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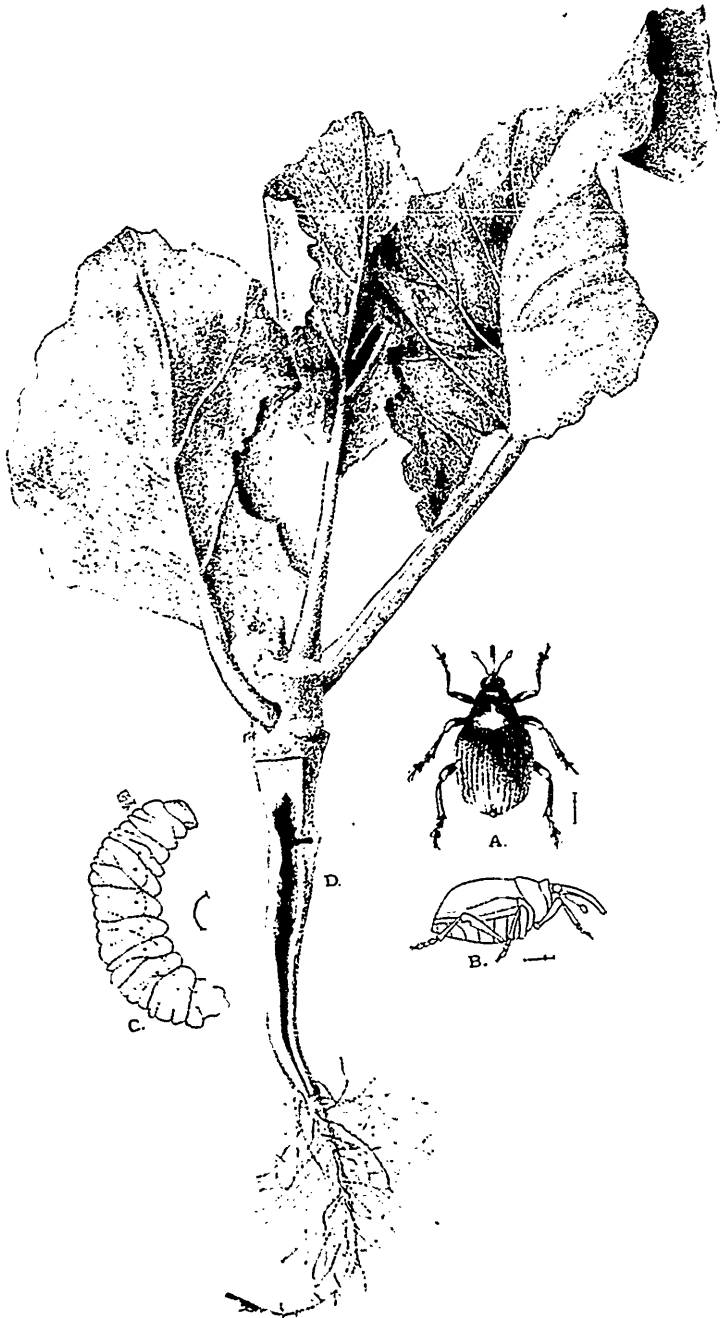
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THE CABBAGE CURCULIO (*CEUTORHYNCHUS RAPAE*, GILL.)

The Canadian Entomologist.

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No. 3.

CEUTORHYNCHUS NAPI OR CEUTORHYNCHUS RAPÆ.

BY F. M. WEBSTER, WOOSTER, OHIO.

In the report of the Commissioner of Agriculture for 1888, p. 136, Miss Mary E. Murtfeldt gives some notes on the development of *Ceutorhynchus napi*, Gyll., which had worked serious injury to cabbage in Missouri, the species having been determined, as stated by Miss Murtfeldt, by the late Dr. C. V. Riley, at that time United States Entomologist. Prior to the publication of Miss Murtfeldt's notice, she had informed me of her "find," and on my writing to ask her if there was not a mistake, and if she did not refer to *rapæ*, she replied that she, too, had not felt sure of the correctness of the determination until she had written Dr. Riley a second time with reference to the species, and the determination had been reaffirmed. This appeared to settle the matter, and I was satisfied that *napi* must be correct, though not before known to occur in North America.

