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The Canadian Entomologist.

Vol. XXVIII.

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No. 7.

THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

XVII. THE CHRYSOMELIDÆ OF ONTARIO AND QUEBEC—(Continued).

TRIBE VII.—EUMOLPINI.

A large group, containing numerous genera and species; the North American forms have been recently studied by Dr. Horn, and the following generic table is a condensation, with a few modifications, of the one given by him.

- A. Anterior margin of prothorax beneath arcuate, forming post-ocular lobes.
 - b. Body above pubescent or scaly.
 - Thorax without distinct lateral margin *Adoxus*.
 - Thorax with distinct lateral margin, size rather large. *Glyptoscelis*.
 - bb. Body above glabrous.
 - c. Small species (not above .16 in.) *Typophorus*.
 - cc. Larger (above .20 in.)
 - Claws simply divergent, legs dark. *Chrysochus*.
 - Claws divaricate, legs testaceous. *Tymnes*.
- AA. Anterior margin of prothorax beneath straight.
 - d. Thorax without distinct lateral margin.
 - Not metallic above; thorax transverse, third antennal joint not longer than the second. *Xanthonia*.
 - Metallic green above *Graphops*.
 - dd. Thorax margined.
 - e. Head with distinct supra-orbital grooves, middle and hind tibiae emarginate near the apex *Metachroma*.
 - ee. Head without supra-orbital grooves.
 - f. Lateral margin of prothorax irregular or undulating.
 - Prosternum narrow, contracted between the coxæ. *Colaspis*.
 - Prosternum wide, sides nearly parallel. . . . *Rhaddopterus*.
 - ff. Lateral margin of prothorax regular and entire; third joint of antennæ distinctly longer than the second, the outer five joints not abruptly wider *Nodonota*.

ADOXUS, Kirby.

Represented by *A. obscurus*, Linn., var. *vitis*, Fabr., a broad-shouldered insect about .20 to .25 in. long; the thorax dark brownish or black and much narrower than the yellowish elytra, which are punctate in rows and clothed with a fine whitish pubescence. Legs dark, tibiæ paler. The typical *obscurus* has the elytra dark, unicolorous with the thorax.

GLYPTOSCELIS, Lec.

The only record is of *G. pubescens*, Fabr., a rather large (about .35 in.) insect of somewhat parallel form and green-bronze colour, clothed with a pubescence of mixed cinereous and yellowish hairs. The thorax and elytra are confusedly and distinctly punctured; the neighbourhood of the scutellum has a depressed space. Legs more or less reddish.

TYPOPHORUS, Er.

T. canellus, Fabr., is one of the most variable of our Chrysomelidæ. It is a small insect, not exceeding .16 in. in length; the thorax narrower than the elytra, which are distinctly punctured in rows. Surface shining. In colour there is such a variation as to have given rise to several varietal names, *aterrima*, Oliv., having been applied to an entirely black form. The name *4-notatus*, Say, belongs to a variety with black thorax and spotted elytra, while *4-guttatus*, Lec., has a yellow or reddish thorax and spotted elytra. Others occur, but not having been recorded from the region under consideration, they are passed by for the present. A full account of them will be found in Dr. Horn's paper.

CHRYSOCHUS, Redt.

A common species on the Dog's-bane (a milk-weed) is *C. auratus*, Fabr., a large green-bronze beetle, about .40 in. long, often with the most brilliant golden reflections. The body is rather more elongate in form than the preceding species and very convex. There is also a record of *C. cobaltinus*, Lec. (properly a Pacific Coast species), which is of blue colour, sometimes with a touch of green.

TYMNES, Chap.

L. tricolor, Fabr., is a rather brilliant beetle, about .25 in. long, metallic green or bronzed in colour, the legs almost always reddish or yellowish, the upper lip pale. Elytra coarsely punctured, acute at apex; "anal segment often pale, especially in the males, in which sex that segment is broadly emarginate and with a transverse depression" (Horn).

XANTHONIA, Baly.

Here belong two Canadian species. They are small beetles with broad elytra and narrower thorax, as in *Adoxus*, the upper surface finely pubescent. Dr. Horn separates them thus:—

Punctures of elytra very confused, with a feeble seriate tendency towards the sides; elytra usually dull ochreous with piceous spots, but sometimes entirely fulvous. .12 in. *decemnotata*, Say.

Punctures of elytra much finer and arranged in regular series, but slightly confused near the suture; colour usually pale fulvous, varying through brown or piceous, not spotted:

.12 in. *villosula*, Mels.

With the last species is united *X. Stevensii*, Baly.

GRAPHOPS, Lec.

Small species of more than usually cylindrical form and metallic green or coppery colours. The prothorax is rugose, at least on the sides, and the elytra pubescent with rather large striæ composed of distant punctures. The two species from the region under consideration are:—

Larger (.16 in.). Prothorax punctured, rugose at sides *pubescens*, Mels.

Smaller (.10 in.). Prothorax rugosely punctured over the whole disk *curtipennis*, Mels.

METACHROMA, Lec.

Contains species which resemble in form the well-known *Typophorus*, but with post-ocular lobes. Two are found in Eastern Canada.

Posterior femora simple; thorax densely punctate, somewhat strigose; usually black, elytra sometimes with a humeral and apical spot (occasionally united along the margin) dull red. Legs pale in Northern specimens. .12-.14 in. *quercatum*, Fabr.

Posterior femora with a small tooth on lower edge about one-third from the knee; thorax scarcely at all punctate; colour variable, from entirely pale through forms with black thorax, suture and elytral spots to those completely black excepting the legs. .13-.18 in. *dubiosum*, Say.

COLASPIS, Fabr.

