a white line beneath; abdomen with the second, third and base and sides of fourth segments bright yellowish-ferruginous. Length 6—7½ lines.

*Hab.*—Connecticut, (Coll. Mr. E. Norton). Two ♂ specimens.

**I. volens.**—♀. Robust, dull black, head and sides of thorax shining, head not narrow beneath; antennæ with a white annulus about the middle; scutellum polished, metathorax rugulose, central area oblong-quadrate, posterior angles prominent cariniform; tegulæ dull ferruginous; wings pale fusco-hyaline, nervures brown, stigma fulvous; legs black, tips of anterior femora, their tibiæ and tarsi, most of the middle tibiæ and tarsi, and the basal two-thirds of the posterior tibiæ ferruginous, their tarsi brown; abdomen robust, ovate, black, second and third segments entirely ferruginous, two apical segments with a central white spot, beneath as above, except that the apical white spots are wanting. Length 6 lines.

*Hab.*—Massachusetts, (J. Ridings.) One ♀ specimen.

**I. Nortonii.**—♀. Black, thinly pubescent, head broad, slightly narrowed beneath, eyes large and prominent; a white spot on each side of the vertex on the anterior orbits; antennæ long and unusually slender, especially at tip, black, with a white annulus about the middle, basal joints of flagellum long and subequal; two spots on the collar, a spot before tegulæ and another beneath, and the scutellum except tip, white; a ferruginous spot on the post-scutellum; metathorax densely and confluent punctured, the elevated lines well defined, the central area elongate, subquadrate; wings subhyaline, dusky at tips, nervures brown, stigma yellow, areolet 5-angular; legs slender, black, thinly pubescent, tips of four anterior femora, their tibiæ and tarsi, and basal half of posterior tibiæ rufo-testaceous; abdomen subdepressed, narrow, ferruginous; first segment black at base, slender, dilated and depressed at tip, which is smooth and shining above, basal foveæ of second segment very deep; the fifth and following segments black, the two last tipped with white. Length 5½ lines.

*Hab.*—Connecticut, (Coll. Mr. E. Norton). One ♀ specimen. A very pretty and distinct species.

**I. finitimus.**—♀. Head black, sides of the face, clypeus, most of the mandibles and the palpi white; one specimen has the face white, except a small black central spot; antennæ long, slender, black, with a white annulus beyond the middle, at base beneath the joints are reddish; thorax black, sometimes brownish; the metathorax, except sometimes its lateral margin, and more or less of the pleura ferruginous; metathorax excavated behind, with a short, blunt, prominent spine on each side, the elevated lines well defined, the central area quadrate, rather large; tegulæ, scutellum and post-scutellum white; wings hya-



line or subhyaline, iridescent, areolet triangular, legs rather long, ferruginous, the four anterior coxæ and trochanters white, tips of posterior femora, of their tibiæ and most of their tarsi black; abdomen long, narrow, very slender at base, pale ferruginous: posterior margin of the fourth segment, the fifth entirely, the sixth, except apex, and the sides of the following segments black, rest of the apical segments above, white; beneath honey-yellow, the tip black. Length  $4\frac{1}{2}$  lines.

*Hab.*—Connecticut, Pennsylvania, Illinois. Four ♂ specimens. Allied to *terminalis* Cresson.

**I. milvus**, (Harris' Catal.)—♂. Head and thorax black; anterior orbits, face, clypeus, mandibles and palpi yellow or fulvous; antennæ long, slender, especially so at tips which are dusky, the rest fulvous; tegulæ, a spot before, the scutellum and a spot behind, and the tegulæ, bright fulvous or yellow; metathorax finely sculptured, with the elevated lines sharply defined, the posterior angles produced into a short blunt spine, central area quadrate or subquadrate; wings long, ample, pale yellowish-hyaline, nervures and stigma fulvous, areolet five-angular, narrow above; legs rather slender, entirely yellow or bright honey-yellow, posterior pair long; abdomen long, narrow, shining, yellow or bright honey-yellow, the fifth and remaining segments deep shining black, and sometimes the fourth segment, except the basal corners, is also black. Length 7 lines.

*Hab.*—Massachusetts, Connecticut, Rhode Island. Four ♂ specimens.

**I. bariolus**.—♀. Black, shining, finely punctured; head not large, anterior orbits dull ferruginous; mandibles luteous, black at tips; antennæ rather slender, brown-black, with a white annulus about the middle; thorax immaculate, except a small transverse spot beneath each anterior wing; metathorax feebly sculptured, the elevated lines not sharply defined, the central area moderate, subrotund, the posterior truncation abrupt and transversely striated; wings subhyaline, nervures and stigma black, the areolet broad, 5-angular; coxæ black, more or less tinged with rufous, the posterior pair with a rather long, blunt tooth beneath near the tip; the four anterior legs ferruginous, the posterior pair brown-black, the tibiæ, except tips, and tarsi rufo-fuscous; abdomen rather short, depressed, shining black, the second, third and fourth segments, except apex, dull rufous; first segment smooth and polished; the basal foveæ of second segment very transverse and rather deep. Length 4 lines.

*Hab.*—Massachusetts, (Ridings.) One ♀ specimen.

**I. hebrus**.—♀. Small, black, densely punctured, finely pubescent; head broad, scarcely narrowed beneath; antennæ rather short, black, the third, fourth and fifth joints rufous, the tenth to thirteenth white; thorax immaculate; metathorax rugulose, the elevated lines sharply defined, the central area elongate, subquadrate, posterior truncation rather abrupt, and transversely striated; tegulæ brownish; wings subhyaline, tinged with dusky, iridescent, nervures brown, areolet broad, 5-angular; legs, including all the coxæ, rufo-ferruginous, apical half of posterior femora and tips of their tibiæ, black, tips of all the tarsi dusky; posterior coxæ with a short, blunt tubercle beneath towards the tip; abdomen rather narrow, subparallel, rufous, the fifth and following segments black; first segment shining, almost smooth, not broadly or suddenly dilated at tip; beneath as above. Length  $4\frac{1}{2}$  lines.

♂. Much like the ♀, with the antennæ longer, and the basal joints black.

*Hab.*—Connecticut, Illinois. Two ♀, one ♂, specimens.

**I. Hebe.**—♀. Small, black, head broad, eyes large, most of mandibles and the palpi testaceous; antennæ rather short and slender, brown-black, joints 2—5 honey-yellow, a narrow whitish annulus a little beyond the middle, the tip beneath paler, joints 4—6 elongate and subequal; thorax black, immaculate; tegulæ white; wings subhyaline, iridescent, nervures pale, areolet broad, 5-angular; legs, including the coxæ, pale honey-yellow, the coxæ and trochanters paler; tips of posterior femora and of their tibiæ black; tarsi yellowish, their tips blackish; posterior coxæ with a stout tooth beneath near the tip; abdomen oblong-ovate, depressed, slender at base, pointed at tip; first segment smooth and shining above at tip, not suddenly dilated, second segment transversely depressed at base; second, third and fourth segments honey-yellow, sometimes the tip of the first segment is tinged with reddish. Length 3—3½ lines.

♂. Sides of face and spot on each side of clypeus, white; antennæ entirely reddish-brown, dusky above and at base beneath; posterior coxæ unarmed, posterior tarsi dusky; first segment of abdomen honey-yellow, smooth and shining. Length 3 lines.

*Hab.*—Connecticut, Illinois. Two ♀, three ♂ specimens. The male specimens described above may not belong to this species.

**I. fungor.** (= *Alomya fungor* Norton, MS.)—♂. Long, slender; head large, transversely quadrate, densely punctured, thinly clothed with a fine whitish pubescence, black, clypeus more or less ferruginous, the mandibles, except base and apex, and the palpi, yellow; antennæ long, filiform, fulvous, ferruginous or brown-ferruginous; thorax closely punctured, thinly pubescent, black, shining, immaculate, except scutellum, which sometimes has a reddish spot; occasionally the mesothorax and metathorax have rufous stains; metathorax densely sculptured, thinly pubescent, the elevated lines sharply defined, the central area quadrate or subquadrate, moderate; tegulæ generally pale yellow; wings hyaline or subhyaline, areolet broad, 5-angular, nervures and stigma brown, both more or less yellowish at base; legs slender, and including their coxæ, honey-yellow, the posterior coxæ at base beneath, their tibiæ at tips and most of their tarsi are generally dusky; abdomen long and slender, especially at base, entirely ferruginous or honey-yellow, the first segment only slightly dilated at tip, which is smooth and shining, sometimes faintly aciculate; remaining segments shining and subpubescent. Length 4—5 lines.

*Hab.*—Ct., N. Y., Pa., Ills. Twenty ♂ specimens.

**I. hospitus.**—♀. Robust, black; the anterior orbits and face tinged with rufous; antennæ tricolored, the base ferruginous, middle yellowish-white, and apex black; thorax flattened; scutellum yellow; tegulæ ferruginous; wings subhyaline, nervures and stigma luteous, areolet 5-angular; legs, including their coxæ, ferruginous, apex of posterior femora and of their tibiæ black; abdomen rufo-ferruginous, the fourth and following segments black. Length 3½ lines.

♂. More slender than the ♀, the face and clypeus yellowish-ferruginous, with the sides of both yellow; the antennæ nearly as long as the body, subserrate, brown above, with a narrow fulvous annulus beyond the middle, beneath entirely fulvous; the posterior tibiæ are dusky, with a yellowish-ferruginous annulus near the base; the abdomen is narrow, parallel, with the fourth and following segments brown-black. Length 4 lines.

*Hab.*—Canada, (Saunders.) One ♀, one ♂, specimens.

**I. citrifrons.**—♂. Small, black; face, clypeus, spot on mandibles, and the palpi, lemon-yellow; antennæ rather long, filiform, fulvous, darker above; thorax shining black; tegulæ, spot before and another beneath, scutellum and post-scutellum lemon-yellow; metathorax with sharply defined elevated lines and a large quadrate central area; wings hyaline, iridescent, nervures pale, areolet 5-angular; legs, including the coxæ, pale lemon-yellow, the four anterior coxæ and trochanters lemon-yellow beneath, apical half of posterior femora and tips of their tibiæ black; tarsi yellowish; abdomen blackish, the second and third, and base of fourth segments pale ferruginous; first segment bilineate, finely aciculate; base of second segment deeply impressed on each side. Length 3—3½ lines.

*Hab.*—Connecticut, Pennsylvania. Two ♂ specimens.

**I. trogiformis.**—This will probably form a new genus. The ♀ is uniformly ferruginous, the antennæ shorter than in ♂, and the legs are entirely ferruginous, with the tarsi not yellow as in the ♂. Eight ♂, one ♀, specimens, from New Jersey, Florida and Louisiana.

**I. Lewisii.**—This species varies considerably. The head, thorax above and abdomen are sometimes ferruginous, with the thorax beneath and incisures between the first, second and third segments of abdomen, black; sometimes the metathorax is black, and the mesothorax and scutellum reddish-brown; the antennæ are long and slender, tricolored—fulvous, yellow and black; the legs fulvous, with the coxæ black, and the base of the third abdominal segment has a broad black band; one specimen has the body almost entirely blackish, the head, scutellum, apex of second abdominal segment and the apical segments being dull reddish; the wings are always uniformly dark fuscous, and more or less violaceous. *I. sandix* is probably a variety of this species.

**I. maius.**—♀. Head black, narrowed beneath, palpi pale; antennæ rather long and slender, brown, with a white annulus about the middle; thorax black, mesothorax and most of prothorax brown-ferruginous, the former shining and depressed; scutellum obscure yellowish; metathorax shining, rugulose, broadly excavated posteriorly, central area quadrate; wings hyaline, faintly yellowish, nervures and stigma brown; legs ferruginous; coxæ, base of trochanters, middle femora behind, most of posterior femora, and tips of their tibiæ, black; abdomen broad, ovate, depressed, shining, rufo-ferruginous; petiole of first segment slender, flat, polished, black; two apical segments above with a yellow central spot; beneath yellowish. Length 5 lines.

*Hab.*—Massachusetts, (Mr. F. Stratton, May 17.) One ♀ specimen.

**I. fuscifrons.**—This species varies by having the anterior orbits more or less yellow, sometimes almost white; sometimes there is a yellow sutural line before the wings; the legs are sometimes ferruginous, with the coxæ spotted with yellow; the abdomen is also sometimes ferruginous, with an obscure yellowish spot on each side of second segment at tip. Three ♀ specimens from Illinois.

**I. disparilis.**—♀. Ferruginous, tinged with dusky; upper anterior and a spot on the posterior orbits, yellow; antennæ stout, blackish-brown, with a yellowish annulus about the middle, between the middle and apex the joints are dilated and flattened beneath; incisures of the thorax and the region on each side of scutellum blackish; tegulæ, short line before and another beneath, scutellum and post-scutellum yellow; metathorax shining, confluent punctured, excavated behind, the lateral angles prominent, the elevated lines well defined, and the central area smooth, subconical, emarginate behind; wings hyaline, ner-

vures and stigma brown, areolet 5-angular; legs stout, rather short, ferruginous, the four anterior coxæ and trochanters, and the posterior trochanters, more or less yellowish, tips of posterior coxæ, of their femora and of their tibiæ black; abdomen robust, convex, slender at base, shining, densely punctured, ferruginous, the disk of the second and the following segments more or less fuscous; basal segment dilated at tip, flattened above, shining, with a few punctures on the apical margin; an apical spot on each side of the second and third segments, a central spot on the two apical segments, yellow. Length 5 lines.

*Hab.*—Connecticut, (Coll. Mr. E. Norton.) One ♀ specimen. In consequence of the structure of the antennæ, this species may belong to the genus *Joppa*.

**I. canadensis.**—♀. Robust, black, shining, anterior orbits, above antennæ rufous; antennæ short, joints thick set, brown-black, with a broad white or yellowish annulus in the middle; scutellum flat, polished, bright lemon-yellow, sometimes a spot of the same color on the post-scutellum; metathorax more or less distinctly obliquely aciculated, the central area large, quadrate, a dull rufous stain on each side in one specimen; tegulæ brownish; wings uniformly pale fusco-hyaline, posterior pair paler; legs black, two anterior pairs ferruginous, their femora more or less black, their tibiæ with a broad yellow band at base, posterior femora black, their tibiæ yellow, black at tip, their tarsi ferruginous; abdomen robust, ovate, ferruginous, third and fourth segments with a black band at base, sometimes the second segment has a black spot on each side at base; first segment black at base, the tip often with a yellow dot on each side. Length 4—5 lines.

*Hab.*—Canada, New York. Four ♀ specimens.

**I. ventralis.**—♀. Small, robust, shining, black; anterior orbits, apical margin of clypeus, spot beneath the eyes, most of mandibles, and the palpi, ferruginous; antennæ stout, the joints very short and thick set, black, tip of the third and the fourth to twelfth joints fulvous; mesothorax and metathorax stained with dull ferruginous; scutellum very flat, polished, dull ferruginous; metathorax densely sculptured, rugulose, with a large, square, central area, not well defined; tegulæ testaceous; wings subhyaline, iridescent, nervures and stigma fulvous; legs robust, fulvous; the coxæ, basal half of trochanters, anterior femora behind, the four posterior femora, except extreme base and apex, and tips of posterior tibiæ, black; abdomen oblong-ovate, robust, fulvous, base of first segment, lateral margin of second at base, basal margin of third, and the fourth and fifth segments entirely, black; apical segments fusco-ferruginous; venter whitish, second to fourth segments with a black spot on each side, the two following segments with a broad black band; apex fuscous. Length 4 lines.

*Hab.*—Hudson's Bay Territory. (Coll. Mr. E. Norton.) One ♀ specimen.

**I. signatipes.**—♀. Black, robust; antennæ moderately long, stout to the apex, the joints short, thick set, black, reddish at base beneath, a narrow whitish or yellowish annulus about the middle; head robust, not narrowed beneath, more or less varied with reddish; thorax black, depressed; tegulæ, sutural line before and spot beneath, ferruginous, sometimes yellowish; mesothorax sometimes tinged with ferruginous; scutellum flat, polished, yellow; metathorax densely punctured, the elevated lines well defined, but not sharp, the central area quadrate or subquadrate; wings subhyaline; legs short and robust, four anterior coxæ red or brown, the posterior pair black; femora swollen, rufous, the posterior pair more or less black at tips; tibiæ ferruginous or dusky, with a yellow spot near the base; tarsi dusky; abdomen robust, convex, ovate, rufous

or ferruginous, immaculate, the extreme base of the first segment sometimes blackish. Length 4½—5 lines.

*Hab.*—Connecticut, Pennsylvania. Seven ♀ specimens. Closely allied to *canadensis*, but differs principally by the immaculate abdomen, that of *canadensis* being banded with black.

**I. anceps.**—♂ ♀. Elongate, narrow, subcylindric, polished, fulvo-ferruginous; head rather small, not narrowed beneath; antennæ slender, convolute, blackish, fulvous at base, a broad white annulus about the middle; space around the scutellum and the sutures of the thorax beneath, black; scutellum slightly convex, polished, bright lemon-yellow; metathorax feebly sculptured, the central area large, subquadrate, polished, the elevated lines not well defined; tegulæ pale honey-yellow; wings hyaline or yellowish, nervures fulvous, areolet rather large, 5-angular; legs moderate, four anterior coxæ pale beneath; tips of posterior femora, and of their tibiæ, black; abdomen long, almost cylindrical, the tip more or less compressed, highly polished; first segment slender at base, swollen and convex at tip, arcuate; apical segment with a yellow spot, sometimes obscure; in one specimen the apical segments are more or less stained with blackish; venter yellowish. Length 6—6½ lines.

*Hab.*—Connecticut, Delaware. Five specimens. Remarkable for the shape of the abdomen being like that of some species of *Exetastes*.

**I. duplicatus**, varies much in the color of the posterior legs which are sometimes mostly black, but generally the femora are entirely fulvous, occasionally with the tips blackish; their tibiæ are generally dusky, with the basal half yellowish; the coxæ vary from almost entirely black to almost entirely yellow or whitish, generally of the latter color, with an exterior black mark. Numerous ♂ specimens.

**I. W-album.**—This is very closely allied to *duplicatus*, Say, but the ♂ is larger, more elongate and slender, the head broader, the legs more slender and the abdominal segments proportionately longer and narrower. The second and following segments are sometimes much stained or spotted with blackish or fuscous, generally the second and third segments have a fuscous spot on each side before the middle; some examples have all the segments, except the first, entirely fulvous, immaculate. The posterior legs pale fulvous, with the coxæ and trochanters white, spotted above with black. The markings of the head and thorax are almost exactly like those of *duplicatus*. The ♀ is much more robust than the ♂, but is similarly colored, except the head, which is black, with the anterior orbits, generally interrupted on each side of antennæ, a spot on middle of face and more or less of the clypeus, either yellow or ferruginous; the antennæ are short and stout, black, reddish at base beneath, and with a white annulus in the middle; the pleura is often without any spots; the legs are short and robust, fulvous, the coxæ and trochanters whitish, the posterior coxæ marked with black as in the ♂; the abdomen is oblong-ovate, depressed, shining; the first segment smooth and shining at tip, which is margined with yellow; sometimes this segment varies from fulvous to black; second and third segments sometimes with a brown stain on each side as in the ♂. Length ♀, 6½—7 lines; ♂, 6—8 lines. Six ♀, eighteen ♂ specimens, from Mass., Ct., N. Y., N. J., Pa., Del., Md., D. C.

**I. laevis.**—♂. Head black, the orbits, very broad on the cheeks, the face, except a triangular black mark on the middle, the clypeus, except a central black stripe, the mandibles, except tips, and the palpi, white; antennæ long,

slender, black, with a yellow annulus about the middle, the basal joint beneath white; thorax black, upper and lower margins of prothorax, two central, longitudinal lines on mesothorax, two spots on tegulæ, scutellum and post-scutellum, white; a large white mark on each side of pleura, bearing two oblique black lines; metathorax with two spots behind, and one on each extreme side, white; wings hyaline, nervures black, areolet triangular, slightly oblique; legs fulvous, the four anterior coxæ and trochanters white; posterior coxæ and trochanters black, the former with a large mark above, and their apex beneath, white; tips of tarsi dusky; abdomen fulvous, tinged with dusky at base; first segment bicarinate, black at base and apex, the latter with three white spots; second, third and fourth segments with a lateral white spot at tip; beneath fulvous. Length  $4\frac{1}{2}$  lines.

*Hab.*—Illinois, (Dr. Lewis). One ♂ specimen.

**I. honestus.**—♂. Head white, two spots behind insertion of antennæ, spot on vertex covering ocelli, and the occiput, black; antennæ long, more slender at tips, subserrate, black, with a broad yellowish annulus beyond the middle, beneath the basal half is fulvous, and the apical half yellow and dusky, the basal joint beneath whitish; thorax black, margins of the prothorax, two longitudinal lines on mesothorax, two dots on posterior margin, tegulæ, scutellum, post-scutellum, metathorax, except base and sides, line beneath each anterior wing, and the pleura, except upper margins and spot in front of each middle coxa, all white; wings hyaline, faintly tinged with yellowish before the apex; legs honey-yellow, coxæ and trochanters white, the posterior pair with an exterior black mark, tarsi yellowish, tips of posterior femora within, and tips of their tibiæ dusky; abdomen elongate, narrow, subdepressed, honey-yellow, darker at apex; apical margin of the four basal segments and the apical segment entirely, yellowish-white, the margin on the second, third and fourth segments dilated on each side. Length 5 lines.

*Hab.*—West Virginia, (Jas. Ridings). One ♂ specimen. A prettily marked species.

**I. uxorius.**—♀. Robust, black; head large, slightly narrowed beneath, eyes prominent; orbits, very broad on the cheeks, face, clypeus, mandibles and palpi, white; antennæ long, convolute at apex, black, with a broad white annulus beyond the middle; collar, a large mark on each side of prothorax above, double spot on middle of mesothorax, a spot on each side behind near base of scutellum, line beneath each anterior wing, scutellum, except base, post-scutellum, most of pleura on sides and beneath, a large round spot on each extreme side of metathorax and the posterior excavation, all white; metathorax transversely rugose, the elevated lines sharply defined, the central area large and subquadrate, and the posterior angles produced into a blunt spine; wings hyaline, areolet smaller than usual and triangular; legs honey-yellow, the four anterior coxæ and trochanters and base of posterior trochanters behind, white; abdomen unusually short, ovate, polished, fusco-ferruginous above, the basal segment blackish at tip above; beneath dull honey-yellow. Length 6 lines.

*Hab.*—Cuba, (Coll. Dr. J. Gundlach, No. 30.) One ♀ specimen. May possibly be the ♀ of *serricornis*.

**I. scitulus.**—This is an exceedingly variable species. The antennæ have the annulus sometimes very broad, sometimes subobsolete; the thorax often more or less varied with ferruginous; the metathorax varies from black spotted with yellow, to entirely ferruginous or yellow; the pleura often varied with yellow;

the posterior coxæ and femora are always more or less black, and the abdomen varies from entirely honey-yellow to ferruginous banded with black. Length  $2\frac{1}{2}$ — $4\frac{1}{2}$  lines. *I. pectoralis* seems to be closely allied to this species, differing principally in the colors of the posterior legs. Say must have meant that the pleura has a large yellow spot between the anterior and intermediate legs, instead of the "intermediate and posterior" pair, the four posterior coxæ being nearly or quite contiguous.

**I. facetus.**—♂. Head whitish, vertex and back of occiput black; antennæ long, slender, blackish above, with a broad white or yellowish annulus beyond the middle, the basal half beneath whitish; pectus and pleura white or whitish; prothorax more or less white, sometimes honey-yellow and black, margined with white; mesothorax varies from entirely honey-yellow to entirely black, sometimes there are two faint, pale, longitudinal lines in the middle, and sometimes two short white lines or a square white spot on the disk; tegulæ, scutellum and post-scutellum white or yellowish-white; metathorax whitish, variegated with honey-yellow at base, sometimes entirely honey-yellow; wings hyaline, iridescent; legs pale honey yellow, the four anterior coxæ and trochanters and posterior pair beneath white, tarsi pale yellowish; abdomen narrow, shining, entirely honey-yellow; first segment slender, smooth and polished, the extreme tip sometimes pale yellow. Length 4— $4\frac{1}{2}$  lines.

*Hab.* West Virginia, (Ridings.) Fifteen ♂ specimens.

**I. utilis.**—♂. Pale honey-yellow; head broad, short, black or brown; face, clypeus, mandibles and palpi yellow; antennæ long, filiform, honey-yellow, dusky above, basal joint yellow beneath; sutures of the thorax blackish; tegulæ, sutural line before the wings and a short line beneath, anterior margin of prothorax, scutellum and the post-scutellum, yellow; metathorax sometimes tinged with yellow behind; wings subhyaline, nervures and stigma honey-yellow, areolet subtriangular; legs honey-yellow, the four anterior coxæ and trochanters pale yellow; abdomen entirely pale honey-yellow, first segment slender, slightly swollen at tip which is clearly and finely punctured and shining. Length 4 lines.

*Hab.*—Mass., (Ridings); Conn., (Norton).—This is a parasite on the Canker-worm, and is closely allied to *facetus*.

**I. tumidifrons.**—♀. Small, stout; head black, face protuberant (but not so much as in *Erochus*), ferruginous, clypeus and mandibles also ferruginous; antennæ short, stout, convolute, joints short and thick, basal joint large, subglobose, basal third ferruginous, middle yellowish-white and apical third black, thorax ferruginous, pleura beneath, the spaces on each side of scutellum, and the metathorax entirely, black; scutellum pale yellow, the post-scutellum tinged with ferruginous; metathorax punctured, shining, central area large, elongate-subquadrate, not well defined; tegulæ honey-yellow; wings subhyaline, iridescent, nervures pale brown, stigma honey-yellow, areolet broad, 5-angular; legs robust, ferruginous, including their coxæ; most of the posterior femora and tips of their tibia; black; abdomen broad, depressed, pale ferruginous, apex of fourth segment and the remaining segments black; apical segment with a central yellow spot. Length  $2\frac{1}{2}$  lines.

*Hab.*—Illinois, (Dr. Lewis.) One ♀ specimen. The protuberant face resembles that of the genus *Erochus*, but the antennæ are convolute and the areolet of the anterior wing is 5-angular and complete. In some specimens of this species the color of the thorax may vary from entirely ferruginous to entirely black, as with *annulipes*.

**I. quadriceps.**—♀. Elongate, narrow, subcylindric; honey-yellow; head large, quadrate, or somewhat subglobose, deeply emarginate behind, entirely black, polished; antennæ short, thickened at tip, the joints short, the basal third fulvous, the rest black, with a broad yellow annulus about the middle; thorax long, narrowed anteriorly, the region about the scutellum blackish; metathorax long, feebly sculptured, with a long central area; wings short and narrow, hyaline, iridescent, areolet broad, 5-angular, nearly quadrate, nervures brown; legs short and stout, honey-yellow, the four posterior femora, except base, and their tibiæ entirely black; abdomen subcylindric, thickened towards the apex, first segment smooth above, gradually dilated to the tip; the fifth and following segments black. Length  $3\frac{1}{2}$  lines.

♂. Colored like the ♀, but the antennæ are much longer, filiform, fulvous, dusky above and at tips beneath; only the tips of the middle femora and tibiæ are black, and the abdomen has the sixth and following segments black.

*Hab.*—Canada, Connecticut. One ♀, one ♂, specimens. This has much the appearance of an *Alomya*.

**I. helvus.**—♀. Ferruginous, very densely punctured, slightly pubescent; head broad, transversely quadrate, eyes small, mandibles brownish; antennæ short, with short, thick-set joints, apical joints blackish; mesothorax, scutellum and base of metathorax shining; scutellar region sometimes blackish; tegulæ yellowish; wings shorter than usual, subhyaline, tinged with pale fuscous, nervures and stigma brown, areolet broad, 5-angular; legs rather slender, entirely ferruginous; abdomen elongate, depressed, shining, slender at base, the first segment not suddenly dilated at tip, the upper surface of which is very finely aciculate. Length  $3-3\frac{1}{2}$  lines.

*Hab.*—Connecticut, Pennsylvania, Illinois. Fourteen ♀ specimens.

**I. helvulus.**—♀. Elongate, narrow, ferruginous, somewhat shining, very delicately sculptured; eyes smaller than usual; antennæ moderate, dusky, with a narrow whitish annulus about the middle, basal joints ferruginous, short, not so thick set as in *helvus*; scutellum polished, the region on each side more or less blackish; metathorax with the elevated lines indistinctly defined; tegulæ pale; wings shorter than usual, subhyaline, nervures pale, areolet broad, 5-angular; legs stout, tips of posterior femora and of their tibiæ dusky, posterior coxæ with a short, blunt tubercle beneath near the tip; abdomen elongate, subcylindric, subconvex, first segment convex at tip, smooth and shining; the two or three apical segments blackish. Length  $3-3\frac{1}{2}$  lines.

*Hab.*—Connecticut, Pennsylvania, Illinois. Four ♀ specimens. Closely allied to *vincibilis*, but has the joints of the antennæ shorter, the legs stouter and the posterior coxæ armed beneath; the abdomen is differently formed.

**I. vincibilis.**—♀. Small, ferruginous, head large subquadrate; antennæ rather long, filiform, dull ferruginous, the incisures of the joints dusky, a narrow yellowish annulus a little beyond the middle, joints three and four long, subequal, five—seven a little shorter; metathorax with an elongate central area; tegulæ whitish; wings shorter than usual, subhyaline, iridescent, nervures pale, areolet 5-angular; legs slender, entirely pale ferruginous, tips of tarsi dusky; abdomen elongate, slender at base, broadest a little before the apex; first segment minutely aciculate at tip; three apical segments black, shining, sometimes the fourth segment is more or less blackish. Length 3 lines.

*Hab.*—Illinois, (Dr. Lewis.) Two ♀ specimens.



## GEOTRUPES OF BOREAL AMERICA.

BY GEO. H. HORN, M. D.

[Communicated December 9th, 1867.]

My attention was directed to this well known genus by the elaborate monograph of H. Jekel, published a short time since in the *Annals of the Entomological Society of France* (Series IV, Vol. V, pp. 513 et seq), in which all the species known to him have been more fully described, and characters for their subgeneric division more fully detailed than in any preceding work. Many new distinctions have been pointed out, which, though subject to some and even important variation, are none the less useful in enabling the establishment of a certain number of groups around which, with a large series, all the aberrant forms may be readily arranged.

As regards our own species, the characters given for their subgeneric division have long been known, though never published by any American entomologists, still to Jekel must be given the credit of so elaborating his observations as to make the study of this genus a matter of easy accomplishment.

In no other genus has tradition so completely controlled specific names as in this, and specimens have been scattered over our own and foreign countries with names far from correct, while under a single name, individuals of different species have been found associated with no other points of resemblance save that of color.

The names of Mr. Say have become purely traditional, as his typical collection has been totally destroyed and but few if any specimens named by him remain. With this fact before us it appears proper, with the able work of Jekel, to fix definitely the names of Say and others, so that in future, trouble may be avoided. The determination of our own species in this work has been a matter of special argument, and, though all American cabinets will be thrown into confusion, it is none the less proper that these determinations should be adopted.\*

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\* The species formerly known in our cabinets as *Blackburnii*, will be found in the subsequent pages as *semiopacus*, while the former name is applied to that known as *excrementi*. As the change affects our most prominent species, it would be well for those who may be interested in the matter, to refer to the work of Jekel, where the reasons for the change will be found.

Our species may be divided into four subgeneric groups, characterized as follows:—

Thorax dissimilar anteriorly in the two sexes.

Elytra connate; body apterous, metasternum short.....**Mycotrupes** Lec.

Thorax similar ♂ ♀; elytra free.

Antennæ with the second joint of club normal. Apical tooth of anterior tibia prolonged internally in ♂, simple ♀.

Middle tarsus ♂ short, thick.....**Onychotrupes** Jekel.

Middle tarsus ♂ normal.....**Cnemotrupes** Jekel.

Antennæ with the second joint of club truncate or emarginate, so as to be hidden at some point when the club is closed.

Apical tooth of anterior tibia similar ♂ ♀.....**Anoplotrupes** Jekel.

#### MYCOTRUPES Lec.

This subgenus forms a very natural transition between the two *Chelotrupes* Jekel and *Thorectes* Mulsant, agreeing with both in the connate elytra and short metasternum, though differing from either in the form of the thorax. In the male the thorax has a broad transverse excavation, the females have a very well marked longitudinal groove with a shallow excavation on each side. The thorax is strongly sinuous at base and without margin. The head of the male is strongly tuberculate, and in one specimen prolonged into a horn. The elytra are not striate but ornamented with small granules in a manner similar to some of our species of *Canthon*. The anterior tibia has the apical tooth prolonged internally ♂; the middle tarsus is normal ♂ ♀, though longer in the ♂.