In Bulletin 22, Division of Entomology, United States Department of Agriculture, p. 73, Miss Murtfeldt mentions *Ceutorhynchus rapæ*, Gyll., but does not state whether or not it is the same insect that had been previously mentioned, and there is nothing to imply that such was the case.

In Bulletin 30, of the same series, p. 50, mention is again made of *Ceutorhynchus rapæ*, and this time in a manner that might imply that it was identical with *napi*, but there is nothing definite to this effect, though a correction might have been made in either this or the reference previously cited. Miss Murtfeldt was clearly going by the information given her from the Department of Agriculture, and any errors in that information would not be hers, but of the Division of Entomology, whose place it was to make proper corrections of such, even though of a clerical nature, as a matter of justice to the many who looked to the then United States Entomologist as authority on such matters.

Last May I received young cabbage plants from Montgomery County, Ohio, that were being destroyed by larvæ of some insect burrow-

ing in the stem, especially in the upper portion thereof. I found the larvæ difficult to rear in confinement, and only succeeded in securing one adult from plants removed to the insectary June 14. Correctly supposing that I was dealing with the same species as had Miss Murtfeldt, and overlooking her note in Bulletin 30, I presented the matter in my "Notes of the year in Ohio," at the last meeting of the Association of Economic Entomologists, under the name *C. napi*, Gyll., coupled with the statement that it was not in Henshaw's lists, and in this condition my paper was placed in the hands of the Secretary for publication. My single specimen, reared from affected plants, did not exactly correspond with my specimens of *rapæ*, and remembering the double determination by Dr. Riley for Miss Murtfeldt, and also not at the time having access to the latter's note in Bulletin 30, was led to a conclusion that was, perhaps, not justified, and under different circumstances would not have been arrived at by myself. I had no description of *napi* and a very poor one of *rapæ*, but the work of my larvæ corresponded so exactly with that ascribed to the former species, in Europe, as given in Bargaglia's *Rassegna Biologica di Rincofori Europei*, that I was still further misled.

Before my note went to press, however, I was informed that the old determination of *C. napi* had been found incorrect, that the species was *C. rapæ*, as was probably true of mine. I submitted my single specimen to Mr. Howard, the present U. S. Entomologist, with the request that, if it turned out to be *C. rapæ*, my note should be changed in the proof to correspond thereto. This was all very kindly done, so far as the specific name was concerned (See Bulletin No. 2, New Series, U. S. Department of Agriculture, Division of Entomology, p. 90), but, unfortunately, the statement that "the species is not yet included in Mr. Henshaw's lists of North America Coleoptera," and which was not intended to apply to *C. rapæ* at all, but to *C. napi*, was, through an oversight, allowed to stand, thus placing me in a position that demands an explanation, and which is, here and for this reason, given. *C. napi* is not yet known to occur in America.

In the accompanying plate illustrating the development of *Ceutorhynchus rapæ*, the adult is shown, dorsal view at A, lateral view at B, the larva C, excavation in affected plant in which one or more larvæ may develop at D. The drawings were made by Miss Detmers, under my supervision, and developed at the Department of Agriculture, the electrotype being kindly furnished me by Mr. L. O. Howard.

To Miss Murtfeldt belongs the credit of working out the life-history so far as this is now known, my own observations being only supplementary. Miss M. records the occurrence of larvæ, supposedly belonging to this species, in early spring burrowing in the stems of pepper-grass (*Lepidium virginicum*), and also in the same plant in July, thereby implying at least two annual broods. The injury to cabbage, as observed by her, appears to have been confined to early plants either in hotbeds or soon after having been removed therefrom. In the case of the Ohio outbreak, the attack was among young plants started late for fall and winter use. My attention was not called to the exact trouble until June 4, and both larvæ and adults were taken from these plants July 18, so that I seemed to have been dealing with the second brood. The plants were growing on low ground bordering on a pasture, and the latitude was nearly the same as that of Kirkwood, Missouri, where Miss Murtfeldt's studies were carried on. It is, of course, quite possible that the period of oviposition is protracted, and that I was dealing only with the latter part of the first brood.

REMARKABLE WORK OF INSECTS.