Here belongs *C. brunnea*, Fabr. (*suilla* of the Society's List), a pale brownish or yellowish beetle, of oblong-oval form, the elytra costate, the

spaces between these costæ being occupied by two irregular rows of coarse, deep punctures. It is extremely variable and the varieties have received names as follows: *suilla*, Fabr., is applied to the form in which the head and thorax are brown with slight metallic lustre; *costipennis*, Cr. (*Crotchii*, Lefvr.), to those specimens with brilliantly metallic head and thorax and brown elytra with yellow costæ; while *flavida*, Say,

is the yellowish-testaceous form, merely a little darker beneath. [Horn.] Length, .16-.24 in. Fig. 17 represents *C. flavida*, natural size and magnified. Fig. 18, the larva, highly magnified.

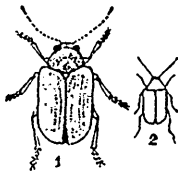


Fig. 17.

RHABDOPTERUS, Lefvr.

The insect formerly known in collections as *Colaspis pratexta*, Say, has been referred to this genus, and Dr. Horn has substituted the older name, *picipes*, Oliv., therefor. It will therefore stand as *Rhabdopterus picipes*, Oliv. It is a rather brilliant bronzed or greenish insect, .16-.20 in. long, of oblong-oval form, very convex above. The antennæ are testaceous with darker tip, under surface of body greenish, abdomen brown, tip paler, legs testaceous. Elytra with coarse, irregular punctures on the disk, apex substriate.

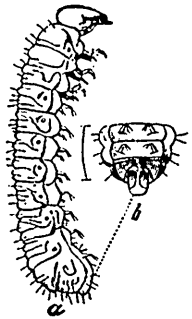


Fig. 18.

NODONOTA, Lefor.

Includes species formerly placed in *Colaspis*. Our species are all rather small insects, of convex form, something like *Colaspis*, but shorter in proportion; in colour more or less metallic, bluish or greenish, legs piceous or testaceous. Dr. Horn separates the three species (formerly recognized only as varieties) found in our region as follows:—

Form short, oval, punctuation of prothorax simple.

Upper surface shining; metasternum not punctate at sides. .11-.15 in.....*tristis*, Oliv.

Upper surface dull; metasternum coarsely punctate at sides. .15-.18 in.....*convexa*, Say.

Form oblong, subparallel, punctuation of prothorax substrigose; elytra with distinct costa behind the umbone.

.13-.17 in.....*puncticollis*, Say.

NOTES ON SOME MOTHS FROM THE COLLECTION OF
MR. A. BOLTER.

BY HARRISON G. DYAR, PH. D., NEW YORK.

Hepialus hyperboreus, Möschler.

This species exhibits a well-marked local variation. Before discussing this I would correct the account in Journal N. Y. Ent. Soc., II., 168, in respect to the synonymy of *confusus*. This form is really the same as *roseicaput*, N. & D., as the description shows. How we were misled into referring the name as a strict synonym, I cannot now recall. It may be well, moreover, to retain a distinct name for the American form until its life-history is known and we can be certain whether it is or is not the same as the European *ganna*.

H. hyperboreus occurs throughout the northern and mountainous parts of North America, from the Atlantic to the Pacific. It is recorded from Labrador [Möschler]; Mt. Washington, N. H. [Mrs. Slosson]; Colorado [Grote]; Calgary, Alberta [Wolley Dod]; Sierras of California [Hy. Edw.]; Vancouver I., B. C. [Bolter]; Cascade Range, B. C. [Neum. & Dyar]; and Alaska [H. Edw.].

The colour of primaries is brown, varying from dark to pinkish or yellowish-brown; the silvery markings are complete in all the specimens from the Rocky Mountains and eastward and south of Oregon. In the Northwest, the silvery marks begin to be distinctly replaced by the blackish shades which form their borders in specimens from Vancouver Island (*Matthewi*). In the Cascades and Alaska the specimens have no silvery marks, but are banded only with smoky blackish. The size of the specimens is variable. The largest that I have seen is Mrs. Slosson's example from Mt. Washington (50 mm.), and the smallest are some of the specimens of *McGlashani* (30 mm.). The usual size is close to 40 mm., ranging larger in the East. From present information, I would arrange the varieties and synonymy thus:—

HEPIALUS HYPERBOREUS (= *ganna* of Europe?).

hyperboreus, Möschler, 1862. Labrador and Mt. Washington; expanse, 40-50 mm.

pulcher, Grote, 1864. Colorado, and Alberta, Canada; expanse, 36-38 mm.

McGlashani, Hy. Edw., 1886. Truckee, California; expanse, 30-39 mm.

intergrade, MATTHEWI.

Matthewi, Hy. Edw., 1874. Vancouver Island, B. C.; expanse, 35-41 mm.

local race, CONFUSUS.

confusus, Hy. Edw., 1884. Alaska; expanse, 44 mm.

roseicaput, Neum. & Dyar, 1893. Cascade Range, B. C.; expanse, 33 mm.

SYNOPSIS :

Yellowish or reddish-brown, full silvery white marks. . . . *hyperboreus*.

Reddish-brown, the ground colour irregular or spotted with yellowish; silvery marks more or less replaced by smoky black. . . . *Matthewi*.

Pinkish or yellowish-brown, white marks all replaced by smoky black *confusus*.

Alexicles aspersa, Grote.

A fresh specimen from Las Vegas, N. M. (The type is rubbed.)