But one species is known in this group, *retusus* Lec. (Proc. Acad. 1866, p. 381,) long known under the same name, though unpublished, by MacLeay, and distributed in some European collections by Major Leconte as *fungivorus*. It was unknown to Jekel, who thought it might possibly be synonymous with the *opacus* of Haldeman. It may be readily distinguished from any other *Geotrupes* by the characters above given, and the more easily from our own species by its short metasternum and connate elytra. It is found in our southern states feeding in fungi or under dried animal matter.

#### ONYCHOTRUPES Jekel.

Several of our largest and most prominent species enter into this subgenus. It is characterized by a great thickening of the middle tarsus. The first four joints are shorter than broad (♂), the last very thick, with the two claws also much thickened and suddenly re-

curved, extending as far back as the third and even second joint. In the females the same tarsi are thickened, less so however than in the males. The internal apical spine of the middle tibia equals in length the first four joints of the tarsus, in both sexes.

This subgenus has been divided into two groups, 1st, head tuberculate, thorax margined posteriorly, 2nd, head not tuberculate, thorax without posterior margin. These characters are subject to great variation, though in the first group the head is never so smooth and the margin so nearly absent in any one specimen as to require its position in the second group. In the second group, though the thorax may have a distinct margin behind, the head is never tuberculate. The posterior thoracic margin is defined by a well marked line, and the thorax is said to be inmarginate when this line is absent or replaced by a few distant punctures only. Individuals occur in *semiopacus* in which the margin is quite distinct. These two groups have a different appearance. The first more or less metallic or shining, the striæ punctured in a greater or less degree. The second group contains species more or less opaque, with the dorsal striæ entirely impunctured.

In the first group Jekel mentions three species as occurring in our territory, *splendidus* Fab., *Starkii* Jekel, *miarophagus* (Say) Jekel, in the second, *semiopacus* Jekel and *Melsheimeri* Jekel; one other in each group is mentioned as possibly occurring in our territory.

With *splendidus* Fab. as a starting point in the first group, the other two species will be compared and their value determined.

*G. splendidus* Fab.—In every collection I have examined, this species has been found with the correct name, though as varieties of the same were to be found several of the other species whose color happened to be more brilliant than common. When of typical form and color, there can be no trouble in recognizing this species, though it varies in color through all the shades from brilliant metallic green to a dark bronze, and in size from .46 to .68 inch.\*

Before considering the varieties of *splendidus*, better results would be produced by reviewing the differences between it and *miarophagus* Jekel.

*G. miarophagus* is defined as a "very large *splendidus*, of which the color above is violet or purple, sometimes bronze, generally moderately brilliant but not metallic, always darker and duller beneath." The

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\* These and all subsequent measurements will be considered as having been made from the anterior thoracic margin to the apex of the elytra.

remainder of the description affords nothing more definite. In fact, it is said to be merely a little broader and more massive, and with rather less convex elytra. In a small series or from a series collected in two remote portions of our country, individuals will be found capable of definition as veritable *miarophagus*. In large series, however, these vanish and varieties of all shades of color and almost every degree of convexity appear. I cannot but consider this species a variety of *splendidus*, inseparable by any well defined characters.

*Starkii*, which Jekel places between the two above mentioned, will be considered hereafter. It does not belong to the group, in my opinion, and reasons will be given when the *Anoplotrupes* are considered.

The races may be defined as follows:—

- a. *splendidus*, brilliant metallic green, very shining. Elytra deeply striate, with well defined, crenate punctures; interstices very convex.
- β. *miarophagus*, violet, purple or aeneous, not metallic. Elytra striate, punctures scarcely crenate; interstices moderately convex.
- γ. *mixtus* (Harris in coll. Leconte), purple, bronze, almost black, less shining than either the above forms, rather larger and more robust. Elytra faintly striate, punctures small, not crenate; interstices flat, scarcely elevated.

In the large series at my disposal, specimens can be arranged in a circle without the possibility of defining distinct species, though the differences between a typical *splendidus* and a nearly smooth *mixtus* are very great.

The second group of this subgenus is represented in the Monograph of Jekel by two species in our territories, *semiopacus* and *Melsheimeri*. *Semiopacus* Jekel has been distributed through the cabinets of this country under the name *Blackburnii*, and has been known as such in all our collections of reference. To Jekel is due the credit of recognizing the true species of Fabricius, and placing our most common species under a separate name. It may be readily known by the absence to a greater or less degree of the marginal line at the base of the thorax, the smooth, unarmed head, with striate elytra, striæ not punctate, interstices flat, smooth. Specimens occasionally occur in which the marginal line at base of thorax is complete, though never so well marked as in the most poorly-marked species of the preceding group. *Melsheimeri* differs too slightly from *semiopacus* to be considered distinct. Specimens agreeing in all particulars with his description are before me, and as his specimen was a female (by far the most variable sex in all the species), I have less hesitancy in uniting them.

## CNEMOTRUPES Jekel.

In this subgenus the middle tarsi are normal in both sexes. The joints are more or less cylindrical, and much longer than broad; the first three joints equal the longest spur of the same tibia. The claws are less thickened than in the preceding group, and not abruptly recurved upon the tarsal joints.\*

The species of temperate and intertropical America form two groups, best defined by the form of the anterior coxæ and the sinuosity of the posterior thoracic margin.

Those of our own country are again divided into two sub-groups. In the first the spine of the anterior tibia of the male is short and robust, not equaling half the length of the external apical tooth. In the second group the spine is slender as in the female, nearly equaling the length of the external apical tooth. To the first division belong *Blackburnii* Fab. and *conicollis* Jekel.

The former is our smallest species, and varies considerably in every particular, though at all times preserving the characters of the subgenus and group to which it belongs. A form occurs, rather abundantly, in which the thorax is much more convex longitudinally and transversely, the elytra are also rather more convex. It has considerable resemblance to a small bronzed *miarophagus*; as a variety I would propose the name *Jekelii*. The elytra are also more deeply striate and punctured than in the typical form. It cannot be regarded as a distinct species, numerous individuals show a variation towards the original type.

*Conicollis* Jekel has not been seen by me. It appears distinct from *Blackburnii*. Its name suggests the only important difference between it and the preceding species. In order that it may be recognized if found, the original description is inserted:—

"*CONICOLLIS* Jekel. Ovatus, supra æneo-brunneus, infra subviolaceo-piceus, epipleuris angustis violaceis; antennis rufis clava fulva; clypeo semi-circulari marginato tuberculo obtuso; thorace longiore et angustiore, subconico, lateribus haud rotundato nec ampliato, dorso obsolete laxe—lateribus evidenter sat dense—punctato, cum foveola parum impressa punctulata; scutello transverso subtriangulari; elytris mox ultra medium subparallelis, apice latius subtrun-

\* Care should be used in the determination of the specific names of females. The comparative length of the spur and tarsal joints, though readily perceived, may at times cause erroneous results, as from various accidental circumstances the spur may be broken, or the tarsus itself may be thicker than usual. It is therefore better to consider, at the same time, the relative breadth and length of the joints.

cato-rotundatis, striis punctatis angustis, interstitiis tenuiter concinneque transversim rugulosis.—Long. 13; lat. 8 mill., ♂.”

The second group is again divided into polished species with deeply striate elytra and with a yellow antennal club, and those which are opaque, elytra finely striate and antennal club sooty.

*Egeriei* Germar and *Lecontei* Jekel constitute the first sub-group.

*Egeriei* has the elytra deeply sculptured and deeply crenato-punctate, forming in this respect the most rugose of our species. In the typical forms the epistome is rounded, in the females it is frequently more prolonged and becomes almost triangular, forming the species *Lecontei*, itself founded on a unique female. A well defined series before me, gathered from all parts of our country, show the elongation of the epistome to be merely an accident or variation and not by any means a permanent character. The females more particularly are subject to this variation. In fact, among all the specimens at my disposal I am unable to find a single male with this and other characters sufficiently marked to enable it to enter this variety. *Egeriei* has been known in some cabinets, native as well as foreign, as *exaratus* Dej.

The second sub-group contains *Haldemani*, *opacus* and *Chevrolati*. In regard to the first species Jekel has been singularly unfortunate, as Huldeman's type corresponds exactly with his description of *Haldemani*. Specimens from Texas are large and robust, and much more convex than those from more northern regions. *Haldemani* and *Chevrolati* have both been founded on unique specimens, and though I have seen representatives of each in a series, it is impossible to tell where one begins and the other ends.

#### ANOPLOTRUPES Jekel.

The *Geotrupes* of this subgenus are characterized by a truncation of the second joint of the antennal club, and by the absence of any sexual difference in the apical tooth of the anterior tibia. Our American species have also a rather broad margin to the elytra, particularly at the basal third, similar to that seen in many species of the group *Phebotrupes*, and in the European *Anoplotrupes sylvaticus* and *Sternotrupes vernalis*. The thorax has a slight dorsal sulcus, and the scutellum is also sulcate.

Among the numerous specimens of this subgenus now before me, considerable variation exists in the degree of emargination of the second joint of the club. In one large specimen of *similis* Jekel the joint is deeply notched so as to appear reniform. From this we have every degree of degradation. Many specimens show simply an oblique trun-

cation of the joint, others again without any truncation or emargination, but a thinning of the edge so that the other joints, which are always thicker in this instance, readily conceal a portion of the edge. Specimens in my possession show in one antenna a slight truncation, in the other a normal condition of the second joint of the club, similar indeed to that seen in the other great sub-division of the genus.

Specimens agreeing in all particulars with the description of *Onychotrupes Starkii* Jekel are before me, which, it appears to me should enter into this subgenus, notwithstanding the absence of the characteristic emargination of the second joint of the antennal club. In no other of our species do we find anything approaching the margining of the elytra seen in this group. The fact of the resemblance of this species to his *Balyi* has been noticed by Jekel. A singular fact in connection with this species, is that it, also, was founded on females (?), as the measurements given refer to that sex alone, at the same time mentioning that the species was not rare in European cabinets. I was equally unfortunate in recognizing males referable to the subgenus *Onychotrupes*, in a comparatively large series gathered indiscriminately from all parts of our country. With this fact before me, and with the known variation of the degree of emargination of the club, the number of tibial ridges, and with the margining of the elytra, no other course could be pursued than that taken in the preceding part of this paragraph. In external appearance, *Starkii* cannot be distinguished from *Balyi*.

In regard to the characters separating *Balyi* and *similis* it can only be said that they are among the most evanescent of those used for defining species. The variation of the tibial ridges has been noticed in *Blairburnii*, and the same variation is seen in the species of this group. Specimens are before me with three well defined ridges, and as the specimens become smaller and the antennal emargination vanishes, the third ridge grows less, until a small tubercle remains on the line with the others which are normally above it.

I cannot therefore but consider all these as merely races of one species, and unite them under one specific name in the following order:—

**Anoplotrupes Balyi** Jekel.

*Var. α, similis* Jekel.—Posterior tibia tricarinate. Second joint of antennal club emarginate.

*Var. β, Balyi* Jekel.—Posterior tibia bicarinate. Second joint of antennal club emarginate or obliquely truncate.

*Var. γ, Starkii* Jekel.—Posterior tibia bicarinate. Second joint of antennal club normal or but slightly truncate.

I have the less hesitation in uniting these species as individuals in number are before me from the same localities from which the specimens of Jekel were obtained; while in determining the synonymy of all the species, specimens have been sought from all parts of our country, and have been studied individually.

The species of the genus *Geotrupes*, proper to Boreal America, may be arranged in the following manner, with only such synonyms given as rest on published descriptions, to which reference will be made.

### GEOTRUPES Latr.

#### MYCOTRUPES Lec.

*G. retusus* Lec. Proc. Acad. 1866, p. 381.

#### ONYCHOTRUPES Jekel.

*G. splendidus* Fab. Syst. Ent. p. 18, No. 63.

Var. *miarophagus* Jekel, Monog. loc. cit. p. 611.

Var. *mixtus* Horn, supra.

*G. semipacus* Jekel, Monog. l. c. p. 612.

Var. *Melsheimeri* Jekel, Monog. l. c. p. 613.

#### CNEMOTRUPES Jekel.

*G. Egeriei* Germ. Ins. Spec. I. p. 114.

Var. ♀ *Lecontei* Jekel, Monog. l. c. p. 592.

*G. opacus* Hald. Proc. Acad. 1853, p. 362.

Var. *Haldemani* Jekel, Monog. l. c. p. 593.

Var. *Chevrolati* Jekel, Monog. l. c. p. 595.

*G. Blackburnii* Fab. Spec. Insect. I, p. 20, No. 85.

var. *excrementi* Say, Journ. Acad. iii, p. 210.

Var. *Jekelii* Horn, supra.

*G. conicollis* Jekel, Monog. l. c. p. 591. (Not known to me.)

#### ANOPILOTTRUPES Jekel.

*G. Balyi* Jekel, Monog. l. c. p. 617.

Var. *similis* Jekel, Monog. l. c. p. 617.

Var. *Starkii* Jekel, Monog. l. c. p. 609.

In order to render the preceding paper more easy of study, the author has had the following cuts prepared, rather as diagrams however than as exact illustrations. The species of *Geotrupes* are so common everywhere during the summer months, that with but little trouble a good series may be collected during a single season. As there does



not exist a good series in the collection of any one person or Society, it would be well for observers to turn their attention to a matter long since neglected by the older collectors among us, while novices for the most part care but little for investigation in material so unattractive as that forming the natural habitat of these insects.

Fig. 1 represents the form of antennal club called normal. The joints are all visible when the club is closed, there is no thinning of the edge nor emargination at any part. A lateral or end view shows the margins of all the joints. Their outline is elongated oval, and as seen by the illustration arranged eccentrically. The outer joint has in many specimens two grooves oblique to each other, sometimes uniting in a form resembling V.



Fig. 2 affords an illustration of the abnormal antenna as seen in our species of *Anoplotrupes*. The second joint, in most of the specimens, shows a distinct emargination, in fact being reniform in outline. The outer joints are more or less thickened at a point corresponding to the emargination, so that when the club is closed its form is preserved, and the touching of the first and third causes the hiding of the intermediate joint at the point of emargination. As stated in the body of the paper, this character is subject to some variation. Fig. 3. will serve to give an idea of the forms assumed, the spot in each being the point of articulation.



Accompanying this character will be found another in a different organ of the body. Fig. 11 shows the lateral margin of the elytra. The dotted line is the last stria extending in a very nearly straight line from the humerus to the apex. Beneath this line is another somewhat sinuous, this is the true elytral margin. Near the humerus a wide space can be seen. This is smooth, not striate, and but sparsely punctured. The margin thus formed between the last stria and elytral edge appears more or less constant in those species in which there is no sexual distinction in the apical tooth of the anterior tibia, and is consequently found in no other North American species save those of the subgenus *Anoplotrupes*. Fig. 12 shows the nearest approach to it in *Egeriei*.

The thickening of the middle tarsus in the group *Onychotrupes*, is shown in Fig. 4, which illustrates the middle tarsus of the male, either of *splendidus* or *semiopacus*. The spur of the tibia is much longer than the first four joints. The claws are much thickened and rather suddenly recurved.



Fig. 5 is that of the same tarsus of the female. The joints are broader than long, being in fact so short that the tibial spur equals and even exceeds the length of the first four joints.



Among the *Cnemotrupes* the joints as shown in fig. 6 are normal, being cylindrical and of such a length that the first three generally equal and exceed the length of the longest spur of the same tibia. Fig. 7 shows both spurs; the shorter being slightly curved. In both groups, *Cnemotrupes* and *Onychotrupes*, the long spur of the middle tibia (in ♀) appears to be equal in length. The disparity between it and the tarsus being solely dependant on the shortening of the latter, and not upon any greater development of the spur in either case.

In the two groups above mentioned (as well as in *Mycotrupes*), the anterior tibia affords evidence of sex. Figs. 8 and 9 represent the form assumed in the males. The apical tooth will be seen to be produced inwards and emarginate at tip. The spur also varies in length and thickness, as will be seen in the two figures given, in one (8) short robust, scarcely equaling the half of the length of the apical tooth. In the other (9) it is much longer and more slender, being, in fact, as in the female. The anterior tibiae of the females of all the groups resemble each other, and fig. 10 may represent that sex in each group. On the under surface of the tibia, running its whole length nearly, may be seen an elevated line, more or less denticulate or serrate, varying somewhat in each species, though not sufficiently in our own to be of much use in classification. In some East Indian species this line is elevated (in ♂) into several large hook-like teeth.



In figs. 13 and 14 will be found an illustration of the posterior marginal line of the thorax, more or less continuous across the whole border, broadly interrupted in *semiopacus* (13), continuous and well marked in *splendidus*, *Egyrrei* etc. (14).

## DESCRIPTIONS OF AMERICAN LEPIDOPTERA.—NO. 3.

BY A. R. GROTE AND C. T. ROBINSON.

## Family LYCAENIDAE.

THECLA, *Fabr.**Thecla inorata*, n. sp.*Thecla falacer* † Bdv. & Lec. (not Godt.), Plate 29. (1833.)

*Male*.—Allied to *Thecla lorata*, *G. & R.* Head, black, eyes circled narrowly with white; antennae, black, annulate with white, the club black. Body, above, black; the abdomen is whitish beneath. Legs, black, dotted with white; the longer scales are bluish grey.

*Upper surface* of wings of a uniform black or blackish, with a subdued brassy green reflection, which becomes prominent in certain lights, and is especially visible on the secondaries. An ovate paler sexual spot on the disc of primaries. Secondaries with two very unequal tails, the lower the longer, edged with white. Base of the fringes, from anal angle to the lower tail, white and at this place is a narrow white terminal line. Between the tails, the fringes, which elsewhere are dark, are tipped with white.

*Under surface* somewhat paler than upper, brownish-black, with a slight reflection. Two short whitish lines on the disc of primaries, shaded inwardly with blackish. Beyond, an interrupted, extra discal, semilunated, bluish white line, preceded by a band of interspaceal dark shadings, of which the line forms the outer margin; the inner margin of this band is also formed by pale scales, but these are usually improminent. An arcuate, incomplete, subterminal, bluish white line, edged outwardly by blackish scales. A narrow, dark, terminal shade on the margin. Secondaries with two short whitish lines on the disc, as on primaries, but here the lines are longer. An extra discal band formed by dark interspaceal shades, and edged on either side by semilunated, bluish white lines, the exterior the stronger marked. This band is irregularly macular; a detached spot is formed on the subcostal interspace; on the interspaces between veins 1 and 3 (H.S.) two elongated and inwardly arcuated, lunulated spots are formed. A lunulated, subterminal, bluish white line, edging inwardly a broken black line or series of reduced interspaceal black lunules; this line, inferiorly, is also faintly edged externally with bluish white; along anal angle

the black scales are followed by a fulvous streak, this by first a few white then black scales. Outside of the black scales, edging the subterminal line on the next interspace above, is a patch of powdery blue scales extending to the margin; on the interspace above is a distinct fulvous crescent, succeeded by black scales on the margin; the fulvous scales are also faintly continued on the next succeeding interspace, within the subterminal lunule, which is here completely enclosed. A narrow white line lies directly before the margin; its analogue on the primaries is faintly perceptible at internal angle. A narrow, dark, terminal shade; fringes as on primaries.

*Expanse*, 30 m. m. *Length of body*, 10 m. m.

*Habitat*.—Atlantic District. (Can.! N. Y.! Ga.!)

The absolute distinguishing character of this species from *T. lorata*, its nearest ally, consists in the absence of the extra basal line of dark atoms which crosses both wings beneath in the species from Virginia. A female specimen (Ga.!) differs by the costal edge of primaries at base and the extremity of the antennal club beneath being fulvous.

Since describing *T. lorata*, we have seen the typical specimen of Godart's *T. falacer*, in the Collection of Dr. Boisduval in Paris. It is a specimen of *T. calanus*, and is so regarded by Dr. Boisduval. The species figured by LeConte was not known in nature to Dr. Boisduval, who was led to regard these figures as representing Godart's species. Under the name of *T. falacer* Dr. Harris has probably described specimens of *T. calanus*. From this latter species *T. inorata* differs by its smaller size, its more blackish color, darker fringes, and the absence of the orange lunule on the upper surface of secondaries before anal angle.

The synonymy of these closely allied species will then be as follows:

1. *T. calanus*, *Westw.* (*Rusticus armatus Calanus*, Hüb.; *Thecla falacer*, Godt.; *id.* Bdv. & Lec., p. text).
2. *Thecla inorata*, *G. & R.* (*Thecla falacer*, † Bdv. & Lec., Plate 29).
3. *Thecla lorata*, *G. & R.*
4. *Thecla acadica*, *Edwds.* In this latter species the extra discal band of the under surface of primaries is completely macular, and the general color is more as in *Thecla mellinus*, *Westw.* (*T. humuli*, Harris). In all these species the costal edge of primaries at base is more or less touched with fulvous, most prominently so in *T. calanus*, while in *T. lorata* it is with difficulty to be detected.

## Family SPHINGIDAE.

Tribe *Macroglossini*.*SESIA*, Fabr.*Sesia thetis*.

♀.—Size and form of *S. diffinis*. Head, above, dull olivaceous; eyes narrowly circled with white scales; labial palpi pale yellowish beneath and on the sides, tinged with ferruginous inwardly, and with superior, lateral, black scales tipping the terminal joint. Antennae rather stout, blackish. Beneath, the thoracic parts are clothed with pale yellowish scales, as are the anterior femora outwardly. Legs, black. The thorax beneath is encroached upon centrally by the pale pectoral scales, but is elsewhere black. Above, it is entirely obscure olivaceous. Abdomen, above, black, shaded with brownish from over the base downwardly; the two pre-anal segments are entirely pale yellow except centrally beneath, while dorsally the pale yellow scales are narrowly tinged with brownish. Anal segmen and tuft, black. Beneath black.

Wings largely vitreous; anterior pair narrowly clothed with dark brownish scales along costal edge; an unusually narrow, terminal band tapering to internal angle; a basal scale patch below median nervure outwardly obliquely on internal margin. Secondaries largely vitreous; a very narrow, even, terminal, dark brownish edging; from the base downward the internal margin is broadly clothed with dark scales. Beneath, as above; the wings at base are partially clothed with pale yellow scales.

*Expanse*, 45 m. m. *Length of body*, 22 m. m.

*Habitat*.—California. *Lorquin*.

This species closely agrees in structure with *S. diffinis*; the body squamation is rough. The coloration of the body parts, and the narrow edging of the wings, will at once distinguish the present from our common species from the Atlantic District. *S. thetis* is the species mentioned by Dr. Boisduval under the name of "*Macroglossa thetis*," *Ann. Soc. Ent. Fr. Sieme Ser. Bull.* p. xxxii. During our recent visit, Dr. Boisduval kindly communicated to us a specimen of *S. thetis* for the purpose of publishing the species, together with other material illustrated in the present Paper, collected in California by M. Lorquin, and for which we have adopted the specific names with which the specimens were labelled by Dr. Boisduval.

## Family ZYGAENIDAE.

## Sub-Family CASTNIINAE.\*

ALYPIA, *Hübner*.

Three species belonging to this genus have been described from the Eastern portion of North America. Of these, our common *A. octomaculata* † from the Atlantic District, and *A. langtonii* ‡ from Canada, are very nearly related, but apparently to be regarded as distinct species. Not only does it appear that the differences between the two are constant, but a somewhat parallel relation sustained between two species herein described from the Pacific Coast, assist our conclusions as to what we may regard as specific differences so far as the ornamentation of the secondaries are concerned. Canadian specimens of *A. langtonii*, in the British Museum Collection, have been described as constituting a form of *A. octomaculata*, by Mr. Walker §; but, if our present views are correct, this is the result of an error. The third species, of which we have examined the specimens contained in the British Museum Collection, is *A. maccullochii*, described and figured in the *Fauna Amer. Bor.* Vol. 2, Pl. 4, fig. 5. In the style of ornamentation, this species is to be readily distinguished from the two preceding, being allied to *A. ridingsii* ||, from Colorado Territory, and to a new Californian species herein described.

As at present considered, the North American species of *Alypia* are as follows:—

1. *Alypia octomaculata*, *Hübner*. (*Zygaena octomaculata*, Fabr.)
2. *Alypia langtonii*, *Couper*, (*Al. octomaculata* ‡, Walk.)
3. *Alypia dipsuci*, n. sp. (Plate 6, fig. 37, ♀.)

♀.—Resembles *Alypia octomaculata*. Black. Head, black; labial palpi well extended beyond the front, black, roughly scaled; eyes very narrowly margined with pale sulphur yellow scales before the antennal insertions and more prominently and continuously so beneath. Patagia, pale sulphur yellow, fringed with black hairs. Abdomen entirely black or blackish. Legs, black; anterior and middle

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\* For the sake of conformity, we have adopted the sub-family termination for this Group, instead of retaining the original *Castniarces*, Bdv., under which it was primarily indicated. For a very interesting Paper illustrating the growth of *Castnia*, see Dr. R. A. Philippi's "*Metamorphose von Castnia*," *Stettiner Ent. Zeit.* p. 337, 1863.

† *Packard*, Notes on the Family Zygaenidae.

‡ *Couper*, *Can. Nat.* p. 64, 1865.

§ *List Lep. Ins. Brit. Mus.* Pt. 1, pp. 59—60.

|| *Grote*, *Proc. Ent. Soc. Phil.* Vol. 3, p. 521, Plate V, 1864.

tibiae clothed with orange colored scales; on the anterior tibiae the scales are thicker and more prominent and do not extend over the lower extremity of the joint; on the middle tibiae the orange scales are shorter, forming a lateral tuft and include a black dot near the lower extremity of the joint; the middle femora are faintly shaded with orange inwardly. All the tarsi are marked with whitish, the basal joints most distinctly. Antennae long, gradually thickening toward the tips, black, narrowly sub-annulate with white over their slender basal portion.

Wings black, with a faint reflection. Primaries with two large sulphur yellow spots: the first towards the base, smaller, sub-triangular; the second over the nervules, larger, sub-pyriform, oblique. Secondaries with a reduced, basal, sulphur yellow spot, and an outer, much larger, sub-quadrate patch. Beneath, the markings of the upper surface are exactly repeated, while the yellow of the spots is paler. The fringes of both wings, on either surface, are entirely black and silky.

*Expanse*, 28 m. m. *Length of body*, 12 m. m.

*Habitat*.—California. *Lorquin*.

Readily distinguishable from *A. octomaculata*, by its smaller size and the different color and proportion of the spots on the secondaries.

4. *Alypia sacramenti*, n. sp. (Plate 6, fig. 38, ♀.)

♀.—Size large. Black. Head black; labial palpi well extended beyond the front, black, inwardly touched with pale sulphur yellow scales. Antennae long, black, thickened toward the apices. Eyes narrowly margined on the front, before the antennal insertion, with pale sulphur yellow, and more prominently and continuously so beneath. Legs black, anterior and middle tibiae clothed with orange colored hair. Thorax black; the patagia and sides of the prothorax are sulphur yellow, the former fringed with black hairs. Abdomen entirely black.

Wings ample, black. Primaries with two subequal sulphur yellow spots: the first towards the base, irregularly sub-quadrate, its upper margin being angulated; the second over the nervules, sub-ovate, oblique. Secondaries with a single reduced sulphur yellow spot shading to whitish, situate beyond the discal cell. Underneath the spots are paler, more irregularly shaped and notably larger; this latter character is especially to be perceived when the single spot of the secondaries is considered; it is here whitish and much larger, being externally produced, than its analogue on the upper surface.

*Expanse*, 36 m. m. *Length of body*, 14 m. m.

*Habitat*.—California. *Lorquin*.

The present species sustains a similar relation to *A. dipsaci*, with that borne by *A. langtonii* to *A. octomaculata*. It is, however, larger than any of the allied species. From *A. dipsaci*, it differs prominently by the single reduced spot of the secondaries. The condition of the body parts in our material prevents any nice discriminations between the two species, so far as the corporal coloration is concerned.

5. *Alypia maccullochii*, Kirby.

6. *Alypia ridingsii*, Grote.

7. *Alypia lorquini*, n. sp. (Plate 6, fig. 39, ♂.)

♂.—Allied to the Canadian *A. maccullochii*, and to *A. ridingsii* from Colorado Territory. Black. Head black; eyes prominently margined behind with sulphur yellow; labial palpi roughly scaled, black, prominently exceeding the front; maxillae blackish; antennae black, terminally enlarged, neatly and closely sub-annulate with white along their basal portion. Thorax, black; tegulae sulphur yellow, fringed with black hairs. Abdomen, black, with two approximate, dorsal, sulphur yellow dots at base. Legs, mostly closely scaled, blackish; anterior and middle tibiae fulvous; the middle femora are also somewhat touched with fulvous inwardly.

Wings black, somewhat lustrous. Anterior wings with the costa swollen and slightly convex centrally, owing to the enlargement of the interspace above sub-costal nervure. Veins marked by lustrous scales. At base, a large sulphur yellow patch, obliquely margined outwardly and straightly inferiorly, neatly divided by the black median nervure into dissimilar portions. A rounded spot on the disc, and a transverse, sulphur yellow, narrow elongate-oval spot beyond the disc, neatly divided four times by the black nervules. Secondaries with a large whitish spot at base, the black median nervure separating a small portion inferiorly. Beyond the discal cell, an elongate, narrow, whitish spot, much as on primaries (but reversed, tapering inferiorly), and divided three times by the black nervules. Fringes, on both wings, black and lustrous. On both wings beneath, the ornamentation of the upper surface is reproduced; the spots are very pale yellow; on the secondaries the extra discal spot has lost its inferior dot, is broader and prolonged above sub-costal nervure towards the base of the wing.

*Expanse*, 26 m. m. *Length of body*, 11 m. m.

*Habitat*.—California. *Lorquin*.

Compared with three ♂ specimens of *A. maccullochii*, agreeing with Kirby's figure, contained in the British Museum Collection, and so determined in the B. M. Lists, the present species differs by the sub-ter-



minal band, which is divided into spots by the black nervules, being much narrower on either wing and coming to a point superiorly on the primaries. The discal spot of the primaries is smaller in *A. maccullochii* than in *A. lorquini*, and on the under surface the basal patch is larger. On the upper surface of the secondaries, the sub-terminal band is composed of five spots in Kirby's species, while in *A. lorquini*, where it tapers inferiorly, it contains but four. On the under surface, the white basal patch in Kirby's species is more extended, and the sub-terminal band receives one or two accessory spots inferiorly. Finally, the maculations of the secondaries are white in *A. maccullochii* and pale yellow in *A. lorquini*.

8. *Alypia mariposa*, n. sp. (Plate 6, fig. 40, ♀.)

♀.—Black. The eyes, behind, are prominently margined with pale yellow scales, elsewhere the legs, body parts and appendages are entirely black. Wings elongate, ample, black. Costal edge of primaries sub-sinuate, being medially depressed and acuminate at apices. An elongate, sub-triangular, pale yellow spot at base. A rounded discal spot and two similarly colored, angular, sub-terminal spots: the first situate superiorly sub-costally beyond the disc; the second on the interspace above nervule 2 (H.S.), beneath, but widely separate from the first, and differing from it in shape. Fringes, black, except at the apices where they are white. Secondaries with a series of extra discal, pale yellow spots, of which the first is larger and rounded, the second and third, situate inferiorly towards the internal margin, are approximate, smaller and obsoletely separated. Fringes black, white at the apices. Beneath, as above; on the primaries the basal spot is divided by dark scales clothing the median nervure; on the secondaries the inferior extra-discal spots are obsolete, being represented by a few powdery scales; the maculations on both wings are paler, nearly white. On their upper surface, the primaries show sparse and scattered pale scales along internal margin. On the secondaries there is a faint indication of a discal spot, more prominent beneath. In this species the wings show a disposition to become dusted with pale scales on either surface.

*Expanse*, 35 m. m. *Length of body*, 13 m. m.

*Habitat*.—California. *Lorquin*.

In this species the ample and elongate wings, the number of the alar spots and the black legs, afford ready distinguishing characters. The antennae are defective in our specimen.

The limits of the genus appear to be here reached, and we would not refer to *Alypia* a species communicated to us by Dr. Boisduval from Mexico under a MS. name, but which is apparently as figured *Agarista bimaculata*, *H.-S.*, *Exot.* fig. 26.

Sub-Family ZYGAENINAE.