At the meeting (of February 3rd) of the Academy of Science, of St. Louis, Mo. (President Gray in the chair), Mr. Trelease exhibited several specimens, about three feet square, of a curious silk tapestry, taken from the ceiling of a corn-storing loft in San Luis Potosi, Mexico, by Dr. Francis Eschauziër, stating that he was informed that the larger specimen had been cut from a continuous sheet over twenty yards wide and about four times as long. The specimens, of a nearly white colour, and of much the appearance and feeling of a soft tanned piece of sheepskin, were shown to be composed of myriads of fine silken threads, crossing and recrossing at every conceivable angle, and so producing a seemingly homogeneous texture. Although specimens of the creatures by which they are produced had not been secured, it was stated that there was no doubt that these tapestries are the work of lepidopterous larvæ which feed upon grain, the presumption being that they are made by the larvæ of what has been called the Mediterranean Grain or Flour Moth (*Ephestia Kühniella*). The speaker briefly reviewed the history of this insect and its injuriousness in various parts of the world, and quoted from a report of Dr. Bryce, showing that in Canada, where it became established in 1889, "a large warehouse, some 25 feet wide, 75 feet long, and four stories high, became literally alive with moths in the short course of six months."

WILLIAM TRELEASE, *Recording Secretary.*

A FEW NEW SPIDERS.

BY NATHAN BANKS, SEA CLIFF, N. Y.

Micaria gentilis, n. sp.

Length, 3.6 mm.; ceph.: long, 1.4 mm.; broad, 1 mm. Cephalothorax, sternum, femora i. and ii., blackish; rest of legs i. and ii. pale yellowish; legs iii. and iv. yellow-brown, the femora scarcely darker; abdomen black above, with a narrow white band across the middle and a white spot on each anterior lower side; venter pale. Cephalothorax broad, in ♂ a little narrower; posterior row of eyes procurved, the P. M. E. oval, fully their diameter apart, and about as far from the P. S. E.; anterior row strongly procurved, the A. M. E. fully their diameter apart, and about as far from the larger A. S. E. Sternum oval, pointed behind; legs of moderate length, femora i. and ii. stouter than others, femora iii. slightly excised before the tip behind. Abdomen not constricted, quite broad, somewhat depressed, epigynum appearing much like *M. montana*, Em., but the openings are farther apart and more oblique. Tibia of ♂ palpus has short projection at tip on the outer side: the bulb is triangular in side view, the red parallel marks are along the outer edge; near the middle is a short tube.

Several specimens from Franconia, N. H. [Mrs. Annie T. Slosson]. Related to *M. perfecta* from Colorado, but larger and with a broader sternum.

Scius montanus, n. sp.

Length, 2.1 mm.; ceph.: long, 1 mm.; broad, .6 mm. Jet black, shining, almost coppery; extreme tips of palpi, tips of maxillæ, a spot on each coxa and trochanter, and an elongate spot on the femur, pale; the tarsi infuscated; pale dots on legs at origin of hairs. Cephalothorax long, moderately low, nearly flat, sides almost parallel. Eye region one-third broader than long, occupying not much over one-third of the cephalothorax; a trifle broader in front than behind; eyes of second row full as close to the dorsal eyes as to lateral eyes; A. M. E. large, distinctly separated, plainly farther from the S. E. Sternum one-fourth longer than broad, broadest in middle, pointed behind, truncate in front; coxæ i. separated by full width of lip; legs short, fourth pair longest, femora i. thicker than others; only a few indistinct spines, those on metatarsi iv. are at apex. Abdomen barely wider than cephalothorax and but little longer, pointed behind. Body and legs clothed with scattered black hairs. The ♂ palpi short, the tibia with a short process on the

outer side, twice as long as wide, and appressed to the tarsus so as to be hardly visible except in side view; palpal organ very large, with the lower part full and extended over the base of the tibia; on the outer side near tip is a crescent-shaped yellowish mark; the bulb is small and on one side, and is tipped with a minute spine-like tube.

One ♂, Mt. Washington, N. H. [Mrs. Annie T. Slosson]. A very distinct little species, and doubtless peculiar to mountains.

Dismodiscus alpinus, n. sp.