Thorax thickly haired, dark gray-brown, touched with white at the bases of the anterior wings, along the collar on the sides below the fore wings; eyes posteriorly margined with red. Upper side of all the femora and the tips of the tibiæ and the tarsal joints bright red. Abdomen bright red above except at base and a series of dorsal dark brown spots; gray-brown below, the last two segments tipped with whitish. Fore wings rather thin, grayish-brown, with five transverse rows of dark brown spots and a large discal spot, cutting the otherwise white veins. Expanse, 32 mm.

Macrurocampa Dorothea, n. sp. (Fig. 19.)

Primaries ash-gray with a lilac tint, composed of black and gray scales, quite uniform, without any contrasting pale shades. Basal space up to the t. a. line shaded with blackish-gray, filled in uniformly except the extreme base, which is pale, and a distinct longitudinal black line along vein 1 to the t. a. line, bordered on its lower side by an ochreous shade. T. a. line bounding the dark space, geminate, obscure, blackish, outwardly angled on median vein and inwardly in submedian space. Discal spot lunate, black, confined to the cross-vein. Beyond it the faint, narrow, wavy, black t. p. line crosses the wing, paralleled by a fainter median shade through the discal dot itself and beyond by a row of small venular black dots, the three lines ending on the internal margin in a darker shade of

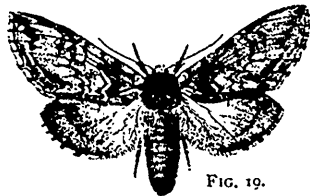


FIG. 19.

the ground colour. In the interspace of veins 3-4 and 6-7 basally, a triangular patch of the same ochreous tint as borders the basal longitudinal line below. Subterminally a distinct black band issues from the apex, slightly toothed outwardly on the veins, inwardly on the interspaces, and proceeds to vein 4, where it is interrupted; but reappears at vein 3, curving inward and reaching a little way along submedian fold, where it ends. Terminal field gray, scarcely lighter than the general ground, irrorate with black. Fringe dark, with obscure venular spottings. Abdomen and secondaries smoky gray, secondaries whitish at basal half. Thorax dark iron-gray, black and white hairs intermixed, the head and under side of thorax paler.

Type, one female. Las Vegas, New Mexico; collection of Mr. A. Bolter, Chicago.

The only Southern species which seems to approach this form is *Heterocampa surinamensis*, Möschler.

NOTE ON TRIGONOGENIUS FARCTUS.

BY E. A. SCHWARZ, WASHINGTON, D. C.

Thirty years ago Dr. Leconte described (New Species, Smithsonian Misc. Coll., 167, p. 100) the Ptinid *Trigonogenius farctus* from specimens received from San Francisco, Cal. Most specimens in our cabinets come from the same locality, but I have seen others from Alameda and Los Gatos, Cal. The collectors of the specimens never published anything on its mode of occurrence, and I fail to find in the literature a single record of its habits. Quite recently, however, Dr. James Fletcher, while on a visit to Washington, D. C., showed me two species of Coleoptera found living in red pepper, in Victoria, Br. Col. One is *Tribolium ferrugineum*, a common cosmopolitan Tenebrionid, which has been found before under similar conditions; but the second species proves to be *Trigonogenius farctus*. Several specimens of this were obtained, thus showing that its occurrence in the pepper was not accidental, and I have no doubt that upon further research the earlier stages of the beetle can also be found in the pepper. [Larvæ of all sizes and cocoons with pupæ in them occurred in this consignment of pepper, which was sent to me by Mr. E. A. Carew-Gibson, of Victoria, B. C.—J. F.] Dr. Fletcher informed me that Victoria gets much produce from San Francisco, and we may

thus infer that the infested red pepper came from that place. On this and various other points connected with the economy of this species, Dr. Fletcher will no doubt be able to furnish further information.

Various Ptinid beetles, *e. g.*, *Ptinus fur*, *Sitodrepa panicea*, *Lasioderma serricorne*, are very fond of red pepper, and the occurrence of *Trigonogenius* in this substance is therefore not surprising, but it brings up another point for consideration. All insects which we find in this country living in groceries, drugs, etc., are of foreign origin, or at least do not belong to the Nearctic fauna. The insects native to North America do not seem to be able, or are not inclined, to adopt this mode of life, and thus it may be questioned whether *Trigonogenius farctus* really belongs to our fauna. Its general appearance certainly bespeaks a foreign origin. The genus *Trigonogenius*, as restricted by recent authors, contains only two described species: *T. globululum*, Sol., from Chili, and *T. squalidus*, Boield., from New Grenada*, and upon comparing the original descriptions the identity of our species with *T. globululum* appears to me quite possible. I have, however, not seen Solier's figure, and a comparison with the type is apparently necessary to decide this question.

The mere feeding of these beetles and their larvæ cannot be said to injure the red pepper, which does not lose its pungent quality by passing through the bodies of insects. But should the *Trigonogenius* be very numerous, the presence of the silken pupal cocoons would cause some inconvenience and loss.

While speaking of imported Ptinidæ, I would add that at least two Old World species are most likely to find their way to North America sooner or later. One is *Niptus griseofuscus*, DeGeer (*Ptinus crenatus*, Fabr.), which appears to be a native of Europe, where it commonly occurs in old straw in cellars and stables. The other species is *Niptus hololeucus*, readily known by the appressed golden-yellow pubescence covering the entire body. It is probably a native of Asia Minor, whence it was imported into Great Britain about sixty years ago. It occurs now at many points in Western and Central Europe, not only living in all sorts of spices and drugs, but also proving to be injurious in various ways. It would be a most undesirable addition to our fauna.

* The two species described and figured by Gorham in Biol. Centr. Amer. are certainly not congeneric with *T. globululum*

THE SMALLER BEES OF THE GENUS *ANDRENA* FOUND
IN NEW MEXICO.

BY T. D. A. COCKERELL, MESILLA, NEW MEXICO.

