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The Canadian Entomologist.

VOL. XXXI.

LONDON, NOVEMBER, 1899.

No. 11.

ENTOMOLOGICAL SOCIETY OF ONTARIO.

The thirty-sixth annual meeting of the Society was held in London on the 11th and 12th of October. On the former day a very interesting and important conference and discussion took place in the afternoon, on the San José Scale, which was participated in by Prof. James, Deputy Minister of Agriculture; Dr. Fletcher, Dominion Entomologist and Botanist; Mr. J. Dearness, one of the Special Commissioners on the Scale; Prof. Lochhead, Ontario Agricultural College; Prof. Webster, Wooster, Ohio; Mr. Fisher, Provincial Inspector; and others. A public meeting of a popular character was held in the evening, at which the President, Mr. Lyman, read his annual address, and Dr. Fletcher, Professors Webster and Lochhead, and the Rev. Drs. Fyles and Bethune took part. The second day was devoted to the general business of the Society and the reading and discussion of papers. A full account of the proceedings will be given in the annual report of the Society.

The following were elected officers for the ensuing year:—

President—Rev. T. W. Fyles, D. C. L., F. L. S., South Quebec.

Vice-President—Professor Wm. Lochhead, Ontario Agricultural College, Guelph.

Secretary—William E. Saunders, London.

Treasurer—J. A. Balkwill, London.

Directors: Division No. 1—W. H. Harrington, F. R. S. C., Ottawa.

Division No. 2—J. D. Evans, Trenton.

Division No. 3—D. G. Cox, Toronto.

Division No. 4—James Johnson, Bartonville.

Division No. 5—R. W. Rennie, London.

Directors ex-officio (ex-Presidents of the Society).—Professor Wm. Saunders, LL. D., F. R. S. C., F. L. S., Director of the Experimental Farms, Ottawa; Rev. C. J. S. Bethune, M. A., D. C. L., F. R. S. C., London; James Fletcher, LL. D., F. R. S. C., F. L. S., Entomologist and Botanist, Experimental Farms, Ottawa; John Dearness, I. P. S., London; Henry H. Lyman, M. A., Montreal.

Director ex-officio (Ontario Agricultural College).—Professor Wm. Lochhead, Guelph.

Librarian and Curator—J. Alston Moffat, London.

Auditors—J. H. Bowman and W. H. Hamilton, London.

Editor of the Canadian Entomologist—Rev. Dr. Bethune, London.

Editing Committee—Dr. J. Fletcher, Ottawa; H. H. Lyman, Montreal; J. D. Evans, Trenton; W. H. Harrington, Ottawa; Prof. Lochhead, Guelph.

Delegate to the Royal Society—Rev. Dr. Bethune, London.

Delegates to the Western Fair—J. Dearness and Dr. Bethune, London.

Committee on Field Days—Dr. Wolverton, Messrs. Balkwill, Bowman, Elliott, Law, Percival, Rennie, and Saunders, London.

Library and Rooms Committee—Messrs. Balkwill, Bethune, Dearness, Moffat, and Saunders, London.

The following gentlemen were unanimously elected Honorary Members of the Society:

DR. L. O. HOWARD, United States Entomologist, Washington, D. C.

PROFESSOR JOHN B. SMITH, Sc. D., Rutgers College, New Brunswick, N. J.

PROFESSOR F. M. WEBSTER, Wooster Ohio.

PROFESSOR H. F. WICKHAM, Iowa City, Iowa.

SOME NEW DELTOCEPHALINÆ (JASSIDÆ).

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

Deltocephalus callidus, n. sp.

Form and general appearance of *signatifrons* nearly, more robust, venation slightly variable, resembling that of *compactus*. Length 3 mm.; width 1 mm.

Vertex obtusely angulate, one-sixth wider at base than its middle length, scarcely equalling the pronotum; front long and narrow, but slightly wider than clypeus below; pronotum more than twice wider than long; elytra equalling the abdomen, rather broad, outer claval area slightly reticulated, central anteapical cell usually divided.

Colour: pale creamy white, vertex with a triangular spot either side the apex, an interrupted bar before the ocelli and an ocellate spot on either side at the base, fuscous or black; pronotum irregularly marked with olive and fuscous; elytra with the nervures light, margined with

brownish fuscous, interrupted on a distinct band across the second cross-nervure and the first apical veinlet; below dark, the lower half of face light, with the sutures and a spot on the clypeus fuscous.

Genitalia: female, ultimate ventral segment convex, one-third longer than penultimate, posterior margins roundly emarginate from the acute lateral angles, produced on the middle third into a rounded process which is triangularly notched at the apex, lateral angles light, median process black.

Described from three female specimens from Pullman, Wash. (C. V. Piper).

Deltocephalus ordinatus, n. sp.

Similar to *collinus* in form, but with a shorter vertex, vertex shorter than in *Melsheimeri*. Pale straw yellow with brownish olive markings. Length 3.5-4 mm; width 1.5 mm.

Brachypterous form: vertex slightly obtusely angulate, the margin blunt and rounding, one third longer on middle than against eye, as long as the pronotum, slightly wider than long; face as in *collinus*, front rather broad, lateral margins convex; pronotum broad, but slightly emarginate posteriorly; elytra broad and short, exposing the two last abdominal segments, apex evenly rounding from both sides, the apical cells very short; wings rudimentary.

Macropterous form; vertex longer, right-angled; elytra and wings exceeding the abdomen, apical cells long, the appendix present, central ante-apical cell long and parallel margined.

Colour: vertex with the lateral margins and a median stripe, widening posteriorly, pale straw yellow, the disc on either side brownish olive; pronotum with four brownish stripes; elytra pale subhyaline yellowish; more or less of the fuscous on the sides of the abdomen showing through; face pale olive with lighter arcs, below pale yellow.

Genitalia: female, ultimate ventral segment equalling the penultimate, posterior margin roundly emarginate for one-third the distance from the lateral angles, then produced into a pair of slightly divergent, acutely angular processes between which is a short rounding tooth.

Described from six females from Marshall's Pass and one from Ft. Collins, Colo., all taken by Prof. Gillette.

Deltocephalus paludosus, n. sp.

Somewhat resembling *auratus*, but with the elytra flaring rather than compressed. Colour lemon yellow in female, greenish yellow in male.

Elytra with black spots either side of the apex. Length 3.5-4 mm; width 1 mm.

Vertex roundly rectangular, the margins obtusely rounding, apex subconical, length and width about equal, shorter than the pronotum; pronotum twice wider than long, broadly produced between the eyes, posterior margin nearly straight; elytra equalling the abdomen in the female, slightly longer in the male; venation as in the female of *auratus*, the second cross nervure seldom present.

Colour: female pale lemon yellow, the eyes deep green or fuscous, a spot in the second apical and another in the anal cell, and sometimes a line around the apex fuscous; male greenish yellow, the face and vertex sometimes orange, eyes and a spot in each apical cell fuscous, those in the third and fourth coalescing into a line on the margin.

Genitalia: female; ultimate ventral segment equalling the penultimate, the lateral angles somewhat produced, between which the posterior margin is nearly truncate, a large median triangular notch, either side of which there is a black spot. Male: valve long, the apex rounding, plates as broad at the base as the ultimate segment, regularly narrowing to one-half that width at their truncate apices, width at base and length about equal, margins reflexed and armed with stout hairs, a fuscous spot on the tip of each plate and a small black one before it.

Described from twenty-five specimens taken from *Carex*, Ft. Collins, Colo.

Deltocephalus castoreus n. sp.

Short compact, with a short conical vertex. Black, with light markings on vertex and three subhyaline light bands on elytra. Length 2.5 mm; width 1 mm.

Vertex conical, obtusely angulate, equalling the pronotum, its basal width one-third greater than its length on middle, anterior margin roundly narrowing to the broad convex front, which is roundly narrowing below to the broad parallel margined clypeus; clypeus two-thirds the length of the front; elytra broad, evenly rounded behind, with a broad, short appendix, covering the abdomen in the male, a little shorter in the female; venation obscure except on the hyaline areas, clavus not reticulated, central anteapical cell short, not divided.

Colour: vertex shining black, a small circle around tip, connected with the ocelli by a slender line, and a broad irregular mark at base light yellow; pronotum black, with a tri-lobate yellow mark along the posterior

margin ; scutellum black ; elytra shining black with an indistinct light band extending from the point of the scutellum obliquely across the first cross-nervure of corium, another band from the apex of clavus transversely across the second cross-nervure, and a third along the apical margin ; below shining black, the margins of the genæ and the spines on the posterior tibiæ orange.

Genitalia : female, ultimate ventral segment half longer than penultimate, posterior margin rounding, slightly excavated, with a small median tooth ; male valve broad, triangular, the margins membranous except at the tip ; plates as broad as the ultimate segment, slightly convexly narrowing two-thirds their length, then curved slightly upwards and extending into a broad finger, the whole three times the length of the valve, equalling the pygofers.

Described from one male and one female from the head waters of the Little Beaver (9,500 ft. alt.), Larimer Co., Colo.

Deltocephalus satur, n. sp.

Resembling *compactus*, smaller, scarcely larger than *blandus*, with a shorter vertex. Olive brown with light and fuscous markings. Length : ♀ 2.5 mm., ♂ 2 mm.; width 1 mm.