Length, 2 mm. Cephalothorax pale yellowish, blackish around eyes, sternum infuscated, abdomen dark gray, legs almost white. Structure somewhat like *Loph. decem-oculatum*, Em., with a large lobe on the clypeus as in that species, but the lobe on the head is higher, narrower, rounded above, not bilobed, clothed with short hairs on top and in front, and rises suddenly from the surface of the cephalothorax in front and behind; the P. M. E. are on the cephalothorax at its base, and not on the lobe; the holes are in a large groove on each side. The posterior row of eyes is straight, equal in size, the P. M. E. fully as far from each other as from the S. E.; the anterior row is slightly recurved, the A. M. E. very small and close together. Sternum but little longer than broad, truncate at base, pointed behind, sides rounded. Legs slender, a spine above on patella and two on tibia iv., tarsus i. plainly shorter than the metatarsus. The tibia of the ♂ palpus has above two short spines and two projections at its tip, the outer one the broader and pale, the inner one more pointed and reddish; the palpus is barrel-shaped, the tube going once around the tip as in *Diplostyla*; there is a large curved hook at base.

One ♂, Mt. Washington [Mrs. A. T. Slosson]. Although this species does not strictly agree with Simon's description of the genus *Dismodiscus*, I believe it should go here, as also *Loph. decem-oculatum*, Em. The best character for the genus to me is the clypeal lobe.

Dicyphus, Menge, which Simon unites to *Gonatium*, I would agree with Kulezynski in keeping as a separate genus, and closely related to *Dismodiscus*. The head of the ♂ has a lobe above which does not bear the P. M. E.; there is no clypeal lobe. I have seen two species from the United States, the first of which has much affinity with the type of the genus, *D. bituberculatus*.

Dicyphus bilobatus, n. sp.

Length, ♂, 2 mm. Cephalothorax orange, a little black around the

eyes, the lobe on top yellow, a black line from the hole on each side; abdomen blackish above and below, the spinnerets pale, sternum yellowish, legs and palpi pale, clothed with fine hairs. Just behind the eyes is a large bilobed body with a hole at base each side; seen from above each lobe is elliptical, and scarcely twice as long as broad, shorter than in *D. bituberculatus*. Posterior row of eyes nearly straight; P. M. E. once and a half their diameter apart, slightly farther from the S. E.; A. M. E. very small and about touching. Sternum as broad as long, triangular; legs moderately long, no spines above on tibiae, tarsus shorter than metatarsus. The tibia of ♂ palpus has a long projection above near tip, much as in *D. bituberculatus*, but it is more slender, more straight and but little curved at tip; on the outer side of tibia is a very small hook-shaped appendage; the tube is moderately long, bent in the middle, and the tip supported by a hyaline sheath. The palpi are comparatively small.

Two males, one from a deep swamp near Ithaca, N. Y., the other from Olympia, Wash. [Trevor Kincaid].

Dicyphus trilobatus, n. sp.

Length, ♂, 2 mm. Cephalothorax yellow-brown, black about the eyes, lobe yellow; abdomen black, with a few light cross-lines near tip sternum and venter black; the spinnerets pale; legs and palpi yellowish a little brown on the coxae. Posterior row of eyes straight; P. M. E. twice their diameter apart, much closer to the S. E.; A. M. E. close together, not so very much smaller than the S. E. Just behind the eye is a large triangular flat body, trilobed in front, the lobes of about equal size. The sternum is broad, projecting between the hind coxae, the sides rounded. Legs moderately long, hairy, no spines on tibiae. The palpi are long and slender, the tibia has above a large bifid process there are two tube-like pieces: one, starting from near the middle of the bulb, bends out and then toward the tip of the palpus; the other, starting from near the inner tip of bulb, extends toward the base of the first one on the outer side there is a quite prominent pale-coloured projection— is somewhat like a sheath or support for the tube.

One specimen from Ithaca, N. Y.

The genus *Erigonoplus* has the head lobed as in the preceding genera, but differs from them at once in having the anterior metatarsi the male swollen.

Erigonoplus gigas, n. sp.

Length, 2.2 mm. Cephalothorax yellowish, black around the eyes and on the clypeus; legs and palpi pale, patellæ of legs a little darker; abdomen blackish, with narrow pale chevrons above, spinnerets pale; sternum yellow-brown. Head broad and swollen in front; posterior row of eyes slightly procurved; P. M. E. nearly twice their diameter apart, about as far from S. E.; A. M. E. far in front of P. M. E., small and close together. Behind the eyes there is a small, low, yellow body, trilobed in front and with a smaller lobe on each side. The legs are long and hairy, without spines above; metatarsi i. much enlarged in the middle, fusiform. The sternum is short, pointed between the hind coxæ, fully as broad at coxæ ii. as in front. The tibia of the ♂ palpus has on the outer tip a short, stout projection; a large hook across basal part of bulb with a projection outward from it; the tube starts from near the middle, curves along the bulb to the tip, then extends outward and curving, so as to nearly form a square.