The genera *Ctenucha* Kirby, and *Gnophaela* Walk., have been referred to the Bombycidae by Authors, but are now recognized as belonging to the Zygaenidae. Under the name *Callalucia* Grote, the characters of *Gnophaela* have been sufficiently exposed.

CTENUCHA, Kirby.

1. *Ctenucha virginica*, Grote (*Sphinx virg.* Charp.; *Cten. Latreillana* Kirby).
2. *Ctenucha cressonana*, Grote.
3. *Ctenucha ochroscapsus*, n. sp.

♂ ♀.—Size of *C. virginica*. Head entirely orange yellow. Labial palpi shorter than in *C. virginica*, and held porrected against the front; the short terminal article is black, while the basal joints are entirely orange yellow. Antennae long, black, closely bipectinate; in the ♂ the pectinations are longer than in the ♀, but shorter than in ♂ *C. virginica*. Collar dark cyaneous, bordered anteriorly and laterally with powdery orange yellow scales which also obtain obsoletely centrally. Sides of the prothorax orange yellow. Tegulae largely orange yellow, narrowly and evenly black on the sides outwardly. Thoracic disc dark cyaneous. Abdomen, above, bright cyaneous; beneath, black. Legs black; in the ♂ inwardly shaded with obscure whitish. Anterior wings dull black, with a faint cyaneous shade at base, immaculate. Fringes black except at apices, where they are prominently white and are again faintly whitish before anal angle. Secondaries black, shaded with cyaneous centrally and over internal margin; fringes black, except at apices, where they are white. Under surface resembling upper, but more brownish.

*Expanse*, 47 m. m. *Length of body*, 17 m. m.

*Habitat*.—California. ♂ ♀, *Mus. Berol.*

*C. ochroscapsus*, and the following species differ from *C. virginica*, and *C. cressonana*, in that the head is slightly narrower behind, while the labial palpi are somewhat shorter and porrected. These differences do not seem sufficient to authorize their generic separation, since in the totality of their remaining characters they agree with the typical species of the genus, which they resemble in form, size, and in the style of ornamentation.

4. *Ctenucha rubroscapsus*.

*Glaucopis rubroscapsus*, Ménétrières, En. Cor. An. Mus. Pet., p. 142, Plate 14, fig. 7. (1855).

♂. Head crimson on the vertex, occiput and between the eyes; front black. Labial palpi entirely crimson, except the short terminal article, which is black. Antennae, long, black, closely bipectinate. Prothorax above, black, behind the head, crimson. Tegulae largely crimson; at the sides, outwardly, these are narrowly and evenly bordered with black, and fringed with longer hair-like scales. Abdomen brilliant cyaneous, changing to greenish, anal hairs black. Legs black, anterior coxae whitish; middle femora spotted with white above the tibial joint. Anterior wings brownish-black above, much as in *C. virginica*; the costal edge is entirely and markedly white from base to apices, the latter fringed with white, as in *C. ochroscapsus*. Fringes black, except before internal angle, where they are prominently white. Secondaries bluish-black, much as in *C. virginica*; the fringes are white at apices and before anal angle, elsewhere black. Under surface resembling upper.

*Expanse*, 46 m. m. *Length of body*, 16 m. m.

*Habitat*.—California. ♂, *Mus. Berol.*

Differing from *C. ochroscapsus*, merely in coloration, the present species is readily distinguished by the crimson caputal and thoracic ornamentation, and by the white costal edge of the primaries.

## GNOPHAELA, Walker.

1. *Gnophaela aequinoctialis*.

*Dioptis (Gnophaela) aequinoctialis*, Walker, C. B. M. Lep. Het. Pt. II, p. 331. (1854).

*Habitat*.—South America. (Venezuela!)

♂ ♀. Coll. Mus. Brit. et Berol.!

Mr. Walker proposes the name *Gnophaela* to designate a group of the genus *Dioptis* and to contain *G. aequinoctialis*. This latter species, however, together with the two following, presents but a superficial resemblance to the typical species of Hübner's genus (*D. rica*, &c.) in its alar ornamentation, and is structurally very amply distinct. Although proposed by its Author to designate a *group* and not a *genus*, *Gnophaela* should nevertheless be retained in its present signification, instead of the equivalent but later term *Callalucia*, in accordance with custom and the law of priority in scientific nomenclature.

This is a structurally stout genus standing higher than the weak winged species of *Dioptis*, *Hübner*, with their powdery squamation.

**2. *Gnophaela vermiculata*.**

*Omoiala vermiculata*, Grote, Proc. Ent. Soc. Phil. Vol. ii, p. 334, Pl. 6, fig. 1 ♂. (1863).

*Callalucia vermiculata*, Grote, Proc. Ent. Soc. Phil. Vol. iv, p. 316. (1865).

♂ ♀. Compared with *G. aequinoctialis*, which the present species closely resembles, *G. vermiculata* is slenderer, smaller, and the abdomen and hind wings are less brilliantly cyaneous. The stigmatal abdominal white scales form continuous lateral white lines, and are not restricted to segmentary dots, as in *G. aequinoctialis*. The upper portion of the median white patch is more extended and nearly covers the discal cell, whereas in *G. aequinoctialis* it is restricted to a subquadrate spot at the outer extremity of the cell. On the secondaries the median patch is separated into two portions in *G. aequinoctialis*, by the intrusion of the dark scales which form the ground color of the wing. A very numerous series of *G. vermiculata*, has been brought by Mr. Ridings from Colorado Territory, the examination of which has evidenced the fact of the constancy of the species.

The three species of *Gnophaela* here cited, are structurally identical and very interesting, from the constancy to the very evident and simple generic pattern of ornamentation; their mimetic relation to the Diurnal *Stalactis heliconides*, has been already noted by Mr. Grote (l. c.). A specimen of *G. vermiculata* has been deposited in the Berlin Museum. The description of *Gnophaela*, *Walk.*, in the British Museum Lists, is unfortunately so insufficient as to have prevented the recognition of its characters by Mr. Grote when describing the species from Colorado Territory.

**3. *Gnophaela Hopfferi*, n. sp.**

♂ ♀. Size large. Head black; labial palpi black, except at base, where they are powdered with orange-yellow scales. Sides of the prothorax orange-yellow, which color extends between the anterior legs at base. Legs, black, slightly touched with white; the minute spurs on middle and hind tibiae are white. Thoracic region, above and beneath, black. Abdomen, cyaneous black; a white, lateral, stigmatal line, as in *G. vermiculata*. Wings large and full. Primaries trigonate, brownish-black, with three dull lemon-yellow spots at the middle divided by the median nervure and its fourth nervule; between this latter at base and the continuation of the nervure, the outer and smallest is placed. The upper spot, at the outer extremity of the discal cell, is restricted as in *G. aequinoctialis*. Over the nervules, terminally, is an oblique series of four interspaceal, unequal, ovate yellow spots, of which the second and largest is placed opposite the discal cell; these spots are

further apart than in *G. aequinoctialis* or *G. vermiculata*. Secondaries resembling primaries in coloration and ornamentation, but with a very faint bluish reflection. A large central yellow patch, analogous to the spots at the middle of primaries, is divided by the median nervure into two unequal spots, while the third, at base of fourth median nervule, is obsolete. Two ovate yellow spots are situated opposite the disc, and are separated by the black first median nervule. Under surface of both wings resembling upper. The fringes on either pair are black, faintly touched with white at the apices of primaries and costal angles of secondaries.

*Expanse*, ♂ 50 m. m.; ♀ 60 m. m. *Length of body*, ♂ 17 m. m.; ♀ 20 m. m.

*Habitat*.—California. ♂ ♀, *Mus. Berol.*

Dedicated to Mr. C. Hopffer, the well known Lepidopterist, to whose obliging courtesy we were much indebted during our recent stay at Berlin, and to whom we owe the privilege of examining many rare North American Lepidoptera, contained in the excellently preserved collection of the Berlin Museum. *G. Hopfferi* is readily distinguished from either of its congeners, by its superior size and the yellow color of the alar spots. In the conformation of the median patches on both wings, it resembles rather *G. aequinoctialis* than *G. vermiculata*, as also in that the external margin of the secondaries is slightly more angulated and less rounded than in the species from Colorado Territory. In the British Museum Collection, and in that of Dr. Boisduval, in Paris, are specimens of *G. Hopfferi* under an erroneous generic determination and unpublished specific name. Numerous specimens of *G. Hopfferi* are contained in the extensive collection of Dr. Felder, in Vienna; this eminent lepidopterist also possesses specimens of a fourth species of *Gnophaela*, from Mexico, allied to our *G. vermiculata* from Colorado Territory.

## Family BOMBYCIDAE.

### Sub-family ARCTIINAE.\*

#### EPICALLIA, *Hübner*.

1. *Epicallia virginalis*. (Plate 6, fig. 42, ♂.)

*Chelonia virginalis*, Boisd., Lep. Cal., p. 49. (1852).

*Arctia virginalis*, Walk., Cat. Lep. B. M., Pt. 3, p. 611. (1855).

*Arctia virginalis*, Morris, Syn. Lep. N. Am., p. 337. (1860).

*Epicallia virginalis*, Packard, Syn. N. A. Bomb., Proc. Ent. Soc. Phil. p. 108. (1864).

*Habitat*.—California!

\* *Arctiidae*, Stephens. For the sake of conformity, the Sub-family termination is here and elsewhere applied to the names hitherto employed to designate groups of this value, which have not apparently received such corrections.

We figure this species which has been described by Drs. Boisduval and Packard, as above cited, owing our material to the kindness of Dr. Boisduval, whose extensive collection contains a number of specimens of the present and following species.

**2. *Epicallia guttata*.**

*Agarista guttata*, Boisd., Lep. Cal. p. 48. (1852).

*Pleretes guttata*, H.-S., Lep. Exot. pp. 72, 83, fig. 464. (1858).

*Habitat*.—California!

This species, of which we have examined several individuals, agreeing with Dr. Boisduval's description and Dr. Herrich-Schaffer's figure, as above cited, seems to us to be properly regarded as a distinct form. While very similarly sized with *E. virginalis*, it yet appears somewhat slenderer, and differs most obviously by the black secondaries with a single yellow maculation near external margin before anal angle. This genus is allied to *Callimorpha*, *Latr.* The casual resemblance which *E. guttata* presents to *Agarista*, owing, perhaps, to its black uniguttate secondaries, induced its original describer to refer it erroneously to a different group from *E. virginalis*, with which it is structurally identical.

**ARCTIA, Schrank.**

*Arctia achaia*, n. sp. (Plate 6, figs. 45 ♂, 46 ♀.)

♂.—Head, between the eyes, pale yellowish buff. Labial palpi brownish black; eyes encircled with brownish black. Antennae rather short, bipectinate, brownish black. "Collar" pale yellowish buff with lateral black stripes behind the antennae. Patagia black, fringed with pale yellowish buff; a central thoracic black stripe; the upper surface of the thorax (including the patagia) may thus be described as pale yellowish buff with three longitudinal black stripes. Beneath, the under thoracic surface and legs are blackish brown; the longer lateral hairs below the insertion of the wings are yellowish. Abdomen yellowish, the sides tinged with reddish towards the base; a broad central black stripe; anus with lateral black spots; the segments beneath are brownish black fringed with longer pale yellowish hairs. The body is short and hirsute.

Wings full; primaries well produced at apices. Anterior wings black; the veins obsolete covered with pale yellowish scales, as is the costal edge at base. A broad, pale yellowish buff, longitudinal stripe runs from the base of the wing, at the center, to internal angle, where it is furcate at the margin. A broader, similarly colored, sub-basal, transverse band spreading on costal and internal margins. A median and much narrower stripe, similarly colored and tapering to internal mar-

zin. Terminally, upon the single longitudinal stripe, rests a series of similiarly colored bands resembling the letter K, with the straight stroke turned toward the base of the wing and the upper limb, not attaining the external margin, reflexed to costa before the apex. Internal margin narrowly and the short fringes entirely pale yellowish buff. Beneath, the ornamentation of the upper surface is repeated but less brightly. Posterior wings clear orange red, distinctly maculate with black: a luniform black spot at the outer extremity of the discal cell, over lying the cross-vein. A more squarish spot at the origin of vein 2 (ripped 2, *H-S.*); a third, smaller, before internal margin, parallel with the lunate discal spot. A subterminal or outer series of three parallel black spots, of which the first is smallest and the second largest; the spots composing this outer series are situate opposite those of the inner; the third is on internal margin near anal angle. The costal edge is yellowish; there is a black spot at base and a larger at basal third (both hidden by the primaries even when the wings are expanded); within the costal angle an irregular, black, terminal band is commenced, which extends along external margin to extremity of vein 2; between its cessation at this point and the spot near anal angle, there is a single small black spot situate midway on the margin; the terminal band inwardly and all the spots, with the exception of the discal, are very narrowly and faintly edged with ochreous. The fringes are yellowish. Beneath, the secondaries are yellowish with a reddish reflection; the ornamentation of the upper surface is repeated; there is a minute additional black dot on the costa before the inception of the terminal black band.

♀.—The general color is more ochreous. The transverse bands of the primaries are narrower, the veins are entirely marked with ochreous yellow scales. The spots on the secondaries are much larger while similiar in position; there are accessory spots at the base and on internal margin. The central black spot of the secondaries is notably larger when compared with that of the ♂. The under surface resembles the upper, where the same differences are perceivable. Antennae blackish, simple.

*Expanse*, ♂ 41, ♀ 43 m. m. *Length of body*. ♂ and ♀, 15 m. m.

*Habitat*.—California, *Lorquin*.

Allied to *A. virgo* and *A. saundersii*, from the Atlantic District.

**Arotia dahurica.** (Plate 6, fig. 41, ♂.)

*Chelonia dahurica*, Boisd., Icon. Hist. Lep. 126, 2, fig. 1. (1832).

*Chelonia dahurica*, Boisd., Lep. Cal. p. 48. (1852).

*Chelonia dahurica*, H-S., Saunm. Eur. Sch. Band II, p. 145. (1845).

*Arctia dahurica*, Walk., C. B. M. Lep. Het. Pt. 3, p. 597. (1855).

*Arctia dahurica*, Clem., Proc. Acad. Nat. Sci. Phil., p. 527. (1860).

*Arctia dahurica*, Morris, Syn. Lep. N. A., p. 341. (1860).

*Arctia dahurica*, Pack., Syn. U. S. Bomb., Proc. Ent. Soc. Phil. p. 118. (1864).

♂.—Head, pectus and labial palpi brownish; behind the antennae are ochreous scales; antennae black, finely bipectinate. Prothoracic pieces black, edged with ochreous hairs. Thorax black. Patagia black, fringed with ochreous. Thoracic parts, beneath, clothed with long brownish black squamation. All the tibiae are pale ochreous outwardly, as are the hind tarsi, while the anterior femora are also partially ochreous towards the lower end of the joint; elsewhere the legs are black or blackish. Abdomen, at base and dorsally, black, laterally bright ochreous; a segmentary series of black stigmatal spots. Beneath pale ochreous with sub-lateral series of broad segmentary maculations diminishing towards the anus.

Anterior wings somewhat produced at apices, black. Costal edge towards the base pale ochreous. Nervules finely marked by pale ochreous scales. An incomplete sub-basal transverse band and an outwardly arcuate median band, not extending below the internal nervure. A longitudinal stripe running from the base below the median nervure outwardly to internal angle, before which it is furcate on cell 1b; on this stripe rests terminally a series of transverse bands resembling the letter K, with the straight stroke turned towards the base of the wing and the fusion of the bands obsolete on cell 3. The short fringes are pale yellow, and extend uninterruptedly from the apices over the rounded internal angle along internal margin. Beneath, the wing is paler, while the markings of the upper surface are repeated, but less distinctly; the veins are obsoletely marked with pale scales. Secondaries largely black; subterminally these show irregularly shaped and elongated bright ochreous patches; fringes as on primaries. Beneath, the secondaries are largely marked with bright ochreous bands on a black ground.

*Expanse*, 34 m. m. *Length of body*, 15 m. m.

*Habitat*.—California. *Lorquin*.

Allied to *A. virginicula*, *Kirby* and *A. speciosissima*, *Moeschler*. The latter species is unknown to us and is possibly not sufficiently distinct from *Kirby's*, with which its describer has not compared it. *Dr. duval*, who communicated the specimen of *A. dahurica* we here de-



scribe and figure, stated to us that the original of this species was received by him from Eschscholtz as being collected in Siberia. Subsequently, receiving specimens from California, Dr. Boisduval conceived that the locality originally given was possibly the result of an error, since Eschscholtz had collected in Russian America on the Aleutian Isles, where his specimen may have been obtained.

**NEMEOPHILA**, *Stephens.*

**Nemeophila casspitis**, n. sp. (Plate 6, fig. 43, ♂.)

♂. Head, black, pilose. Labial palpi slender, tipped with ochreous scales. Antennae black, bipectinate. Collar black, with ochreous-yellow lateral patches. Thorax and patagia black. Legs, blackish inwardly; the femora are streaked with ochreous-yellow outwardly over the lower half of the joint; the tibiae and tarsi are continuously whitish-ochreous outwardly. Abdomen blackish, ochreous-yellow at the sides, where the brighter scales enclose a row of black segmentary spots; beneath, the segments are fringed narrowly with ochreous scales.

Anterior wings black. The costal edge is distinctly marked with yellowish-ochreous for nearly a third of its length. A broad, longitudinal, whitish-ochreous stripe, narrowing medially, stretches from the base of the wing till just before internal angle, terminating abruptly. A terminal series of transverse, similarly colored, and broad bands resembling the letter K reversed, and obsolete connected with the longitudinal inferior stripe. A large round, whitish-ochreous spot on the disc. Beneath, as above; the discal spot and the bands are tinged with yellow; this is noticeable particularly where the bands approach the margins of the wing. Fringes whitish-ochreous.

Secondaries largely blackish. A subterminal and very broad yellow-ochreous band enclosing two large black spots, and a third reduced at costa. This yellow band is deeper colored inferiorly, and terminates abruptly much before the anal angle; the blackish ground color which obtains beyond the termination of the band, encloses a small pre-anal yellowish spot. There is a terminal blackish border broken centrally where the yellow band reaches to the margin, which it does again very narrowly at its termination, thus enclosing a black spot on the margin. Beneath, as above. Fringes ochreous-yellow, deepening in color towards anal angle; the longer fringes along internal margin are blackish.

*Expanse*, 88 m. m. *Length of body*, 12 m. m.

*Habitat*.—California. *Lorquin*.

angle. Under surface dark wood-brown, without prominent markings; the terminal space and costal region is paler, on the latter the three pale ante-apical dots of the upper surface are repeated; the internal margin is more sparsely scaled below the nervure ("rippe 1," *H-S.*) where the short squamation is tinged with reddish. Posterior wings, above, closely scaled, wood-brown, with a faint reddish tinge over the costal region. Beneath, there is a distinct dark discal dot, and the exterior half of the wing is obsoletely limited as a darker portion.

*Expanse*, 55 m. m. *Length of body*, 27 m. m.

♂. Nearly resembles the female in color, size and ornamentation. The antennae are clean pale testaceous, strongly and evenly bipectinate. On the primaries there is a parallel elongate constricted spot, concolorous with the reniform and partially fused with it, resting on the median fold on the discal cell. This spot may be regarded as the orbicular, and is seen in some ♀ specimens, though reduced and usually absorbed by the outer edge of the oblique basal space. In its extent this spot seems to be subject to individual variation. The general color of the ♂ is paler than that of the ♀. The deep shading outside of the pale oblique basal space is very prominent below median nervure. The abdomen is terminally pointed and narrowed; since it is thickened and obtuse at the anus in the ♀, it presents a very striking sexual character.

*Expanse*, 48 m. m. *Length of body*, 23 m. m.

*Habitat*.—Atlantic District. (N. Y.!)

This species differs from *Arzama densa*, *Walk.* (*C. B. M. Lep. Het. Supp.* p. 645), the typical ♂ specimen of which we have compared in the British Museum, by its much larger size and different color. In ornamentation the two species are very similar. In *A. obliquata* the primaries are more produced at apices and the external margin is more sinuate. The style of ornamentation and appearance of this genus are not a little singular. The heavy ♀ abdomen and the dense squamation, reminds one of the *Bombycidae*. The shape of the primaries is normal with the present family; the costa is straight, and the nearly parallel internal margin is fully three-quarters as long as the costal, while the peculiar ornamentation of the upper surface of the primaries deceives one at first glance as to the real proportions of the wing. Mr. Walker's type is a male, in which the abdomen is comparatively slender, terminating pointedly. The much smaller Georgia species is entirely tinged with dull red-brown, the basal patch of the primaries is

less oblique than in *A. obliquata*; while wanting all hoary or pale scales, the thorax above is dark and unicolorous in *A. densa*. The genus seems allied to *Nonagra*.

**GORTYNA, Ochs.**

*Gortyna purpurifascia*, n. sp. (Plate 7, fig. 51, ♀.)

♀. Size, moderate. Bright ochre-yellow and purple. Head, underthoracic surface and legs light purple. Palpi purplish, beneath with pale scales. Antennae testaceous, tufted with white scales at base. Collar shaded with purple at the sides and in front, the scales becoming deep yellow behind. A prominent purple tuft centrally on the thorax, behind the prothoracic scales. Thoracic disc deep yellow, becoming purple behind where the scales are raised. Patagia deep yellow, shaded with purple in front and terminally. Abdomen pale, tufted on the dorsum, cinereous, with a purplish cast, the latter more prominent beneath.

Anterior wings slightly interspaceally excavate along external margin, deep yellow, powdered with red and shaded with purple. Base deep yellow. Basal half line reddish, geminate, its inner line traversing straightly the basal space; its outer, more sinuate, edging inwardly a broad purplish shade filling up the sub-basal space except at internal margin. This shade is margined outwardly by the transverse anterior line which is geminate, the two lines composing it becoming fused inferiorly, and running at variance and more widely apart at costa. Orbicular small, round, white, more or less stained by the ground color of the wing. Situate inwardly obliquely with regard to the orbicular, and below the median nervure, lie the intermediate and claviform spots, also white, moderate, the intermediate more or less stained by the ground color of the wing, both annulate with black and more or less coalesced, held apart by the red scales clothing the sub-median fold. All the nervures faintly marked by red scales over the median space. Median shade red, slightly irregular, running as usual from the costa downwardly and outwardly obliquely to the lower extremity of the discal cell beneath the reniform spot, thence inversely obliquely to internal margin. Reniform, distinctly annulate with red, of the ground color of the wing, upright and but little constricted, a parallelogram in shape, not resolved into clustered white dots as in allied species, but more or less edged with white above and below inwardly. Transverse posterior line double, consisting first of a narrow red line interspaceally very slightly waved, then of a broad and prominent even blackish band, the presence of which is a strong specific character. The line

in its totality runs downward and inwardly obliquely from just below costa; its inception takes place in reality above the reniform spot on costa, whence it runs immediately outwardly; the costal edge shows three pale dots at this place. The subterminal space is entirely purplish, edged outwardly by the subterminal line, the latter dark reddish, relieved outwardly by scattered yellow scales, dentate, irregular. An apical yellow shade; terminal space reddish-purple. Beneath, testaceous cinereous, shaded with pale purplish along the margins, and with two transverse pale purplish lines, the outer preceded on costa by a broad darker shade. A very narrow excavate line on external margin. Secondaries testaceous cinereous, with a broad, pale purplish, subterminal shade, within which is a faint transverse line. A narrow terminal line marks the external margin of the wing; fringes pale. Beneath, as on primaries, pale, with powdery-purplish scales along the margins; two faint transverse lines, the inner discontinued.

*Expanse*, 43 m. m. • *Length of body*, 20 m. m.

♂. Much smaller than the female, of a brighter yellow. The broad blackish transverse posterior line is very evident. The orbicular spot is pure white, and a little longer than in the female. The two inferior spots are also white, united and more prominent than in the opposite sex. Reniform distinctly marked with white above and below on its inner margin.

*Expanse*, 32 m. m. *Length of body*, 13 m. m.

*Habitat*.—Atlantic District. (Mass.!)

Allied to *G. rutila*, *Guenté*, but a more fulvous colored species, distinct in the form of the transverse posterior line and in the shape of the reniform spot. The male appears to vary in size, as is usual with the species of *Gortyna*.

*Gortyna speciosissima*, n. sp. (Plate 7, fig. 52, ♀.)

♀. Size large; form stout. Orange-yellow and purplish. Head, under thoracic surface and legs, pale purplish. Labial palpi pale beneath. Antennae testaceous with white basal tufts. Collar purplish; behind, yellowish. Thorax and patagia deep yellow, the latter shaded at the sides with purple, the former slightly sprinkled with purple behind. Abdomen tufted on the dorsum, entirely pale rosy-purple.

Anterior wings fulvous yellow, entire, smoothly scaled, with distinct ornamentation; veins marked with dark scales. Deep yellow at base; the narrow geminate basal line as in *G. purpurifascia*. The sub-basal space is suffused or irrorate superiorly with purplish. Transverse anterior line double, more or less distinct, reddish, once prominently den-

tate at costa, arcuate from subcostal to internal nervure, thence again outwardly but more roundedly projected to internal margin. Median space clouded centrally superiorly with reddish scales. Orbicular spot white, elongate, annulate with dark scales, moderate in size. Below the median nervure the intermediate and claviform spots are fused and form one moderate ovate white spot, annulate with black and smaller than the orbicular. Median shade-band shaped as usual, diffuse. Reniform peculiar in shape, being extremely attenuate and outwardly oblique; it is elongate, widening slightly inferiorly, and pure white, not resolved into distinct spots, annulate with dark scales. Transverse posterior line very distinct, consisting of two lines (of which the outer is deeper colored and most diffuse), roundedly arcuate over the nervules superiorly, thence running slightly inwardly obliquely to internal margin. Subterminal space darker than the rest of the wing, purplish, margined outwardly by the irregular and dentate subterminal line, which appears as the dark uneven edge of the space; three pale separate dots on costa. Terminal space concolorous with median, deep yellow, below the apices more or less irrorate and shaded with reddish scales on the interspaces. Secondaries entirely pale rosy-purple, becoming faintly and narrowly paler before external margin; traces of the usual transverse subterminal shade and internal line, but, owing to their general dark color, the secondaries appear immaculate; fringes concolorous with the wing, tipped with a paler shade. Primaries beneath washed with pale rosy purple over the disc, irrorate with similarly colored scales on the margins, and becoming testaceous or pale cinereous along internal margin and at base; traces of two parallel transverse subterminal shade lines. Secondaries testaceous cinereous, rather thickly irrorate with pale rosy purple scales, especially superiorly; a distinct transverse shade line and fainter subterminal shade; fringes less purplish than on upper surface.

*Expanse*, 49 m. m. *Length of body*, 26 m. m.

*Habitat*.—Atlantic District. (*See* *konk*, R. I., *Mrs. Bridgham*.)

This fine species is, perhaps, the largest North American representative of the genus. It varies but slightly in the distinctness of the ornamentation. From *G. purpurifascia* and *G. rutila*, it differs by its smoother squamation, heavier form, the peculiar attenuate shape of the white reniform spot, the even coloration, more distinct ornamentation, and the rosy-purple tinge of the secondaries above and wings beneath, this latter character reminding us of the species of *Nephelodes*, *Gn.* From *G. purpurifascia* it is easily separated by the course of the trans-

verse posterior line which, in the former, runs outwardly straightly on the costa and thence downwardly obliquely over the subcostal and median nervules, while in *G. speciosissima* it is outwardly arcuate over the nervules as in *G. rutila*, *Guente*.

*Gortyna inquassita*, n. sp.

♀. Size, small; form stout. Head, sides of the prothorax beneath and legs outwardly, dull purplish. Under thoracic squamation pale dull testaceous. Abdomen, above, testaceous cinereous, shaded with purplish beneath and at anus. Thorax deep ochre-yellow, shaded with purplish behind and at the sides. The head is sunken.

Anterior wings thinly and closely scaled, entire, deep ochre-yellow, shaded with purplish outside of the transverse posterior line. All the veins very distinctly marked with blackish, and the external margin shows a narrow distinct dark line. From the base to transverse posterior line, the deep yellow ground color of the wing is shaded with ferruginous scales. Transverse anterior line geminate, slightly undulate, perpendicular, improminent. The ordinary spots are very small, clear deep yellow, with dark reddish narrow annuli. Orbicular small, spherical, equally sized with the intermediate and claviform. These three spots in one specimen (Rhode Island) are whitish. Median shade very distinct and prominent, blackish, running as usual outwardly from costa to lower and outer angle of discal cell, thence inversely obliquely to internal margin. Reniform, narrow, elongate. Transverse posterior line geminate, consisting of a narrow reddish inner, and a broader blackish outer line, regularly arcuate over the median nervules, and running much as in *Hydroecia lorea*, *Gn.* Beyond this line the wing is obscurely washed with purplish; there are traces of the usual irregular subterminal line, while the terminal space is as usual free from dark shades at the apices, leaving these yellowish. Fringes rather dark, paler at base. Secondaries cinereous testaceous, with a faint diffuse subterminal darker shade. All the veins marked with dark scales. A narrow even terminal dark line follows the external margin of the wing. Beneath, the under surface of both wings is similar, silky, pale testaceous cinereous, powdered with pale dull purplish scales. Veins more or less completely marked with dark scales. Faint traces of a dark subterminal shade on costa of primaries. The secondaries are paler than primaries, and comparatively free from purplish scales below the costal region; they show faint indications of a transverse line.

*Expanse*, 29 m. m. *Length of body*, 15 m. m.

*Habitat*.—Atlantic District. (N. Y., *Mr. Ridings*; R. I., *Mrs. Bridgham*.)

Resembles superficially *Hydroecia lroea*, *Gn.* The body is proportionally heavier and the head more sunken than in that genus, from all the species of which it is readily distinguished by the presence of the very distinct angulated median shade and the lower accessory ordinary spots. In the shape of the wings it agrees with *Hydroecia lroea*, but the color is different, being brighter and deeper, as in the species of *Gortyna* above described. It appears to be the smallest of the North American species of *Gortyna* yet discovered with yellow or purple wings, the female being but little larger than small males of *G. nitela* or *G. nebris*, while proportionally much heavier bodied.

**HYDROECIA**, *Guenee*.

*Hydroecia sera*, n. sp. (Plate 7, fig. 55, ♂.)

♂ ♀. Very dark carneous brown. Antennae dark testaceous, with basal whitish scale tufts. Legs, inwardly, and under thoracic surface pale testaceous cinereous; tarsi subannulate; legs outwardly shaded with carneous or purplish-brownish, as is the under surface of abdomen. Sides of the ♂ abdomen with longer and brighter purplish scales. Abdomen, above, blackish cinereous, tufted on the dorsum basally. Hind tibiae with two pairs of pale unequal spurs.

Anterior wings dark carneous or purplish brown. Transverse lines geminate. A geminate basal half-line, the outer of its two component lines obsolete, the space between the lines is pale. Transverse anterior line geminate, its inner line obsolete, the space included by the lines paler than the ground color of the wing. The transverse anterior line is sharply dentate on costa, below median nervure twice arcuate to internal margin. A large orbicular spot with paler shaded centre, narrowly annulate with white and black scales. Median shade very diffuse. Reniform spot large, much constricted, annulate narrowly by black and white scales, spreading inferiorly over the median nervure and the nervules at base, where it is blackish, being superiorly concolorous with the orbicular. Transverse posterior line slightly arcuate superiorly, but straighter than usual, very regularly interspaceally lunulate; it is geminate, the outer line but faintly visible. Subterminal space paler than the rest of the wing. All the veins terminally are neatly marked with black and white scales, like the annuli of the ordinary spots. Subterminal line pale, irregular, preceded by a dark diffuse shade band; terminal space dark, paler at apices, A paler narrow even terminal line. Fringes dark, interspaceally excavate. Three minute, ante-apical, pale dots on costa. Secondaries blackish cinereous, becoming paler towards the base; a narrow dark terminal

line; veins shaded with darker scales; fringes pale, testaceous. Under surface of primaries blackish; costal region and external margin shaded with purplish scales; an arcuate blackish transverse shade band, beyond which a second, fainter, and followed on costa before the apex by a few whitish scales; between these two lines on costa are two pale dots; the terminal space is very pale purplish. Secondaries with the costal region and external margin thickly irrorate with pale purplish scales; a discal mark and two parallel unequal transverse blackish shade lines.

*Expanse*, ♂ 32, ♀ 34 m. m. *Length of body*, ♂ 16, ♀ 12 m. m.

*Habitat*.—Atlantic District. (N. Y., Penna.; No. "67," Canada, Mr. Bowles.)