Macropterous form : vertex convex, sloping, narrowing posteriorly, where it equals the middle length, slightly shorter than pronotum, slightly obtusely angulate, the apex produced, conical ; face convex, front large, lateral margins rounding, clypeus long and prominent ; elytra slightly longer than abdomen in both sexes ; venation similar to *compactus*, inner claval vein approaching the outer and connected by two cross-nervures, outer margin of clavus irregularly reticulated, central anteapical cell divided, the dividing nervure being beyond the apex of clavus. Brachypterous form : elytra short, obliquely truncate, exposing the ultimate and most of the penultimate dorsal segments, apical cells minute, posterior part of central anteapical minute or wanting.

Colour : vertex olive brownish, a light band between the ocelli, another along the anterior margin, these coalescing, omitting a triangular spot either side the apex and a fuscous one inside the ocellus on either side, an oblique fuscous dash on either side near the base ; pronotum olive brown with a submarginal row of fuscous spots and subobsolete light stripes ; elytra subhyaline, the nervures broadly light, irregularly, narrowly margined with fuscous, a spot on the centre of costa, the inner anteapical cell and the second apical, fuscous or black.

Genitalia: female, ultimate ventral segment nearly four times wider than long, posterior margin slightly emarginate with a short broad median tooth; male valve broad, short; plates broad at base, concavely, attenuately pointed, two and one-half times longer than valve, equalling the pygofers, which are thickly beset with stout hairs.

Described from two females and two males from Holly, Colo. The small size and the black spot near the anal angle of the elytra at once distinguish this species.

Lonatura salsura, n. sp.

Form and general appearance of *catalina*, but much larger. Pale sordid yellow. Length: ♀ 4.5 mm., ♂ 4 mm.; width 1.25 mm.

Macropterous form: vertex broad, obtuse, convex, one-half longer on middle than against eye, one-third wider than long, anterior margin rounding; front very broad above, rapidly roundingly narrowing to the long parallel margined clypeus; pronotum one-fourth longer than the vertex, as wide as the eyes; elytra slightly longer than the abdomen in both sexes, broadly overlapping behind clavus, appendix well developed, nervures indistinct, veins on clavus connected, antepical cells very long, parallel margined, their apices truncate.

Brachypterous form: as above except that the abdomen is elongate and the elytra very short, truncate, only covering the first abdominal segment, the exposed part being one-half the whole length of the insect.

Colour: pale sordid straw in the brachypterous form, macropterous form washed with brownish olive on the head and pronotum, tergum fuscous, partly visible through the hyaline elytra; below dark fuscous except the face. In dark specimens, there are a pair of spots at the apex and an oblique pair near the base of the vertex.

Genitalia: female, ultimate ventral segment slightly emarginate either side of a prominent median tooth, which is as long as its basal breadth, the lateral angles deeply excised, displaying a rounding lobe of a membrane beneath; male valve rounding, almost concealed by the ultimate segment, plates concavely acuminate, longer than ultimate segment, equalling the pygofers.

Described from numerous specimens collected at Ft. Collins and a few from Holly and the Little Beaver, Colo.

COLEOPTERA IN SEPTEMBER.

Stone-turning on the hillsides and in the woods, usually productive late in the season, gave very poor returns this year. However, on September 17th, a brother entomologist and the writer visited a locality which would satisfy the most exacting collector. Where the Chicopee River empties into the Connecticut, a depression in the low meadowland marks the course of a former branch of the river. The spot is well wooded with poplars, willows and maples, in whose dense shade

a rank undergrowth thrives. Early in the season a pool of water, left by the spring inundation, occupies the deeper part of the old watercourse, but disappears in the course of the summer. However, the ground remains moist and muddy throughout the season. Here we found beetles fairly swarming. Carabidæ and Staphylinidæ were running over the ground everywhere, and every bit of debris, hole and crevice sheltered them. Most of the specimens taken belonged to the two families mentioned, but several species of Scarabeidæ, Chrysomelidæ and weevils, driven to shelter by the early frosts, were also found. Carabidæ occurred in considerable variety, Bembidiums, of course, predominating. The species of this genus which most pleased us was the handsome *B. postremum*, which the writer had not seen alive for many years. It is a showy species with highly-polished green surface and a couple of light patches on the elytra. It runs most rapidly when alarmed, but does not take flight like so many others of its genus. On some circumscribed patches of ground it was quite numerous, and scampered out from nearly every bit of litter that was disturbed, or peeped from holes in the ground, while only a few paces away none were to be found. It seemed to prefer the places where the weeds were densest, while in more open spots the less conspicuous species, as *B. dorsale*, *B. variegatum*, *B. flavopictum*, etc., abounded. Running over the mud a few *Elaphrus ruscarius* were taken. Under debris a number of *Carabus vinctus* and a few of the pretty, though minute, *Dyschirius hæmorrhoidalis*. Perhaps the most abundant beetle was *Platynus anchomenoides*. It was found wherever the herbage was turned aside. In this connection may be mentioned this beetle's curious habit of feigning death when thrown on its back, although otherwise very lively. Occasionally an *Omophron* was found under a fallen leaf or bit of twig, and they increased in numbers as we approached the open ground lately occupied by the pool. Here they were found under debris and by digging just beneath the surface of the soil. The pressure from our feet, as we moved about, drove them from their burrows, and they could be seen emerging close to us, while several were generally in sight running over the ground. An old dust-broom, which happened to be at hand, gave excellent service at this juncture. By sweeping the ground and thus exposing the burrows, the beetles were taken literally by hundreds. This was highly satisfactory, as in my search of former years along sandy shores, I had found them very sparingly.

FREDERICK KNAB, Chicopee, Mass.

A LIST OF MANITOBA MOTHS.—PART IV.

BY A. W. HANHAM, WINNIPEG, MAN.

(Continued from page 206).

- Hadenella subjuncta*, Smith. A few at light in 1897 about the beginning of July. (See page 323, Vol. XXX.)
- Drybota stigmata*, Grt. Cartwright.
- Polia confragosa*, Morr. Sept. 15th (1896). Three specimens at sugar in Elm Park.
- Laphygma frugiperda*, S. & A. Sept. 8th, one at bloom.
- Eupsephopæctes procinctus*, Grt. Cartwright. I think Mr. Heath has only taken one of these fine insects.
- Trigonophora periculosa*, Gn. Cartwright.
- Brotolomia iris*, Gn. June 19th, etc., several at light, also taken resting on walls of house.
- Euplexia lucipara*, Linn. June 18th to middle of July, a few at light.
- Nephelodes minians*, Gn., and var. *violans*, Gn. Rather rare here apparently; taken at light and on the wing, August 21st to September 9th.
- Tricholita semiaperta*, Morr. Occasional at light towards the end of July.
- Helotropha reniformis*, Grt., and var. *atra*, Grt. A common moth at sugar from middle of August until middle of September.
- Hydrœcia sera*, G. & R. Sept. 23rd (1897), one at light.
- “ *juvenilis*, Grt. A pair in July.
- Hydrœcia atlantica*, Smith. A somewhat variable species and common. Taken at bloom, at light, and at sugar (rarely) from middle of July to the middle of September.
- Hydrœcia interoceanica*,* Smith. Winnipeg.
- “ *verona*, Smith. Winnipeg.
- Hydrœcia obliqua*, Harv. Rare at light, end of July (only one ♀ taken). Also at Brandon.
- Hydrœcia cerina*, Grt. One at light on 21st September (1897).
- Hydrœcia purpurifascia*, G. & R. Mr. Heath seems to have found this species not uncommon. I took one in Elm Park by beating dead leaves on bough, September 26th (1896).
- Hydrœcia rutila*, Gn. Cartwright.
- “ *immanis*, Grote. Cartwright.

*Among the specimens of *nictitans*‡, = *atlantica*, Sm., received from Mr. Hanham were three small, very dark specimens, without date or other label save “Winnipeg.” These proved distinct and were described in *Trans. Am. Ent. Soc.*, XXVI, 17, May, 1899. J. B. Smith.

Hydroecia frigida, Smith. One at light here on September 16th, also taken by Mr. Heath.

Hydroecia nelita, Streck. Cartwright.

Hydroecia appassionata, Harv. A beauty at light on September 22nd (1898).

Nonagria, sp. I have taken two specimens here at light, one August 31st (1897), the other August 14th (1898), and I have seen the same species from Brandon and Cartwright. (Prof. Smith says concerning *Nonagria*, that the species are absolutely undetermined in collections.)

Senta defecta, Grt. In 1897 this species was very numerous at light on July 19th, and stray individuals were seen several nights following, but in 1898 not a single specimen was taken.

Tapinostola variana, Morr. July 20th (3), 24th (1). Altogether about a dozen were taken, all at light, the others being found dead lying about the floor and shelves of my room. Also taken at Brandon and Cartwright.

Leucania pallens, Linn. Taken during July and August. Very common in July at light.

Leucania albilinea, Hbn. June 19th, etc., several at light.

“ *phragmatidicola*, Gn. July, not uncommon at light.

Leucania commoides, Gn. Common at light in July, and very plentiful at bloom at Brandon in 1896, about the middle of the same month.

Leucania juncicola, Bdv. One at light, September 24th (1897.)

“ *insueta*, Gn. June 18th, one at light; also from Cartwright.

Leucania unipuncta, Harv. Occasional at light, and at sugar from the middle of August until end of season. This species is usually a lively one at sugar, and a nuisance, driving off other things.

Ufeus plicatus, Grt. Cartwright, Douglas and Rounthwaite. Mr. Marmont says that Mr. Criddle, of Aweme, informed him that examples of this species were often captured in their house during the winter.