None of the species herein described or listed are as much as 10 mm. long.

r. Marginal cell truncate.

The species of this section are not true *Andrena*, but will form a distinct genus, apparently as near to *Prosapis* as to *Andrena*. Two of the larger species, *A. asclepiadis*, Ckll., and *A. mexicanorum*, Ckll., are congeneric. I have before me also a species from Texas.*

i. Tarsi piceous in female.

Andrena trifoliata, n. sp.—♀. Length nearly 10 mm. Closely similar in all respects to *A. maurula*, but differing in being slightly smaller, the eyes dull slate colour, not at all greenish; the clypeal mark smaller, paler, and more distinctly trilobed; the front more sparsely punctured, with minute punctures between the large ones; the last 6 or 7 joints of the flagellum becoming testaceous; the wings not rufescent, but the apical half slightly smoky; the third submarginal cell more narrowed above, the first recurrent nervure entering the second submarginal cell at the end of its second third; the legs black; the abdomen with the basal white hair-bands on segments 3 and 4 entire; the hairs on venter very few, and whitish. The metathorax and postscutellum are quite black, not at all brownish. The pale, cream-coloured face-mark is shaped something like a vine leaf.

**Andrena maurula*, n. sp.—Female. Length nearly 10 mm. Black, no more pubescent than a *Prosapis*, strongly punctured. Head broader than long, face very broad; eyes rather small, dull olive green; clypeus arcuate below, its upper half, just enclosing the black dots, and extending as a rounded lobe downwards in the median line, pale primrose yellow. A very narrow, sometimes interrupted, pale yellow supra-clypeal transverse mark. Labrum prominent, truncate, with a small longitudinal keel. Clypeus with large but rather sparse punctures, median line impunctate. Front and vertex closely punctured. Antennæ short, dark brown, scape punctured. Thorax somewhat shining, bare except the minutely pubescent hind border of prothorax, lower part of pleura, and lateral angles of metathorax. Median and parapsidal grooves distinct. Mesothorax and scutellum strongly and closely punctured; postscutellum and metathorax slightly brownish, coarsely granular, or so closely punctured as to seem so; metathorax with a deep pit, enclosure not defined, except by an impunctate band at sides, basally very obscurely wrinkled. Tubercles light yellow, tegule testaceous with a yellow patch. Wings stained with ferruginous, nervures and stigma dark rusty brown, marginal cell truncate. Legs dark brown, the four anterior knees light yellow. Abdomen strongly and closely punctured, segments after the first with more or less distinct lateral basal white hair-bands. Anal fimbria ochreous. Hairs on venter more or less tinged with ochreous.

Habitat.—Texas; three collected by Belfrage, and now in U. S. Nat'l Museum. One bears the number 237.

Habitat.—Albuquerque, N. M.; two, on June 30th, 1895, between the town and the University [Ckll., 3254, 3256.].

ii. Tarsi rufous in the ♀; yellowish white in the ♂.

Andrena heteromorpha, n. sp.—♀. Length about 8 mm.; similar in build and general appearance to *A. trifoliata*, but rather more slender. Black, no more pubescent than a *Prosapis*, face-mark and tubercles pale primrose yellow. Head a little broader than long; eyes black; supra-clypeal mark very narrow, as in the other species of the group, forming the base of the clypeal mark, which is trilobed below, much rounder in general outline than that of *trifoliata*, decidedly longer in proportion to its breadth than in that of *maurula*. Mandibles simple, rufous, with the tips blackish and the bases becoming yellow. Face and front shining, strongly but irregularly punctured, vertex strongly and closely punctured. Antennæ black, the flagellum from the 4th joint becoming rufous beneath. Tubercles pale yellow with a black spot near the hind margin. Mesothorax shiny, closely punctured, parapsidal grooves distinct. Scutellum closely punctured. Postscutellum and metathorax coarsely granular, base of metathorax with small, ill-defined longitudinal wrinkles. Tegulae testaceous, with a triangular pale yellow spot; wings smoky hyaline, nervures and stigma dark brown, the former ferruginous at base of wing. First recurrent nervure entering second submarginal cell at the end of its second third. Legs black, first four knees yellow, hind knees ferruginous; tarsi ferruginous, first joint of middle tarsi quite broad. Abdomen strongly and closely punctured, without distinct hair-bands or spots, but the last two segments pruinose with white pubescence. Anal fimbria pale ochreous.

♂. Smaller and more slender, the abdomen subcylindrical. Face wholly pale primrose yellow below level of antennæ, the upper margin of the yellow straight, only notched on each side of the dog-ear marks and produced narrowly a short distance along the orbits. Basal portion of mandibles externally all pale yellow. Antennæ entirely dark, not at all rufescent. Second submarginal cell very narrow. Anterior tibiae pale yellow in front; all the tarsi cream colour, except the darkened terminal joint. Abdomen with the last four segments primrose. Punctures of basal segment not so close.

Habitat—Las Cruces, N. M.; close to the Agricultural College, on *Verbesina encelioides*; Sept. 12th, 1895 [Ckll., 5056, ♀; 5058, ♂.].

2. Marginal cell pointed.

- i. ♀ with wings tinged yellowish, stigma pale ferruginous, abdomen impunctate; ♂ with clypeus dark; hind tarsi clear ferruginous in both sexes.

Andrena salicinella, Ckll., Psyche Suppt., 1895, p. 4. The type was taken on willow, but was unique, and among many bees collected on willow at the same place, May 2nd and 3rd, 1896, are no *salicinella*. Both sexes were, however, taken in quantity on *Sisymbrium caesecens*, on the College Farm, Mesilla Valley, N. M., April 12th and 16th, 1895, the males predominating.