Size of *H. nictitans*, and is readily distinguished from either that species or *H. lorea*, by its darker color, the shape of the reniform spot and the excavate fringes. In the extensive Collection of Mr. Guenée, at Chateaudun, are specimens of this species which we have been able to compare with our material, owing to the kindness of this distinguished Entomologist.

#### XANTHIA, Ochs.

*Xanthia ralla*, n. sp. (Plate 7, fig. 49, ♂.)

♂. Ochreous-yellow. Size moderate; form slight. Head and thorax concolorous, ochreous-yellow; antennae testaceous. Abdomen somewhat flattened, dull pale ochreous beneath. Eyes small, conical, black; maxillae rather short, testaceous; labial palpi short, not extending beyond the front. Legs ochraceous, paler inwardly; under thoracic squamation dull pale testaceous.

Anterior wings dark ochreous-yellow, transverse lines blackish, broken. A faint basal half-line. The blackish transverse anterior line is geminate, the lines widely separate, the outer paler and indistinct. It is perpendicular and a little irregular, preceded by a blackish dot at the base of the discal cell. The orbicular is very faint, merely outlined, ovate, the annulus including a blackish dot inferiorly at median nervure, which is usually perceivable even when the annulus is obsolete. The median shade is prominent, slightly irregular and nearly perpendicular, running approximate to the reniform spot. The latter is of the normal shape, obsoletely outlined, the inner pale annulus including three or four black dots inferiorly (of which that on the inner side of the spot, situate in the outer and lower angle of the discal cell, is usually the most prominent) and one or two superiorly. The transverse posterior line is geminate, the outer of the two lines composing it the most distinct, very slightly arcuate superiorly, slightly inwardly sinu-



ate inferiorly. The subterminal line consists of a series of black interspaceal dots obsolete below costa. A terminal series of short black nervular dashes. A narrow terminal pale line; fringes ochreous, touched interspaceally with blackish. Secondaries very pale clear yellow testaceous, pellucid, immaculate. Beneath, the primaries are pale ochreous testaceous; faint traces of a discal streak and a transverse line, also of a few terminal blackish nervular marks. Secondaries resembling primaries; a faint discal mark and a transverse line.

*Expanse*, 28 m. m. *Length of body*, 11 m. m.

*Habitat*.—Atlantic District. (Trenton Falls, N. Y. *Mr. James Ridings!*)

Smaller than the common *Xanthia bicolorago*, *Guenee*, and readily distinguished by the darker color of the primaries above, the maculate subterminal line, the broken black stain of the reniform spot, and the pellucid secondaries with their immaculate upper surface. With the following it is more slenderly shaped, and differs from *Xanthia rufago*, *Hübner* sp. by the less acutely produced apices of the primaries, less rufous color, and smaller ordinary spots, which latter in *Hübner's* species have prominent pale annuli.

*Xanthia puta*, n. sp. (Plate 7, fig. 50, ♂.)

♂. Dull rufous. Head and thorax dull obscure rufous. Labial palpi darker, more obscurely colored. Antennae testaceous. Legs, outwardly, dark, with subannulate tarsi. Abdomen somewhat flattened, beneath and at the sides carneous grey, above more purely griseous and without the rufous tinge of the under surface.

Anterior wings dull obscure rufous, with distinct geminate ordinary lines and prominent ornamentation. Basal half line faint, geminate, with a pale included shade. Transverse anterior line distinct, geminate, perpendicular, slightly and regularly arcuated; the inner line the darker, somewhat blackish; the outer, dark rufous; the included space pale and prominent. The veins tend to become marked with pale scales. Orbicular faint, with a pale annulus and more or less obscure centre. Median shade dark rufous, broad, diffuse and distinct, somewhat irregular on the cell. Reniform large and prominent, upright, slightly medially constricted, stained with black inferiorly, with a prominent pale annulus and rufous centre. From the base to transverse posterior line, the wing is brighter colored than terminally. Transverse posterior line very prominent, even, geminate, arcuate over the median nervules beyond the reniform, over which it is incepted on costa. It is composed of an outer distinct blackish line and a faint

and narrow inner rufous line; the space between the two being pale and prominent as with the transverse anterior line. Beyond the t. p. line the wing is shaded on costa with dark obscure rufous enclosing three pale dots. The incomplete subterminal line is preceded by a pale shade below costal region, and is succeeded by one much narrower emanating from an apical discoloration. The narrow terminal space is obscurely colored, being mixed with blackish scales; fringes dark dull rufous.

Secondaries testaceous, tinged with reddish and shaded with cinereous scales, leaving a narrow terminal space clear; fringes somewhat strongly tinged with reddish. A discal mark and a narrow dark interrupted terminal line on the margin. Beneath, the wings are pale, tinged with reddish and powdered evenly with dark scales; from the apex of the primaries downwards, the external margin is narrowly shaded with white intermixed scales. Narrow terminal black lines on both wings, and prominent blackish discal lunules. Fringes pale rufous, darker tipped on primaries.

*Expanse*, 27 m. m. *Length of body*, 10 m. m.

*Habitat*.—Atlantic District. (Trenton Falls, N. Y., *Mr. James Ridings!*)

This species is readily distinguished from *X. ralla*, by its dull purple-red or rufous color, by the darker secondaries, and the details of the ornamentation, although very similar to it in size and form.

#### AGROTIS, *Trait.*

*Agrotis collaris*, n. sp. (Plate 7, fig. 53, ♀.)

♂ ♀. Size moderate; form slender. Blackish, somewhat silky. Frontal squamae and tips of palpi mixed grey; elsewhere the thickly haired palpi are blackish-brown. Antennae slender, clothed above with dark greyish scales. Legs brownish, mixed with pale scales; hind tibiae with two pair of spurs. The under thoracic squamation is rather long and tinged with obscure reddish. Above, the prothoracic pieces are covered with intensely blackish-brown close scales, contrasting forcibly with the paler color of the head and thorax. Patagia and thoracic disc concolorous, smoothly scaled, mixed gray, nearly concolorous with primaries. Abdomen slender, smooth, blackish cinereous, a little darker than the secondaries.

Anterior wings elongate, narrow, widening to external margin. The ground color is blackish-brown, but so closely and evenly mixed with grey scales as to give a greyish hue. Ornamentation simple and distinct; the lines narrow and pale. A basal line, beyond which is the transverse anterior, which is even, somewhat outwardly oblique and

slightly angulated below costa. Contiguous to this line, on the disc, is a smaller, subquadrate, velvety-brown patch (concolorous with the collar) between the transverse anterior line and the orbicular spot, which latter is large, concolorous with the rest of the wing, with parallel sides and narrowly annulated with pale scales tending to become obliterate above and below. Between the orbicular and reniform spots is a second and larger subquadrate velvety-brown patch on the cell; the reniform spot is also concolorous with the rest of the wing, full sized, of the normal shape, and faintly and narrowly annulated with pale scales. The transverse posterior line is distinct, even, and is regularly subarcuate. Beyond it, a dark wide transverse shade obtains between the transverse posterior line and the subterminal, the latter merely indicated by the irregular outer edge of the shade being brought into relief by the paler color of the terminal space. External margin narrowly edged by a dark linear shade. Posterior wings ample, of the usual blackish cinereous hue, silky. The external margin is depressed below the costal angles. The color slightly deepens towards external margin, which is narrowly edged with a darker linear shade. Beneath, the primaries are blackish, without markings; on costa is seen the inception of a transverse line at apical third, brought into relief by pale costal scales. Secondaries darker than on upper surface; a discal dot (apparent also, but more faintly above) and a transverse, darker, but indistinct line; the costa and the region at costal angle are covered with blackish scales.

*Expanse*, 30 m. m. *Length of body*, 12 m. m.

*Habitat*.—Atlantic District. (New York!)

The present and next following species are slender in form, but agree with the characters of the genus as now understood by Continental Entomologists.

*Agrotis geniculata*, n. sp. (Plate 7, fig. 54, ♂.)

♂. Size moderate; form slender. Blackish-brown, silky. Labial palpi blackish, fringed beneath and tipped with grey scales. The general caputal squamation presents a speckled appearance owing to the mixture of blackish-brown and grey scales. On the vertex the scales are somewhat massed. Antennae dark, with two rows of minute serratures. Collar mixed blackish-brown, a little darker than thorax; a distinct blackish line crosses the prothoracic pieces posteriorly, forming two curves. Thorax and tegulae mostly brownish-grey; at the sides the tegulae are shaded with dark brownish. Legs brownish, dotted with pale grey; hind tibia strongly spurred. Under thoracic

squamation greyish. Abdomen cinereous, thickly irrorate, especially beneath, where the segments are indicated by whitish scales. Anal hairs blackish.

Anterior wings blackish-brown, silky, with a faint purplish shade; transverse lines geminate, with broad pale included shades. A basal half-line, dentate, distinctly margined. Transverse anterior line perpendicular, distinct, forming an M-shaped mark opposite the orbicular, thence running straightly downwards, forming a slight curve to internal nervure, below which it forms a single outward projection returning to the margin. It is geminate, distinctly limited outwardly by a narrow black line; the inner line is wanting or nearly so. Median space paler than the wing elsewhere, but obscured centrally by a very diffuse dark transverse median shade. Orbicular spot rounded, pale, with a narrow black annulus, and obscured outwardly by the median shade. The space between the spots on the cell is darker than elsewhere. The usual accessory claviform spot below the median nervure resting on the transverse anterior line. Reniform large, pale, of the normal shape, but so approximate to the transverse posterior line that it appears to be fused with it superiorly and outwardly, where its black annulus is obsoletely continued. Transverse posterior line distinctly edged on costa, its inception taking place at a point within the reniform, outside of which it is outwardly projected; opposite the middle of the reniform it bends slightly inwardly, thus conforming to the shape of the spot; it is then outwardly and roundedly projected, and runs thence downwardly and slightly inwardly obliquely to internal margin. It is geminate, its inner line unevenly lunulate and distinct, its outer even and obsolete. Beyond the transverse posterior line the wing is very dark and glossy; the irregular subterminal line is very narrow and pale; between the transverse posterior line and the subterminal, are three minute pale costal dots. On external margin, a very narrow inconspicuous, broken black line; fringes a little paler than the wing, with a basal darker shade. Secondaries griseous, glossy, gradually becoming darker towards external margin, without line or discal spot. Fringes white or whitish, prominently contrasting with the wing and showing a faint darker basal line.

*Expanse*, 88 m. m. *Length of body*, 14 m. m.

*Habitat*.—Atlantic District. (Philadelphia!)

*Agrotis repentis*, n. sp. (Plate 7, fig. 58, ♂.)

♂. Size moderate; form somewhat slender. Dark olivaceous cinereous or blackish. Head and thoracic parts, above, dark olivaceous

cinereous; collar with a narrow dark line. Antennae slender, blackish, slightly thickening to base. Labial palpi divaricate, the second joint rather thinly scaled, concolorous with the head. The under thoracic squamation is rather loose and long, pale olivaceous cinereous. Abdomen cinereous; a few blackish scales above at anus.

Anterior wings rather long and narrow, silky in certain lights, dark olivaceous cinereous or blackish, concolorous with the head and thorax above. Ordinary lines black and narrow. Basal half-line and transverse anterior, geminate. The first dentate, its inner line distinct, its outer faint; the space enclosed by the two is pale. The transverse anterior is slightly outwardly oblique and thrice-waved; it is distinctly marked on costa, but below this its inner line becomes obsolete, but the distinct outer line is preceded by a narrow pale coincident and faint shade, analogous to that contained by the basal half-line. Ordinary spots moderate, concolorous with the wing, with very narrow black annuli which are unequally marked. Orbicular rounded; reniform of the normal shape, faintly stained inferiorly with darker scales, with an indistinct internal annulus. Median shade distinct, especially superiorly, outwardly projected, edging the reniform spot inwardly on the cell; inferiorly it spreads slightly outwardly on the veins. Transverse posterior line faint, less distinct than the median shade; at its inception, above the reniform spot on costa, it is geminate, being preceded by a black mark; elsewhere it is single, slightly inwardly arcuated between the veins, regular and but slightly projected; the dark scales extend slightly beyond it on the nervules. Three pale dots on costa before the narrow irregular subterminal line, which is faint and pale, preceded by a diffuse dark shade resolvable into interspaceal sagittate marks. A very narrow, black, interrupted terminal line. Fringes but little paler than the wing. Secondaries pellucid, silky, whitish, with a cinereous tinge which deepens externally, becoming very determinate along external margin without forming a limited border. The veins are marked with dark scales; no discal spot or transverse line; fringes white or whitish. Beneath, the primaries are dark, unicolorous, but little paler than on the upper surface, glossy; faint traces of a blackish transverse line, discontinued inferiorly. Secondaries whitish, powdered with cinereous scales which are gathered into a broad terminal band, obsoletely limited inwardly by darker scales on the veins; no discal streak; fringes as on upper surface.

*Expanse*, 35 m. m. *Length of body*, 15 m. m.

*Habitat*.—Atlantic District. (New York!)

The specific name which we have given this species is that given it in MS. by M. Guenée, who possesses it in his Collection at Chateaudun. Our thanks are due to M. Guenée for much valuable information relative to American Noctuidae, communicated during our recent visit to France, and which has assisted us materially in identifying the already noticed species of the Family.

*Agrotis muræanula*, n. sp. (Plate 7, fig. 48, ♀.)

♀. Size moderate; form rather stout. Pearly cinereous. Head and thorax, above, grey, immaculate. Antennae slender, simple. Labial palpi whitish cinereous, stained with blackish at the sides. Under thoracic squamation pale cinereous. Legs cinereous, darker outwardly; tarsi sub-annulate, marked outwardly with whitish. Abdomen whitish cinereous.

Anterior wings cinereous, evenly frosted with equally mixed whitish and dark scales. Ornamentation obsolete. Transverse anterior line marked on costa by two blackish marks between which are pale scales; below costa the line can with difficulty be discerned; it seems to be strongly dentate and irregular, preceded by pale scales. Orbicular indicated by a small blackish stain, the annulus obsolete. Reniform vaguely annulated, diffusely and strongly stained with blackish inferiorly; the black scales forming a prominent blotch. Transverse posterior line marked on costa in the same way as the transverse anterior; elsewhere it is sub-obsolete, being merely distinctly indicated by black scales on the veins, succeeded by wider white dots, these edged outwardly again more faintly with blackish. Thus the line, obsolete on the interspaces, may be considered geminate, its component dark lines including white scales between them, though visible only on the nervules. Very faint traces, merely, of a subterminal line. A very narrow, broken, black terminal line. Secondaries immaculate, white, glossy, faintly dusted with cinereous about the apices; veins marked with cinereous; fringes white. Along external margin, superiorly, are narrow interspaceal marks, the fragments of the dark terminal line. Under surface of primaries cinereous, whitish along internal margin. Faint traces of a transverse line on the nervules and some dark scales on the cross vein. Secondaries white, immaculate, evenly dusted with cinereous scales over costal region.

*Expanse*, 38 m. m. *Length of body*, 17 m. m.

*Habitat*.—Atlantic District. (New York! Rhode Island!)

Easily distinguished by the pearly grey primaries with their obsolete ornamentation, and by the peculiar guttate form of the transverse posterior line.

*Agrotis violaris*, n. sp. (Plate 7, fig. 59, ♂.)

♂. Size moderate; form rather stout. Violet-ashen. Head and thorax violaceous ashen, frosted with pale scales. Labial palpi with darker scales beneath. The scales are somewhat massed on the front and between the antennae; these latter dark testaceous, bi-serrate, the serratures diminishing toward the tips. Abdomen, under surface of thorax, and legs ashen, the latter darker outwardly, with sub-annulate tarsi; hind tibiae strongly four-spurred, the pale spurs marked centrally with black.

Anterior wings with simple and distinct ornamentation, violet ashen, appearing as if overlaid with pale scales and sparsely irrorate with dark points. From the reniform spot to transverse posterior line the median space is darker colored than the wing elsewhere, the pale overlying scales which extend from the base outwardly to this place becoming obsolete. The basal half-line is wanting, and merely indicated by costal marks. Transverse anterior line very prominent, geminate and distinct; its outer component line is broad, dark brownish and very evident; its inner, obsolete, but marked on costa; the outer line is seemingly preceded by a pale shade (the ground color of the wing free from irrorations) which in reality is the usual included interspace of the line. The course of the transverse anterior line is very determinate. It is angulated below costa, thence continued straightly and perpendicularly downwards till below the internal nervure (vein 1, *H-S.*), when it is again correspondingly outwardly and rather more prominently angulated. The median space is unusually wide. The orbicular spot is of the ground color of the wing, with a very narrow and partially incomplete dark brownish annulus. Reniform prominent, but slightly constricted, narrowly circled with dark brown and with a pale ochreous-white internal annulus, more or less distinct, edging the dark centre which is concolorous with the dark posterior portion of the median space. The median shade is wanting. Transverse posterior line very evenly arcuate, slightly projected over the nervules, thence running slightly inwardly to internal margin; it is even, not dentated or lunulated, slightly notched at costa. It is geminate; its inner component line the darker and most distinct, narrower than the outer line of the transverse anterior; its outer line is faint and the space included is of the pale ground color of the wing, free from irrorations. The subterminal space is darker shaded than the terminal, but paler than the median space posteriorly; along its outer edge the irregular subterminal line is indicated. Terminal line very faintly

marked; fringes brownish. Secondaries glossy, brownish cinereous, becoming paler to base, with an indistinct discal lunule and transverse shade line. Fringes long, whitish. Beneath, both wings are pale, powdered with violet ashen and dark scales. Discal dots and transverse shade lines, most distinct on secondaries.

*Expanse*, 36 m. m. *Length of body*, 15 m. m.

*Habitat*.—Atlantic District. (Penna.!)

This fine species, which is very distinct in its color and the ornamentation of the primaries above, has a resemblance to certain species of the genus *Taeniocampa*.

**XYLINA**, *Ochs.*

*Xylina Bethunei*, n. sp. (Plate 7, fig. 56, ♂.)

♂ ♀. Size and form of *Xylina signosa*, *Walk.* Pale whitish cinereous shaded with ochreous. Head and thorax whitish, with ochreous and ashen tinges. Head four-tufted on the front and behind the antennae; these scale tufts are arranged in two pairs and projected horizontally forwards. Labial palpi with a very narrow lateral dark line. Antennae simple; the stem above clothed with pale scales, beneath it is dark testaceous. The prothoracic scales beneath are stained darker than the thoracic squamation, which is very pale ochraceous whitish as are the under abdominal surface and legs; tarsi marked with dark scales on the joints; tibiae sparsely touched here and there with black. Above, the abdomen is ochraceous ashen, sprinkled with dark scales; there is a median dark interrupted line. The thoracic squamation is slightly mixed with dark scales, which are specially perceivable towards the inner sides of the tegulae. The thorax has a central small ochraceous tuft.

Anterior wings with the ground color of a pale creamy-whitish, largely shaded with ochraceous. Base of the wing pale olivaceous-ochreous, shaded with whitish along costal region. The transverse anterior line is indicated by black costal dots and by pairs of similar dots on the subcostal, median and internal nervures. There are traces of the line on the interspaces beyond these dots, which indicate that it is interspaceally very zig-zag and dentate, but there is no coherence in its course. Over the orbicular spot there is a transverse whitish shade. Orbicular large, outwardly oblique, incomplete, annulated with dark ochreous. Terminally the median space is dark olivaceous ochreous, except along costal region, which is shaded with whitish. The reniform is large, inversely oblique with regard to the orbicular, a little paler than the surrounding color of the wing and incompletely annulated with dark ochreous. The space between the spots is narrow and



constricted inferiorly by their juxtaposition; it is surmounted on costa by a distinct black dot, and two others, nearer together, are placed above the reniform spot. These latter may be regarded as indicating the inception of the transverse posterior line which, like the transverse anterior, is fragmentary and indicated by pairs of black dots with whitish scales between them, situated on the veins. The line itself is faintly interspaceally visible within them and appears geminate (as is probably the transverse anterior), inwardly slightly lunulate, with an included whitish shade which is edged by ochraceous and, on the interspace above internal nervure, inwardly by blackish scales. Subterminal line irregular and prominent, dark ochreous, succeeded narrowly by a pale shade. The costa shows three pale dots on the subterminal space. Terminally, the nervules are sprinkled with blackish scales, and there is a terminal series of black interspaceal dots, fragments of the usual line. Fringes ochraceous. Secondaries testaceous, largely and evenly shaded with dark cinereous, which leaves the costal region free. A very faint discal mark; a broken blackish terminal line; fringes pale. Beneath, the wings are pale whitish testaceous. Primaries with a faint discal spot and three blackish ante-apical dots on costa; a series of black interspaceal dots along terminal margin. Secondaries with similar terminal marks obsolete inferiorly; a blackish discal lunule and a faint transverse irregular narrow line composed of dark scales. The wings are very sparsely irrorate with dark scales; this is notably prominent along costal region of secondaries.

*Expanse*, 34 m. m. *Length of body*, 15 to 16 m. m.

*Habitat*.—Atlantic District. (Long Island, New York! Canada! No. "294," *Rev. C. J. S. Bethune!*)

Readily distinguished by its pale color and ochraceous shadings; the ornamentation of primaries is, as often occurs in this genus, difficult to make out, but the markings are much more distinct than in *Xylina signosa*, *Walk.*, with which it agrees in size and form. •

Named after the Rev. C. J. S. Bethune, to whom we are indebted for an opportunity of examining the present and a number of other species of Nocturnal Lepidoptera found in Canada, and whose published writings on this subject evince his interest in the progress of Entomology in that part of the North American Continent.

*Xylina capax*, n. sp. (Plate 7, fig. 57, ♀.)

♂ ♀. Size large; form rather stout. Dark brown, shaded with purplish-ashen. Head with frontal and occipital tufts. Antennae simple and long, minutely ciliated and somewhat thickened at base in the male.

The caputal and prothoracic squamation is dark ashen, thorax and tegulae with a paler purplish-ashen cast; there is a blackish line on the collar, and the tegulae are faintly edged by blackish scales. Thorax crested in front. Legs ashen, darker outwardly, mixed with whitish scales; tarsi sub-annulate. Abdomen, above, blackish, with prominent tufts on the middle segments; beneath, paler, mixed with whitish or ashen scales.

Anterior wings large and broad, brown, largely overlaid with pale purplish-ashen; ornamentation distinct. A dark geminate basal half-line. Transverse anterior geminate, outwardly dentate on sub-costal nervure where it attains the orbicular spot, directed outwardly obliquely till above internal nervure, when it is sharply dentated backwards on the vein. It is brought nearly into contact with the transverse posterior line on the interspace, owing to a corresponding, or rather inverse, reflection of the latter line at this place. The inner component line of the transverse anterior is faint, but the outer is strongly marked and, at its point of proximity with the transverse posterior line on the sub-median fold, the dark scales extend as a prominent streak or dash, across this narrow portion of the median space. Beyond the transverse posterior line this dark streak is again continuous along the submedian fold to internal angle, and forms a prominent feature of the ornamentation of the species. The brown ground color of the wing is more or less apparent over the median space, and is noticeably perceivable above the dark streak from its inception to internal angle. The orbicular spot is large, pale, and outwardly oblique. Median shade marked on costa above the orbicular. Reniform very large, but slightly constricted, transverse, narrowly annulated with dark blackish scales, which are especially marked outwardly and inferiorly; it is pale, with an interior darker shaded ring conforming to the shape of the spot. Transverse posterior line geminate, its inner component line most strongly marked, slightly inwardly lunulate between the nervules. It originates in two dark marks on costa above the reniform; in its general course it is outwardly arcuate over the nervules, running obliquely inwardly inferiorly to submedian fold, on which it is inwardly dentate until it nearly attains the transverse anterior line, thus greatly constricting the median space at this point; it then runs obliquely outwardly, and is again dentate on internal nervure before the margin. The subterminal line is dark and irregular, diffusely shaded, and preceded by a narrow pale shade. The nervules are very narrowly marked with dark scales. The external margin is slightly interspaceally exca-

vate. Fringes dark, cut with pale scales at the extremity of the nervules. Secondaries blackish, becoming paler toward the base. A discal spot and inner transverse line. An outer transverse shade merged in the dark color of the terminal portion of the wing. Fringes much as on primaries. Beneath, the primaries are mostly blackish, sprinkled with whitish scales along the costal region and terminally. Four ante-apical costal whitish dots. A discal annulated spot and two dark transverse shade lines. Secondaries covered with mixed pale and dark scales; a distinct dark discal lunule and two parallel transverse lines.

*Expanse*, 50 m. m. *Length of body*, 18 to 20 m. m.

*Habitat*.—Atlantic District. (Penna.!)

This fine species is of large size and the wings are unusually broad. Hence with its purplish-grey color it has at first sight a resemblance to certain species of *Hadena* or *Eurois*. The structural characters of the body parts, however, indicate its position here with a degree of certainty. A cursory examination of a specimen of *X. capax*, *n.* by Mr. Lederer in Vienna, resulted in that Entomologist kindly giving it as his opinion, that the generic position we assign to this Noctuid is the correct one.

#### **ERASTRIA**, *Ochs.*

*Erastria synochitis*, *n. sp.*

♂ ♀. Size small. Whitish. Antennae testaceous; the small palpi are obscure testaceous. Collar and thorax whitish powdered with blackish scales; the former edged behind with black and with a broad central line. Under surface of the body and legs obscure whitish tinged with testaceous; tarsi subannulate with brownish; hind tibiae with two pairs of thorny subequal spurs. Abdomen crested towards the base. Anterior wings pearly white, largely shaded with dark olivaceous green. The transverse lines are obsolete. Basal portion, within the orbicular, largely whitish except on costa; this pale portion is margined outwardly and obliquely by the inner edge of a median transverse green band, which fills the entire median space of the wing below median nervure and obtains more narrowly superiorly to costa between the ordinary spots, being limited here outwardly by the short median shade line. The transverse anterior line may be detected superiorly within the orbicular; it is more strongly marked on costa; below the sub-costal nervure it seems to form a single inward arcuation to median nervure, thence joining the inner edge of the median green band and running inwardly obliquely to internal margin. The orbicular spot is white, faintly margined, irregularly shaped and with

a very distinct black dot; the latter always to be seen, whereas the true annulus of the orbicular is apt to become obsolete and is difficult of detection. The reniform spot is prominent, ovate, white, with an internal diffuse blackish annulus which almost entirely fills it, leaving the ground color to appear as a narrow encircling ring. Beyond the reniform, the dark green color of the median space again obtains to the transverse posterior line, which is here inwardly edged with black scales. The transverse posterior line is very irregular, and appears as a paler shade against the darker portions of the wing which it margins. Superiorly it is prominently arcuated over the nervules to median nervure, where it runs inwardly to within the reniform, whence it runs downwardly, forming a short tooth below median nervure and a long outward arcuation, to internal margin. The subterminal space, from below the reniform to internal angle, is whitish, usually suffused with a delicate roseate hue; this portion of the wing forms a prominent feature in the ornamentation of the species. Superiorly the subterminal space is dark olivaceous green with longitudinal streaks of black, and powdered with black scales. The subterminal line is white; superiorly it is shortly dentate on the blackish apical portion of the wing, it runs shortly and straightly outwardly above the broadest longitudinal black dash, and then runs downwardly, forming slight arcuations to internal margin. There is a terminal series of greenish interspaceal marks, the broken terminal line. Fringes tinged with greenish, with a basal linear shade. Secondaries griseous, silky, darker shaded towards the external edge, with faint indications of a transverse line and discal dot. Fringes whitish, paler than the wing, long, with a faint, narrow, dark internal line. Beneath both wings are stained with ochreous. The primaries are largely cinereous centrally. The secondaries are powdered with dark scales, and show a distinct discal dot and an often indistinct transverse shade line. Both wings are neatly edged along the external margins by a broken line.

*Expanse*, 19 to 20 m. m. *Length of body*, 8 m. m.

*Habitat*.—Atlantic District. (Mass. to Penna.!)

Allied to *E. carneola*, *Gn.*, rather than to any of the other species of the genus, but very distinct in its coloration, which gives it the false appearance of an *Acontia*. *E. synochitis* is of common occurrence during June and July, in the vicinity of Brooklyn, N. Y., where it may be found on fences in company with *E. carneola*, *Gn.* and *E. nigriflora*, *Gn.*

*Erastria musta*, n. sp.

♂ ♀. Size small. Head and thorax obscure griseous mixed with blackish scales; collar with a faint blackish line. Antennae dark.

Abdomen griseous, crested towards the base; beneath, paler, with two fine lateral dark lines. Legs pale testaceous griseous; tarsi subannulate.

Anterior wings of an intense bright green above. Ordinary lines prominent and distinct, carneous with black edges. A basal half-line. Transverse anterior line nearly straight, regularly and shortly jagged or dentate. Median space wide. Orbicular and reniform spots distinct; the former carneous with a prominent black central dot and a fine black annulus; the latter, largely carneous, rounded, faintly margined and shaded outwardly with whitish. There is an accessory spot below the median nervure underneath the orbicular and smaller, while similarly appearing to this latter, wanting, however, the carneous color. There is a diffuse, discally interrupted, dark median shade line strongly marked on costal region, which latter shows also a second dark shade line. Transverse posterior line arcuated strongly over the nervules, but running very slightly inwardly obliquely below median nervure, thus leaving the median space wide inferiorly. This line is followed by the narrow, but very distinct, pure white subterminal space; the white color gives place superiorly to the green ground color of the wing. Subterminal line black, consisting of a series of interrupted cuneiform marks, irregular below costa. Three white costo-apical streaks. Terminal space bright green; a terminal series of dark interspaceal marks. Fringes dark griseous, narrowly cut with paler hairs at the extremity of the nervules. Secondaries evenly dark griseous, silky, with no perceptible markings; fringes a little paler than the wing. Beneath, both wings are obscure greyish; secondaries with a darker shaded transverse line and discal dot; primaries with costal marks and dots, the fringes plainly cut with pale shades.

*Expanse*, 18 m. m. *Length of body*, 7 m. m.

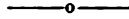
*Habitat*.—Atlantic District. (New York to Penna.!)

This pretty species is a miniature reproduction of *E. muscosa*, *Gn.*, and is readily separated from the latter by its smaller size, the brighter green of the primaries, the carneous color of its transverse lines and ordinary spots, and quite prominently by the absence of the white subterminal line which is characteristic of Guenée's species.

*Selenia kentaria*, *G. & R.*, Desc. Am. Lep. No. 1, pp. 12—13, figs. 5—6.

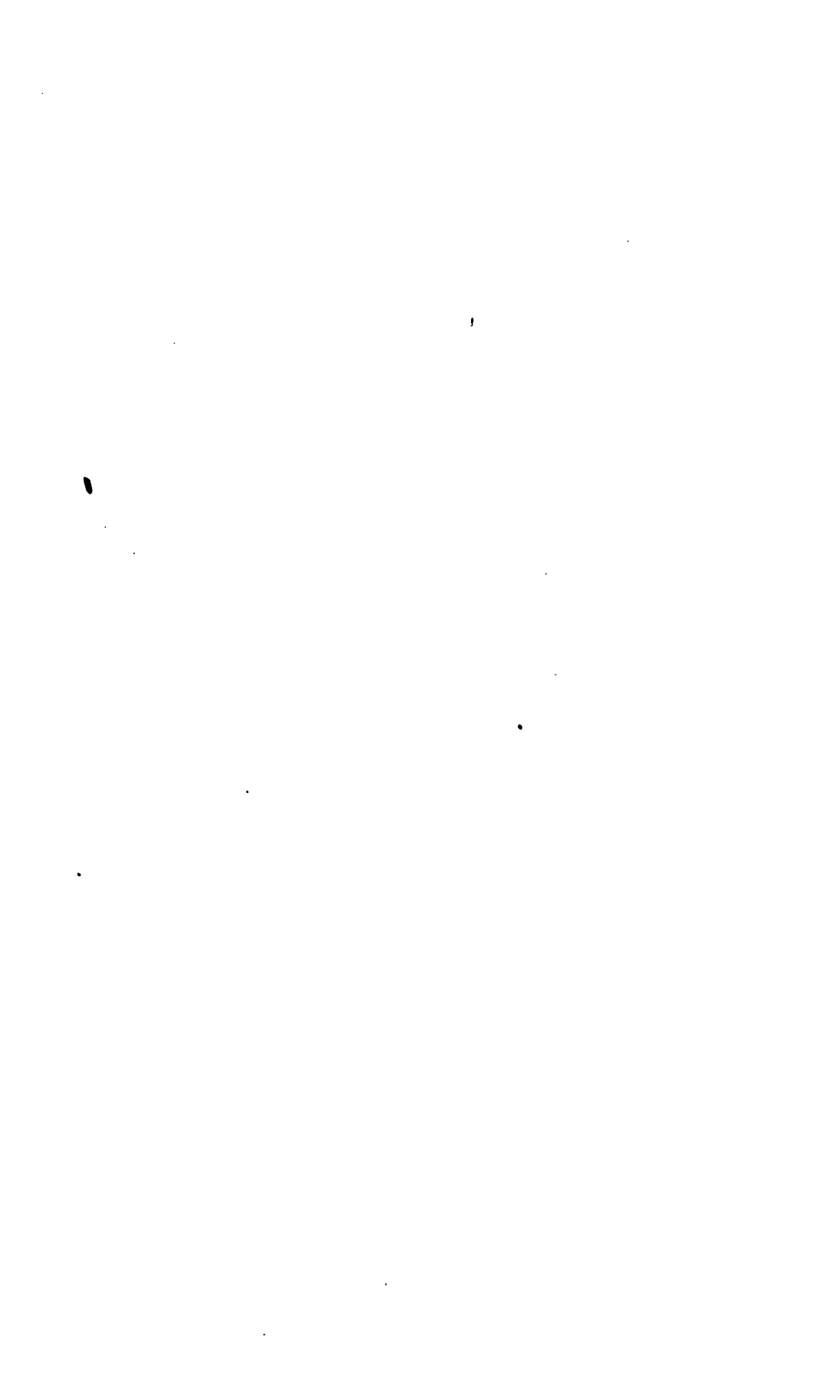
This species, which is a true *Selenia*, is mentioned to correct an error which accompanied its original description. It is closely allied to the European *S. illunaria*, with which it is compared and the specific differences pointed out, but owing to an error in the determination of our material of the European species, this latter is alluded to as "*Pericallia syringaria*," which in reality is a distinct though allied form.