Nolophana malana, Fitch. Cartwright.

Caradrina miranda, Grt. Fairly common at light from middle of June into July.

Caradrina meralis, Morr. A pair at Brandon on September 1st, either at bloom or sugar.

Caradrina extimia, Walk. (= *civica*, Grt). Particularly common off bloom at Brandon during August. Also taken at light from 20th of July on.

- Caradrina punctivena*, Smith. Common at light from middle to end of July.
- Pyrophila tragopoginus*, Linn. One in 1895, not seen since.
- Pyrophila pyramidoides*, Gn. Common at sugar in Elm Park in 1896, from August 18th to middle of September.
- Orthodes cynica*, Gn. Rare here at light.
- “ *crenulata*, Smith. Occasional at light during June.
- Tæniocampa thecata*, Morr. (No. 2335.) Cartwright.
- “ *oviduca*, Grt. One or two at light, May 22nd, etc.
- Tæniocampa pacifica*, Harv. Plentiful with Mr. Heath. I got one or two at light early in May.
- Tæniocampa alia*, Gn. Cartwright.
- Tæniocampa subterminata*, Smith. Brandon. Mr. Boger has a specimen of this rather handsome species.
- Calymnia orina*, Gn. Brandon. Three specimens at sugar on August 21st (1897). One here at light August 6th, also from Cartwright. Prof. Smith says this is quite a variable species.
- Cosmia infumata*, Grt. Another very variable species. Comes freely to sugar and light, middle of August to end of September.
- Parastichtis discivaria*, Walk. This variable species is not uncommon at light, middle of July to middle of August, and I have often met with it during the day at rest on golden-rod.
- Ipimorpha pleonectusa*, Grt. Both seasons at light from middle to end of July, but not common.
- Pyrrhia exprimens*, Walk. Not uncommon at light in 1897, rather rare last season. End of June until middle of July. This species, too, has quite a range of variation.
- Orthosia ferruginoides*, Gn. Taken both at light and at sugar, out during part of August and September. A fresh specimen that I took at sugar on September 15th (1896) was so pale that I was sure I had taken a new species until I referred it to Prof. Smith.*
- Orthosia euroa*, G. & R. Occasional at light and at sugar during August, into September. On August 10th (1896), by sweeping Canada thistle heads after dark I could have taken hundreds of this species. The thistles were in a clearing among bush at River Park, near the city.

*This specimen was probably *decipiens*, Grt., which I had not recognized as distinct until the recent receipt of good material. (J. B. S.)

- Orthosia Conradi*, Grt. Occasional here at light towards end of July.
 During the same month at Brandon in 1896 this was one of the common things on the wing about dusk.
- Orthosia lutosa*, Andr. July 12th (1898), one or two at light; also from Cartwright.
- Homoglaea hircina*, Morr. This early species was met with first this season. On April 14th and 15th I took a couple of dozen at light. These were easily divided into three forms or varieties.
- Glaea inulta*, Grt. Occasional at light, and one of the most plentiful species at sugar, end of August to end of season (October).
- Xanthia flavago*, Fabr. End of August to end of September. Taken at sugar, at bloom and at light, also by beating.
- Cirrœdia pampina*, Gn. Common at sugar from middle of August until well on in September, comes to light. A somewhat variable species.
- Scoliopteryx libatrix*, Linn. Plentiful at sugar in Elm Park on Sept. 15th (1896). Taken as early as the 1st. Last season I took a specimen at light on May 20th.
- Scopelosoma tristigmata*, Grt. At sugar and light.
 " *Walkeri*, Grt. At sugar and light.
 " *sidus*, Gn. At sugar and light.
- Scopelosoma devia*, Grt. Two at sugar and another taken under a log on April 22nd (1894), the latter being a beautifully fresh specimen. I have taken these *Scopelosomas* at sugar from September 15th into October, also a few individuals in the spring at light; none of them have been taken in any numbers. *Walkeri* appear to vary considerably.
- Litholomia napæa*, Morr. Frequent at light during September.
- | | |
|---------------------------------|--|
| <i>Xylina disposita</i> , Morr. | } At sugar from middle to end of September, also at light (September and May) and by beating. <i>Pexata</i> seems to be rare here, and of the others, the only really common species is <i>laticinerea</i> . <i>Xylinas</i> are often met with sitting on fences. On August 10th two pupæ were found under the bark of a stump, producing <i>Bethunei</i> at end of month. |
| " <i>petulca</i> , Grt. | |
| " <i>signosa</i> , Walk. | |
| " <i>Bethunei</i> , G. & R. | |
| " <i>contenta</i> , Grt. | |
| " <i>Georgii</i> , Grt. | |
| " <i>laticinerea</i> , Grt. | |
| " <i>pexata</i> , Grt. | |
- Xylina Thaxteri*, Grt. I have not taken this species at sugar, my three specimens all being captured off fences.
- Xylina capax*, G. & R. A pair at light on September 1st (1897).
 " *carbonaria*, Harv. Cartwright.

- Morrisonia vomerina*, Grt. May 17th (1898), three specimens at light.
- Xylomiges dolosa*, Grt. Rare. Brandon and Rounthwaite.
- Lithomia germana*, Morr. Quite common in 1896 at sugar from August 27th to end of September, and has been taken at light.
- Calocampa nupera*, Lint.
- “ *cineritia*, Grt.
- “ *curvimacula*, Morr.
- These three species have been taken at sugar in about equal numbers; *nupera* as early as the end of August, and a couple of weeks at least before the others. All have come to light, and I have taken *nupera*, if not the others, again in the spring, and also under a log (May 24th).
- Cucullia asteroides*, Gn. Quite rare, taken sitting on fence early in the summer.
- Cucullia florea*, Gn. Our common species at light during July; a specimen taken as late as September 1st, at rest on fence.
- Cucullia Speyeri*, Lint. One at Brandon at bloom about the middle of July.
- Cucullia intermedia*, Speyer. June 27th, July 12th, etc., an occasional specimen at light and on fences.
- Cucullia albida*, Smith. Mr. Marmont found this good species rather plentiful at Rounthwaite last season, and I got one in my house on May 18th.
- Asteroscopus borealis*, Smith. Cartwright. (See page 25 of present volume for description of this new species).
- Ogdoconta cinereola*, Gn. Several at light in 1897 about the middle of July.
- Abrostola urentis*, Gn. } Occasional at light, both seasons, early in
Deva purpurigera, Walk. } July; the latter was also taken off prairie
flowers at Brandon in 1896.
- Plusia ærea*, Hbn. July 13th. I have never taken more than a single specimen of this species in Manitoba, though so common in the East.
- Plusia æreoides*, Grt. With the exception of *simplex*, our commonest *Plusia*, especially so at light during July in 1897.
- Plusia balluca*, Geyer. At light, August 3rd, etc., rare.
- Plusia Putnami*, Grt. Plentiful at light in 1897, early in July, and one taken as late as September 1st; rare in 1898. A pupa was found quite exposed on June 10th in a white loose cocoon attached to a weed.

- Plusia striatella*, Grt. (= *venusta*, Wlk). Over 60 specimens were taken in 1897 at light, from June 27th into August. Last season only four were seen.
- Plusia thyatiroides*, Gn. Rare, 5 specimens taken off *Heliopsis scabra* in Elm Park on August 18th and 24th (1896), and another off *Cnicus Canadensis* on August 15th (1895).
- Plusia bimaculata*, Steph. Not infrequent at light both seasons towards the end of July.
- Plusia biloba*, Steph. One captured at Brandon on July 23rd (1896), off *Cnicus undulatus*.
- Plusia precatationis*, Gn. Quite rare here, only 2 or 3 specimens taken at bloom, July 25th, August 11th, etc.
- Plusia californica*, Speyer. Only taken in 1895, two at bloom in my garden on July 29th, and another at light on the 30th.
- Plusia brassicæ*, Riley. One, July 30th (1895), in my garden. An unusually dark form of this species has been taken by Mr. Boger at Brandon.
- Plusia viridisignata*, Grt. (Dr. R. Ottolengui informs me that this is really (2632) *selecta*, Walk). July 19th, one at light in 1897.
- Plusia epigæa*, Grote. August 25th, one at bloom.
- Plusia ampla*, Walk. I have taken this specimen at light from the 22nd of June until July 12th, and in fair numbers.
- Plusia simplex*, Gn. A pale form of this species occurs here. The species is double-brooded, or appears to be on the wing throughout the summer; it was very plentiful on the prairie at Rounthwaite on September 11th last. Have only taken one specimen at light.
- Plusia flagellum*, Walk. (*monodon*, Grt., and *insolita*, Smith, are, Dr. Ottolengui tells me, identical). I first took this species at Brandon, at bloom on July 15th, 1896; the two following seasons it has come to light here from June 24th into July, some half dozen specimens being captured.
- Calpe Canadensis*, Beth. Only from Cartwright.
- Plusiodonta compressipalpis*, Gn. One on the wing when sugaring in Elm Park on August 27th (1896). Some years back, when living in Hamilton, Ont., I bred a number of these moths from numerous larvæ found feeding on moonseed (*Menispermum Canadense*). This vine covered the veranda of the house in which I lived. The larvæ taken early in July were full-grown and very beautiful; a second brood appeared about the middle of August.