The ♂ differs by the face being covered with dense white pubescence, the flagellum ferruginous beneath; the wings clear, not yellowish; the stigma reddish brown, darker than in the ♀; the abdomen narrower, but distinctly banded. When I published *salicinella*, Miss J. E. Casad had already described the species as new (in MS.) from the ♂, but I was not aware that her insect was the opposite sex of mine.

Miss Casad has described (in MS.) another species from a ♂ taken on *Krynitzkia* (supposed to be *K. Jamesii*), on Little Mountain, Mesilla Valley, April 1st, 1895. This is smaller than ♂ *salicinella*, and the head seems very much broader in proportion to its length; but the latter feature is probably due, at least for the most part, to the retraction of the mouth-parts and the absence of the dense white clypeal pubescence, except at the sides. My present opinion is that it is probably an individual mutation of *salicinella*, but it may be a distinct but closely allied species.

- ii. Wings not tinged yellowish, hind tarsi not clear ferruginous.

a. Clypeus dark in the ♂, abdomen tessellate but impunctate.

Andrena monilicornis, n. sp.—♂. Length about $8\frac{1}{2}$ mm. Black, with long dull white pubescence. Head broader than long, face densely covered with long white hairs, cheeks less densely; vertex bare, flattened or even slightly concave, microscopically reticulate, and with large, rather sparse punctures. Antennæ long, wholly black, the joints somewhat swollen, moniliform, first joint of flagellum not longer than the third. Mandibles wholly black. Thorax covered with long hairs; the prothorax, disk of mesothorax, scutellum, and enclosure of metathorax, bare. Mesothorax rather dull, with large, rather sparse punctures. Scutellum shiny, with sparse punctures; a small impunctate space on each side of the middle. Enclosure of metathorax dull, minutely roughened, bounded only by an impressed line. Tegulæ shining dark brown. Wings hyaline, iridescent, nervures and stigma testaceous, costal nervure black. Second

submarginal cell very broad, receiving the first recurrent nervure at its middle. Legs black, apical joints of tarsi becoming dull ferruginous. Femora with very long white hairs. Abdomen moderately broad, having a silky lustre, strongly minutely tessellate, impunctate. All the segments sparsely hairy, their hind margins with thin white hair-bands, failing in the middle. Venter with continuous white hair-bands. Apex with white hairs.

Habitat.—College Farm, Mesilla Valley, N. M.; on plum; March 25th, 1896.

b. Clypeus pale primrose yellow in the ♂, abdomen punctate.

(1) Larger, distance between the clypeal dots in ♂ not greater than distance from one to top of clypeus.

Andrena capricornis, Casad and Ckll, n. sp.—♂. Length, 8 mm.; stoutly built; black, with dull white pubescence; clypeus and a large mark on each side of it very pale primrose yellow. Head broader than long, face and front with rather long but thin pubescence; clypeus large, unusually high, almost bare, with scattered punctures; there are either two minute gray dots or there may be two gray bands, extending upward and laterad from the position of the dots, meeting each other at a right angle. The lateral face-marks are irregularly diamond-shaped, the upper outer margin notched. Vertex roughened, a polished, sparsely punctured area at the summit of each eye. Antennæ fairly long, black, the tip of the flagellum beneath becoming dark coffee-colour. First joint of flagellum about as long as second and third together, second not as long as broad. Mandibles wholly black; lower margin of clypeus black, arcuate; basal process of labrum emarginate. Thorax quite densely pubescent; mesothorax dull, rather closely punctured; scutellum shiny, irregularly punctured; enclosure of metathorax granular, bounded only by an impressed line. Tegulæ dark chestnut brown, wings hyaline, nervures and stigma dark reddish brown, costal nervure black; second submarginal cell narrowed above, receiving the first recurrent nervure just before its middle. Legs black, pubescent, apical joints of tarsi becoming more or less rufescent. Abdomen rather broad and short, punctured, only moderately shiny, clothed all over with thin white pubescence, which forms ill-defined bands, interrupted in the middle, on the hind margins of the segments. When the insect is viewed from the side the bands on segments 2 to 4 look very white and distinct, as, indeed, do those on 2 and 3, viewed from above.

Habitat.—One on plum, College Farm, Mesilla Valley, N. M., April 9th, 1895 [Casad, 161]; another on plum, same locality, March 25th, 1896 [Ckll.].

- (2) Smaller, distance between the clypeal dots in ♂ much greater than distance from one to top of clypeus.

Andrena primulifrons, Casad, n. sp.—♂. “Black, pubescence ashy, head broader than thorax; clypeus and lateral spots somewhat triangular in shape, their longest side toward clypeus and extending a little above it on sides of face, pale lemon yellow; clypeus broader than long, with black dots about half way between upper and lower edge and separated from each other by about the length of the clypeus; rest of head black, face clothed with ashy hairs and fringed at its base, vertex bare, occiput and cheeks clothed with long hair; antennæ testaceous beneath; thorax clothed same as head, hairs longest on pleura, very sparse on metathorax; wings hyaline, iridescent, nervures piceous; legs with hairs, sparsest and longest on femora; abdomen sparsely clothed with short hairs; segments banded apically. Length about 6 mm. Its general appearance is much like that of *Halictus fasciatus*.” [Jessie E. Casad.]

♀. “Black, having an oily appearance, pubescence grayish, mixed with ochraceous; head very little broader than thorax, face as long as broad, clothed sparsely with short pale ochraceous hairs, those on clypeus very scattered; antennæ pale brown from fourth joint to tip beneath; thorax clothed similarly to head, metathorax bare, punctured and fringed marginally; wings hyaline, third submarginal cell long, narrowed more than one-half toward marginal, stigma fulvous, tegulæ testaceous; legs dark brownish, clothed with pale hairs, heaviest on tibiæ and tarsi; last joints of tarsi reddish; abdomen punctured, clothed with fine, short, scattered hairs; apical marginal bands interrupted on segments one and two; bands entire on following segments.” [Jessie E. Casad.]