## EXPLANATION OF PLATES 6 &amp; 7.



- Figure 36, ♀ *Sesia thetis*, *Boisd.* sp.  
 37, ♀ *Alypia dipsaci*, *G. & R.*  
 38, ♀ *Alypia sacramenti*, *G. & R.*  
 39, ♂ *Alypia lorquini*, *G. & R.*  
 40, ♀ *Alypia mariposa*, *G. & R.*  
 41, ♂ *Arctia dahurica*, *Boisd.* sp.  
 42, ♂ *Epicallia virginalis*, *Boisd.* sp.  
 43, ♂ *Nemeophila caespitis*, *G. & R.*  
 44, ♂ *Nemeophila cichorii*, *G. & R.*  
 45, ♂ *Arctia achaia*, *G. & R.*  
 46, ♀ *Arctia achaia*, *G. & R.*  
 47, ♀ *Arzama obliquata*, *G. & R.*  
 48, ♀ *Agrotis muraenula*, *G. & R.*  
 49, ♂ *Xanthia ralla*, *G. & R.*  
 50, ♂ *Xanthia puta*, *G. & R.*  
 51, ♀ *Gortyna purpurifascia*, *G. & R.*  
 52, ♀ *Gortyna speciosissima*, *G. & R.*  
 53, ♀ *Agrotis collaris*, *G. & R.*  
 54, ♂ *Agrotis geniculata*, *G. & R.*  
 55, ♂ *Hydroecia sera*, *G. & R.*  
 56, ♂ *Xylina bethuuei*, *G. & R.*  
 57, ♀ *Xylina capax*, *G. & R.*  
 58, ♂ *Agrotis repentis*, *G. & R.*  
 59, ♂ *Agrotis violaris*, *G. & R.*



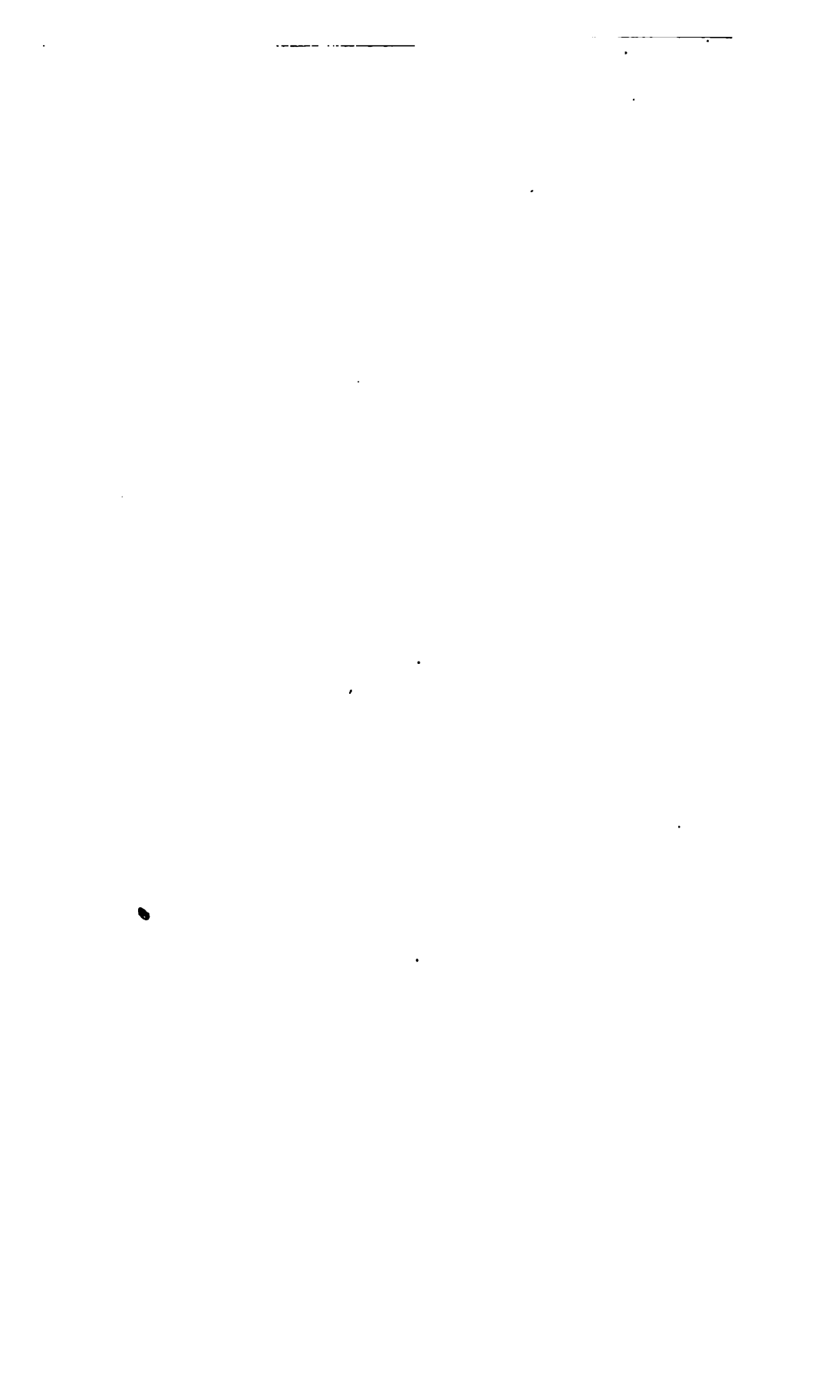


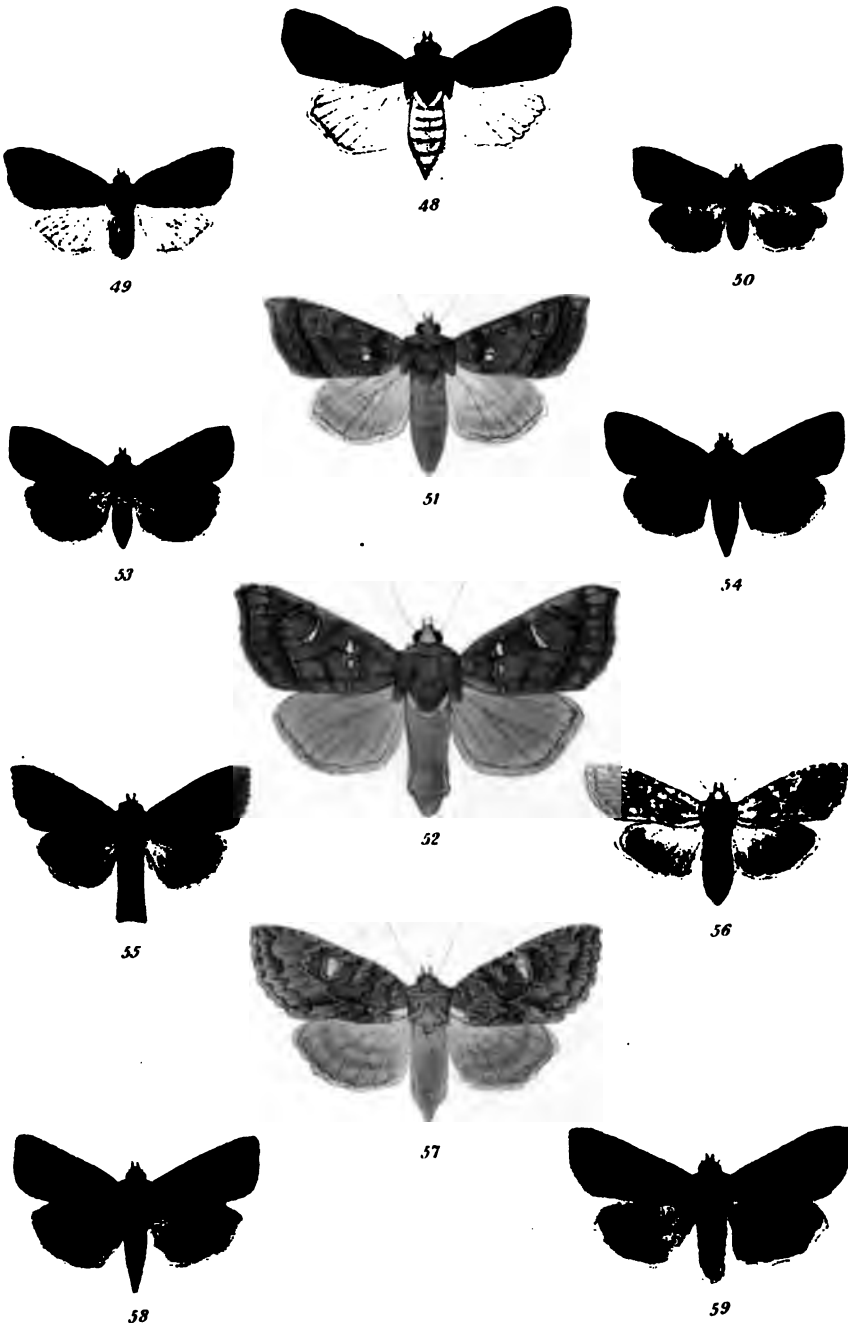












Drawn by D. Wiest.

Bowen & Co lith Philada.



## NOTES ON THE "APPLE BARK-LOUSE,"

*(Lepidosaphes conchiformis, Gmelin sp.)*With a description of a supposed new *Acarus*.

BY HENRY SHIMER, A. M., M. D.

I have made the Apple Bark-louse an object of very careful study for several years, for the purpose of becoming better informed of its natural history; and to determine, if possible, upon some feasible plan of destroying these highly injurious insects; or to gain any information that might be learned regarding its natural enemies, &c.

The leading practical Entomologists of our country, have given very poor satisfaction regarding the natural history of this very important insect. Dr. Harris assures us that the young Bark-lice wander about on the tree for ten days, and then attach themselves; and that there are two broods of them in a season. Dr. Fitch states that "these scales are the relics of the bodies of the gravid females, covering and protecting their eggs." (1st and 2nd *Report Noxious Insects, New York*, p. 32.) Others state that the eggs are laid in a sack or pouch, &c.

My observations contradict these statements, and I therefore give a synopsis of them, extracted from my Notes of the present year, with the dates of such of the observations as appear useful in defining the true natural history of this insect.

June 9, 1867.—A delightful, sunny morning, following several beautiful days; thermometer at noon, 86° Fahr. At 9 o'clock, A. M., I saw, by the aid of a pocket-lens, millions of young bark-lice running about briskly over the limbs of the apple-trees, and on the leaves and their petioles. This is the first day of their appearance on the bark; whether they were hatched and remained a few days under the scale, or not, I cannot say; but I believe that they were just hatched this morning.

*Description of the young "Apple Bark-louse."*

*Form* ovoid. Length .01; breadth .005; thickness .0025 inch.

Color pale yellow, with a reddish-orange spot near each extremity. Two long, pliable, tapering hairs project backward from the posterior extremity of the abdomen; these taper to a very slender point, and as

they drag over the slide, are seen greatly to impede their motion, on account of the precipitation of a very slight film or moisture on the slide. Six short spines are seen to project from the forehead, and many all around the body. *Feet* one-jointed. Two finger-like organs.—*digituli*—(*Proc. Acad. Nat. Sciences, Phil.*, Jan. 1867,) are readily seen projecting beyond the extremity of the tarsi, with enlarged extremities, but which are not globular, as in the *Dactylosphæridæ*. These extremities appear much like *arolia* or *pulvilli*, which I am convinced they are, from various observations.

But upon a closer examination of the feet, we find four of these *digituli*, the upper pair being apparently longer, as seen from above, the under pair is set somewhat farther back on the tarsi beneath, and usually, when walking, both these lower *digituli* are directed forward to aid in locomotion, when they appear bent forward; sometimes, however, when the leg was not in vigorous motion, or when it was injured somewhat, I saw them closed on the foot beneath, very much like the thumb in the palm of the hand; and then the movements of the insect were very awkward, manifestly lame. I have frequently seen under close examination, with a one-twelfth inch objective, that the insect, when walking naturally and in possession of its full powers of locomotion, invariably projects the two inferior *digituli* obliquely forward, and that it supports its weight upon them; the upper *digituli* frequently bend into quite a curve in walking, thus proving that they are coraceous or membranaceous, and not corneous.

These *digituli* are, without doubt, of the same material as the leg. Repeating my examinations of these tarsal organs, on the following days, I have noted that the tarsal segment is very short, almost inconspicuous as to its separation from the tibia; the *digituli* almost appear to sprout out of the lower end of the tibia, so short and undeveloped does the tarsal segment appear under the microscope.

In form, all the *digituli* are somewhat tapering towards the distal end, and terminated by an enlargement or disk; the two *digituli* beneath present the most conspicuous disks, which, under the microscope, appear blackish. The lower *digituli* are invariably directed forward when the insect walks. This bending forward is caused by the muscular exertion of the insect as it pushes its body onward, giving thereby, sufficient backward pressure on the foot to make the *digituli*, on which its weight is sustained, to bend forward as already described.

This proves two things:—1st. That these organs beneath are true *digituli*, or organs, at all events, that are sufficiently pliable to bend



readily, and are not horny claws. 2d. That whatever they may be, they sustain the weight of the body. I am sure that they sustain the entire weight; no part of the tarsal joint or tibia rests on the slide, and consequently are of greater proportional strength than hairs could be presumed to have; for two *hairs* on the sole of each foot would not support the weight of any animal, at least in larger animals where we are better capable of examining hairs and other dermal appendages. We never find *hairs* thus capable of producing such support. Whoever may think that these organs are hairs, will find them of a different structure, and by such examinations and reflections will see that they are out of all proportion, for hairs, when compared with the minute size of the body itself; moreover, the disks, or suckers, on the extremity, is another argument against regarding them as hairs.

I breathed upon the glass plate, and the precipitated moisture caused the setæ of the abdomen to adhere to the slide, and thus prevent the usual rapid locomotion of the insect or retard its progress entirely; but like a good ox it pulls and struggles faithfully, sometimes backing up, taking a fresh start, or turning in the opposite direction; thus it perseveres perpetually while life lasts. This manipulation gives an excellent opportunity to view the tarsal appendages, for it uses every means in its power to aid locomotion, and thereby spreads apart all the organs nature has provided, so that they can all be seen with entire satisfaction.

These methods of examination are infinitely superior to any method of examining the dead specimen, for by no possible contrivance can we manipulate these delicate organs so well as the animal itself, when placed in the proper conditions.

The anal setæ are more than one-half the length of the body, of capillary fineness, and at the distal end so slender as to appear as a fine point under the one-twelfth inch objective.

Prolonged and repeated observations confirm what has been stated above; the more I examine the feet, the more I am convinced of the brevity of the tarsal segment. The tarsus here is composed, probably, of but one primitive segment or ring, while the longer tarsal joints of other insects are composed of many, and the tibiæ of scores of rings as I have shown in the *Proc. Acad. Nat. Sciences, Phila., Jan. 1867.*

I succeeded in crushing several of these little insects very slightly, just sufficient to cause them to lie on the side (an operation easier spoken of than performed), by which manipulation I saw the four digituli more nearly equal than in any other field of view. The tarsi, there-

fore, are terminated at the extremity by four finger-like organs,—are split up into four parts, the lower pair of digituli appearing farther back by virtue of the obliquity of the extremity of the tarsi. These are the only organs of prehension or locomotion, the claw being so undeveloped as to be useless, so far as I could learn from the living animal in every possible field of view under the microscope. Indeed, I am not able to see any claw-like organ, in even the most imperfect state of development, on any part of the foot, although I tried faithfully, by crushing the insect in every possible manner, so as to bring the foot into every view in the field of the microscope; yet, reasoning from analogy, we can hardly believe that it is without ungues; but, scientifically, how can we assign a place to a thing that cannot be seen? for in anatomy we can only know by seeing.

*Antennæ* with about seven joints, five subequal, the last two smaller, terminated by two short branches, or forking into two parts; two spines on the distal end of the fifth joint, about as long as one of the joints; color same as that of the body and legs.

At 3 o'clock, P. M., I went to a cool cellar and brought out an apple limb that I had deposited there in the morning, well stocked with young Bark-lice; they were all quiet—no signs of a change into the scale-like state; they had the same pale yellowish-white appearance, with an orange-yellow spot near either extremity, as observed this morning; they were all motionless, but after a few minutes' exposure to the warmth of the outside atmosphere, they began to move as they were doing in the morning. I then went to the orchard, and found more than one-half of the lice located, many of them already presenting a very complete scale-like appearance; others were but just locating, and yet capable of moving their limbs,

The transformation from the moveable to the fixed or scale-like state, after anchoring themselves by the proboscis to the bark, is effected by the operation of moulting or shedding their skins, which must be done by rupturing it either along the sides or beneath, for at this time the scale can be removed, and the free insect can be isolated beneath in a memberless state. I carefully detached some of these insects, and, by microscopic examination, could detect the form of an independent being, but no motion. In those most recently moulted, I can plainly see the legs, even the digituli in the skins, but in somewhat of a curled or distorted condition, and in a little while they become fully dry, when they are found to have lost all trace of their limbs and former appearance.

The insects lie motionless beneath the scales, with their backs humped up, and the belly a little concave, presenting some resemblance to a meniscus glass. The sharp-pointed proboscis may be seen, in some cases, projecting a little downward and into the bark, if we are sufficiently fortunate to separate the scale properly.

The insect is now perfectly free from its outer garment, and in casting it off it has pulled off its legs, antennæ, &c.; henceforth it lives beneath it as under a roof, and having no more use for legs it has amputated them.

*Evening.*—Very few are free and moving. Strangely to me, after reading from reputable Authors that they fix themselves in about ten days, I behold so great a change, in one beautiful, warm, summer day. None of those on the apple limb in the cellar have located themselves, and I am not able, at least, to detect any in the scale form.

*June 10th.*—I examined the apple-trees this morning, and found a very few larval Bark-lice crawling about on the limbs. Afternoon and evening very showery.

*June 11th.*—I find a very few larval Bark-lice running on the apple limbs. I re-examined the feet of these insects and find the same appearance as above noted.

*July 1st.*—The young Bark-lice have grown considerably. The scale has received an enlargement by a second addition to the posterior extremity of the first, or original scale over the head, which is in its primitive location and of a yellow color. The insect, by growing, extends backward from the primitive point of attachment. The color of this second addition to the scale is hoary cinereous or incanus. The first, or old scale, can readily be separated from the second; the attachment has not yet grown firm.

This scale, which so much resembles a waxy exudation, is really the cast-off skin of the insect, cemented, by some kind of an exudation, to the bark, and the several pieces of separate moultings are cemented into one roof-like habitation. What this exudation may be, is a matter open to reflection and examination. Is it an exudation from the whole surface of the body, from the anus, or from secreting tubes in the abdomen, as the honey-tubes in some of the Aphidians? That it is not a surface secretion, we know, from the fact that the integument is always free from the scale, and the body is as strictly articulate as that of any other insect. The absence of honey-tubes prove that it is not secreted by such organs. I have not seen this secretion being deposited, and presume that it will be difficult to detect; but as it is deposited

gradually during the summer, it must be a secretion of some kind from the posterior end of the abdomen; and as I was not able to detect any excrement inside of this habitation at any time during the summer, I believe it to be excrementitious matter, deposited in a semi-liquid state, which, upon drying, is the impervious tenement of the insect. This idea may appear ridiculous to many, that an insect should use its own dung to patch its old cast-off garments and thus construct a comfortable house. Instead of being absurd, however, it is an example of unparalleled economy. Neither is it without a partial example, for the larva of *Lema (crioceris) trilineata* Olivier (the Three-lined Leaf-beetle, see *Harris' Inj. Ins.* p. 119,) which covers its back with its own dung to protect it from the sun and injurious insects.

But in this Apple Bark-louse we have one of the most wonderful examples of the economy of nature—a naked insect anchored on the limb of a tree, exposed to all the inclemency of the elements, too poor to secure the labor of others more favored by the Goddess of Fortune, doomed to remain fixed to the spot for life, without limbs to help itself, unable to rob some poor sheep of the fleecy covering on its back, or to secure the products of a cotton-field: not provided with the silk of the caterpillar, nor yet able to employ a weaver or tailor. In such a deplorable condition it does not despair, but diligently uses the only means at its command—its cast-off exuviae and excrement, by which it constructs a shelter that protects, not only itself, but also its eggs from the sun and rains of summer, and the piercing blasts of winter, with the thermometer 20°, 30°, and even 40° below zero. Truly, the works of nature are infinitely variable, wonderful in their extremes, and remarkable in adapting means to ends.

*July 7th.*—Examined the Bark-louse microscopically. They are easily separated from their scales. They present at this time a flattened flask or jug-shaped appearance, in profile, obovate. The abdomen is very large, the sides crenate, the abdominal extremity with a distinct notch, the segments plainly visible, the neck and head narrow. Color yellow. A few short hairs are visible around the margin of the abdomen. Is motionless, appearing pupa-like, except in wanting marks of developing legs and wings. Length .04, breadth .02 inch. Concave beneath, convex above. At this time a few of them appear to be dead and drying up, but mostly when crushed a reasonable quantity of liquid juice is seen. The accidental arrest of development in this state has led some, erroneously, to think that these small scales are male producing.

*July 21st.*—The Bark-louse has grown much, has moulted again, and its scale now presents three parts, distinct divisions, and consequently is becoming thicker and stronger from day to day. Each new skin cast and its cement are light ashen-grey, which together make an addition to the scale at its posterior end, for by several such increments is the scale constructed, somewhat simulating shell growth in Mollusca, but the upper older portion of the scale is reddish-brown. The insects beneath are white, instead of yellow, as noted on the 7th, evidently having just moulted; now, if the scale be turned up carefully with a fine instrument, the insect will be found attached by the thread-like organ (proboscis) which arises out of a groove towards the anterior extremity of its ventral surface; this groove is formed by two ridges, by this slender proboscis it holds on to the tree with great tenacity; if the scale is entirely removed the insect hangs fluttering in the breeze. I have noticed a similar trembling or jerking motion of the insect when protected from the wind, probably a muscular effort expressive of dissatisfaction at the loss of its covering. When thus exposed for a few days it invariably falls off and is lost; its house is, therefore, necessary to its life.

*July 31st.*—I now find the Bark-louse scale of nearly full size and normal color; the insect snugly enclosed; the edges of the scale much thickened and turn in under the body, firmly glued to the tree. The insect no longer presents the jug-shaped form, but is oblong-ovate and very succulent, and when crushed the eggs can be seen.

Here and there, over the tree, I observe one out of about five hundred scales, that present an abnormal form and color. They are papery-white, and much longer than the usual dark-colored scales, but I am not able to discover any difference in the insect beneath the scales, that is between this and those of the normal scales.

*Aug. 11th.*—I observe that they are beginning to lay their eggs, and from one to a dozen can be found under each scale, towards the posterior extremity. The form of the insect is now oblong-ovoid, flattened, cylindrical, instead of obovate, as observed during the progress of development. The insect is attached by the same thread-like organ, which is about as long as the body, and produces the same jerking motion after the scale is removed. It may now be seen, when the scale is removed, by the naked eye at the distance of a yard or more, shaking and jerking as if agitated by the wind.

*Aug. 17th.*—I observe that the egg-laying season is progressing rapidly; most of the scales are filled with white eggs, posteriorly and

along the sides, where she can reach with her abdomen to deposit them. A few have already finished laying eggs, and are dead and contracted into the anterior part of the scale. I also observe, that the parent becomes gradually smaller as she deposits her eggs, so that when she is finishing she is not more than one-third the length she was when she commenced, and then she dies, as I already begin to observe in a few instances.

Of a vast number of scales examined, all that arrive to full size are inhabited by fertile egg-laying insects. Occasionally I find a young scale aborted in its origin or at half development; these are found empty, the inhabitants having died from some unobserved cause, most likely from the parasitic insect presently to be noticed. I have not been able to find separate sexes, although I have sought diligently during the entire summer with this object especially in view.

Aug. 18th.—I made a microscopic examination of the thread-like proboscis of this insect, and was able to separate it into three parts at the point of attachment, but did not thus separate it during the entire length.

On the parent insect and among the eggs, I saw an eight-legged parasite\* by the aid of a pocket lens. This *Acarus* has short, stubbled legs, with long hairs on the tarsi; head appearing something like that of a turtle, projecting forward of the body.

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\* Having made a microscopic examination of this *Acarus*, and believing it to be a highly important and interesting insect, as well as new and heretofore undescribed, I suggest for it the following name:—

*ACARUS? MALUS*, n. sp.

Body pale or whitish; two long, hair-like spines behind the abdomen; posterior extremity of the abdomen emarginate, as seen from beneath. Head and anterior legs ochraceous, the latter having the spines from the lower part of the tibia longer than the limb itself; femur short, much swollen, scarcely projecting beyond the body; tibia swollen above, tapering towards the tarsus; tarsus abruptly smaller than the lower end of the tibia, linear, terminated by a disk—*arolia* or *pubvillus*, the appearance under the microscope being that of the former, without a claw or any other tarsal appendages. The two pairs of anterior legs are well forward, encroaching close upon the head, the two pairs behind the middle of the body somewhat more distant than the anterior pair.

A few long hairs on the abdomen, those especially springing out of the prominences, one on each side of the centre of the posterior extremity of the abdomen are longer than the body itself. The hairs on the posterior legs are much longer than those on the anterior. From the extremity of the snout the mouth organs can be seen as short spines projecting forward. Length .003—.005—.008 inch; breadth half the length.

*Sept. 15th.*—The egg-laying season is drawing to a close; many of the scales are full of eggs, the females drawn up towards the head; some of them brown, dry and so shriveled up as not to be observable without close search. The eggs are placed somewhat irregularly, more so at the posterior extremity.

When examining a great number of scales, I find about one-fourth of the eggs in a damaged condition; they are brown, or of a ferruginous color. In some of this year's scales all the eggs are thus brown. A close examination proves them to have been dispoiled of their contents, the brown remnants being the dry shells; the parasitic Acarus, above noted, is among them, and sucking the eggs. These insects are very small, and are lying quietly among the eggs, and about the same apparent size as the eggs. Hence, without close examination, may be overlooked when exploring with a pocket-lens; but close search will prove them quite abundant, one or more under every scale thus being dispoiled. They always begin to work among the eggs in the posterior extremity of the scale, hence, I conclude that they enter from without, at the opening at this extremity, left for the exit of the young Bark-louse in the following summer.

*Oct. 13th.*—I made a careful examination, and find many of the Acari traveling slowly around on the bark of the tree—having dispoiled all the eggs in one scale they are out searching for others. Having greatly multiplied during the last month, I can now find a hundred where I found one a month ago. It is very interesting to behold this great, and heretofore unheard-of, enemy of the Apple Bark-louse; truly, every noxious insect has its enemies, although, like this, they may be hard to discover.

*Oct. 22d.*—I spent a long time in examining the eggs of the Apple Bark-louse, and exploring the bark of the trees for the Acari; they are

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When this insect is thrown over on its back on a glass plate, it is not able to turn over. These Acari may readily be mistaken for young Bark-lice by the naked eye or through a pocket exploring-lens, because each are very small, whitish, slow-moving animals, and each have long, projecting, abdominal filaments; but the detection of eight legs and the snout-like form of the head in the Acarus, will be diagnostic marks, without a microscopic examination; and the season of appearing is another feature. The color of the head and anterior legs being about the same as that of the empty egg-shells, has raised the inquiry in my mind—may not this color be derived from the juices of the eggs while it is eating? This, however, will remain mere supposition, for the Acarus is rather too small to justify an attempt at "washing his face and hands." There is a bare possibility that the natural color of the head and fore legs is whitish, like the rest of the body.

not so abundant on the bark, traveling around, as during the fine sunny days just passed. They are mostly remaining quiet under the scales, but here and there one may be seen on the bark, although it is quite cool for insect comfort. The careful observer will not confound this *Acarus* with another yellowish-white mite-like insect, that I find here on the bark of the trees; this runs much more rapidly than my *Acarus*; its body is, in proportion to its size, much longer, as it appears under my exploring glass. What more might be determined of its habits by careful observation, although very interesting, I have not taken the time to do, neither have I made a microscopic examination. I don't find it under any of this year's scales, therefore I do not believe that it is an egg-eater, like my *Acarus*; it may be a vegetable feeder, or possibly feeding on the decomposing matter of the scales of former years.

I raised up a great number of the new, this year's—scales, for they are easily distinguished from the old, last year's, scales—and I found that in nine-tenths of them, all, or nearly all, the eggs were destroyed; they are all shriveled skins of a ferruginous color. Of the remainder, only a few, perhaps one-hundredth of this year's scale, are in the possession of all perfect eggs. In the others, at least one-half of the eggs have been destroyed where I conducted my observations; regarding this, I am not able to speak of many different localities.

I have no doubt that the Pomologist, who has not already seen this *Acarus*, will hail its discovery with great joy; for in this insect I behold the most, and indeed the only efficient, insect-enemy of the Apple Bark-louse that I have been able to discover, during the entire course of my investigations. From my observations it can be seen that, although it may not entirely exterminate the Apple Bark-louse, yet it is exerting a wholesome, restraining influence, doing much more than man could do, without great trouble and expense, with a thousand washes—an unobserved microscopic object of deep interest.

Of methods for destroying the Bark-lice, I observed that, when they are just hatched, a strong, common, soft soap-suds is as effectual as anything; when wet with it, the insect dies in a moment; but after the scale is formed the case is more difficult, and soon the strongest washes will not affect them. A hint to the wise is sufficient—watch for the hatching of the young Bark-lice a few days after the appearance of the blossom. This year here it occurred about ten days after.

MT. CARROLL, Ill., November 1, 1867.



## NOTE

The structure of the feet above noted, is very peculiar and interesting, and in a measure, appears to separate this insect from the *Coccidæ* proper. Its scale-like habitation would appear, from casual observations, to be the insect itself, and, therefore, to retain it in that family; but a thorough examination proves the insect to be distinct from the scale, which it only uses for a habitation; therefore, truly, also appears to separate it from the *Coccidæ* of former authors, which is a *scale-like* insect, and this a *scale-making* insect. In that, the scale is the body of the female, while in this the scale is a constructed roof or habitation, and is as distinct from the insect that lives beneath, as our houses are distinct from ourselves.

If this insect is never found in the winged state, (and after the most diligent search for years I have never found a winged insect, or a male of any description, and I am entirely convinced that the females were fertile this year without copulation)—we can only have these larvæ for examining the tarsi, the females being footless, maggot-like bodies.