- Stibadium*, sp. Several specimens of the same species were taken at light about the middle of July (1897); all were destroyed in the mails.
- Heliopsis phlogophagus*, G. & R. Cartwright.
- Alaria florida*, Gn. Aweme, Cartwright and Rounthwaite.
- Schinia cumatilis*, Grt. Brandon and Cartwright. I took one at light at Brandon on August 20th (1897).
- Schinia Meskeana*, Grt. Brandon. I think Mr. Boger took a pair in 1896.
- Dasypoudæa lucens*, Morr. Rounthwaite. Two or three were captured by Mr. Marmont, all the same season.
- Dasypoudæa Meadii*, Grt. One specimen only in 1897, came to light on July 1st. A beautiful moth and in perfect condition.
- Melaporphyria immortua*, Grt. Rounthwaite.
- “ *ononis*, Fabr. Brandon and Rounthwaite.
- Acontia erastrioides*, Gn. } Taken from middle of June into July;
 “ *candefacta*, Hbn. } neither species abundantly.
- Spragueia inornata*, Grt. Common on the prairies, on the wing during the day, in June and again in August.
- Metathorasa monetifera*, Gn. One at light, July 2nd (1897).
- Lithacodia bellicula*, Hbn. June 9th into July. A common day flier on the prairies.
- Erastria albidula*, Gn. Plentiful at light, etc.
- “ *synochitis*, G. & R. Common in Elm Park, at rest on trees.
- “ *muscosa*, Gn. Rare here, one or two specimens taken.
- “ *carneola*, Gn. Common at light, etc.
- Erastria includens*, Smith. One here several years ago, and from Cartwright.
- Galgula hepara*, Grt. One here in 1894.
- Drasteria erectea*, Cram. This very variable moth appears to be out during the whole season. I have taken it early in May, and fresh specimens as late as October.
- Drasteria erichto*, Gn. This species is not nearly so plentiful.
- “ *distincta*, Neum. Not common. June 12th to 19th.
- Euclidia cuspeida*, Hbn. One of our earliest day fliers, and too plentiful at light last June.
- Melipotis limbolaris*, Geyer. Brandon, Cartwright and Rounthwaite.
- Catocala grynea*, Cram. Aweme.

- Catocala praeclara*, G. & R. One at light, August 4th (1898), also from Cartwright.
- Catocala Clintonii*, Grt. Single specimens at light, July 14th and 20th (1898).
- Catocala coccinata*, Grote. July 21st to August 10th, a few at sugar in my garden.
- Catocala parta*, Gn. August 18th into September, at sugar in Elm Park in 1896, also seen from Brandon and Cartwright.
- Catocala unijuga*, Walk. Out with *parta*, but less local.
- Catocala briseis*, Edw. A somewhat variable species. Taken at light as early as July 12th, and at sugar until middle of September.
- Catocala concumbens*, Walk. Taken plentifully at light and at sugar. Is out in July and I have taken it at sugar on October 3rd. This is our common species in Manitoba.
- Catocala aspasia*, Strk. (3056 B) Cartwright.
- Catocala relictata*, Walk. Taken at light, August 4th, etc., and at sugar until middle of September. Fairly plentiful.
- Zale horrida*, Hbn. One at light here on May 24th (1898).
- Pheocyma lunifera*, Hbn. One at light on May 23rd (1898).
- Homoptera edusa*, Dru. (var. B). One bred from pupa, evolved in April.
- Homoptera minerea*, Guen. Cartwright.
- “ *obliqua*, Gn. A pair at light on May 25th (1898).
- Homopyralis tactus*, Grt. Occasional at light.
- Spargaloma sexpunctata*, Grt. Rare, only a pair taken
- Pseudaglossa lubricalis*, Geyer. Cartwright.
- Helia borealis*, Smith. A pair taken at light in 1897.
- Epizeuxis aemula*, Hbn. }
 “ *americalis*, Gn. } All fairly plentiful at light in July.
 “ *goasalis*, Walk. }
- Hormisa orciferalis*, Walk. (= *Sisyrhpena pupillaris*, Grt.) A pair here at light on July 20th (1898).
- Megachyta deceptricalis*, Grt. A pair at light in July.
- Litognatha rubilifascia*, Grt. One here at light.
- Herminia morbidalis*, Gn. Taken at light, etc.
- “ *petrealis*, Grt. Taken at light, etc.
- Zanclognatha laevigata*, Grt. }
 “ *ochreipennis*, Grt. } Taken at light, etc.; none commonly.
 “ *obscuripennis*, Grt. }

- Zanclognatha Hanhami, Smith. Common at light in 1897, rare in 1898, middle to end of July.
- Pallachira bivittata, Grt. July 7th, etc. (1897), six examples, none seen in 1898.
- Philometra longilabris, Grt. }
 " eumelusalis, Walk. } Both species seem rare here.
- Rivula propinqualis, Gn. }
 Palthis angulalis, Hbn. } All are common species in Elm
 Phalenophana rurigena, Grt. (3254) } Park and they have been taken
 Capis curvata, Grt. Rounthwaite. } at light.
- Renia flavipunctalis, Geyer. One of our most common "snouts."
- Bleptina caradrinalis, Gn. Another common species.
- Bomolocha scutellaris, Grt. Elm Park, July.
- " bijugalis, Walk. Elm Park, July, not uncommon.
- " toreuta, Grt. A pair taken. Elm Park.
- " sordidula, Grt. A pair taken. Elm Park.
- " profecta, Grt. Elm Park, July, rare.
- " deceptalis, Walk. Only one taken.
- Hypena humuli, Harr. Not uncommon.
- Hypena scabra, Fabr. Worn examples taken on the wing in the spring; a common species, have taken it late at sugar.
- Hypena edictalis, Walk. Not uncommon in Elm Park.
- " eductalis, Walk. (= 3277). One specimen taken.
 (To be continued.)

LIST OF COLEOPTERA FROM HALIFAX, N. S.

BY J. D. EVANS, TRENTON, ONT.

The beetles enumerated below were taken in 1897, some of them while the writer visited that city on the occasion of the annual meeting of The Royal Society of Canada, in June. Unfortunately, the weather was most unpropitious for insect hunting until the last day, when quite a number were taken, and later on in the season the list was increased by captures made by a brother, resident of the city.

While some of the species were well represented, very many were by only one or two specimens, and in a few cases by three or four. I feel very grateful to Prof. H. F. Wickham for kindly determining many of the species.

Ciciudela 12-guttata, Dej.
 Loricera cærulescens, Linn.

Corymbites tarsalis, Melsh.
 Asaphes memnonius, Hbst.

Bembidium lucidum, Lec.	Agrilus fallax, Say.
“ scopulinum, Kirby.	“ politus, Say.
Pterostichus lucublandus, Say.	Ellychnia corrusca, Linn.
Common.	Podabrus, 2 sp.
Pterostichus convexicollis, Say.	Telephorus fraxini, Say.
“ mutus, Say.	“ lineola, Fab.
Amara exarata, Dej. Common.	Thanasimus nubilus, Kl.
Amara pallipes, Kirby.	Platycerus depressus, Lec.
var. depressus, Lec.	Onthophagus nuchicornis, Linn.
Amara impuncticollis, Say.	Common.
“ sp. Common.	Aphodius fossor, Linn. Common.
Platynus extensicollis, Say.	“ fimetarius, Linn.
“ cupripennis, Say.	“ ruricola, Melsh.
“ placidus, Say.	“ erraticus, Linn.
“ obsoletus, Say.	Diplotaxis tristis, Kirby.
Chlœnius sericeus, Forst.	Trichius affinis, Gory.
Harpalus viridiœneus, Bea u v.	Phymatodes dimidiatus, Kirby.
Common.	Hyperplatys maculatus, Hald.
Harpalus fallax, Lec.	Donacia proxima, Kirby.
“ basilaris, Kirby.	Bassaricus sellatus, Suffr.
Anisodactylus rusticus, Say.	Cryptocephalus 4-maculatus, Say.
Cercyon hæmorrhoidalis, Fab.	Chrysomela elegans, Oliv.
“ sp.	*Chrysomela staphylea, Linn. ?
Silpha surinamensis, Fab. Com-	One sp. only.
mon.	Trirhabda tomentosa, Linn. Com-
Silpha lapponica, Hbst.	mon.
Anthobium, sp.	Haltica bimarginata, Say.
Adalia bipunctata, Linn.	Isomira quadristriata, Coup.
Lœmophlœus convexulus, Lec.	<i>Cistelidæ</i> gn. sp.
Peltis ferruginea, Linn.	<i>Melandryadæ</i> “ “
Cyphon variabilis, Thûmb.	Salpingus virescens, Lec.
Monocrepidius auritus, Hbst.	Nacerdes melanura, Linn.
Agriotes mancus, Say.	Anaspis rufa, Say.
“ limosus, Lec.	Attelabus rhois, Boh.
Dolopius lateralis, Esch.	Lepyrus colon, Linn.
Betarmon bigeminatus, Rand.	Hylobius confusus, Kirby.
Melanotus fissilis, Say.	Anthonomus corvulus, Lec.
Corymbites cylindricornis, Hbst.	“ cratœgi, Walsh.
“ spinosus, Lec.	Dendroctonus terebrans, Olio.

*This Chrysomela is very near the European Staphylea, Linn., if it is not the same. Comparing it with one specimen from Europe, the Nova Scotian insect is larger, being .32 in., as compared to .26 in., the length of the one from Europe. The thorax of the European insect is more densely, and the elytra much more coarsely, punctured than in the N. S. insect.