One male from a deep and cold swamp near Ithaca, N. Y. (May).

A REPLY CONCERNING NOCTUA AND AGROTIS.

BY A. RADCLIFFE GROTE, A. M., HILDESHEIM, GERMANY.

Prof. John B. Smith on page 8 of this volume criticizes my rejection of the terms *Noctua* and *Noctuidæ* and says: "I state my own knowledge as follows: In Scudder's 'Nomenclator' we find

"Noctua, Klein, Moll., 1753.

Noctua, Fabr., Lep., 1776.

Noctua, Sav., Aves., 1809.

Noctuæ, Linn., Lep., 1758."

I may say, that were this "knowledge" the utmost we could attain to, my statement that "Noctua is preoccupied in the Birds" would be justified. The term "Noctuæ, Linn.," 1758, is, according to Prof. Smith, to be rejected and the generic term is to be credited to Fabricius, although Guenée and others write "Noctua, Linn.," so that the date 1758 would be ruled out. The citation "Noctua, Fabr.," 1776, if looked up, would show that it represents a bare name, and therefore [see Comstock's observations] this would also fall. We would then come to Savigny, 1809, and this would be the proper use under the rules, according to the "Nomenclator" as cited by Smith, of the name "Noctua." But while Prof. Smith's knowledge, as above stated, justifies me, it is not final.

Prof. Comstock finds that Fabricius in 1792 uses "Noctua" for 380 species, and this is not in the "Nomenclator." More than this, I have found that Fabricius uses the term "Noctua" for 309 species already in the Mantissa, 1787.* So that we are getting more light and more facts, and it may be that my rejection, although warranted by the "Nomenclator," may have to be reconsidered. But there remains the fact that the type is unknown [pending what we may hope to hear from Mr. Kirby's researches] and, also, that no author is obliged to use a generic term which has not a properly designated type. In this case I have shown at least the necessity for reviewing Guenée's statement, that *his* genus "Noctua" is a proper restriction of the Linnean term.

And now as to *Agrotis* and Prof. Smith's statements on page 6. He does not quote my full text on p. 16 of the Bremen List, where I show that he copies the sense and as near as may be my words as to the characters on which we may divide the genus, without any acknowledgment. He excuses the omission now by the "bald statement" that the contents of my paper† were not "in any sense of the word original," and that Lederer used the characters in his work on "the European Noctuids so long ago as 1857." This is the first I have heard that Lederer had worked up the American Agrotids; it would have spared me much trouble had it been so. In reality Lederer only discusses the European species, and my work on the American and my suggestions as to the characters to be found serviceable was in so far original. But the statement that the characters proposed and observed by me were not "original" seems incorrect. First: Lederer does not propose to use the unarmed fore tibiae as an excluding character. He alternates groups of the species with armed and unarmed tibiae.‡ So that I should have been credited for this original suggestion. Second: I am the first to discover the tuberculate front in *Agrotis*; this discovery is "original" and it does not detract from its originality that I only applied *Carneades* to the two species which I examined and only could examine at the time of my discovery, I being then very ill and having parted with my collection. That some of the European species probably have the tuberculate front is implied by Prof. Smith when suggesting that *Chera* should replace *Carneades*. But Lederer does not mention the clypeal tubercle or elevation at all.

* Grote, Die Apateliden, Mitt. Roem. Mus. San., 1896.

† CAN. ENT., XV., 51, 1883.

‡ Lederer, Syst. Noct., p. 81. I have constantly in my writings given Lederer every credit for his observations on the characters in this family.

THE COLEOPTERA OF CANADA.

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

XV. THE CHRYSOMELIDÆ OF ONTARIO AND QUEBEC.

The above family is of immense extent and attains, in the tropics, a considerable development in the size of its members, though not equalling in this respect its wood-eating neighbours, the Cerambycidæ. Towards the north, many groups fade out entirely and the large or gaily-coloured species decrease in number. Nevertheless, the representation in Canada is quite considerable, and since many of the species are closely allied and separate with some difficulty, while tables of genera are widely scattered, or, in many cases, not readily accessible, it has been deemed worth while to bring together the salient characters by means of which the collector in Eastern Canada may hope to identify his captures.