The older Authors were men of close research and untiring observation; against them we have nothing to say, but it is proper to infer, that the characters of the *Coccidæ* were correctly established; however, I am free to confess that my research has not been sufficiently extended to verify *their* results. Their observations were conducted in a different quarter of the globe. For me to condemn them by changing the characters they established for *Coccidæ*, so as to make it so different a thing as to admit this "Apple Bark-louse," would be sacrilege. They created the family *Coccidæ* for the reception of *scale-like* insects, although in *Aspidiotus* the female is fixed and immovable, yet in other genera she may be moveable. But the characters which are permanent are, tarsi with *one* joint and *one* claw. To this I can find no exception in the old landmarks of this family. Here we have a scale-building insect, but the insect itself is no more scale-like, than is a dipterous larva; neither has this insect any tarsal claw.

In classification, then, how can we retain this insect under the *Coccidæ*? To do so is a manifest error, without making additions to the characters of this family. Can we change the characters of a genus without examining all its species, and determining that they all harmonize with the change? The observer cannot do this, widely diffused as they are, in the four quarters of the world; closet observation here is useless, the insect *must* be studied in its living, active state, in its native haunts, daily, for at least an entire season.

If we have a right, from examining a single species, to add to the characters of a genus, we have a right, also, to deduct therefrom. And such licence would evidently undermine the very foundations of science.

Hence, our only remedy is to construct a genus with characters that will admit the insect in question. Some may argue that this insect for ages, by the most profound entomologists, has been esteemed a typical representative of the *Coccidæ*. What matters that? If we have been six thousand years in arriving at a true knowledge of the natural history of this otherwise well known insect, shall we, therefore, on account of a veneration for time-honored names, among the cob-webs of error and obscurity, continue in error, by retaining it in a family whose characters no more accord with its true anatomical structure, than they do with that of a dipterous larva? We have a plain and simple remedy, and but one—to the classical mind a demonstrated truth.—Create a new genus,

and if needs be a new family, for its reception, however slow the scientific world may be to adopt it, and however loth I may be to genus manufacturing.

In this case it appears necessary, at least, to place this insect in a sub-family *Coccinæ*; even in this step there is a manifest defect, failing to reach out far enough.

We have in the section *Monomera* already two families, *Dactylospharidæ*, (*Proc. Acad. Nat. Sciences Phil., Jan. 1857*,—tarsi with one joint and *two* claws,) and *Coccidæ*, (tarsi with one joint and *one* claw.)

May we not, with equal propriety, construct a new family for this insect—Tarsi with one joint and *no* claw? If these views are justifiable in the minds of the scientific world, we, therefore, have here a new genus, which may be named *Lepidosaphes* (from *λεπίς*, a scale, and *σαφής*, distinct), the principal characters of which, differing from the two families of the *Monomera*, are: *Four digituli terminated by pulvilli or arolia, and no claw, and the female living beneath a scale or shell-like habitation of her own constructing, and with equal propriety a new Family, Lepidosaphidæ, may be formed.*

I do not introduce these ideas out of a desire to be heard, or to engage in Family-making. This insect has been under observation a long time, according to Authors, both in Europe and America.

Westwood informs us that the females of *Cocci* and *Aspidioti* lose all traces of articulations in the body as well as losing their limbs, becoming motionless and apparently senseless objects of animal matter, resembling, in a measure, the vegetable excrescences called galls.

My observations, in part, subjoined with day and date, for the purpose of giving more complete assurance, and to enable any other observer to verify them, find in the case of this insect a very different state of things. The body of the female is distinctly articulate during the entire period of her existence, and, without doubt, is fully as sensative as other articulates. The absence of limbs is nothing more than an evidence of the economy of nature; limbs are furnished these insects, as others, while they need them, when they are no longer needed, they are lost; this loss is no evidence of "degeneration" "as they approach the imago state." Indeed, legs would only be an incumbrance to the animal, in the state of life it leads beneath its little shell-like habitation.

Nor do I introduce these views in opposition to those of *Linnaeus, Geoffroy, Fabricius, Burmeister, Curtis, Réaumer, Westwood*, and other great leaders and close observers in natural science. I have nothing to say about what they saw, but I simply give a brief history of what I saw, with some reflections upon the results which I conceive derived therefrom.

If these views are justifiable, we have characters sufficient for a new Family differing from the *Coccidæ*.

## Family LEPIDOSAPHIDÆ, Shimer.

Genus LEPIDOSAPHES, Shimer.

**Lepidosaphes conchiformis**, Gmellin sp.*Coccus conchiformis*, Gmellin, Ed. Syst. Nat. i, 4, 2221.*Coccus arborum linearis*, Modeer, Act. Gothenb. i, 22. Geoff., Ins. Par. i, 509. Réaum., Ins. iv, 69, pl. 5, figs. 5—7. Kirby and Spence, Int. Ent. i, 201. Harris, Inj. Ins. (new ed.) 252, fig. 96.*Coccus Pyrus Malus*, Kennicott.*Diaspis linearis*, Costa, Faun. Regn. Nap. Gallinsetti, 21.*Aspidiotus conchiformis*, Ruricola, Gard. Chron. iii, 735. Fitch, N. Y. Rep. I, p. 31; III, p. 13. Walker, Cat. Homop. B. M. iv, p. 1067. Walsh, Prac. Ent. II, pp. 31, 81.*Aspidiotus linearis*, Walker, Cat. Homop. B. M. iv, p. 1067.

*Tarsi with one joint; this joint may be very indistinct—a single primitive organic ring—so that the digituli almost appear to sprout directly out of the tibia and without ungues, but splitting up into four digituli, which are arranged in their origin subquadrangularly. Female living beneath a scale or shell-like habitation of her own constructing and of a coreaceous consistency; this shell, or house, increasing in size in a direction opposite to the apex or head at several distinct intervals during the summer; and laying her eggs beneath this shell, by extruding them from her body, as any other egg-laying insect does.*

*Male unknown.*

The lamented Robert Kennicott, believing this insect to be new, named it *Coccus Pyrus Malus*. Dr. Fitch assures us that this is identical with that at the East; of this I am convinced, so far as I can be, by examining the habitations filled with eggs, in the winter and spring time, both East and West. About its being distinct from the European species, I am not able to say anything, having never visited Europe. Dr. Fitch sent specimens of this Apple Bark-louse to Mr. Curtis, the distinguished English Entomologist, for determination, and in reply, he says, that it is identical with *Coccus arborum linearis*, Geoffroy.

Now, in the condition the specimens must have reached Mr. Curtis, he had only the shell or habitation for examination, and, therefore, he could hardly speak understandingly regarding the animal itself; moreover, this opinion does not appear correct, as the *C. arborum linearis* was described from the Elm. Certainly, if the Elm is the natural food of this insect, it has been badly neglected in this country—a very improbable thing for an insect of this order, to leave the Natural Family *Ulmaceæ* and locate on a species of the *Romaceæ*, differing so widely, botanically, as they do. Mr. Curtis assures Dr. Fitch that he is right in placing this insect under the genus *Aspidiotus*. Could Mr. Curtis judge impartially by examining mere shells? The recorded observations of Dr. Fitch do not show sufficient research in the field, to entitle his opinion to any weight. It is an easy matter to fill pages by collecting the writings and loose observations of irresponsible parties, which usually are unreliable, and in the main utterly worthless. The foundations of all correct reasoning and deductions in

Natural History, and especially in Entomology, are deeply laid in *thorough, untiring observation and investigation*, and he that departs from this *rock*, builds his castle on the sand; hence, it will not endure the storms of time.

These points of difference, between this insect and the typical *Coccidæ*, are very important, in that the tarsus is terminated by one claw—in this, by none, but having four digituli instead; in that the body of the female becomes transformed into a scale, in this the female lives beneath the scale, a distinct and separate thing throughout the entire period of her existence.

In view of this combination of facts, I am persuaded that all close investigators will discover in this, an insect comprising the characters of a new Family, or at least a Sub-Family *Coccineæ* under the *Coccidæ*. The weight of the testimony is emphatically in favor of a new Family for the reception of this apparently new Genus. The only argument that can, scientifically, be brought to bear against these views, regarding the classification of this insect are, that the examinations of the feet have been derived from the larval state; to this I can but reply, that I appreciate the importance of having a winged imago for description, and to this end made every possible effort to obtain one, and could find no evidence or sign of the existence of such a state, and hence I do not see the propriety of waiting longer for a state, that has never been seen by any one in this country, among the many observers of the present century, and may, and probably will, never be seen, perhaps having no existence whatever. And furthermore, I never find any difficulty in determining the tarsal characters of any of the numerous Aphidians, from examining them in the larval state; the same is true of the *Dactylospæridæ*. Like these larvæ, this has six true legs, having femur, tibia and tarsus, with true joints, as have other insects; these, therefore, are manifestly no prolegs, and are entitled to our regard in classification.

Apparently imperfect and peculiar as are these feet, they appear well adapted to the wants of the insect. I have taken up the young larval "Bark-louse" on the end of a fine needle, and was surprised to witness its ability to retain its footing on so hard and smooth a surface, and it is jarred off of the needle with great difficulty. This proves that the digituli are terminated by a suction or vacuum-producing apparatus—*pulvilli*, or more probably *plantæ*, or perhaps *arolia*—and, therefore, much better adapted to travel with safety over the hard, smooth surface of the bark of the tree, without being blown away by the sweeping winds of spring. A fall to the ground would be fatal to the life of the insect, and if it ventures upon the downy young limbs and leaves, the digituli serve them as well as in the case of the "Grape Leaf-louse," as I have already observed, in my paper on the *Dactylospæridæ*.

Mt. CARROLL, ILL., November 1, 1867.

Catalogue of a small Collection of HYMENOPTERA made in New Mexico during the summer of 1867.

BY E. T. CRESSON.

The species comprised in this catalogue were collected in New Mexico, during the summer of 1867, by Dr. Samuel Lewis, while accompanying the Survey of the Pacific Railway, E.D., from Fort Wallace, Colorado, to Fort Craig, New Mexico. Dr. Lewis's specialty being Coleoptera, he made no effort to collect any other Order, and the species enumerated below were accidentally captured in the net while sweeping. The fact of nearly one-half of the species collected being undescribed, shows what a rich harvest a good collector of Hymenoptera could reap in that region of our country. The entire collection has been kindly presented to this Society by the collector.

1. *Urocerus areolatus*, n. sp. ♂

*Female*.—Black, with a bluish-green reflection; head clothed with black hairs; vertex with large, deep, confluent punctures, and three rather deep, longitudinal furrows; the surface around and about the ocelli, rugose; cheeks polished, sparsely punctured; clypeus longitudinally striated; antennæ black, shining, punctured, as long as the head and thorax, 24-jointed; thorax above coarsely rugose, except middle of mesothorax, which is almost smooth; sides of prothorax above more coarsely rugose than rest of thorax; pleura subdepressed on the sides, coarsely punctured; wings violaceous-black, darker at base and along costa, neuration as in the accompanying figure; legs slender, entirely shining black, tinged with blue-green, femora deeply punctured, first joint of posterior tarsus three-fourths the length of the tibia; claws rufo-piceous, with a strong inner tooth, removed from the tip; abdomen above steel-blue, with a slight velvety appearance, very finely sculptured; the venter and sides of dorsal segments shining and tinged with greenish, the former sparsely punctured; terminal dorsal impression deep and rounded; anal horn (cornus) shaped much as in *U. cyaneus*, being acutely conical, not at all shouldered, much flattened at base above, apex tuberculate, serrate on the sides; ninth segment convex on the sides, smooth and polished, with a few scattered punctures; ovipositor longer than the abdomen, piceous. Length 14 lines; with ovipositor 17 lines.



One ♀ specimen. Closely allied to *U. Edwardsii*, but distinct by the different shape of the anal horn of the abdomen. The presence of an areolet beneath the third submarginal cell on anterior wings may be accidental, although it is exactly the same on both wings; the left anterior wing has the separating nervure between the second and third submarginal cells incomplete; the second branchial cell has a complete cross-nervure.

2. *Mutilla bioculata*, Cresson.

*Mutilla bioculata*, Cresson, Proc. Ent. Soc. Phil. iv, p. 431. (1865).

One ♂ specimen.

3. *Mutilla californica*, Radochk.

*Mutilla californica*, Radochk. Cresson l. c.

One ♀ specimen.

4. *Mutilla fulvohirta*, Cresson.

*Mutilla fulvohirta*, Cresson, l. c., p. 433.

One ♂ specimen. This will probably prove to be the ♂ of *californica*.

5. *Scolia (Discolia) Lecontei*, n. sp.

*Female*.—Head black, sparsely punctured, a large rufous spot on the front, extending from the lower ocellus to and including the space between the antennæ, and also the emargination of the eyes; posterior orbits, clypeus and mandibles, except tips, rufous; occiput clothed with a dense golden pubescence; antennæ short, robust, black, scape dull rufous; thorax with deep, rather close punctures; prothorax, except its anterior middle, extreme lateral margin of mesothorax, tegulæ and scutellum rufous, the latter flat, with a few scattering, deep punctures; postscutellum bright yellow; rest of thorax black, sparsely clothed with golden pubescence, more dense on prothorax in front, and on metathorax, the prominent, lateral lobes of the latter with an obscure rufous spot; wings fusco-hyaline, strongly tinged with yellowish, especially along the costa to the tip of the marginal cell, beyond which it is violaceous-black; both wings have a beautiful purple reflection, especially towards the apical margin; anterior wing with two submarginal cells, the second receiving one recurrent nervure; legs rufo-ferruginous, clothed with yellowish hair, most of coxæ black; abdomen rufo-ferruginous, sparsely punctured, shining, second to fifth segments above stained more or less with blackish, second and third segments above with a large, ovate, bright yellow spot on each side, nearly meeting on the disk, those on the third segment more transverse and regular; fourth segment with a transverse yellow band at tip; fifth segment with

a subobsolete, narrow, yellowish stripe near the tip, sub-interrupted in the middle; apical margins of all the segments with a dense, rather long fringe of yellowish hairs; venter dull ferruginous, the third segment black at base. Length 6 lines.

One ♀ specimen. At first sight this species has much the appearance of *Elis Xantiana* Sauss.

6. *Scolia* (*Discolia*) *flavocostalis*, n. sp.

*Male*.—Black, deeply and rather closely punctured, clothed with long, golden pubescence; a spot on the anterior orbits, below the emargination of the eyes, and a narrow line on lower half of posterior orbits, yellow; mandibles bright fulvous, black at tips; antennæ entirely black, robust; a spot on each side of prothorax anteriorly and another on postscutellum, yellow; scutellum with large, scattered punctures; tegulæ fulvous; wings hyaline, with an opaline reflection, costa broadly yellow to the tip of marginal cell, beyond which it is violaceous-black; anterior wing with two submarginal cells, the second receiving one recurrent nervure; legs rufo-ferruginous, clothed with yellowish hair, most of coxæ black; abdomen black, clothed with yellowish hair, especially dense on the apical margins of the segments, apex of the three basal segments more or less ferruginous; on each side of second and third segments above a yellow ovate spot, large and transverse on the third segment; fourth segment with a narrow, apical, yellow band, interrupted in the middle, and dilated laterally; apex with three short spines; venter blackish, most of the second segment ferruginous. Length 4½ lines.

One ♂ specimen. This may be the ♂ of *S. Lewisii*. It is however much smaller.

7. *Elis* (*Trielis*) *Xantiana*, Sauss.\*

*Elis Xantiana*, Sauss., Ann. Soc. Ent. Fr. 4e sér iii, p. 18, ♂ ♀; Cat. Spec Gen. Scolia, p. 149, pl. 1, fig. 10 ♀, 11 ♂.

*Scolia regina*, Cresson, l. c., p. 447, ♀.

?*Scolia flavosignata*, Cresson, l. c., p. 449, ♂.

Two ♀ specimens.

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\* Since the publication of the 2d Part of my Paper on the Hymenoptera of Colorado Territory (*Proc. Ent. Soc. Phil.* iv, p. 426, 1865.) I have seen Dr. de Sausure's Paper, entitled "*Sur quelques Scolies de Basse-Californie*" (*Ann. Soc. Ent. Fr. 4e sér.* iii, p. 18, 1863); in which he describes several species apparently identical with specimens from Colorado and New Mexico. The identity of his *Elis Xantiana* ♀ with my *Scolia regina* ♀, is decided by a specimen kindly communicated to me by Mr. Norton, who has also sent me a specimen, described by the same author as the ♂ of *Xantiana*, and which is identical with a species from Colorado described by me as *flavosignata*. I had been led to suppose,

8. *Elis (Trielis) zonaria*, Cresson.

*Scolia consors*, Cresson, l. c., p. 449, ♂. (nec *Sauss.*)

One ♂ specimen.

9. *Elis (Dielis) plumipes*, Drury.

*Sphex plumipes*, Drury, Exot. Ins. i, pl. 44, fig. 5, ♀.

*Scolia radula*, Fabr., Ent. Syst. ii, p. 232, ♂.

*Scolia fossulana*, Fabr., Syst. Piez. p. 242, ♀.

*Colpa fossulana*, St. Farg., Hym. iii, p. 540.

*Scolia confluenta*, Say, Am. Ent. pl. 29; Bost. Jour. i, p. 364.

*Elis plumipes*, Sauss., Ann. Soc. Ent. Fr. 1858, 245; Cat. Spec. Gen. Scolia, p. 243, ♂ ♀.

Two ♀, one ♂, specimens.

10. *Pompilus marginatus*, Say.

*Pompilus marginatus*, Say, Long's Second Exped. ii, p. 333. Cresson, Trans. Am. Ent. Soc. i, p. 68.

*Pompilus (Miscus) petiolatus*, Say, Bost. Jour. Nat. Hist. i, p. 305.

One ♀ specimen.

11. *Pompilus (Priocnemis) terminatus*, Say.

*Pompilus terminatus*, Say, Amer. Ent. pl. 42; Cresson, Trans. Am. Ent. Soc. i, p. 113.

Two ♀ specimens.

12. *Pepsis formosa*, Say.

*Pompilus formosus*, Say, West. Quart. Rep. ii, p. 76; Amer. Ent. pl. 42.

*Pepsis formosa*, Cresson, Trans. Am. Ent. Soc. i, p. 144.

Two ♀ specimens.

13. *Ammophila varipes*, Cresson.

*Ammophila varipes*, Cresson, Proc. Ent. Soc. Phil. iv, p. 457. (1865).

Three ♀ specimens.

14. *Coloptera Wrightii*, n. sp.

*Female*.—Fulvo-ferruginous, smooth and polished; head broad, flattened; clypeus tinged with yellowish, tips of mandibles and of antennæ, black; cheeks with a few scattering pale hairs; thorax subopaque, finely aciculate, transversely so above, obliquely so on pleura and sides of metathorax; pleura and tip of metathorax with a dense, fine, silvery pile; tip of metathorax with a bilobed black spot; wings short, hya-

that my *consors* (l. c., p. 449) would prove to be the ♂ of *regina*, which supposition was strengthened by the capture of both the last named species in New Mexico by Dr. Lewis. Dr. de Saussure may, however, be correct, and my *consors* may be a distinct species. In this case the name of the latter species must be changed to that of *zonaria*, the former name being used by Dr. de Saussure in the paper above quoted.

*Scolia Ridingsii*, Cress., from Colorado, seems to agree very well with Dr. de Saussure's description of what he decides to be a variety of *nobilitata* Fabr. (l. c., p. 18), but which, I think, is a distinct, though closely allied, species.



line; coxæ more or less silvery, the posterior pair black behind; abdomen highly polished, the petioles slender, as long as the thorax, very slightly and gradually thickened to the tip; second petiole with a stain near base and apex, and a transverse stain on the middle of the remaining segments (which are together not as long as the petioles and are oval in form), blackish, more distinct laterally. Length  $5\frac{1}{2}$  lines; expanse of wings 5 lines.

One ♀ specimen. This is the only species belonging to the genus *Coloptera* that has as yet been discovered in America, the only two species hitherto described having their habitat in Algeria and Guinea.

At the request of Dr. Lewis, this pretty little species is respectfully dedicated to General W. W. Wright, Chief Engineer of the Pacific Railway, E. D.

15. *Priononyx Thomæ*, Fabr.

*Sphex Thomæ*, Fabr., Ent. Syst. ii, p. 199.

*Pepsis Thomæ*, Fabr. Syst. Piez. p. 209.

*Priononyx Thomæ*, Dahlb., Hym. Eur. i, p. 28. Saussure, Novara Exped. Hym. p. 43.

One ♀ specimen.

16. *Priononyx atrata*, St. Farg.

*Sphex atrata*, St. Farg., Hym. iii, p. 355.

*Priononyx atrata*, Smith, Brit. Mus. Cat. Hym. iv, p. 266.

One ♀ specimen.

17. *Larrada abdominalis*, Say.

*Larra abdominalis*, Say, West. Quart. Rep. ii, p. 77. (1823).

One ♀ specimen.

18. *Larra uncinata*, Say.

*Stizus uncinata*, Say, West. Quart. Rep. ii, p. 77; Amer. Ent. pl. 2.

*Larra uncinata*, Cresson, Proc. Ent. Soc. Phil. iv, p. 472. Packard, ib. vi, p. 444.

Twelve ♂ ♀ specimens.

19. *Gorytes propinquus*, n. sp.

*Female*.—Black, polished, sericeous; face narrowed beneath, eyes large; narrow frontal orbits, conical space beneath antennæ, clypeus, mandibles, except tips, and the palpi, pale yellowish; clypeus convex, its anterior margin subsinuate; antennæ slightly thickened toward the tips, fulvous, the three or four apical joints black; thorax impunctured; posterior margin of prothorax, tubercles, line over the tegulæ, large spot on each side of pleura beneath anterior wing, a small spot beneath posterior wing, scutellum, except basal margin, postscutellum, tegulæ, and a large ovate spot on each side of metathorax, pale yellowish; the

triangular basal space of metathorax deeply channeled down the middle; wings fuscous, the apex of the anterior pair subhyaline, stigma and costal nerve yellowish; third submarginal cell quadrangular, oblique; legs pale yellowish, the coxæ black, and the femora fulvous; abdomen subpetiolate, pale yellowish; extreme base of first segment, a transverse, wavy band before the middle of the second, sometimes slightly interrupted, and a broad band at base of the third, fourth and fifth segments, narrowed to a point laterally, black; the black band on third segment is continued beneath; abdomen impunctured. Length  $4\frac{1}{2}$  lines.

Described from three ♀ specimens, two of which were collected in Texas by Dr. Gideon Linneceum. This is closely allied to *G. abdominalis* from Colorado.

20. *Gorytes tricolor*, n. sp.

*Female*.—Black, shining, sparsely punctured, subsericeous; broad frontal orbits, spot beneath antennæ, clypeus, mandibles, except tips, and the palpi, lemon-yellow; face scarcely narrowed beneath; clypeus, flattened, its anterior margin truncate; antennæ brown-black, the scape beneath yellow; posterior margin of prothorax, tubercles, scutellum, spot over the tegulæ, and a transverse line behind tubercles, shading into ferruginous beneath, lemon-yellow; tegulæ, and the metathorax, except basal enclosed space, ferruginous; scutellum crenulated at base; metathorax rounded above and laterally, subtruncate behind; wings subhyaline, the marginal and part of submarginal cells and a longitudinal streak about the middle of the wing, fuliginous; stigma and costal nerve fulvous; third submarginal cell quadrate, scarcely at all oblique; legs ferruginous, the tarsi and part of the posterior tibiæ yellowish; abdomen ovate, convex, polished, the second segment and the following segments toward the apex, with scattering punctures; the basal and three apical segments ferruginous, the apex of the former with a broad lemon-yellow fascia, narrowed in the middle anteriorly; second, third and fourth segments each with a straight lemon-yellow fascia at apex, broadest on the second segment; beneath, the base and apex, and the apical margins of the second, third and fourth segments, ferruginous, the second and third segments with a lateral yellow spot at apex. Length 4 lines.

One ♀ specimen.

21. *Odynerus annulatus*, Say.

*Odynerus annulatus*, Say, Long's Second Exped. ii, p. 348.

Two ♀ specimens.

22. *Odynerus rufinodus*, n. sp.

*Female*.—Black, densely and deeply punctured; head large, face and base of clypeus with glittering pubescence, the latter subconvex; mandibles rufous, black at tips, the inner edge with three obtuse teeth; palpi honey-yellow; antennæ short, clavate, entirely blackish; a transverse line, interrupted medially on prothorax, a round spot on each side of pleura, tegulæ, except a brown medial spot, and two spots on scutellum, white; metathorax rufous, silvery on the sides, deeply excavated posteriorly, the extreme lateral apical angles produced into a subacute spine; wings subhyaline, the costa narrowly fuliginous; legs entirely rufous, the posterior tarsi slightly dusky; abdomen with the apical margins of the first and second segments reflexed and narrowly whitish, as well as that of the third; basal segment companulate, convex, without any transverse carina and suture at base, rufous; second segment suddenly swollen, convex, its posterior whitish margin sinuous anteriorly, and is continued, narrowly, beneath; fourth and following segments entirely black. Length  $3\frac{1}{2}$  lines.

One ♀ specimen.

23. *Odynerus ocellatus*, Say.

*Odynerus ocellatus*, Say, Bost. Jour. Nat. Hist. i, p. 385. Sauss., Mon. Guêpes Sol. Supp. p. 219.

One ♀ specimen. The first segment has an oblique spot on each side.

24. *Odynerus Toas*, n. sp.

*Female*.—Black, densely and deeply punctured; a lunate line at base of clypeus, spot at base of mandibles, another above insertion of antennæ, another in the emargination of eyes, and a short line on posterior orbits, pale yellowish-white; clypeus with longitudinal punctures, narrowed at tip which is subemarginate; apical half of mandibles ferruginous; palpi pale; antennæ with the scape whitish on the outside; two transverse spots on prothorax, tegulæ, except a dusky medial dot, a large spot beneath and a small spot behind tegulæ, postscutellum, and a transverse mark on each side of metathorax, pale yellowish-white; metathorax rugulose, truncate and subexcavate behind; wings hyaline or subhyaline, dusky along the costa, stigma and costal nerve reddish-brown; legs ferruginous, coxæ and part of trochanters black, tips of femora, base of tibiæ yellowish; apical margin of all the abdominal segments, except the last, yellowish, (that on the basal segment confluent with a lateral subtriangular spot; that on the second sinuous anteriorly,) and a sub-basal, transverse spot on each side of second segment, pale yel-

lowish-white; apical margin of latter segment reflexed; the second segment beneath with a yellowish apical margin, and the third with a lateral spot of the same color. Length 4 lines.

*Male*.—Like the ♀, except that the clypeus, upper surface of mandibles, a line between antennæ dilated and sub-bilobed above, and the anterior orbits almost filling up the emargination but not extending above it, yellowish-white; the clypeus is smooth and emarginate at tip; the antennæ are black above, the scape yellowish-white beneath, the flagellum fulvous beneath, the apical joints gradually thickened, the eleventh joint emarginate beneath, the next suddenly smaller, and the apical joint hooked and subacute; the lateral spots on first and second segments of abdomen smaller and more oblique; beneath, the third segment has an entire apical yellowish margin. Length 4 lines.

One ♀, two ♂ specimens. Allied to *O. oculatus* Say. Belongs to the subgenus *Leionotus*.

25. *Pterochilus 5-fasciatus*, Say.

*Pterochilus 5-fasciatus*, Say, Long's Second Exped. iii, p. 347.

One ♀, two ♂ specimens.

26. *Pterochilus Lewisii*, n. sp.

*Female*.—Robust; head and thorax clothed with a pale fulvous pubescence; abdomen silvery sericeous in certain lights; head black, densely punctured, broad posterior orbits, narrow anterior orbits from the emargination down, the clypeus entirely, and the mandibles, except tips, and the base and lower margin beneath, bright ferruginous; clypeus subconvex, sparsely punctured, pubescent, the tip produced and truncate; mandibles large, long, acute at tip, with four obtuse teeth on the inner edge before the tip, the outer surface with two oblique carinæ, and the lower margin fringed with long yellow hairs; maxillæ blackish, their palpi fulvous, the apical joints fringed with very long hairs; antennæ black, the two basal joints bright ferruginous; thorax very densely punctured, black, the upper half of prothorax, spot beneath anterior wing, two large, almost confluent spots on scutellum, and the sides of the metathorax, bright ferruginous; postscutellum and tegulæ, except a central darker spot, yellowish-ferruginous; metathorax short and very abrupt; wings subhyaline, varied with fuliginous, the costa and base stained with yellowish, subviolaceous; legs short and stout, ferruginous, the coxæ and trochanters black, the four posterior tibiæ and base of tarsi covered with short spines; abdomen robust, sessile, very densely punctured; first and second segments dull ferruginous, with their apical margins bright yellow, and a larger black spot

on their basal middle, that on the first segment longitudinal and even, that on the second transverse, angular on the sides and acutely pointed behind; the yellow posterior margin of the second segment is slightly and squarely emarginate on each side anteriorly; remaining segments bright lemon-yellow, the third and fourth more or less black at base; the two apical segments are tinged with orange and the third to fifth segments have a transverse orange spot on each side; beneath ferruginous, with a lateral yellow spot at tip, and a large semicircular black mark on the base of the second segment. Length  $8\frac{1}{2}$  lines.

One ♀ specimen. This fine species resembles *P. 5-fasciatus* Say, but is quite distinct.

27. *Polistes Navajoe*, n. sp.

*Female*.—Head pale yellow, the venter, occiput and tips of mandibles, black; a yellow spot, confluent with the orbits, on each side behind the ocelli; clypeus rounded and ciliated anteriorly, sparsely punctured and pubescent; cheeks tinged with fulvous; antennæ fulvo-ferruginous, the middle of flagellum black; thorax velvety-black; posterior margin of the prothorax, broader in front, tegulæ and scutellum ferruginous; the mesothorax has sometimes a faint reddish stain on each side; metathorax pubescent, obliquely striated, with a deep central, longitudinal channel; wings fuscous, ferruginous along the costa and at base, subviolaceous, nervures and stigma ferruginous; legs black, tips of all the femora, the four anterior tibiæ, basal half of the posterior pair, and all the tarsi, tinged with fulvous; abdomen longer than the head and thorax, sericeous, the first and second segments above and beneath, except apical margins, broader on the second segment, and the basal margin of the third segment above and beneath, black; the remainder lemon-yellow; the anterior half of the apical margin of the second segment above is fulvous, shading gradually into the yellow, sometimes this margin is entirely fulvous; the third and remaining segments have a faint, central, longitudinal, fulvous streak and a lateral spot of the same color, that on the third segment sometimes very distinct. Length 9—10 lines.

Four ♀ specimens. This occurs also in Arizona.

28. *Polistes flavus*, n. sp.

*Female*.—Lemon-yellow, base of clypeus, vertex and cheeks tinged more or less with fulvous; clypeus subdepressed, subquadrate, sparsely punctured, each puncture giving out a short fulvous hair, apex angular, ciliated, the lateral angles with two teeth, the inner one the longest; tips of mandibles black; space between antennæ protuberant; anten-

næ entirely fulvous, darker above; mesothorax fulvous, the incisures and a longitudinal black line on the disk, abbreviated posteriorly, black, a faint line on each side of the disk and the lateral margins, yellow; prothorax faintly tinged with fulvous, its posterior margin yellow; metathorax with a deep central, longitudinal channel; tegulæ with a median, fulvous dot; wings varied with fuliginous, darker along the costa, a bright violaceous reflection, base of both wings, a narrow, longitudinal streak through the middle of the wing, and most of the second submarginal cell, subhyaline; stigma, costal vein from the stigma to the base and the nervures at the base of the wing, fulvous, the rest black; legs faintly tinged with fulvous at base and on the tarsi; abdomen bright lemon-yellow, not longer than head and thorax, subsericeous, a central longitudinal streak posteriorly, a spot at base of first segment, a narrow line across its middle, slight stains on each side of first and second segments at base, a transverse spot on each side near the apex of the second to fifth segments connected by a slender arcuate line (both above and beneath), fulvous; basal segment triangular, its apical breadth equal to its length. Length 9 lines.

One ♀ specimen.

29. *Andrena mellea*, n. sp.

*Female*.—Honey-yellow, clothed with pale appressed pubescence, especially dense at the sides of the face, on the legs and apical margins of abdominal segments; head black, the clypeus, spot above, mandibles at base and stains on the cheeks, honey-yellow; clypeus sparsely punctured, its anterior margin subarcuate; antennæ short, blackish at tips; thorax closely punctured, mesothorax longitudinally impressed anteriorly; metathorax truncate behind and stained with blackish down the posterior middle, the sides and the pleura entirely, black; wings fuscous-hyaline, subviolaceous, the costa broadly fuscous, nervures brown, stigma and costal nerve honey-yellow; third submarginal cell much longer than the second, narrowed for one-half its length toward the marginal and receiving the second recurrent nervure near the apex; legs entirely honey-yellow, the tibiæ and tarsi densely clothed with yellow pubescence; abdomen large, ovate, depressed, densely and finely punctured, the apical margin of the second, and the following segments entirely, more dense on their apical margins, densely clothed with pale yellowish, appressed pubescence; the first and rest of second segment without pubescence (probably denuded); a narrow, sub-basal, blackish fascia on the second and two following segments, the base of the first segment, and middle of apical segment, black; venter entirely honey-yellow. Length 6 lines. One ♀ specimen.