CLASSIFICATION OF THE ENTOMOPHILOUS WASPS, OR
THE SUPERFAMILY SPHEGOIDEA.

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(Paper No. 6.)

FAMILY XXIII.—Nyssonidæ.

Anyone with the use of my table of families ought readily to recognize any wasp falling in this family, and especially after reading my remarks under the family Mellinidæ. The only group that could possibly cause trouble or confusion would be the subfamily *Gorytinæ*, which closely resembles the *Mellinidæ*, but which may be easily separated from the latter by paying close attention to the shape of the first abdominal segment and examining the mesopleura for the mesosternal suture or carina.

The family Nyssonidæ may be divided into four distinct groups, which I have designated as subfamilies, and which are easily distinguished by the characters made use of in the following table :

Table of Subfamilies.

Marginal cell always pointed at apex, never truncate, and without an appendage; antennæ inserted far above the clypeus, always away from the clypeal suture.

Front wings with the second cubital cell broadly sessile, never triangular or petiolate, and receiving both recurrent nervures; mesopleural furrow usually deeply and sharply defined, complete Subfamily I., *Gorytinæ*.

Front wings with the second cubital cell petiolate, rarely triangular, sessile; mesopleural suture wanting or subobsolete, evanescent posteriorly.

Metathorax with the superior hind angles unarmed, rounded or obtuse; pronotum dorsally not short, subquadrate; forms elongate Subfamily II., *Alysoninæ*.

Metathorax with the superior hind angles always acute or produced into stout teeth or spines; pronotum dorsally short, narrowly transverse; forms broad, robust Subfamily III., *Nyssoninæ*.

Marginal cell always broadly truncate at apex, with an appendage; antennæ inserted close to the clypeus, or very close to the clypeal suture Subfamily IV., *Astatinæ*.

SUBFAMILY 1.—Gorytinae.

This subfamily approaches nearest to the Mellinidæ and is the only one that could possibly be confused with it. The characters of the first abdominal segment and of the mesopleura, already pointed out, will, however, readily separate it from the Mellinidæ.

From the other subfamilies, into which this family is divided, it is separated by the *sessile second cubital cell*, and, as a rule, by the distinct mesosternal suture.

The genera are somewhat numerous and closely allied, but may be distinguished by the use of the following table :

Table of Genera.

Mesosternum not separated from the mesopleura by a longitudinal suture or carina, the latter entirely wanting or indicated only slightly anteriorly ; cubitus in hind wings originating *beyond* the transverse median nervure, very rarely interstitial or nearly 4.

Mesosternum always distinctly separated from the mesopleura by a longitudinal suture or carina (sometimes difficult to discern on account of the pubescence).

Cubitus in hind wings originating *before* the transverse median nervure, or interstitial or nearly 2.

Cubitus in hind wings originating *far beyond* the transverse median nervure ; stigma not well developed, the radius originating from its apex 3.

2. Cubitus in hind wings originating *far* before the transverse median nervure.

Triangular area of metanotum sharply defined by grooved lines, the enclosure smooth, polished, not striate, or at most only slightly striate laterally at base. . . Pseudoplisus, Ashm., n. g.
(Type *G. floridanus*, Fox.)

Cubitus in hind wings interstitial or originating only a little before the transverse median nervure.

Cubitus in hind wings most frequently originating a little before the transverse median nervure ; triangular area of metanotum always well defined, the enclosure always longitudinally striate Hoplisus, Lepel.

Cubitus in hind wings *interstitial* ; triangular area of metanotum not sharply defined, but striate or coarsely rugose Hoplisoides, Gribodo.

3. Submedian cell longer than the median ; second cubital cell receiving both recurrent nervures ; anterior tarsi in ♀ with a comb ; triangular area of metathorax well defined, with some striæ at base..... Harpactus, Jurine.
= Dienoplus, Fox.
4. Second cubital cell not receiving both recurrent nervures ; hind tibiæ serrate8.
Second cubital cell receiving both recurrent nervures, or rarely with the first recurrent interstitial with the first transverse cubitus ; hind tibiæ not serrate, although sometimes spinous.
Stigma not well developed, truncate at apex, the radius originating from its extreme apex.....7.
Stigma well developed, not truncate at apex, the radius originating before its apex5.
5. Anterior tarsi in ♀ *with* a comb.6.
Anterior tarsi in ♀ *without* a comb ; cubitus in hind wings originating far *beyond* the transverse median nervure.
First ventral segment *without* a carina or elevation, the second without an emargination at base, when viewed from the side, normal, not elevated..... Kaufmannia, Radoszk.
First ventral segment *with* a carina or elevation, the second abruptly truncate or with an emargination at base and elevated, so as to appear triangular when viewed from the side..... Gorytes, Latreille.
6. Transverse median nervure in front wings joining the median vein far *beyond* the origin of the basal nervure..... Lestiphorus, Lepel.
Transverse median nervure in front wings *interstitial* with the basal nervure.
Body marked with yellow ; first abdominal segment above convex ; scutellum with a transverse impressed line at base, but the same not crenulate..... Clitemnestra, Spinola.
Body wholly black ; first abdominal segment with a hump-like elevation above ; scutellum *with* a transverse, crenulate furrow at base. (New Zealand)..... Argogorytes, Ashm., n. g.
(Type *G. carbonarius*, Smith.)
7. Submedian cell in front wings longer than the median ; antennæ filiform or subclavate ; pulvilli normal ; abdomen mostly rufous.
Cubitus in hind wings originating distinctly beyond the transverse median nervure Harpactus, Jurine.

- Cubitus in hind wings *interstitial* with the transverse median nervure Agraptus, Wesmael.
8. First recurrent nervure *interstitial* or nearly, the second recurrent received by the second cubital cell near its apex; anterior tarsi in ♀ *without a comb*. Miscothyris, Smith.

SUBFAMILY II.—Alysoninæ.

This is a natural group, of small extent, and represented by only two genera, found in both hemispheres.

The species are somewhat narrowed and elongate, and superficially resemble the *Pseninæ*, in the family Pemphredonidæ, although structurally they are widely separated.

Our species have been monographed recently by Mr. Wm. J. Fox.

The genera may be distinguished as follows :

Table of Genera.

- Submedian cell in front wings much longer than the median, the transverse median nervure joining the median vein far *beyond* the origin of the basal nervure; abdomen with a pale spot at each side of the second segment. Didineis, Wesmael.
- Submedian cell of front wings a little shorter than the median, the transverse median nervure joining the median vein a little *before* the basal nervure; abdomen without a pale spot on each side of the second segment. Alyson, Jurine.

SUBFAMILY III.—Nyssoninæ.

This is also a natural and compact group, allied to the *Alysoninæ*, but markedly distinct in the more robust form and by the toothed metathoracic angles. In this last characteristic it shows some affinity with the Stizidæ, but otherwise—in mouth-parts, venation of wings, and in its thoracic characters—the subfamily is quite distinct and easily separated.

Our species in this group have been monographed recently by Mr. Wm. J. Fox, who, however, has suppressed all genera and placed all our species in the genus *Nysson*, Latr. Mr. Fox's work is excellent, but I do not believe in such wholesale lumping, and in the following table I have restored all of these genera, making use of such salient characters as I believe will render their recognition easy and certain.

Table of Genera.

- Front wings with two cubital cells, the third transverse cubitus always wanting. 5.
- Front wings with three cubital cells, the second always petiolate; if with only two cubital cells, the second transverse cubitus wanting.

- Two cubital cells, the first receiving both recurrent nervures 3.
 Three cubital cells 2.
2. Second cubital cell receiving only one recurrent nervure 4.
 Second cubital cell receiving both recurrent nervures.
 Cubitus in hind wings originating *before* the transverse median nervure or interstitial with it; hind tibiæ usually spinous, but not serrate on hind margin; scutellum normal; apex of abdomen in ♂ terminating in 2 teeth Nysson, Latreille.
 Cubitus in hind wings originating beyond the transverse median nervure.
 Hind tibiæ with feeble spines, never serrate; lateral margins of scutellum sometimes more or less margined, the post-scutellum normal; apex of ♂ abdomen terminating in 2 teeth Brachystegus, Costa.
 Hind tibiæ strongly *serrated* on hind margin, and also more or less spinous; lateral margins of scutellum more or less strongly reflexed, the postscutellum bilobed; apex of ♂ abdomen terminating in 4 teeth Paranysson, Guerin.
3. Cubitus in hind wings originating *beyond* the transverse median nervure, the latter short, straight, perpendicular; hind tibiæ on outer face armed with 4 teeth; pygidium very long, with the lateral margins denticulate Metanysson, Ashm., n. g.
 (Type N. Solani, Ckll.)
4. Second cubital cell receiving only one recurrent nervure—*the second*, the first recurrent nervure received by the first cubital cell near its apex; posterior coxæ armed with a spine or tubercle at apex; abdomen normal Helioryctes, Smith.
 (Type H. melanopyga, Smith.)
 Second cubital cell receiving only one recurrent nervure—*the first*, the second recurrent nervure received by the third cubital cell far beyond the second transverse cubitus; posterior coxæ unarmed; hind tibiæ and scutellum as in *Nysson*; abdomen with ventral segments 4-6 each with a lateral tooth, apex of abdomen in ♂ 3-dentate Foxia, Ashm.
5. Second cubital cell triangular, but not petiolate, the first recurrent nervure received by the first cubital cell near its apex, the second recurrent interstitial; metathorax with the superior hind angles produced into strong stout spines Acanthostethus, Smith.