According to the classification followed in this country, the members of the family agree in these points: The tarsi are broad, spongy beneath, the fourth and fifth joints being so closely ankylosed as to give the appearance of but four joints; the head has the front small and oblique, the antennæ are moderate or short and not inserted upon frontal prominences. The prothorax is most frequently margined and the tibial spurs usually wanting. A few exceptions occur to each of the above characters, but most of the Chrysomelidæ may easily be recognized at sight by their resemblance to a few common types, such as *Donacia*, *Cryptocephalus*, *Chrysochus*, *Chrysomela*, *Galeruca*, *Haltica*, *Micro-rhopala* and *Cassida*. There is, however, no uniformity of family habitus, as many of the Cassidini are extremely broad and flattened, while the Cryptocephalini are occasionally nearly globular.

All of the Chrysomelidæ may be said to be vegetable feeders, and most of them are to be found in every stage upon the leaves, in the stems or about the roots of their food-plants. The larvæ are not of a very uniform type of structure, but are modified to suit their particular habits of life. Most of those that feed freely upon the surface of leaves are of rather heavy, subcylindrical or subglobular form and slow in movement. A good example of this type is to be seen in the young of the Colorado potato-beetle. Other leaf-eating larvæ, such as those of *Coptocycla* and its allies, are flattened and curiously armed with spines or covered with a coat of their own excrement. The leaf-mining or stem-boring kinds are usually of more slender, elongate shape and without the conspicuous

ornamentation displayed by so many of the free-feeding forms. A few are case-bearers and occur either at large on their food-plants or in nests of ants; to this category belong *Coscinoptera* and *Chlamys*. The larva of *Chlamys plicata* occurs commonly on grasses in the Lake Superior district, carrying its little case about and protruding only the front part of the body when feeding or crawling. When the inhabitant is ready to pupate, the open end of the case is sealed to a blade of grass and the transformations take place within.

The economic importance of the group has been recognized by all Entomologists, and certain species claim their share of our crops from year to year in spite of the constant war waged against them. The imported elm-leaf beetle, the Colorado potato-beetle, the corn-root worm, and the striped cucumber-beetle are only a few of the many injurious Chrysomelidæ which have to be fought each year in the regions which they infest.

Secondary sexual characters are to be found in the antennæ, the tarsi, the claws, and the ventral abdominal segments of many species, and are often of great value in the separation of otherwise almost indistinguishable forms. These will be referred to in the proper places when necessary for identification.

On account of the great size of the family, it seems best to avoid a long, complicated generic table by the adoption of the groups indicated in the Leconte and Horn "Classification." Each tribe will be taken up by itself and the genera contained in it separated by a table. A slight modification of the tabular synopsis presented in the work above cited may be used to advantage as follows:—

- A. Outline of body elliptical or nearly circular; prothorax and elytra with broad expanded margins, head concealed.... XI. *Cassidini*.
- AA. Outline of body variable, prothorax and elytra without broad expanded margins. Head usually plainly visible from above.
 - b. Front of head inflexed, mouth inferior, body wedge-shaped, broad and truncate behind... X. *Hispini*.
 - bb. Front of head not inflexed, mouth anterior.
 - c. Last dorsal abdominal segment not exposed, middle ventral segments not narrowed.
 - d. Prothorax usually margined.
 - e. Antennæ approximate at base; front coxæ conical and prominent ... IX. *Galericini*

- ee. Antennæ widely separated at base.
 Front coxæ transverse, third tarsal joint usually entire VIII. *Chrysomelini*.
 Front coxæ rounded, third tarsal joint bilobed VII. *Eumolpini*.
- dd. Prothorax not margined at sides.
 f. First ventral about as long or somewhat shorter than the two following.
 Claws simple, elytra punctato-striate III. *Criocerini*.
 Claws cleft or toothed, elytral punctures irregular II. *Sagrini*.
 ff. First ventral about as long as all the others united I. *Donaciini*.
- cc. Last dorsal abdominal segment exposed, declivous. Form of body robust, compact, subcylindrical.
 g. Surface of body coarsely tuberculate above V. *Chlamydini*.
 gg. Surface of body not tuberculate.
 Prosternum not separating front coxæ; antennæ short and serrate IV. *Clythrini*.
 Prosternum extending between front coxæ, antennæ usually long and slender VI. *Cryptocephalini*.