30. *Nomia Nortoni*, n. sp.

*Female*.—Black; sides of face, cheeks, thorax anteriorly, posteriorly and laterally, the legs, and base of abdomen, densely clothed with ochreous-yellow pubescence; antennæ short, with the flagellum testaceous beneath; thorax rather closely and deeply punctured, scutellum sparsely so, the latter impressed medially, (the mesothorax and scutellum are shining and may be denuded of pubescence); metathorax truncate; wings subhyaline, their apical margins fuliginous, nervures brown-black; second submarginal cell small, quadrate, the third as long as the first and narrowed one-half toward the marginal, receiving the second recurrent nervure between the middle and apex; legs robust, densely pubescent, especially the posterior pair, posterior tarsi golden within; abdomen ovate, shining, subconvex, the apical half or one-third of the segments transversely impressed; second, third and fourth segments each with a beautiful emerald green apical margin; apical segments with black pubescence; ventral segments fringed with ochreous pubescence. Length  $7\frac{1}{2}$  lines.

*Male*.—Differs much from the ♀; the head is smaller, with the face densely clothed with ochreous pubescence; the antennæ are nearly as long as the head and thorax, gradually attenuated to the tip, bright fulvous, the scape above and a line on the flagellum above, brown-black, the scape densely pubescent beneath, the joints very distinctly defined, the terminal joint nearly as long as the basal joint and pointed at tip; the anterior half of the mesothorax is densely clothed with fulvo-ochraceous pubescence; the four anterior tibiæ in front and their tarsi are honey-yellow; the posterior femora are short and enormously swollen, being almost globose exteriorly, but are concave within; their tibiæ are short, dilated posteriorly, and are dilated at tip beneath into an irregularly shaped process, which is deeply excavated beneath the insertion of the tarsi, and present, on the inner edge, three long, acute spines; the tibiæ are yellow, black at base; their tarsi are yellow, dusky at tips, the basal joint very long, flat, and broader at base; the abdomen is more depressed and subparallel, clothed, especially at base, with short pale pubescence; the apical fasciæ of the second, third and fourth segments are of a paler green, and the fifth segment has also a greenish fascia, which does not, however, extend the whole width of the segment; apex densely clothed with black pubescence; the apical segment is emarginate at tip; beneath, the second and third segments present broad, flattened, slightly concave plates, each with a sharply impressed line down the middle, the sides are densely pubescent. Length  $7\frac{1}{2}$  lines.

One ♀ specimen. Described from three ♀, and one ♂, specimens. The ♂ and one ♀ was found in Colorado by Mr. James Ridings, and one ♀, in the collection of Mr. Edward Norton, is from Kansas.

31. *Nomia* ? *apacha*, n. sp.

*Female*.—Black, shining, the head, sides of thorax, mesothorax, postscutellum, legs, sides and apex of abdomen and the apical margins of all the segments, densely clothed with short, dull yellowish pubescence; second joint of antennæ dull rufous; metathorax truncate and subexcavate behind; tegulæ very large and pale fulvous; wings yellowish-hyaline, the apical margin fuscous, stigma and costal nerve fulvous; tibiæ and tarsi more or less fulvous, the posterior legs with the pubescence long and dense, basal joint of tarsi large and flat, claws cleft; abdomen oblong-ovate, subconvex, the segments transversely impressed at base and apex, the first segment deeply and angularly excavated at base and transversely impressed on the middle; apical margins of the first and second segments rufo-testaceous and pubescent only on the sides; ventral segments densely fringed with long dull fulvous pubescence. Length 7 lines.

One ♀ specimen. This also occurs in Colorado.

32. *Perdita* ? *albipennis*, n. sp.

*Female*.—Head and thorax dark metallic green, the latter above brassy-green; rather thickly clothed with erect whitish pubescence; clypeus polished, tinged with purplish at tip, a longitudinal yellow line down the middle and a transverse yellow spot on each side; mandibles long, curved at tip, fulvous on the middle; antennæ short, black above, testaceous at tip and beneath, the scape yellow beneath; a subinterrupted line on prothorax, and the tubercles, yellow; tegulæ testaceous; wings whitish-hyaline, with an opaline iridescence, nervures and stigma white; wing-cells arranged as in *Perdita*, except that the marginal cell is a little longer; legs black, paler at tips, thickly clothed with pale pubescence, especially long and dense on the four posterior tibiæ; abdomen ovate, flat, blackish, apical margins of segments subtestaceous, a dot on each side of first segment, a broad band at base of the four following segments, slightly sinuous behind and narrowest on second segment, lemon-yellow; apical segments pale fulvous, clothed with whitish pubescence; beneath, the segments are blackish, with pale apical margins, and subpubescent. Length 3½ lines.

One ♀ specimen. Also found in Colorado.

33. *Anthidium occidentale*, n. sp.

*Female*.—Black, densely punctured, head and thorax clothed with a dense white pubescence, long on the cheeks and sides of the meta-



thorax, and tinged with yellowish on the vertex and mesothorax; anterior orbits, dilated below, and a large triangular spot on each side of the clypeus, white; one specimen has the clypeus entirely white, while another has it white with a black mark at base; lateral margins of the mesothorax and two small round spots on the scutellum, yellowish-white; wings subhyaline, slightly stained with yellowish, the marginal cell, the apical margin of both wings broadly fuliginous; legs black, the coxæ and femora clothed with white pubescence and the tibiæ and tarsi with golden pubescence; tip of the anterior femora and their tibiæ within and generally the intermediate tibiæ within, fulvous; abdomen shining, more finely punctured than the head and thorax, clothed above with a short yellowish pubescence, long and white at base; the first five segments each with an apical yellow fascia, broad at the sides and attenuated toward the middle, interrupted on the middle of the first segment, and emarginate on each side of the first three segments, the fasciæ on the fourth and fifth segments are the broadest; sixth segment with a large yellow mark, deeply notched anteriorly; venter with a very dense clothing of fulvous hairs, becoming whitish toward the base. Length 5—6 lines.

*Male*.—Same as the ♀, except that the face is clothed with a long dense white pubescence, the anterior orbits, clypeus and mandibles, except tips, are white; the mesothorax is margined laterally with whitish in one specimen only, and the scutellum is immaculate in all the specimens; the tibiæ have a white spot at base and are tipped with white, with a ferruginous spot at the extreme apex; tarsi white, dusky at tips; the fasciæ on the first four segments are slightly emarginate on each side anteriorly, and that on the fifth segment is broad, slightly constricted in the middle; the sixth segment is yellow, emarginate anteriorly with black, the apical edge is recurved and rounded; apical segment and venter black. Length same as ♀.

Described from four ♀, four ♂ specimens. Also taken in Colorado.

34. *Anthidium maculifrons*, Smith.

*Anthidium maculifrons*, Smith, Brit. Mus. Cat. ii, p. 214. Cresson, Proc. Ent. Soc. Phil. iii, p. 375.

One ♂ specimen.

35. *Anthidium atrifrons*, n. sp.

*Female*.—Black, densely and very finely punctured, clothed with a dense whitish pubescence, that on the vertex and thorax above tinged with fuscous; head entirely black, except a white spot at the summit of each eye; anterior margin of the clypeus denticulated; four elongate spots on the margin of the scutellum, the tubercles and the tegulæ,

except a central black spot, white; wings subhyaline, costal half of the marginal cell fuliginous; nervures black; legs black, all the tibiæ with an exterior white streak, the tarsi densely clothed with white pubescence exteriorly and brownish within; abdomen clothed above with a short, thin, white pubescence, more dense at the base, each segment has a subapical whitish fascia, dilated on the extreme sides, all of them slightly interrupted in the middle, and emarginate on each side anteriorly, except that on the first segment, which encloses a black dot; the fasciæ become broader on the apical segments; ventral scopa short and white or yellowish-white.

Described from four ♀ specimens. Also taken in Colorado.

36. *Epeolus remigatus*, Fabr.

*Melecta remigata*, Fabr., Syst. Piez. p. 387. Cresson, Proc. &c. iii, p. 393.

One ♀ specimen.

37. *Melissodes menuchus*, n. sp.

*Male*.—Black; head, thorax and legs densely clothed with a long ochreous or fulvo-ochraceous pubescence, the apical margins of the abdominal segments fringed with a short dense, pubescence of the same color; clypeus entirely, and a spot at base of mandibles, pale yellowish; antennæ three-fourths the length of the body, bright fulvo-testaceous, darker and sometimes blackish above, the base blackish; wings hyaline, the nervures, as well as the tegulæ, pale fulvous; legs thickly pubescent, tarsi more or less fulvous; abdomen ovate, thinly clothed, except at apex, with ochreous or fulvo-ochraceous pubescence; the depressed, apical margins of the segments pale testaceous; on the extreme lateral, basal margin of the fifth segment a short angular acute tooth, and a smaller one at the base of the sixth segment, the apex of this segment is concave, with the sides acutely reflexed and its tip truncate; venter brownish, with the apical margin of the segments fringed with ochreous pubescence. Length 5—5½ lines.

Two ♂ specimens. Also found in Colorado.

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**ERRATA et CORRIGENDA.**

Page 5, line 33, for particular read particularly.

8, line 7, for so speak read so to speak.

8, line 13, *dele* comma after to.

13, line 28, for syrangaria read syringaria.

14, line 18, for Authros read Authors.

16, line 1, insert a semicolon after downwards.

26, line 15, for fluently read faintly.

26, line 21, for anterior read posterior.

27, line 13, for interal read internal.

50, line 19, for 171 read 179, 1.

50, line 21, for 671 read 674.

54, line 24 for Sel. read Serv.

63, line 23, for twelve pectoral read twelve abdominal.

64, line 3, *cœruleus* should be under heading *A* instead of *B*.

67, line 6, for 268 read 298.

69, line 3, for venter read vertex.

69, line 41, for *procera* read *poecila*.

71, to line 25 add the following references:—

Klug, Berl. Mag. vi, 300, 26. Lepel., Mon. Tenth. 48, 136.

73, line 1, for 249 read 240.

73, line 34, for *Pteroma* read *Pteronus*.

76, line 15, for theentire torsi read the entire tarsi.

78, line 20, for *atripes* read *albipes*.

193, line 4, for Page 31 read Page 84.

204, line 3, for 0.22—.26 inch read 0.11—.13 inch.

224, lines 6 and 27, for Am. read Ann.

226, line 1, for piliform read filiform.

246, line 32, for *linutaris* read *limitaris*.

256, line 6, for s read is.

266, line 41, for 18 read ix.

286, line 7, for Plate IV read Plate V.

288, line 37, for 186, read 1862.

325, line 23, after dark insert blue.

340, line 11, for clean read clear.

345, line 1, for Iroea read Iroea.

377, line 26, for *Lewisii* read *Lecontei*.

## RECORD OF THE MEETINGS.

MARCH 11, 1867.

President HORN in the Chair.

Fourteen members present.

The Committee appointed at the last meeting to petition the Court to amend the Charter for change of name, reported that application had been made to the Court, considered and granted, and was now ready for acceptance by the Society.

The following donations to the *Cabinet* were announced, and the thanks of the Society voted to the donors:—

A large and valuable collection of Mexican Insects, from Dr. Chas. Sartorius.  
The Entomological Collection of the late Brackenridge Clemens, M. D., from Mrs. S. B. Clemens.

Prof. Ennis made some few remarks in reference to certain species of *Tabanus*, in British Columbia, said to be very destructive to horses and horned cattle, and recommended that the subject be taken up and studied by some one of the members.

The following Papers were presented for publication in the *Transactions*:—

“A Catalogue of the described Tenthredinidæ and Uroceridæ of North America, by Edward Norton.”

“Notes on the Pompilidæ of North America, with descriptions of new species, by E. T. Cresson.”

“Descriptions of new American Lepidoptera, No. 1, by A. R. Grote and C. T. Robinson.”

The following was read and accepted:—

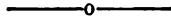
In the Court of Quarter Sessions of the Peace for the City and County of Philadelphia.

In the matter of the petition to change the name of “The Entomological Society of Philadelphia” to “The American Entomological Society.”

And now February 23rd, 1867, upon consideration of petition, and on proof of publication of notice of application for change of name duly filed; it is ordered by the Court that the name of “The Entomological Society of Philadelphia” be changed to that of “THE AMERICAN ENTOMOLOGICAL SOCIETY.” And that notice of this change of name be given to the Secretary of the Commonwealth.

In witness whereof I have hereunto set my hand and affixed the seal of the said Court this 23rd day of February,  
[SEAL] A. D. 1867. J. P. GALTON,  
Pro. Clerk.

On ballot, Rathmell Wilson, of Newark, Del., and John S. Haines, of Germantown, Pa., were elected *Honorary Members*; and Joseph W. Drexel and Thomas E. McElroy were elected *Resident Members*.



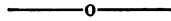
APRIL 8, 1867.

President HORN in the Chair.

Seven members present.

The following donation to the *Cabinet* was announced:—

Two specimens of *Cononotus sericans* Lec., from Dr. Geo. H. Horn.



MAY 13, 1867.

Vice-President PINE in the Chair.

Fourteen members present.

The Committee appointed to revise the By-Laws of the Society, made its final report, which was read, accepted, ordered to be printed, and a copy sent to each resident member prior to its consideration, which was postponed for one month.

The following donations to the *Library* were announced:—

The American Journal of Science and Arts, May 1867. From the *Conductors*.  
The Entomologist's Monthly Magazine for January, February and March, 1867. From the *Editors*.

Proceedings of the Boston Society of Natural History, Vol. IX, pp. 1—80. From the *Society*.

The following Paper was presented for publication in the *Transactions*:—

“Notes on American Micro-Lepidoptera, by C. T. Robinson.”

Dr. Horn made a few remarks on the species of *Cicindela* of the United States and explained the subdivision into groups as adopted by Dr. LeConte in the monograph published some years since in the Transactions of the Amer. Philosophical Society. He also spoke of the Catalogue of the genus recently published by Baron Chaudoir, in which a different classification has been adopted, though without any explanation regarding the points made use of in its formation. In this paper Chaudoir unites several of our species as varieties or races, and doubtless with propriety. In the earlier days of entomological science it was found necessary to describe many uniques as distinct species, as those com-

ing from different regions or sections of the same region showed such differences that it was impossible at that time to consider them as identical. Frequently, in close proximity we find individuals of the same species so differing, that they have been considered as belonging to distinct species, and it is not until explorations are made in more remote regions that other races are found proving the specific identity of the first two. To illustrate this it will only be necessary for the members to examine the series now before them from *oregona* to *repanda*, in which with a fuller series of specimens than we now have, the identity could be established without the possibility of any doubt. Such series may be seen beautifully arranged in the collections of Dr. LeConte and Mr. Ulke. By this it will be seen that within certain limits there can be no greater error committed than that of considering markings alone as indicative of specific differences. We have *dorsalis* and *Saulcyi* becoming at times entirely white, with all degrees between this and the fully marked specimens. *Punctulata* also, from the dull bronze immaculate specimens found with us, becomes in the south western territory brilliant green and with markings almost as distinct as in *tortuosa*. The variation of *rugifrons* are none the less marked, the brilliant bluish green degenerating to a dull black in the race known as *modesta*. It must be evident to the members that from color the only other alternative is structure and it seems finally that nothing short of some well defined and permanent structural differences indicate true specific characters. Permanent, because in the group from *oregona* to *repanda* we find differences in the serration of the elytral tips, some being almost entirely free of this sculpture, while in others it is very strongly marked. In some instances, structural differences are more strongly marked in one sex than in the other, as between the females of *cuprascens* and *macra*. With closely drawn lines it is probable that of our 68 species one-half, at least, would be considered races or varieties. It therefore behooves the members to be constantly on the watch for even the slightest variation from the typical form, so that large series may be studied and the knowledge sooner attained as to what really constitutes a species and what a variety in the interesting genus *Cicindela*.

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JUNE 10, 1867.

Vice-President PINE in the Chair.

Ten members present.

The following Papers were presented for publication in the *Transactions*:—

“Descriptions of a new Pseudomorpha from California, with notes on the Pseudomorphidæ, by Geo. H. Horn, M. D.”

“On Amphizoa insolens, Lec., by Geo. H. Horn, M. D.”

The Report of the Committee on Constitution and By-Laws was taken up, and the Constitution and Chapters 1, 2 and 3 of the By-Laws adopted with several amendments.

JULY 8, 1867.

President HORN in the Chair.

Seven members present.

The following donation to the *Cabinet* was announced :—

8 specimens of COLEOPTERA (*Cicindela oregona*, *C. pusilla*), from Geo. H. Horn, M. D.

The following Papers were presented for publication in the *Transactions* :—

“ Descriptions of new genera and species of western Scarabæidæ, with notes on others already known, by Geo. H. Horn, M. D.”

“ Notes on the Zopheri of the United States, by Geo. H. Horn, M. D.”

“ Descriptions of American Lepidoptera, No. 2, by A. R. Grote and C. T. Robinson.”

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SEPTEMBER 9, 1867.

President HORN in the Chair.

Eleven members present.

The following donations to the *Cabinet* were announced :—

A small collection of COLEOPTERA collected at Newbern, N. C., from Mr. Isaac Patterson.

A small collection of Insects of various Orders, from F. Hermann Strecker.

The following donations to the *Library* were announced :—

Transactions of the American Entomological Society, Vol. 1, No. 1. From the *Publication Committee*.

The American Journal of Science and Arts, July 1867. From the *Conductors*.

The Entomologist's Monthly Magazine for April, May, June, July and August 1867. From the *Editors*.

Proceedings of the Boston Society of Natural History, Vol. IX, pp. 81—208. From the *Society*.

Transactions of the Entomological Society of London, 3rd series, Vol. 2, Part 6; Vol. 3, Parts 3 and 4; and Vol. 5, Parts 2—6. From the *Society*.

Proceedings of the Zoological Society of London, 1865, Parts 1, 2 and 3; 1866, Parts 1, 2 and 3; 1867, Part 1. From the *Society*.

Journal of the Linnean Society of London, Nos. 31 to 35 inclusive. From the *Society*.

List of the Members, &c., of the Linnean Society of London. 1866. From the *Society*.

Proceedings of the Essex Institute, Vol. 5, No. 3. From the *Institute*.

Memoirs of the Boston Society of Natural History, Vol. 1, Part 2. From the *Society*.

Notes on the Lepidoptera of America, by A. R. Grote and C. T. Robinson. From the *Authors*.

A Monograph of the British Psocidæ, by R. McLachlan. From the *Author*. The Zoologist, 2nd series, Nos. 10—21. From the *Editor*.

The American Naturalist, Vol. 1, Nos. 6 and 7. From the *Editors*.

Descriptions of American Pompilidæ, by E. T. Cresson. From the *Author*.

Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine zur Bremen, Bd. 1, Heft 2, 1867. From the *Society*.

Diptera Americæ septentrionalis indigena Descriptis II. Loew. Berlin, 1861. From the *Author*.

Essai d'une Faune Entomologique de l'Archipel Indo-Néerlandais, par S. C. Snellen Van Vollenhoven. Premierè Monographie: Famille des Scutellérides avec 4 Planches coloriées. Seconde Monographie: Famille des Piérides, avec 7 Planches, dont 6 coloriées. From the *Author*.

68 Plates of North American Lepidoptera, engraved on copper and presented by Prof. Townend Glover.

Letters were read from the Smithsonian Institution, the Entomological Society of London, the Zoological Society of London, the Société Entomologique de France and the Stettin Entomologische Verein, acknowledging the receipt of the Society's publication.

The following Papers were presented for publication in the *Transactions*:—

“Descriptions of certain Diurnal Lepidoptera found in the United States, by Wm. H. Edwards.”

“A List of the Ichneumonidæ of North America, with descriptions of new species, by E. T. Cresson.”

“On a new genus of Aphidæ, by Henry Shimer, M. D.”

“Description of a new species of Aleyrodes, by H. Shimer, M. D.”

“Description of a new species of Cecidomyia, by H. Shimer, M. D.”

On ballot, Henry Lorenzen and Herman Sachs, both of New York City, were elected *Corresponding Members*.

The consideration of the Report of the Committee on Constitution and By-Laws was resumed, and the whole finally adopted, as follows:

# CONSTITUTION.

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## ARTICLE I.

This Society shall be called "The American Entomological Society." Its object shall be for the improvement and advancement of Entomological Science and the investigation of the character and habits of Insects.

## ARTICLE II.

The Society shall consist of resident members, corresponding members, and honorary members.

## ARTICLE III.

The right of voting, of holding office, and of transacting business shall be confined solely to resident members. Honorary and corresponding members shall have all other privileges of resident members.

## ARTICLE IV.

The officers of the Society shall consist of a President, a Vice-President, a Corresponding Secretary, a Recording Secretary, a Treasurer, a Librarian and a Curator, all of whom shall be elected annually, at the Stated Meeting in December.

## ARTICLE V.

The common seal of the Society shall be the title of the Association, surrounding the words "Founded 1859," Incorporated 1862," with a figure of "Dynastes Tityus," and the motto "Festina lente" occupying the centre.

## ARTICLE VI.

The Society shall not be dissolved unless by a vote of two-thirds of the members, notice having been given at least six months before of the intended action.

## ARTICLE VII.

The Society may establish such By-Laws for its government and regulation as may be deemed necessary and proper.



## ARTICLE VIII.

No change shall be made in this Constitution unless by a vote of two-thirds of the members present at a stated meeting, notice of such proposed change having been submitted in writing at a previous stated meeting.

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# BY-LAWS.

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## CHAPTER I.

### OF OFFICERS AND THEIR DUTIES.

ART. I.—The President shall preside at the meetings of the Society, enforce the laws, preserve order and decorum, regulate debates, state and put questions agreeably to the sense and intention of the members, and announce the determination of the Society thereupon. He shall nominate the Chairman of all Committees other than those especially excepted, give the casting vote when required, and call special meetings of the Society at such times as he may deem it necessary, or at the request of any three members in writing.

ART. II.—In the absence of the President, his duties shall devolve upon the Vice-President, or in the absence of both, a President *pro tempore*, selected from the members; or at his request when present, his duties may be performed by the Vice-President.

ART. III.—The Corresponding Secretary shall conduct and preserve the correspondence of the Society, keep correct copies of all letters written on the business of the Society, acknowledge the receipt of all donations from persons who are not members of the Society, notify all corresponding and honorary members of their election, and keep a correct list of all such members, with the dates of their election, resignation or death. He shall have charge of the certificates of membership, and cause one to be properly filled up, signed, sealed and delivered to each member, and shall lay before the Society at the stated meeting in December a written report of his transactions during the preceding year.

bers, and shall be relieved from further annual contributions to the Society.

ART. III.—Any member may become a life-member of the Society by a contribution of fifty dollars at one time, which payment shall exempt him from all further pecuniary contributions to the Society.

ART. IV.—Any person may become entitled to receive one copy of the publications of the Society during his life by the contribution of one hundred dollars to the Publication Fund.

## CHAPTER IV.

### OF RESIGNATIONS AND EXPULSIONS.

ART. I.—Any member shall have leave to resign upon application in writing, provided that all arrearages due from him to the Society have been discharged, and that there be no charge pending against him.

ART. II.—Any resident member who shall become two years in arrears for dues, and have been notified thereof, in writing, by the Recording Secretary, of his delinquencies, shall upon the report of the Secretary have his name stricken from the roll of resident members.

ART. III.—A member may be expelled from the Society for sufficient cause, by a vote of three-fourths of the members at a stated meeting, notice of the intention of the Society to consider the subject of expulsion of a member having been given at a previous stated meeting.

ART. IV.—No member shall be expelled without having an opportunity of being heard in his own defence, and any member thus expelled shall under no circumstances be received as a candidate for re-election.

## CHAPTER V.

### OF COMMITTEES AND THEIR DUTIES.

ART. I.—There shall be thirteen Standing Committees, viz.: 1, on Coleoptera; 2, on Lepidoptera; 3, on Neuroptera and Orthoptera; 4, on Hemiptera and Aptera; 5, on Hymenoptera; 6, on Diptera; 7, on Insect Architecture; 8, on Microscopy; 9, on Library; 10, on Publication; 11, on Finance; 12, on Collecting Fund, and 13, on Hall; each to consist of three members, who shall be elected annually at the stated meeting in December.

**ART. II.**—The Standing Committees numbered from one to nine, inclusive, in conjunction with the Curator, shall have charge of the collections in their respective departments. They shall properly classify, arrange, label and keep in order all articles presented to their respective departments, make and preserve annual catalogues of them, with the name of the donor of each article, and at the stated meeting in December of each year, each committee shall report on the condition of its department.

**ART. III.**—The Committee on Library (of which the Librarian shall be a member “*ex-officio*”) shall procure with the funds placed at its disposal, such works as may be directed to be purchased, and report from time to time what works it may consider most desirable to be obtained for the Society. It shall have power to make such exchanges of duplicates as may appear to it desirable, and submit at the stated meeting in December of each year a report of its operations.

**ART. IV.**—The Committee on Publication shall receive all such papers as have been accepted for publication by the Society, have them published as early as possible, and follow in the publication, as far as practicable, the order in which they have been reported upon; and also to publish such abstracts of the records of the Society as may be of general interest, and at the stated meeting in December of each year submit a report of its operations.

**ART. V.**—The Committee on Finances (of which the Treasurer shall be a member “*ex-officio*”) shall take charge, with the Treasurer, of all monies coming to the Society, and invest the same; change any or all of the investments of the Society whenever it may deem it advantageous so to do, and report such changes to the Society at its next stated meeting, with the reasons for making the same, and at the stated meeting in December submit a report of its operations.

**ART. VI.**—The Committee on Collecting Fund shall endeavor to raise such funds as will enable it to send out collectors, and for the purpose of purchasing such collections of insects as may tend to enhance the value of the Society’s Cabinet; all subscribers to be entitled to a share of the insects, and at the stated meeting in December of each year submit a report of its operations.

**ART. VII.**—The Committee on Hall shall have the general care of the Hall, and shall provide such conveniences as may be necessary for the accommodation of the officers and members of the Society. It

shall effect such insurance upon the property of the Society as may from time to time be directed, and at the stated meeting in December submit a report of its operations.

ART. VIII.—In appointing all other Committees the President shall nominate the first member, who is to nominate the second, the second a third, and in like manner successively, until the number agreed upon be complete.

ART. IX.—All committees must report in writing, and every report must be signed by a majority of the committee.

## CHAPTER VI.

### OF TRUSTEES.

ART. I.—The Society is authorized to accept in trust, and also to create separate funds for specific purposes, which shall be distinctly named. The principal of each fund shall be kept invested in the name of the Trustees, to be appointed by the Society, for such special funds, always in such good lawful securities—the loans of the United States, the loans of the State of Pennsylvania, or of the city of Philadelphia, sound real estate securities, or others—as the Society may direct, and shall be held by the said Trustees in trust for the special purposes for which each fund may be created.

ART. II.—All money which may accrue in the process of changing the investment of a Trust Fund shall be invested again without delay for the same trust; but no investment shall be changed without the consent of the Society.

ART. III.—The Trustees for such special funds shall be in number, five, of whom three shall constitute a quorum for the transaction of business. The said Trustees shall hold their office during the pleasure of the Society, and until the Society shall declare said office vacant as to any one or more of said Trustees, and appoint a successor or successors, and said Trustees and all the funds and monies in their hands shall at all times and in all things whatsoever, be subject to the control and management of the Society.

ART. IV.—The said Trustees shall, whenever directed by the Society so to do, pay over the whole or any part of the Trust Funds, or interest thereon, to such other trustees as the Society shall at any time appoint, or to such person or persons, committee or committees, as the Society shall at any time specify.

ART. V.—The said Trustees shall at the stated meeting in December of each year, and at such other times as the Society shall direct, present a report of the condition of the several funds in their hands, the amount of monies, principal and interest, belonging to each fund, how and when invested, the amount of disbursement thereof, and such other information as said Trustees may think proper to present to the Society; and whenever called upon by the Society shall report upon any matters concerned with said funds that the Society shall specify.

## CHAPTER VII.

### OF CABINET.

ART. I.—The keys of the cases containing the Collection, shall be kept by the Curator, subject to the call of the Members of the Committees on the several Departments, who, with the Curator, shall have the liberty to open the cases, and shall be responsible for all specimens committed to their charge.

ART. II.—No specimen or specimens of Entomology contained in the Collection of the Society, shall be loaned from the Hall, under any pretence or for any purpose whatever.

ART. III.—Should any one be desirous of inspecting more closely the specimens in the Collection, for the purpose of study or description, he must apply to the Curator, or any Member of the Committee on that Department.

ART. IV.—No specimens will be received on deposit; but all specimens contained in the Collection, are considered the property of the Society,

ART. V.—The Cabinet of the Society shall be open to the study and inspection of the members, on every Monday evening from 7 to 10 o'clock.

## CHAPTER VIII.

### OF LIBRARY.

ART. I.—The Library shall contain only books having reference to Entomology, and no books presented to the Society, shall be loaned from the Hall, under any pretence or for any purpose whatever.

ART. II.—Books deposited in the Library shall, at all times, be at the command of the depositor, and none shall be loaned from the Hall, unless with his written consent.

ART. III.—The Librarian shall have possession of the keys of the Library, (duplicates being under the care of the Curator.) subject to the call of the Members of the Committee, shall enter in each volume the name of the donor, and, with the Curator, be responsible for all works committed to his charge.

ART. IV.—The Library shall be open to the members, for inspection and reference, on every Monday evening from 7 to 10 o'clock.

## CHAPTER IX.

### OF PUBLICATION.

ART. I.—All written communications intended for publication, read or presented to the Society, shall be referred to the Committee, in whose department they are, to report thereon at the next Stated Meeting.

ART. II.—All such communications become the property of the Society, and shall be deposited in its Archives after publication; a copy, however, of any paper read before the Society, may be taken by the author; but all written communications which shall not be accepted for publication, may be returned to the author if requested.

ART. III.—No author shall be permitted to make any other than verbal alterations in a paper, while it is in the hands of the Publication Committee, without the consent of the Society; nor shall the Committee make any alterations in a paper committed to it, without the consent of the author. All alterations proposed, other than verbal, must be read to the Society, and if the types are set, they shall be made only at the expense of the author.

ART. IV.—The regular publication of the Society, shall be called "The TRANSACTIONS of the American Entomological Society," and shall be published in numbers of a uniform octavo size, at as short intervals as practicable. The expenses of publishing the Transactions shall be defrayed by subscriptions and sales, aided by the interest arising from the permanent Publication Fund.

ART. V.—The Committee shall keep a correct account of its money transactions, receiving all monies arising from the sale of the Transactions and interest from the Publication Fund, and paying all bills for publishing the same, these having been first approved by a majority of the Committee.

## CHAPTER X.

## MEETINGS.

ART. I.—The Stated Meetings of the Society shall be held on the second Monday evening of each month, at such hours as may be fixed from time to time by the Society.

ART. II.—Special Meetings of the Society may be called by the President, whenever he may deem it necessary, or at the request of any three members in writing.

ART. III.—Seven members shall constitute a quorum for the transaction of business.

ART. IV.—The order of business at Stated Meetings shall be as follows :—

1. Minutes of last Stated Meeting shall be read.
2. Reports of Officers and Committees.
3. Donations to Cabinet.
4. Donations to Library.
5. Written communications.
6. Verbal communications.
7. Unfinished business.
8. New business.
9. Proposals and Elections.
10. Rough minutes read and adopted.
11. Adjournment.

## CHAPTER XI.

ART. I.—In case of the dissolution of the Society, a meeting of the Resident Members shall be called, to decide upon the disposition which shall be made of its property.

ART. II.—In all such points of order as are not noticed in these By-Laws, the Society is to be governed by the established usages of similar Institutions.

ART. III.—Every proposition to alter or amend these By-Laws, shall be submitted in writing at a Stated Meeting, and acted upon at the next Stated Meeting, and if adopted by the affirmative votes of two-thirds of the members present, it shall become part of these By-Laws; provided, that at least ten members be present at each of the readings.

ART. IV.—No one or more of these By-Laws shall be suspended.