Second cubital cell petiolate, receiving both recurrent nervures; metathoracic teeth small, acute; scutellum normal; legs smooth, not spinous..... Hyponysson, Cresson.

SUBFAMILY IV.--Astatinæ.

Distinguished from all the other subfamilies by the truncate, appendiculate marginal cell in the front wings, and by the antennæ being inserted far anteriorly, close to the clypeal suture.

Fox has correctly pointed out the close relationship between his genus *Diploplectron* and *Dinctus*, Jurine, but both genera are too closely related to *Astatus* to warrant their separation as a distinct tribe.

Four genera fall into this group, separated as follows:

Table of Genera.

Marginal cell along the costa, much longer than the stigma; eyes in ♂ holoptic; front wings with three cubital cells.....3.

Marginal cell, along the costa not longer than the stigma, most frequently shorter; eyes in ♂ normal, not holoptic.

Front wings with three cubital cells.....2.

Front wings with two cubital cells.

Clypeus at apex in ♀ 3-dentate; tarsal comb distinct; all tibiæ spinous: antennæ in ♂ twisted, the scape much swollen, the flagellar joints 1-6 compressed; anterior tarsi

flattened..... *Dinctus*, Jurine.

2. Clypeus medially convex, slightly produced anteriorly, without teeth; tarsal comb long, distinct; tibiæ spinous; antennæ filiform, similar in both sexes..... *Diploplectron*, Fox.

3. Second cubital cell not receiving both recurrent nervures, the first recurrent nervure *interstitial* with or received a little before the first transverse cubitus; marginal cell not quite twice as long as wide; eyes in ♂ *not* extending to base of mandibles; pronotum in ♀ strongly developed and not hidden beneath the anterior margin of the mesonotum; first cubital cell much longer than the second or third, nearly as large as both united..... *Dryudella*, Spinola.

Second cubital cell receiving both recurrent nervures; marginal cell at least twice as long as wide, and still longer in the ♂; eyes in ♂ extending to the base of mandibles; pronotum in both sexes deeply impressed beneath the anterior margin of the mesonotum; first cubital cell only slightly different from the second or third..... *Astatus*, Latreille.

North American Species.

- Subfamily I.—*Gorytinae*. (16) *H. ruficornis*, Prov., ♀ ♂.
- (1) PSEUDOPLISUS, Ashmead. (17) *H. simillimus*, Smith, ♀ ♂.
= *eppiata*, Prov.
- (1) *P. abdominalis*, Cr., ♀ ♂.
= *propinquus*, Cr. (18) *H. vicinus*, Hdl.
- (2) *P. aequalis*, Hdl., ♀ ♂. (3) HOPLISOIDES, Gribodo.
- (3) *P. alpestris*, Cam., ♀ ♂. (1) *H. armatus*, Prov.
- (4) *P. alticola*, Cam., ♀ ♂. (2) *H. asperatus*, Fox.
- (5) *P. balteatus*, Cam., ♀. (3) *H. bigeloviae*, Ckll.
- (6) *P. bipartitus*, Hdl., ♀ ♂. (4) *H. barbatulus*, Hdl., ♂.
- (7) *P. cameronis*, Hdl., ♀ ♂. (5) *H. confertus*, Fox.
- (8) *P. centralis*, Cam., ♀. (6) *H. Coquiletti*, Fox.
- (9) *P. divisus*, Smith, ♂. (7) *H. costalis*, Cr.
- (10) *P. fasciatus*, Fox, ♀. (8) *H. dentatus*, Fox.
- (11) *P. floridanus*, Fox, ♀.
= *foveolatus*, Fox. (9) *H. denticulatus*, Pack.
- (12) *P. fulvipennis*, Smith. (10) *H. gracilis*, Pattn.
- (13) *P. fuscipennis*, Cam., ♀. (11) *H. hamatus*, Hdl., ♂.
= *micantula*.
- (14) *P. montanus*, Cam., ♂. (12) *H. laminiferus*, Fox, ♂.
- (15) *P. notabilis*, Hdl., ♀ ♂. (13) *H. maculipennis*, Cam.
- (16) *P. phaleratus*, Say, ♀ ♂.
= *flavicornis*, Pack. (14) *H. mexicanus*, Cam., ♀.
- = *modestus*, Cr. (15) *H. microcephalus*, Hdl.
- = *rufoluteus*, Pack. (16) *H. mirandas*, Fox.
- (17) *P. rubiginosus*, Hdl., ♀ ♂. (17) *H. nebulosus*, Pack.
- (18) *P. Smithii*, Cr., ♀. (18) *H. Pergandii*, Hdl.
- (19) *P. splendidus*, Hdl., ♀. (19) *H. placidus*, Smith.
= *rufipes*, Sm
- (20) *P. venustus*, Cr., ♀ ♂. (20) *H. punctifrons*, Cam.
- (2) HOPLISUS, Lepeletier. (21) *H. pygidialis*, Fox, ♀.
- (1) *H. albosignatus*, Fox. (22) *H. robustus*, Hdl., ♀.
- (2) *H. angustatus*, Prov. (23) *H. rugosus*, Pack.
- (3) *H. atricornis*, Pack, ♂. (24) *H. seminiger*, Dahlb.
- (4) *H. atrifrons*, Fox, ♀ ♂. (25) *H. scitulus*, Cr.
- (5) *H. canaliculatus*, Pack. (26) *H. sepulchralis*, Hdl.
- (6) *H. cayenensis*, Spin., ♀ ♂. (27) *H. spilopterus*, Hdl.
- (7) *H. compactus*, Fox. (28) *H. tricolor*, Cress., ♀ ♂.
- (8) *H. decorus*, Fox, ♀ ♂. (4) HARPACTUS, Jurine.
- (9) *H. diversus*, Fox, ♀. = *Dienoplus*, Fox.
- (10) *H. fasciatipennis*, Cam., ♀. (1) *H. Cockerellii*, Ashm., ♀.
- (11) *H. fuscus*, Tischb., ♀ ♂. (2) *H. Howardii*, Ashm., ♀.
- (12) *H. geminus*, Hdl., ♀ ♂. (3) *H. insularis*, Cr.
- (13) *H. maculipes*, Cam. (4) *H. lateritius*, Hdl., ♀ ♂.
- (14) *H. nevadensis*, Fox, ♀ ♂. (5) *H. mendicus*, Hdl., ♀ ♂.
= *pictifrons*, Fox.
- (15) *H. Provancheri*, Hdl., ♂.
= *laticinctus*, Prov. (6) *H. tristrigatus*, Fabr., ♀ ♂.

- (7) *H. (?) insolitus*, Fox, ♂. (14) *N. nigripes*, Prov., ♂.
(Gorytes.) (15) *N. quinquespinosus*, Say, ♀
(5) KAUFMANNIA, Radoszk. ♂.
(6) GORYTES, Latreille. (16) *N. zapotecus*, Cr., ♀.
(1) *G. campestris*, Linné, ♀ ♂. (17) *N. Aztecus*, Cr., ♀.
(2) *G. costalis*, Cr., ♀ (15) BRACHYSTEGUS, Costa.
(3) *G. mystaceus*, L., ♀ ♂. (1) *B. opulentus*, Gerst., ♀ ♂.
(4) *G. nigrifrons*, Smith, ♀ ♂. (2) *B. mellipes*, Cr., ♀ ♂.
(5) *G. (?) piceus*, Hdl., ♂. (3) *B. bellus*, Cr., ♀.
(6) *G. (?) spilographus*, Hdl. (4) *B. tuberculatus*, Handl., ♀ ♂
(7) LESTIPHORUS, Lepel. (5) *B. basilaris*, Cr., ♀.
(8) CLITEMNESTRA, Spinola. (6) *B. pumilus*, Cr., ♂.
(9) ARGOGORYTES, Ashmead. (7) *B. albomarginatus*, Cr., ♀ ♂
(10) AGRAPFUS, Wesmael. (8) *B. moestus*, Cr., ♀.
(11) MISCOTHYRIS, Smith. (16) PARANYSSON, Guérin.
Subfamily II.—*Alysoninae*. (1) *P. texanus*, Cr., ♀ ♂.
(12) DIDINEIS, Wesmael. (2) *P. fuscipes*, Cr., ♀ ♂.
(1) *D. aculeata*, Cr., ♂. (Alyson.) (3) *P. mexicanus*, Cr., ♀ ♂.
(2) *D. nodosa*, Fox, ♂. (4) *P. dives*, Handl., ♀ ♂.
(3) *D. peculiaris*, Fox, ♀ ♂. (5) *P. armatus*, Cr., ♀ ♂.
(4) *D. solidescens*, Scudd. (Fossil.) (17) METANYSSON, Ashmead.
(5) *D. texana*, Cr., ♀ ♂. (1) *M. Solani*, Klll.
(13) ALYSON, Jurine. (18) HELIORYCTES, Smith.
(1) *A. conicus*, Prov., ♂. (19) FOXIA, Ashmead.
(2) *A. Guignardii*, Prov., ♀ ♂. (1) *F. pacifica*, Ashm., ♀ ♂.
(3) *A. melleus*, Say, ♀ ♂. (20) ACANTHOSIETHUS, Smith.
(4) *A. oppositus*, Say, ♀ ♂. (21) HYPONYSSON, Cresson.
(5) *A. radiatus*, Fox, ♀ ♂. (1) *H. bicolor*, Cr., ♀.
(6) *A. striatus*, Fox, ♂. Subfamily IV.—*Astatinae*.
(7) *A. triangularis*, Fox. (20) DINETUS Jurine.
(8) *A. triangularifer*, Prov., ♂. (21) DIPLOPECTRON, Fox.
Subfamily III.—*Nyssoninae*. (1) *D. ferrugineus*, Ashm., ♀.
(14) NYSSON, Latreille. (2) *D. brunneipes*, Cr., ♀ ♂.
(1) *N. spinosus*, Forst., ♀ ♂. (3) *D. bidentatus*, Ashm., ♀.
(2) *N. plagiatus*, Cr., ♀ ♂. (4) *D. Foxii*, Ashm., ♀.
(3) *N. Frey-Gessneri*, Hdl., ♀ ♂. (22) DRYUDELLA, Spinola.
(4) *N. auronotatus*, Say, ♀ ♂. (23) ASTATUS, Latreille.
(5) *N. aequalis*, Pattn., ♀ ♂. (1) *A. unicolor*, Say, ♀ ♂.
(6) *N. compactus*, Cr., ♀ ♂. (2) *A. occidentalis*, Cr., ♀ ♂.
(7) *N. subtilis*, Fox, ♂. (3) *A. Leustromi*, Ashm., ♀.
(8) *N. rusticus*, Cr., ♀ ♂. (4) *A. nubeculus*, Cr., ♀ ♂.
(9) *N. simplicicornis*, Fox, ♂. = *nigrospilosus*, Cr.
(10) *N. lateralis*, Pack., ♂. (5) *A. asper*, Fox, ♀ ♂.
(11) *N. tristis*, Cr., ♂. (6) *A. bicolor*, Say, ♀ ♂.
(12) *N. fidelis*, Cr., ♀ ♂. (7) *A. pygidialis*, Fox, ♀.
(13) *N. rufiventris*, Cr., ♀ ♂. (8) *A. nevadicus*, Cr., ♀ ♂.