Habitat.—Mesilla Valley, N. M.; Little Mountain, April 1st, 1895, on *Krynitzkia* (supposed to be *K. Jamesii*), a ♀ [Casad, 154]; Campus of Agricultural College, on flowers of *Biscutella Wislizenii*, April 9th, 1896, a ♀ [Ckll.]; on plum, College Farm, April 10th, 1895, a ♂ [Casad, 187]; on plum, College Farm, March 25th, 1896, a ♂ [Ckll.]; on *Sisymbrium canescens*, College Farm, April 16th, 1895 [Ckll., 2790, 2742].

Miss Casad had described the sexes as distinct species, but they are doubtless one. The stigma varies in colour, being sometimes reddish

fulvous, sometimes brown; but its margin is always conspicuously darkened below. The enclosure of the metathorax is strongly granular, contrasting with a comparatively shining area on each side of it. The nervures in the ♀ are distinctly darker than in *salicinella*.

P. S.—June 2nd, 1896. After renewed study, and an examination of the tongue and palpi, I am satisfied that the supposed species of *Andrena* described by me with the marginal cell truncate represents a valid new genus, which I will call *Protandrena*. The species are as follows: *P. asclepiadis*, *P. mexicanorum*, *P. trifoliata*, *P. maurula*, *P. heteromorpha*.

LEPYRUS ALTERNANS AND CAPUCINUS, LIXUS FOSSUS, CREMASTOCHILUS HARRISII AND POLYPLEURUS NITIDUS.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

Lepyryus alternans, Casey.—In a former paper (p. 125) the form described under this name was united with *Capucinus*, Schall, owing to an error of observation in regard to the wings. The example then examined was somewhat broken and it is now evident the wings had been removed. A recent dissection of a perfect specimen exhibits a well-developed pair of wings. This form is closely related to *palustris* (perhaps not more than a geographical variety), differing in the form of the thorax, which, instead of being conical, is much wider at middle than at base (subangulate); the rostrum is perhaps stouter and the mesosternum less elevated—both characters somewhat opinionative; there is no femoral tooth in any of the examples seen; the elytral intervals are less regular, either not obviously unequal or the first and third wider, the others narrower and some of them longitudinally sulcate along the middle; the striae punctuation is usually finer and closer, and the striae seem to be acutely impressed when the elytra are perfectly denuded. In vestiture ornamentation and other characters the two forms seem identical.

All the examples seen have been from Maine and New Hampshire (Mount Washington and vicinity).

L. capucinus, Schall.—The removal of *alternans* from synonymy with this species necessitates a little change in the former description, where some of the characters peculiar to the latter form were introduced:—

Apterous, black, robust, vestiture nearly uniform. Rostrum stout, longer than the thorax, sulcate on each side of the carina which attains the frontal fovea, rather closely and not coarsely punctured, and with the head thinly clothed with squamoid hairs; scape of antennae short, not attaining the eye; first joint of funicle stout, second thinner and

two-thirds longer, ferruginous to piceous. Thorax transverse, wider than long, sides nearly parallel to apical third, then rapidly rounding to apical constriction; apex one-fourth narrower than base subconvex, surface even, closely covered with granuloid tuberculations, smaller on the disk, larger and rugous on the sides; median carina fine, mostly attaining the base. Elytra oval, striato-punctate, strike when denuded slightly acutely impressed, intervals not obviously unequal, granuloid tubercles fine and sparse; apices conjointly rounded, notch very slight. Anterior femora with the sinuation for the tibiae strongly rectangularly laminate and usually the middle and posterior; mesosternum elevated between the coxæ. The vestiture is very uniform, mostly of white and gray fine hairlike scales tessellated on the elytra, sparser below; the median spot on the elytra usually seen in the other species is absent, but there is a white one on each apical protuberance; the femora are not annulated and the abdominal spots are wanting. The American examples seen are from Michigan; the European, from Hungary.

L. gemellus, Kirby.—This elegant species was taken by Mr. F. C. Bowditch, in the Rocky Mountains near Eagle Pass, at an elevation of 13,000 feet or over, examples of which, through his courtesy, I have been enabled to see. From these the recorded distribution is Vancouver Island; Alaska (the Peninsula of Kenai and the adjoining Continent, also the Yukon); the Hudson Bay region to Lat. 65°. In the former notice, p. 126, the word "scalerous" should read scabrous.

Lepyryus palustris.—Examples from Indiana in the cabinet of F. H. Snow, Chancellor of the University of Kansas, are absolutely identical with the cylindrical, long-beaked European form usually sent to America.

Lixus fossus, Lec., 1876, Proc. Am. Phil. Soc., XV., 417; *luculentus*, Casey, Ann. N. Y. Acad. Sci., VI., 209.

Fossus was described from a unique taken at Enterprise, Florida; *luculentus* from examples taken at Lake Worth, Florida, about 250 miles southward. Except in size, the individuals of this species are little variable, but enough so to make two or three species of by any one inclined in that direction. Mr. Casey's types seemingly differ from Dr. Leconte's in three or four points which more ample material shows to possess only individual value. The material in my collection, ♂ and ♀, is from near Jacksonville and from Lake Worth, the latter due to the munificence of Mrs. Slosson, who recently sent me nine examples. The ♂ examples from Jacksonville agree with Dr. Leconte's description of the thorax and basal fovea, the ♀ with his description of the supposed ♀ which is the ♀ of Mr. Casey's *luculentus*. In the males of the examples from Lake Worth the thorax and basal foveæ are diverse, some as in *fossus*, some as in *luculentus*, and others intermediate. The characters drawn from the beak are likewise mutually intermixed.