OCTOBER 14, 1867.

President HORN in the Chair.

Ten members present.

The following donation to the *Cabinet* was announced:—

16 specimens of LEPIDOPTERA (*Argynnis Diana*, ♂ ♀, *Thecla poeas*, *T. falacer*, *Polyommatus comyntus*, *Hesperia cellus*, *H. leonardis*, *H. logan*), from James Ridings.

The following donations to the *Library* were announced:—

Annales de la Société Entomologique de France. Vol. 5, Part 4 (1836), Vol. 6 Part 1 (1837), 4th series Vol. 5, Part 4, and Vol. 6, Parts 1 to 4 inclusive. From the *Society*.

The Entomologist's Monthly Magazine, for September 1867. From the *Editors*.

The American Journal of Science and Arts, September 1867. From the *Conductors*.

Condition and doings of the Boston Society of Natural History. (From the Annual Reports of Officers.) May, 1867. From the *Society*.

Letters were received from the Secretary of the Linnæan Society of London, and from the Editors of the Entomologist's Monthly Magazine, acknowledging the receipt of the Society's publication.

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NOVEMBER 11, 1867.

President HORN in the Chair.

Nine members present.

The following donations to the *Library* were announced:—

Proceedings of the Essex Institute, Vol. 5, No. 4. From the *Institute*.

Transactions of the Literary and Historical Society of Quebec, New series, Part 5. From the *Society*.

The American Naturalist, Vol. 1, No. 8. From the *Editors*.

Revue des Cours Scientifiques de la France et de l'étranger, Quatrième année, Numéro 31. From the *Directors*.

Proceedings of the Academy of Natural Sciences of Philadelphia, 1867, Nos. 1, 2 and 3. From the *Academy*.

Transactions of the American Entomological Society, Vol. 1, No. 1. From the *Publication Committee*.

Letters were read from the Smithsonian Institution, the Essex Institute, and the Chicago Academy of Sciences, acknowledging the receipt of the Society's publication.



DECEMBER 8, 1867.

President HORN in the Chair.

Thirteen members present.

The Annual Reports of the Recording and Corresponding Secretaries, the Treasurer, Librarian, Curator and Standing Committees were read and accepted.

The following donations to the *Library* were announced :—

Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien. Band 15 and 16. From the *Society*.

Tijdschrift voor Entomologie, Series 2, Vol. 1, and No. 1 of Vol. 2. From the *Soc. Ent. des Pays-bas*.

The American Naturalist for December, 1867. From the *Editors*.

The Entomologist's Monthly Magazine for October and November, 1867. From the *Conductors*.

The American Journal of Science and Arts, Nov., 1867. From the *Conductors*.

Descriptions of new American Lepidoptera, No. 2, by A. R. Grote and C. T. Robinson. From the *Authors*.

Monthly Report of the Department of Agriculture for August, September and October, 1867. From the *Department*.

The Illustrated Annual Register of Rural Affairs for 1868. From the *Publishers*.

The following Papers were presented for publication in the *Transactions* :—

"Geotrupes of Boreal America, by Geo. H. Horn, M. D."

"Descriptions of American Lepidoptera, No. 3, by A. R. Grote and C. T. Robinson."

"Notes on the 'Apple Bark-louse' (*Lepidosaphes conchiformis* Gmelin sp.), with a description of a supposed new species of *Acarus*, by Henry Shimer, M. D."

On ballot, Dr. Herman Hagen, of Cambridge, Mass. (formerly of Königsberg, Prussia), was elected a *Corresponding Member*.

The Society then proceeded to elect Officers and Standing Committees for the ensuing year, with the following result :—

#### OFFICERS.

*President*—George H. Horn, M. D.

*Vice-President*—William S. Pine.

*Corresponding Secretary*—E. T. Cresson.

*Recording Secretary*—J. Frank Knight.

*Treasurer*—James W. McAllister.

*Librarian*—George B. Dixon.

*Curator*—Ezra T. Cresson.

#### STANDING COMMITTEES.

*On Coleoptera*—G. H. Horn, M. D., Sam'l. Lewis, M. D., Chas. Wilt.

*Lepidoptera*—Jas. Ridings, A. R. Grote, C. A. Blake.

*Neuroptera and Orthoptera*—J. F. Knight, G. B. Dixon, C. H. Hart.

*Hemiptera and Aptera*—J. Ennis, J. Meichel, C. H. Hart.

*Hymenoptera*—E. T. Cresson, J. W. McAllister, Reuben Haines.

*Diptera*—A. R. Grote, E. T. Cresson, Jas. Ridings.

- Insect Architecture*—J. F. Knight, J. H. Ridings, J. Meichel.  
*Microscopy*—C. C. Cresson, M. D., C. T. Robinson, C. A. Blake.  
*Library*—C. A. Blake, Samuel Lewis, M. D., W. S. Pine.  
*Publication*—E. T. Cresson, C. T. Robinson, Samuel Lewis, M. D.  
*Finance*—J. W. McAllister, Samuel Lewis, M. D., Chas. Wilt.  
*Collecting Fund*—Wm. Ridings, J. Ennis, Chas. Wilt.  
*Hall*—C. A. Blake, Wm. Ridings, Samuel Lewis, M. D.

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JANUARY 13, 1868.

Vice-President PINE in the Chair.

Eleven members present.

The following donation to the *Cabinet* was announced:—

Ninety-six specimens of COLEOPTERA (*Dyschirius hamorrhoidis*, *Stilicopsis paradoxa*, *Fustiger Fuchsii*, *Adranes Lecontei*, *A. coecus*, *Ceophyllus monilis*, *Chennium monilicornis*, *Bryaxis abdominalis*, *B. dentata*, *B. rubicunda*, *B. Illinoisensis*, *B. lugiger*, *B. congener*, *Rhexius insculptus*, *Arthmius globicollis*, *Decarthron formiceti*, *D. longulum*, *Pselaphus Erichsonii*, *Tychus minor*, *Microstemma Motschulskii*, *Scydmaenus perforatus*, *S. fossiger*, *S. analis*, *S. capillosulus*, *Xylophilus basalis*, *X. signatus*, *X. n. sp.*, *Hippopsis lemniscata*), from Henry Ulke.

The following donations to the *Library* were announced:—

Monographische Bearbeitung der Sphodrini in naturgemässer Auffassung von L. W. Schaufuss. From the *Author*.

Beschreibungen neuer und wenig bekannter Arten aus der Familie Orbitelae Latr. oder Epeiridae Sund. von Eugen Keyserling. 1864. 8vo. From L. W. Schaufuss.

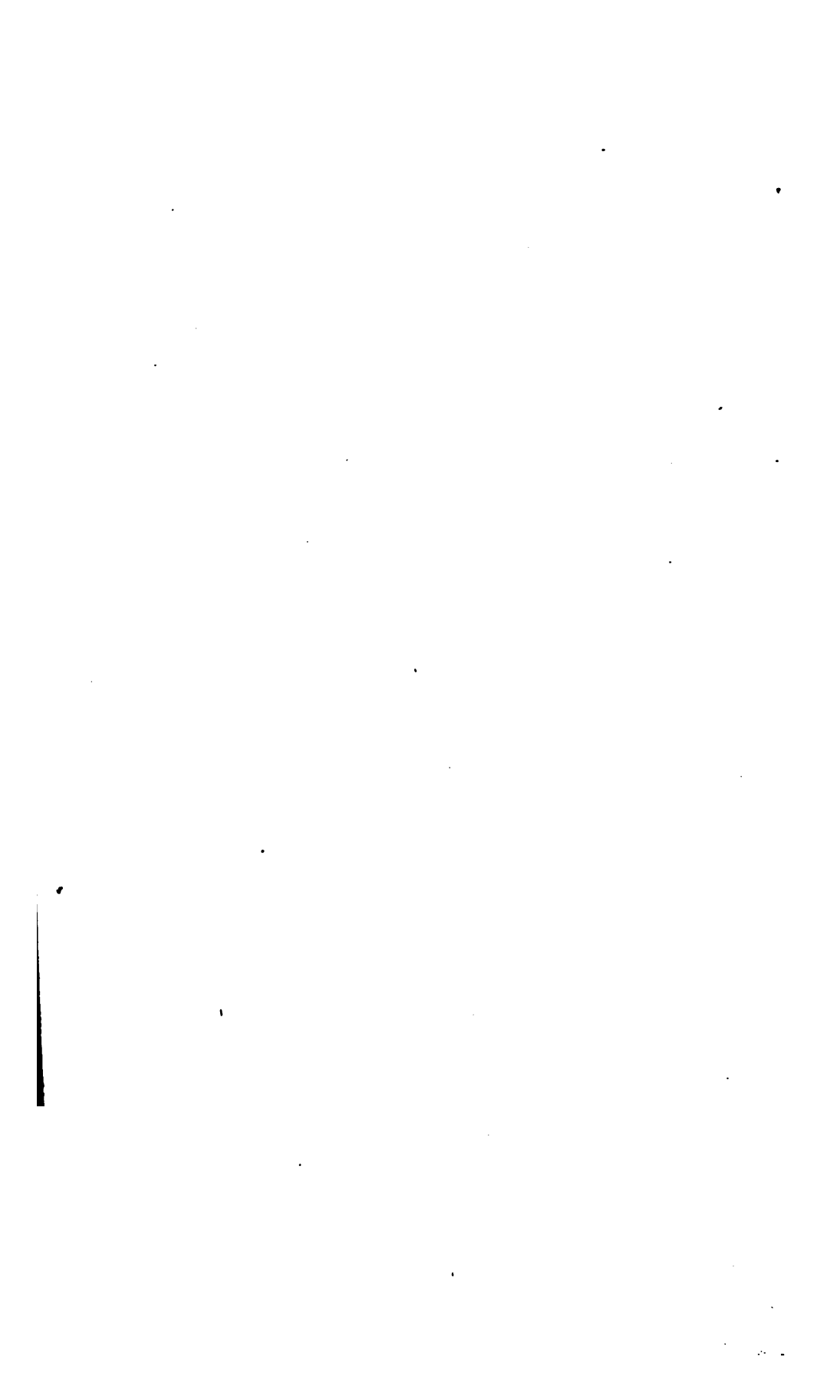
Dr. Horn made a few remarks concerning several Coleoptera, regarding whose identity there is some doubt. Concerning *Dysmathes Sahlbergi* Mann., the view was expressed that it was, without doubt, identical with *Amphizoa insolens* Lec., described but a few months anteriorly. *Dysmathes* was described as a Tenebrionide, and Mannerheim distinctly states that the posterior tarsi are 4-jointed, but with a knowledge of the fact that a similar mistake had already been made and corrected by the same author, it is hardly presuming too much to infer that a mistake has also occurred here. (The error above alluded to is that of re-describing *Amphicyrta dentipes* as *Encyphus hybosoroides* and placing it among the Tenebrionide.) Moreover the measurements are exactly the same, so that with very little trouble a figure can be drawn. It was in this manner that attention was drawn to the identity of the two insects. The antennae of *Dysmathes* are exactly those of *Amphizoa*, and do not at all resemble those of any Tenebrionide.

The attention of the Society was also called to the Geotrupes of the United States. Specimens in series were exhibited, demonstrating the correctness of the views expressed in a paper presented at the preceding meeting, in which the species recognized by Jekel were reduced to less than half the number. The importance of large series of species of this and other genera was urged on all who have collections, as the only means of arriving at a knowledge as to what constitutes a species.

**CATALOGUE**  
**OF WORKS IN THE**  
**LIBRARY**  
**OF THE**  
**AMERICAN ENTOMOLOGICAL SOCIETY.**



**PHILADELPHIA:**  
**PRINTED BY THE SOCIETY.**  
**JANUARY, 1868.**



CATALOGUE  
OF WORKS IN THE  
LIBRARY  
OF THE  
AMERICAN ENTOMOLOGICAL SOCIETY

UP TO JANUARY 1ST, 1868.

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- Agassiz**, (Louis).—Nomenclator Zoologicus, continens nomina Systematica Generum Animalium tam viventium quam fossilium. 1842—46. (1 vol. 4to.)  
Presented by *T. B. Wilson, M. D.*
- Amyot**, (C. J. B.).—Entomologie Francaise Rhynchotes. 1848. (1 vol. 8vo.)  
*J. C. Brevoort.*
- Amyot** (C. J. B.) et **Serville**, (A.).—Histoire Naturelle des Insectes. Hémiptères. 1843. Suite à Buffon. (1 vol. 8vo., colored plates.) *T. B. Wilson, M. D.*
- Anthou** (Chas.).—Latin-English and English-Latin Dictionary. 1859. (1 vol.)  
A Grammar of the Greek Language. 1849. (1 vol. 8vo.) *E. T. Cresson.*
- Apetz** (J. H.).—De Coleopteris, quae Oscarus et Alfredus Brehm in Africa legerunt. 1854. (Pamphlet, 4to.)  
*S. S. Haldeman.*
- Assmus**, (E. P.).—Symbola ad Faunam Mosquensem. Enumeratio Lepidopterorum in Gubernio Mosquensi indigenorum. Fasc. I. Mucrolepidoptera. 1858. (8vo.)  
*Rathmell Wilson.*
- Baer** (Karl Ernst v.).—Welche Auffassung der lebenden Natur ist die richtige? und Wie ist diese Auffassung auf die Entomologie anzuwenden? 1862. (8vo.)  
*T. B. Wilson, M. D.*
- Bach** (M.).—Käferfauna für Nord- und Mitteledeutschland mit besonderer Rücksicht auf die Preussischen Rheinlande. 1849—60. (7 parts, 8vo.)
- Baly** (J. S.).—Catalogue of Hispidæ in the Collection of the British Museum. Part I. London, 1858. (1 vol. 8vo.)  
*T. B. Wilson, M. D.*
- Bassett**, (H. F.).—Descriptions of several new species of Cynips, and a new species of Diastrophus. 1864. (8vo.)  
*The Author.*
- Bate** (C. Spence) and **Westwood** (J. O.).—A History of the British Sessile-eyed Crustacea. London, 1863. (1 vol. 8vo.)  
*T. B. Wilson, M. D.*
- Baudi** (Flaminio).—Alcune Specie Nuove di Stafilini. 1848. (55 pages, 8vo.)
- Beauvois**, (A. M. F. J. Palisot de).—Insectes Recueillis en Afrique et en Amérique, dans les Royaumes d'Oware et de Benin, d'Saint-Domingue et dans les États-Unis, pendant les Années 1786—1797. Paris, 1805. (1 vol. folio, colored plates.)  
*Mrs. Lucy W. Say.*
- Bell**, (Thomas).—Catalogue of Crustacea in the Collection of the Brit. Museum. Part I.—Leucosiadæ. 1855. (12mo.)  
*T. B. Wilson, M. D.*

- Bellardi**, (L.)—Saggio di Ditterologia Messicana. 2 Parts and Appendice. Torino, 1859—62. (1 vol. 4to.) *T. B. Wilson, M. D.*
- Bethune** (Chas. J. S.).—List of Entomologists in Canada. 1862. (8vo.)  
Description of some species of Nocturnal Lepidoptera found in Canada. 1863. (Pamphlet, 8vo.) *The Author.*  
Nocturnal Lepidoptera found in Canada. Part II.—Homopteridæ. (8vo.)  
Descriptions of three species of Canadian Nocturnal Lepidoptera. 1865. (8vo.) *The Author.*
- Bigge** (Edw.).—Observations on the Natural History of two Species of Wasps. 1835. (28 pages, 8vo.) *T. B. Wilson, M. D.*
- Blake**, (C. A.).—Description of a supposed new genus and species of Saturniidæ from the Rocky Mountains. With a plate. 1863. (8vo.) *The Author.*
- Bland** (James H. B.).—Descriptions of several supposed new species of Cerambycidæ in the Collection of the Entomological Society of Philadelphia, with observations on some already described. 1862. (8vo.) *The Author.*  
Catalogue of the Longicorn Coleoptera taken in the vicinity of Philadelphia. 1861. (8vo.) *The Author.*  
Descriptions of a few supposed new species of North American Coleoptera. 1863. (8vo.) *The Author.*  
Descriptions of several new species of North American Coleoptera. 1864—1865. (8vo.) *The Author.*  
Descriptions of new North American Coleoptera. 1864. (8vo.) "  
Compiled descriptions of the Staphylinidæ of North America. 1865. (8vo.)
- Bland** (Thomas).—Note on certain Insect Larva-Sacs, described as species of *Vulvatæ*. 1865. (Pamphlet, 8vo.) *Baron Osten Sacken.*
- Boheman** (C. H.).—Monographia Cassidarum. 1850—62. (4 vols. 8vo.)  
*T. B. Wilson, M. D.*  
Catalogue of Coleopterous Insects in the Collection of the British Museum. Part IX.—Cassididæ. 1856. (1 vol. 12mo.) *T. B. Wilson, M. D.*  
Coleoptera. Species Novas Descripsit. 1857—59. (4to.) (In *Kongliga Svenska Fegatten Eugenes Resa Omkring Jorden.*)
- Boisduval** (Dr.).—Histoire Naturelle des Insectes. Species Général des Lépidoptères. 1836. Suite à Buffon. (1 vol. 8vo., colored plates.)  
*T. B. Wilson, M. D.*
- Boisduval**, (Dr.) et **LeConte**, (John.).—Histoire Général et Iconographie des Lépidoptères et des Chenilles de l'Amérique Septentrionale. Paris, 1833. (1 vol. 8vo., colored plates.) *Brackenridge Clemens, M. D.*
- Bomhoff** (D.).—A New Dictionary of the English and Dutch Language. 1851. (2 vols. 12mo.) *T. B. Wilson, M. D.*
- Bouché** (P. F.).—Naturgeschichte der Insecten, besonders in Hinsicht ihrer ersten Zustände als Larven un Puppen. 1834. (1 vol. 8vo.) *T. B. Wilson, M. D.*
- Bowles**, (G. J.).—On the occurrence of *Pieris rapæ* in Canada. 1864. (8vo.)  
*The Author.*
- Brauer** (F.).—Die Oestriden (Dasselfliegen), des Hochwildes, nebst einer Tabelle zur Bestimmung aller europäischen Arten dieser Familie. (32 pages, 8vo.)
- Brême** (F. de.).—Monographie de quelques Genres de Coléopteres Hétéromères, appartenant à la Tribu des Blapsides. Paris, 1842. (26 pages, 8vo.)

- Brendel**, (Emil).—New species and corrections in the family Pselaphidæ. 1865.  
On some new species of Pselaphidæ. 1865. (8vo.) *The Author.*  
Description of some new species of Pselaphidæ. 1866. (8vo.) “
- Brown** (Capt. T.).—The Taxidermist's Manual, or the Art of Collecting, Preparing and Preserving Objects of Natural History. 1859. (1 vol. 12mo.)  
*E. T. Cresson.*
- Brullé**, (Aug.).—Histoire Naturelle des Insectes. Hyménoptères. Suite à Buffon. Tome quatrième. Paris, 1846. (1 vol. 8vo.) *T. B. Wilson, M. D.*
- Brunner** (Carolus).—Nonnulla Orthoptera europæa nova vel minus cognita. Lipsiæ, 1861. (Pamphlet, 8vo., colored plates.) *Rathmell Wilson.*
- Buckley**, (S. B.).—The Tarantula (*Mygale Hentzii Girard*) and its Destroyer (*Pompilus formosus, Say*). 1862. (8vo.) *The Author.*  
Descriptions of new species of North American Formicidæ. 1866—7. (8vo.) *The Author.*
- Burmeister** (H.).—Handbuch der Entomologie. Band 1—5. 1832—47. (6 vols. 8vo.) *T. B. Wilson, M. D.*  
A Manual of Entomology. Translated from the German by W. E. Shuckard. London, 1836. (1 vol. 8vo., colored plates.) *E. T. Cresson.*  
Genera quaedam Insectorum. Iconibus Illustravit et Descripsit. 1838—46. (1 vol. 8vo., colored plates.) *T. B. Wilson, M. D.*
- Candèse** (M. E.).—Monographie des Élatérides. 1857—63. (4 vols. 8vo.)  
*T. B. Wilson, M. D.*
- Catlow** (Maria E.).—Popular British Entomology: containing a familiar and technical description of the Insects most common to localities of the British Isles. London, 1852. (1 vol. 12mo., colored plates.) *E. T. Cresson.*
- Chapuis** (M. F.) et **Candèse** (M. E.).—Catalogue des Larves des Coléoptères, connues jusqu'à ce jour avec la Description de plusieurs Espèces Nouvelles. 1853. (1 vol. 8vo.) *T. B. Wilson, M. D.*
- Charpentier** (T. de).—Horæ Entomologicae, adjectis Tabulis novem coloratis. 1825. (1 vol. 4to.) *T. B. Wilson, M. D.*  
Libellulinae Europæae descriptæ ac depictæ. 1840. (1 vol. 4to., colored plates.) *T. B. Wilson, M. D.*  
Orthoptera descripta et depicta. 1841—45. (1 vol. 4to., colored plates.) *T. B. Wilson, M. D.*
- Chaudoir**, (Baron M. de).—Trois Mémoires sur la Famille des Carabiques. Genres nouveaux de la famille des Carabiques. 1842. (8vo.) *J. C. Brevoort.*  
Note sur le Groupe des Stomides et description d'un nouveau genre de celui des Somoplattides. 1846. (8vo.) *J. C. Brevoort.*  
Note sur le genre *Agra* et description de plusieurs espèces nouvelles. (8vo.)  
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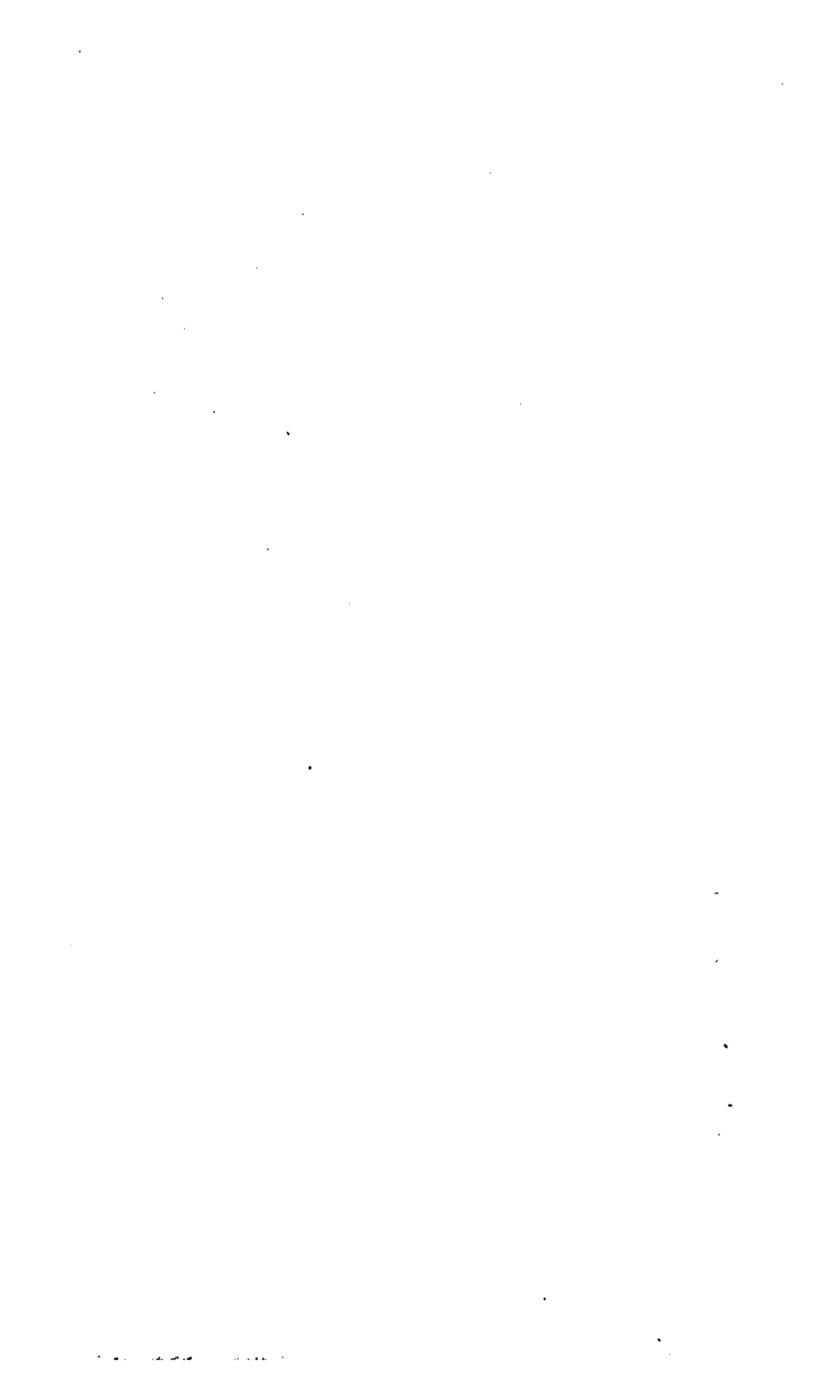


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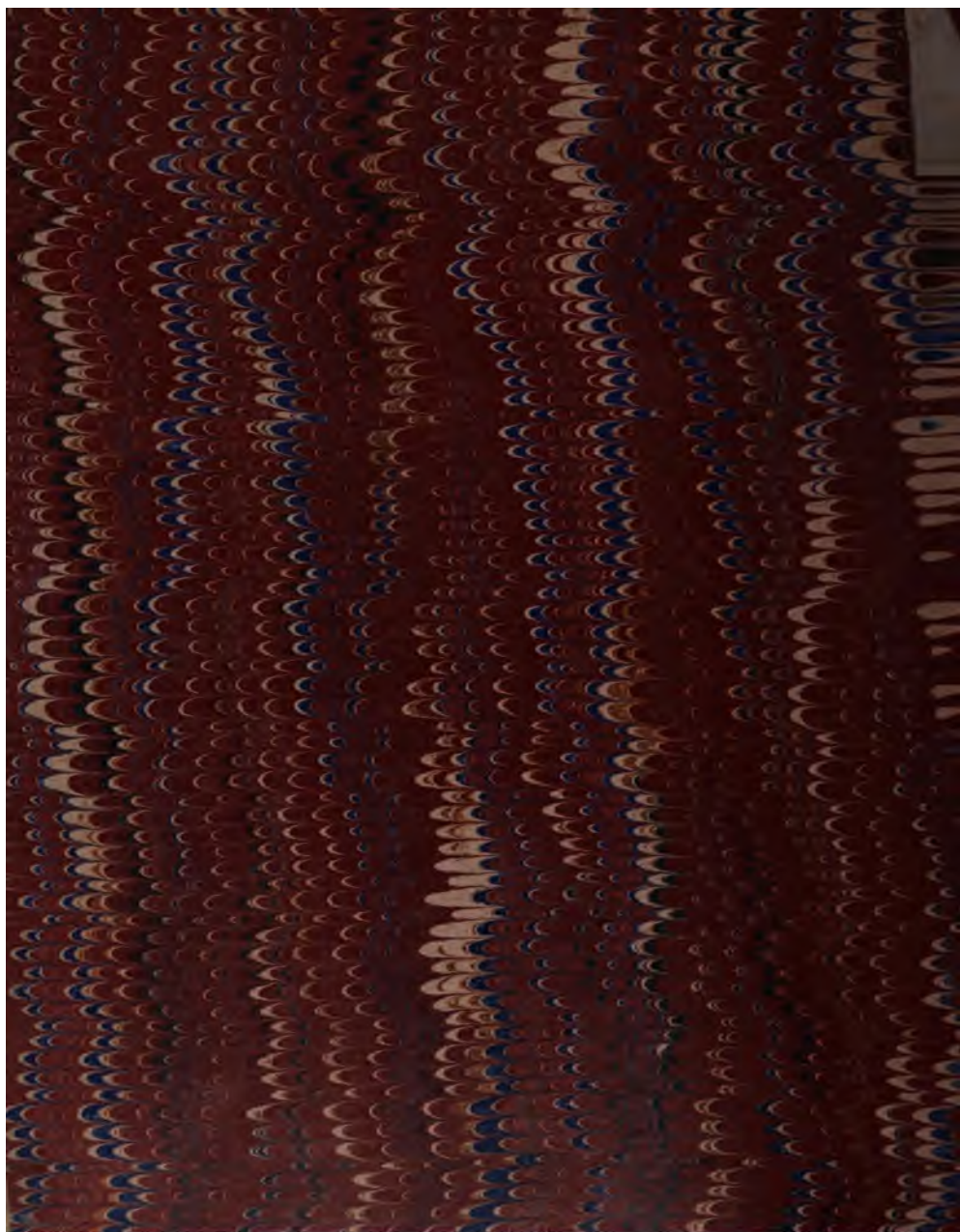




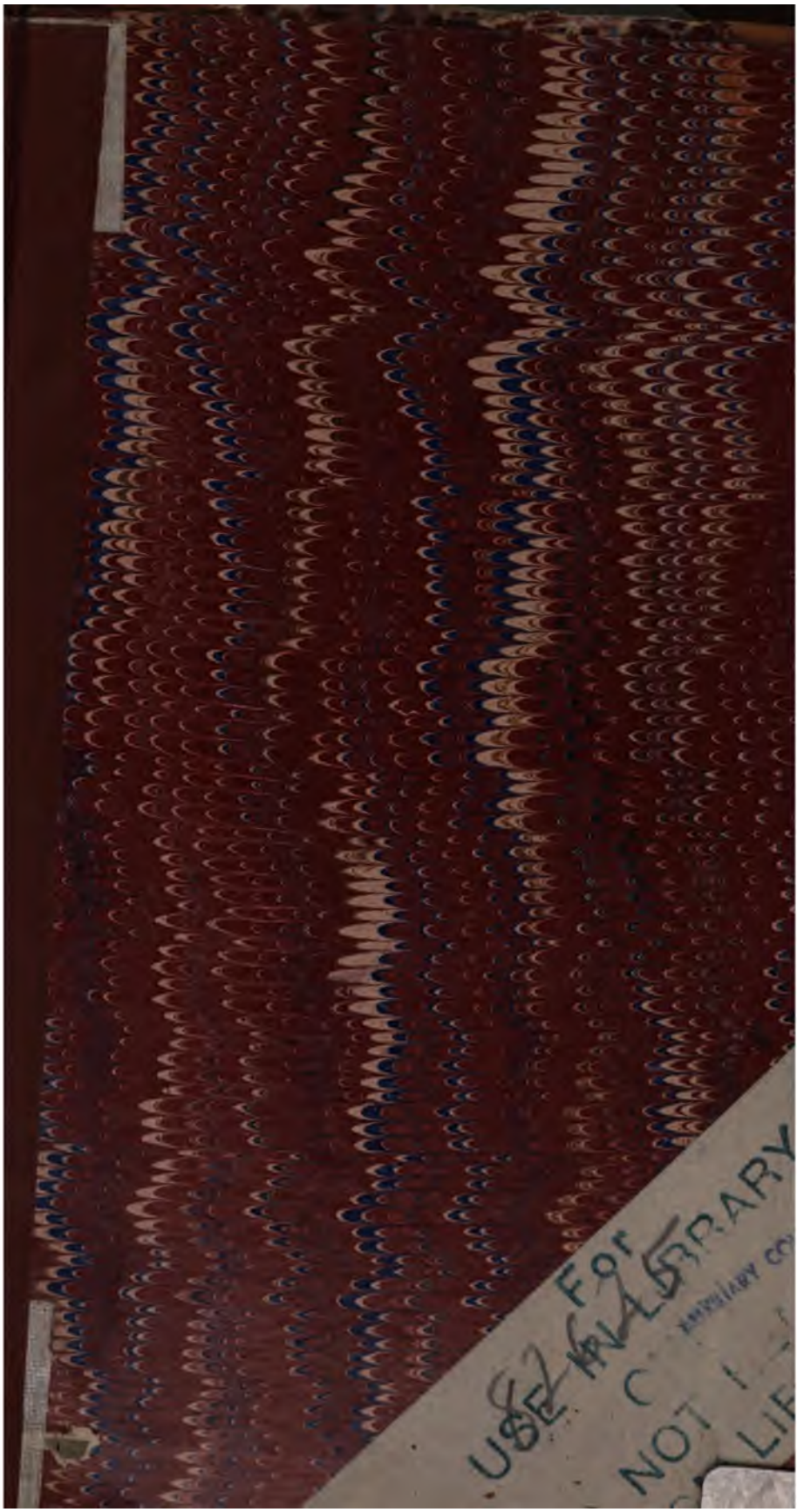
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