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| (9) <i>A. montanus</i> , Cr., ♀. | (16) <i>A. apicipennis</i> , Cam. |
| (10) <i>A. elegans</i> , Cr., ♀ ♂. | (17) <i>A. tinctipennis</i> , Cam., ♀. |
| (11) <i>A. bellus</i> , Cr., ♂. | (18) <i>A. Kohlii</i> , Cam., ♀. |
| (12) <i>A. coeruleus</i> , Cr., ♂. | (19) <i>A. picta</i> , Kohl, ♂. |
| (13) <i>A. albovillosus</i> , Cam., ♀. | (20) <i>A. mexicana</i> , Cr., ♂. |
| (14) <i>A. Sayi</i> , Fox, ♀. | (21) <i>A. alpestris</i> , Cam., ♀. |
| (15) <i>A. strigosa</i> , Kohl, ♀. | (22) <i>A. insularis</i> , Cr., ♀. |

TABLES FOR THE DETERMINATION OF THE GENERA
OF COCCIDÆ.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

(Continued from page 279.)

LECANIINÆ.

- Secretion of ♀ more or less cottony Series I.
 Secretion of ♀ waxy, glassy, or horny Series II.
 Adult ♀ naked, or covered only by a film of secretion Series III.

Of course it must be understood that the expressions "glassy," "horny," and "cottony," refer only to the *appearance* of the secretion, not to its true nature.

SERIES I.

- Female resembling a flat *Lecanium*, secreting an ovisac, which is elongated posteriorly, but does not at all cover the insect 1.
 Female surrounded by cottony secretion, but naked dorsally 4.
 Female completely or almost completely covered by a sac of cottony or felted secretion 5.
 Female secreting dorsally a thick mass of white waxy threads, which however do not cover the middle of the back; round the sides are threads spreading in all directions; antennæ six-jointed, 3 much the longest; legs rather slender; tibia longer than tarsus *Ceronema*, Mask.
 Female oval or elliptical, with a loosely felted secretion, especially in the second stage, but absent or inconspicuous in the adult; antennæ 7-jointed: tarsus longer than tibia; margin with a fringe *Eriochiton*, Mask.
 1. Female triangular, ovisac very slightly developed, a mere fringe round the hind margin *Protopulvinaria*, Ckll.
 Female oval or suboval 2.

2. Ovisac greatly elongating, free except at the end, lifting the insect into the air. *Takahashia*, Ckll;
 Ovisac continuously adherent to the twig or leaf. 3.
3. Body of ♀ more or less chitinous, becoming hard, and without dorsal patches of secretion. *Pulvinaria*, Targ.*
 Body of ♀ soft, not chitinous, pink in front, greenish on dorsum, with some black specks; back with patches of white secretion. *Philephedra*, Ckll.
4. Antennæ 7-jointed; larva with strongly produced caudal tubercles; second stage with waxy secretion, somewhat as in
Orthezia *Pseudopulvinaria*, Atkinson.
 Antennæ 8 jointed; ovisac cone-shaped, fluted. *Pulvinella*, Hempel.
5. Antennæ and legs quite rudimentary; skin not chitinous; thickly covered on dorsal surface with round glands; cottony secretion profuse *Pseudophilippia*, Ckll.
 Antennæ and legs well-formed 6.
6. Antennæ 8-jointed (sometimes 7 in *Spermococcus*) 7.
 Antennæ 7-jointed; ♀ elliptical and convex, sac closely felted; skin with many large circular glands, and numbers of tubular glands; larva with strongly produced caudal lobes. [Possibly this may belong to the Coccinæ]. *Malloccus*, Mask. (*Mallophora*, Mask).
 Antennæ 6-jointed. 8.
7. Body greatly elongated (like *Pergandiella*, etc.), with parallel sides; a considerable cephalic portion in front of the antennæ; legs ordinary, slender, and well developed. *Signoretia*, Targ.
 Body ovate; legs and antennæ slender; anterior tarsi two-jointed; antennæ 8-jointed; ♂ the smallest. In ants' nests. *Exeretopus*, Newstead, 1894.
 Body about twice as long as broad; secreting at the last some cottony matter; antennæ 7 or 8-jointed, broad at the base; legs normal. In ants' nests. [Doubtfully distinct from *Lecanopsis*.] *Spermococcus*, Giard, 1893.
 Body oval or suboval, like a *Pulvinaria*; ovisac produced posteriorly, often felted, usually leaving the cephalic end of the insect more or less exposed. *Lichtensia*, Sign.

* *Tectopulvinaria*, Hempel, is an allied genus from Brazil, not yet published.

8. Elongated like *Signoretia*, but broader in the thoracic region; legs very short; antennæ short and stout, all the segments except 3 and 6 broader than long; sac cottony *Eriopeltis*, Sign.
 Oval; legs and antennæ slender and ordinary; sides of the body and dorsum with numerous tubular glands; sac felted. . . *Filippia*, Targ.

SERIES II.

- Male pupæ enclosed in a mass of spongy wax, which surrounds the wings. *Ericerus*, Guèr.
 Male pupæ separate 1.
 1. Covering of ♂ horny in texture, formed partly of the pellicle of the second stage; antennæ in adult short, confusedly 7-jointed; legs absent; viviparous *Lecanochiton*, Maskell.
 Not so. 2.
 2. Covering of ♀ consisting of wax, often thick; no marginal fringe or radiating processes; a more or less developed caudal horn, visible on removing the wax. *Ceroplastes*, Gray.
 Covering of ♀ consisting of wax, not thick, with seven long radiating processes arising from the margin, giving the insect a star-like appearance. *Vinsonia*, Signoret.
 Covering of ♀ waxy, not thick, with a marginal fringe of tooth-like processes, resembling more or less the teeth of a saw; antennæ and legs present. : : : *Ctenochiton*, Maskell.
 Covering of ♀ glassy, or at least brittle, thin. 3.
 3. Legs and antennæ present in adult 4.
 Legs and antennæ absent in adult 8.
 4. Scale divided into plates, and striated with rows of air-cells. *Inglisia*, Maskell.
 Scale not striated with air-cells. 5*.
 5. Scale divided into two portions, each with small grooves radiating from its apex; antennæ 8-jointed *Parafairmairia*, nov. nom.
 (*Fairmairia*, Signoret, 1874: not of Desv., 1863.)
 Scale not divided into two such portions. 6.
 6. Scale perfectly flat; glossy secretion in middle of back more or less broken up into small oval plates; genital aperture surrounded by cottony matter; antennæ 8-jointed; ♂ scale with dorsal area so narrow as to be practically a single ridge. *Lagosinia*, n. g. (Type *Lagosinia Strachani* †.)

*Mr. Hempel, in describing *Edwallia*, does not say whether it has the air-cells or not.

†*Lecanium Strachani*, Ckll., Entm., 1898, p. 259.

- Scale cone-shaped, with radiating ridges; antennæ
 5-jointed..... *Edvallia*, Hempel.
 Scale convex, but not cone-shaped; not divided at all, but rough or
 beset with protuberances; antennæ 7 or 8-jointed 7.
 7. Natives of the arid region of N. America..... *Ceroplastodes*, Ckll. 1893.
 Native of India..... *Ceroplastodes cajani* (Maskell).*
8. Quite flat, circular, with the glassy covering in two parts, divided longi-
 tudinally in the middle line; glassy covering with rows of air-cells
 as in *Inglisia*..... *Platinglisia*, Ckll., 1899.
 Moderately convex, with the glassy covering in two parts, divided
 longitudinally, each part with a low eminence, from which lines
 radiate..... *Schizochlamidia*, Ckll., ined.
 Very convex, with conical protuberances; glassy covering without
 rows of air-cells..... *Pseudokermes*, Ckll., 1895.