The following description drawn from 10 male examples illustrates

the principal characters of the species, with the most noteworthy differences observed among individuals:—

Beak about as long as the thorax, sometimes longer, mostly shorter; a broad transverse impression between the eyes more or less evident; a round frontal fovea, a smaller elongate one between the insertion of the antennæ sometimes obsolescent; in some examples a trace of a carina between the foveæ, but usually not; punctuation fine and sparse to coarser and denser, clothed with minute whitish scales to tip; antennæ inserted about one-third from apex, slender, light to dark ferruginous; club mostly darker; thorax about as long as wide, sometimes longer, sometimes shorter, conical; process of base prolonged more or less acutely between the elytra in place of the scutellum, which is not visible; fossa deep, sometimes limited at basal third, sometimes the impression extends to middle and sometimes narrowly to apical margin, densely rugoso-punctulate; some fine punctures, mostly on the sides; elytra not or but little wider than the thorax, with irregular series of moderately coarse punctures, of which the inner three are usually well defined; tips separately acutely rounded and conjointly emarginate; uniformly mottled with condensed spots of short white scaly pubescence, as is likewise the thorax and under side, the latter also ornamented with numerous denuded black dots; femora annulate with white.

Length, .30-.40 inch. Habitat.—Common from Jacksonville, Fla., southward.

The denuded elytral area mentioned by Mr. Casey is entirely due to abrasion, as is also that of the disk of the thorax, neither being present in recent specimens. The surface in some of the examples is covered with a yellow pollenoid powder such as is seen in *concauus*. The female seemingly differs from the male only in the more cylindrical, slightly longer, less pubescent, and more finely punctulate beak, with the antennæ inserted near the middle, and the usually longer thoracic impression.

Cremastochilus Harrisii, Kirby.—This species was taken, by myself, with ants (species not observed) in Western Pennsylvania [CAN. ENT., XX., 160]; also in Florida, with a large ant inhabiting under a board [Ib., XXVI., 255], which Prof. Schmitt names *Camponotus floridanus*. In March, 1895, I took an example with the same species of ant at Lake Worth, under circumstances somewhat different from the ordinary. A small pine had been broken off by a wind-storm about six feet from the ground, the broken end resting on the stump; under the loosening bark of the tree a colony of ants had formed a nest, and in it was this *Cremastochilus*; the ants were in great consternation at the exposure of their habitation, and while anxious and in much hurry to remove their pupæ to places of safety, they appeared to be equally solicitous about the *Cremastochilus*, several of them laying hold of it and dragging it with them. At first it simulated death, but after having been dragged awhile it got up and walked off quite lively under their guidance.

Polypleurus nitidus, Lec.—This fine beetle, rather rare in collections, is abundant along Lake Worth, Florida, in pine hummocks where there are stumps. The larva when full-grown is about an inch and one-half in

length, cylindrical but a little flattened, about one-eighth of an inch in diameter; the body is hard, solid, and not easily crushed; the mandibles large, sharp, and powerful enough to draw blood; the colour is pale yellow with the head piceous. It is very active. The beetle breeds in pine stumps which have been cut two or three years and have dried out; the larvæ devour the solid wood always in a vertical direction, two or three dozen of them being frequently found in a stump six or eight inches in diameter, the inside of which is mostly reduced to powder by the time they are ready to pupate. I took the beetle from February to May, and it may possibly disclose at all times during the year.

This species is probably not confined to pine, as I took it frequently quite remote from any pine, under boards, bark, etc., and I strongly suspect that it breeds in roots, etc., after the manner of some of the Elaterid larvæ called "wireworms."

TWO NEW HESPERIDS.

BY HENRY SKINNER, PROF. ENT., ACAD. NAT. SCI., PHILADELPHIA.

Pamphila Howardi, n. sp.

Male.—Expands 1.50 inches. *Upper side*: Superiors tawny with a fuscous border a little more than one-eighth inch in width; there are from one to four small subapical tawny spots in the fuscous border; at end of cell a dark spot which may or may not be connected with the stigma; stigma rather more than an eighth inch in length, very narrow and unbroken, and extending to inner margin. Inferiors have the same fuscous border and tawny central area. *Under side*: Superiors with tawny central area and border same as upper side; there is a large triangular spot extending into the wing from the base. The tawny colour above this spot is of a darker hue than that below and outside of it. Inferiors very light brown, generally with four or five very faint tawny spots in the central area.

The females are larger, without the stigma and have the under side of inferiors immaculate. Described from eight specimens in my own collection and four in that of the U. S. National Museum, through the courtesy of Prof. L. O. Howard. They are all from Florida; two being from Georgiana, on the Indian River; exact locality of others unknown. This species has usually been confounded with *viator*, but is really nothing like it. The species belongs to the *arpa*, *palatka*, *Aaroni*, *viator* group. It

is a much larger species than *Aaroni*; it has not the bright immaculate inferiors below like *arpa* and differs from *palatka* in the stigma, which in that species is in two short sections. The superiors in *viator* above are fuscous, covered with tawny spots.

Pamphila stigma, n. sp.

Male.—Expands $1\frac{1}{4}$ inches. *Upper side*: Superiors bright yellow; border fuscous, about one-sixteenth of an inch in width; the fuscous extending slightly inwards into the yellow between the veins. Stigma broad, black, and semicircular; very wide in proportion to its length; extending from stigma toward tip of wing is a rectangular fuscous spot. Inferiors fuscous with an orange central area which is broken into four or five spots by the nerves. *Under side*: Superiors yellow with the usual fuscous patch at base; there are five fuscous spots on the outer third of wing, which begin at the inner margin and extend upward, each one being smaller than the other as they extend toward the outer third of the centre. Inferiors bright yellow, a few small fuscous spots scattered about the wings. From several specimens in the collection of the author and Dr. Herman Strecker, of Reading, Pa., from southern border of New Mexico and S.-W. Texas. This species somewhat resembles *brettus* and *phyleus*, but can be known at once by the stigma, which is like that of *campestris*.

ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The Association of Economic Entomologists will hold its eighth annual meeting in the Library Building, Buffalo, N. Y., on Friday and Saturday, August 21st and 22nd, 1896. The first general session of the American Association for the Advancement of Science will be held on Monday, August 24th, 1896.

It is earnestly requested that members of the Association of Economic Entomologists should promptly inform the Secretary whether they expect to be present or not, and also submit immediately the titles of communications they desire to present, to enable the distribution before the date of the meeting of a preliminary programme.

Full information relating to railroad rates, hotels, etc., is given in the preliminary bulletin of the American Association for the Advancement of Science, a copy of which may be obtained by addressing the local Secretary, Mr. Eben P. Dorr, care of Society of Natural Science, Buffalo, N. Y.

C. L. MARLATT, Secretary.

U. S. Department of Agriculture, Washington, D. C.

BOOK NOTICE.

MONOGRAPH OF THE BOMBYCINE MOTHS OF AMERICA NORTH OF MEXICO, including their transformations and origin of the larval markings and armature. Part I., family 1, Notodontidæ. By ALPHEUS S. PACKARD. National Academy of Sciences, Vol. VII., 1895 (received May 11th, 1896); 292 pages, 49 plates, and 10 maps.

Dr. Packard's long-promised monograph has at length appeared. The copious text is divided into ten sections: I., Introduction; II., Hints on the mode of evolution of the bristles, spines and tubercles of Notodontian and other caterpillars; III., On certain points in the external anatomy of Bombycine larvæ; IV., On the incongruence between the larval and adult characters of Notodontians; V., Inheritance of characters acquired during the lifetime of Lepidopterous larvæ; VI., Geographical distribution of the American Notodontidæ; VII., Phylogeny of the Lepidoptera; VIII., Attempt at a new classification of the Lepidoptera; IX., A rational nomenclature of the veins of the wings of insects, especially of the Lepidoptera; X., Systematic revision of the Notodontidæ, with special reference to their transformations.

Most of these have previously appeared as separate articles, as the reader will recall. The life-histories are given as fully as our present knowledge will allow, much of this knowledge being due to Dr. Packard's own labours. The plates illustrating them are beautifully coloured, the early stages highly magnified. These plates must be seen to be appreciated.

A few remarks in criticism of the memoir will not be understood to imply a lack of appreciation of its many valuable features. In general the synoptic tables of subfamilies, genera, and species are poor and uncritical. They are no improvement over those of the author's monograph of Geometridæ, to which the same criticism applies. In all the figures of larvæ the setæ are imperfectly shown, and their number and position are not to be relied upon. I corrected for Dr. Packard a number of the plates in this respect, but the corrections were necessarily made from memory and on general principles, and there is not a figure which has the authority of a careful copy from nature. Even the special figures in the text are often very erroneous; *e. g.*, figure 9, on page 63, where the back and side views of the same larva are shown as different. Dr. Packard also fails generally to describe the arrangement of the setæ in the text.

The classification of the Lepidoptera which is used is original with the author. It has been already presented in the *American Naturalist*, where I have had occasion to notice it. In rejecting the classification of Prof. Comstock, the author argues that the frenulum is of small value in classification, because both frenulum and jugum are present in some Jugatæ, and the frenulum is absent in some Frenatæ. While we may admit this argument for what it is worth, it seems that Dr. Packard entirely misses the great cumulative force of the evidence adduced by Prof. Comstock and others for these suborders. Classifications founded on the venation alone [Hampson], the wing scales [Kellogg], and the antennæ [Bodine] give the same suborders. I have also shown that the larval characters do not support Dr. Packard's view. But Dr. Packard gives no weight to larval characters, in spite of the implication in the title.

HARRISON G. DYAR.

NOTES.

COLIAS CÆSONIA.—Messrs. C. T. Hills and C. H. Tyris captured no less than fifteen specimens of this Southern butterfly (Fig. 20) on the 11th of June, besides worn specimens that they let go. "They were flying quite abundantly, mostly in a south-easterly direction, crossing the Humber River near Toronto, where the Canadian Pacific Railway bridge is." One specimen was also taken by them on June 14, near Little York. This butterfly has only once before been recorded from Ontario, having been taken on Long Point, Lake Erie.

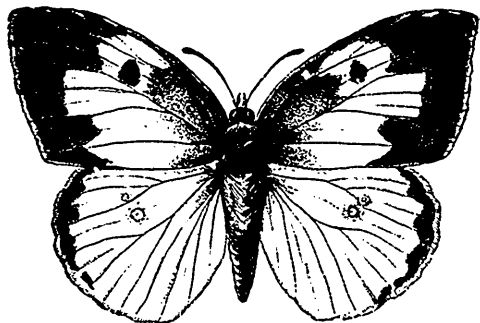


Fig. 20.

PAPILIO AJAX.—At the end of May, and again on the 18th of June, a single specimen of this butterfly was seen at Port Hope, Ont. It has never before been observed so far east in this Province. In Toronto, four specimens have been seen by Mr. C. T. Hills during the month of June this year.

Mailed July 6th.