(To be continued.)

NEW GENERA AND SPECIES OF NYCTERIBIDÆ AND HIPPOBOSCIDÆ.

BY D. W. COQUILLET, WASHINGTON, D. C.

Pterellipsis, n. gen.—Near *Megistopoda*, but with aborted wings. Head once and a half as high as long, in profile subhemispherical, covered with bristles which are longest on upper part of the front; eyes oval, situated on sides of head slightly behind the middle, no ocelli; antennæ one-jointed, flattened, elliptical, three-fourths as long as the head, once and a half as long as wide, covered with bristles and bearing a long one at apex. Thorax greatly compressed, strongly gibbous, the sternum flattened, its front end lamelliform and prolonged in front of the anterior coxæ, a longitudinal impressed median line and on each side, slightly behind its middle, is an impressed line extending from it obliquely outward and backward to the lateral margin just behind the middle coxæ; wings narrow, projecting obliquely upward and forward, divaricate, once and one-third as long as height of thorax, four times as long as wide, with three veins besides the costal, each of the median veins forked near the middle, the front fork of the anterior vein reaches the costa near the last fourth of its length, the posterior fork ends in the extreme tip of the wing; the forks of the following vein are united

**Eriochiton cajani*, Maskell, Ind., Mus. Notes, Vol. II., p. 61. I can only leave this in *Ceroplastodes* for the present, but I think the resemblance to that genus is probably due to convergence and not to real affinity.

at their apices, and extended obliquely forward, reaching the wing-margin slightly below the tip; a short distance before this union the anterior branch is connected by a crossvein with the posterior branch of the preceding vein; the other vein extends along the posterior margin of the wing nearly to its middle, then unites with the posterior fork of the preceding vein; veins bearing several stout bristles; halteres distinct; front femora considerably thickened, their tibiae rather slender, middle femora rather robust, once and a third as long as the front ones, their tibiae as thick as and nearly twice as long as the front ones, hind femora and tibiae more slender than and nearly twice as long as the middle ones, each femur bearing several bristles, the tibiae destitute of bristles; first four joints of the front and middle tarsi subequal in length, each slightly broader than long, together slightly longer than the fifth, which is considerably swollen; first joint of the hind tarsi twice as long as wide, as long as the two succeeding joints, the last joint swollen, as long as the three preceding ones; each tarsal claw bears a large lobe at the base of the under side. Abdomen elongate-ellipsoidal, broader and slightly longer than the thorax, bare except at each end and on the venter, where there are a few bristles. Type, the following species:

Pterellipsis aranea, n. sp.—Pale yellow, the abdomen opaque grayish black, knob of halteres white, tarsal claws and the lobe at their base black, bristles brownish yellow. Length 2 mm. Jamaica and Montserrat, W. I. Three specimens taken on bats in caves by the late Mr. H. G. Hubbard. Also 23 specimens collected on bats in Porto Rico by Mr. A. Busck. Type No. 4208, U. S. Nat. Museum.

Trichobius major, n. sp.—Reddish yellow, the abdomen largely grayish black, halteres white, tarsal claws black, the latter lobed at base of the under side; thorax scarcely longer than high; wings whitish yellow, veins yellow, first vein reaching the costa near last sixth of length of wing; abdomen of female bare except a cluster of bristly hairs on each side near the base and at the tip; in the male the hairs in these four clusters are much more numerous. Length 3 to 4.5 mm. Gum Cave, Citrus Co., Florida, and Chiricahua Mts., Ariz. Fifteen males and sixteen females, collected on bats by the late Mr. H. G. Hubbard. Type No. 4209, U. S. Nat. Museum.

Aspidoptera n. gen.—Near *Trichobius*, but the wings reduced to oblong, coriaceous organs appressed to the body and not reaching beyond the first fourth of the length of the abdomen, densely covered with rather long bristles. Head in profile subquadrate, but the upper margin longer than

the lower, vertical diameter only slightly shorter than the longitudinal, covered with stout bristles which are longest on the upper part of the head; eyes narrow, situated near middle of sides of head, no ocelli; antennæ inserted near lower part of the face, projecting obliquely forward and upward, nearly as long as the head, apparently one-jointed, greatly depressed, oval only slightly longer than broad, bristly and with a longer bristle at apex of each. Thorax polished, depressed, about twice as long as high, mesonotum covered with stout bristles, a median sulcus extending from the front end to the transverse sulcus, which is at the last fifth of the mesonotum. Wings inserted on the posterior end of the thorax, less than twice as long as broad; halteres normal. Legs short, femora greatly swollen, less than twice as long as thick, tibiæ flattened, as long as the femora but less than half as wide, first four joints of tarsi subequal in length, much wider than long, together as long as the fifth which is greatly swollen, claws lobed at base of under side. Type, the following species:

Aspidoptera Busckii n. sp.—Reddish yellow, the palpi and legs light yellow, tarsal claws black, halteres white, head with a subtriangular black spot each side of the middle of the upper side, abdomen opaque, tinged with gray, only slightly longer than broad, bristly on each side at the base and at the extreme apex, composed of two segments of which the basal one is less than one-fifth as long as the other. Femora bearing numerous bristles on the upper sides, the tibiæ with a rather long pubescence. Length 2 mm. A female specimen, found on a bat, *Artibeus* sp., in a cave at Bayamon, Porto Rico, Jan. 15, 1899, by Mr. A. Busck, after whom the species is named. Type No. 4210, U. S. Nat. Museum.

In Dr. Williston's recent manual the genus *Ornithomyia* is credited with tridentate tarsal claws, while in Olfersia they are said to be bidentate. As a matter of fact, the claws in these two genera are structurally identical, each having two blunt-pointed teeth near the base of the under side. Our Hippoboscid genera with fully developed wings separate as follows:

1. Anal cell closed by crossvein.....2.
- Anal cell open to the wing-margin, ocelli wanting.....4.
2. Humeral angles projecting forward in the form of long tubercles, antennæ greatly depressed, not situated in cavities, projecting at least nearly half the greatest diameter of the eyes in front of the latter...3.
- Humeral angles rounded or only slightly projecting, antennæ subovate, situated in cavities, projecting less than one-fourth greatest diameter of eyes in front of the latter (*Ornithomyia confluenta*, Say).....*Anthoica*? Rond.

3. Ocelli present, scutellum smooth, bearing a row of bristles in front of the hind margin, the latter bare *Ornithomyia*, Latr.
 Ocelli wanting, hind margin of scutellum roughened with many nearly vertical ridges and fringed with bristles, scutellum otherwise bare. (Type: *Ornithomyia fulvifrons*, Walk.) *Stilbometopa*, n. gen.
4. Anterior angles of thorax projecting forward in the form of long tubercles 5.
 Anterior angles of thorax rounded *Hippobosca*, Linn.
5. Clypeus one-half as long as the middle of the front, scutellum bearing a stout bristle near each lateral margin. *Olfersia*, Wied.
 Clypeus almost as long as the front, scutellum bare. (Type: *P. maculata*, n. sp.) *Pseudolfersia*, n. gen.
Pseudolfersia maculata, n. gen. et sp. Front yellowish brown, the polished lateral margins and vertical triangle dark brown, the latter tapering anteriorly, broadly rounded at the tip, almost reaching the lower end of the front, a black bristle each side of the vertex and a row of smaller yellow ones on each side of the lower two-thirds of the front inside of the polished lateral margins; clypeus brown, yellowish medially, polished, noticeably longer than broad, notched in the middle of the apex and sulcate in the middle, the sulcus terminating in a deep fovea near the base of the clypeus; antennæ brown, subovate but flattened above, lying in deep grooves, not reaching apex of the clypeus, polished except the inner portion of its upper side which is opaque gray pruinose, bearing toward its apex a few yellow hairs and many long black bristles; palpi brown projecting slightly more than their greatest width beyond the apex of the clypeus; under side of the head brown, a yellow median longitudinal sulcus, and a rather large white lobe at its anterior end. Thorax dark brown, polished, the humeral tubercles apically yellow, a spot at inner side of each, another a short distance back of it, a stripe reaching from the prothoracic stigmata to base of wing, the transverse suture and a pair of spots on the posterior end of the thorax opaque gray pruinose, no median longitudinal sulcus, the transverse sulcus interrupted in the middle; pleura thinly gray pruinose except three spots along the suture in front of wings, sternum polished except its extreme anterior end which is gray pruinose; scutellum polished brown, truncate posteriorly, bare except a short pubescence along the posterior margin. Abdomen opaque grayish brown, the apex and venter yellow. Wings smoky brown, apex of auxiliary vein slightly beyond apex of second basal cell, that of first vein slightly beyond apex of first basal cell, of the second vein nearly midway between the apices of the first and third veins; first two sections of fourth vein subequal in length. Legs polished brown, front coxæ anteriorly opaque gray pruinose, pulvilli yellow, basal tooth of each tarsal claw yellowish. Length 7 to 8 mm. Wisconsin, on a Loon; also without indication of locality, on an Osprey, *Pandion haliactus carolinensis*. April 30, 1883. Nine specimens. Type No. 4211, U. S. Nat. Museum.