The Roman numerals before each tribal name show the order in which they are taken up in the following pages.

TRIBE I.—DONACIINI.

Contains two genera, which are composed of very neat, graceful and usually active species, found on or about such aquatic or subaquatic plants as water-lilies, arrowheads (*Sagittaria*), pond-weed, and various sedges. They have a habitus peculiarly their own, which if once appreciated renders their future recognition easy at a glance. The head and thorax are narrower than the elytra, which are attenuated toward the tip—sometimes almost triangularly so. The antennæ are rather long, extending back beyond the base of the thorax; the under surface of the body is finely pubescent. In colour most of the species are metallic, varying to blue or green, though a few are testaceous, at least in part.

Elytra simple at tip *Donacia*.

Elytra distinctly spinose at tip *Harmonia*.

DONACIA, Fabr.

Numerous Canadian species are known, which, from their general uniformity of appearance, are often difficult to identify. Careful attention to the points recently elaborated by Mr. Chas. W. Leng, and published by him in a late paper on the genus, should result in correct names, however. The following table is based on that of Mr. Leng, though I have changed the arrangement somewhat, in order the sooner to eliminate the more easily recognized species:—

- A. Head, thorax and elytra pubescent. .40-.44 in. *pubicollis*, Suffr.
 A A. Head and thorax pubescent, elytra glabrous.
 .36-.44 in. *hirticollis*, Kirby.
 A A A. Head sometimes, thorax and elytra never, pubescent.
 b. Elytra distinctly rounded at tip ; form convex.
 c. Thorax depressed, no median nor basal line.
 .24-.32 *pusilla*, Say.
 cc. Thorax convex, basal line distinct, longitudinal one usually so.
 d. Legs dark ; body usually metallic blue.
 .24-.28 in. *emarginata*, Kirby.
 dd. Legs reddish-yellow. Body usually copper-bronzed.
 Thorax thickly punctured. .28-.36 in. *flavipes*, Say.
 Thorax sparsely punctured. .26-.30 in. *rufa*, Say.
 bb. Elytra truncate or subtruncate at tip.
 e. Middle coxæ separated by about their own width ; body broad, distinctly flattened above.
 f. Second and third joints of antennæ nearly equal
 .28-.44 in. *cincticornis*, Newm
 ff. Third joint of antennæ much longer than second.
 Elytra truncate at tip. First ventral ♂ simple
 .36-.44 in. *palmata*, Oliv
 Elytra subtruncate at tip. First ventral ♂ with
 pit at middle. .26-.40 in. *piscatrix*, Lac
 ee. Middle coxæ separated by less than their own width.
 Body usually convex above, narrower than in preceding group.
 g. Prothorax scarcely tuberculate at sides, surface with coarse uniform punctures.
 .28-.44 in. *subtilis*, Kunze

gg. Prothorax tuberculate at sides, disk' uneven.

Sutural margin of elytra not sinuate, disk with two transverse indentations. .22-.28 in. *aequalis*, Say.

Sutural margin of elytra sinuate near the tip. .28-.36 in *distincta*, Lec.

It will be noted that several of the names on the Canadian list do not appear in the above table. These have been reduced to synonymy by Mr. Leng, as follows: *D. cuprea* becomes *pusilla*, *D. rugifrons* gives way to *emarginata*, *D. jucunda* to *flavipes*, and *D. Kirbyi* to *rufa*.

Both *proxima* and *magnifica* are considered by him to rank only as varieties of *cincticornis*, *proxima* having the prothorax punctate only at base and apex, while in *magnifica* it is coarsely punctured over the whole surface. He reduces (with an expression of doubt) *torosa* to a varietal form of *distincta*, from which it differs by Dr. Leconte's description in being of a blackish-violet colour and in having the prothorax somewhat elongate, while the same author describes his *distincta* as coppery, with the thorax quadrate. It is a matter of remark that Mr. Crotch should have placed these forms in different and

apparently well-founded divisions in his synopsis, while Mr. Leng thinks them only varietal. Fig. 4 shows the form of body common in the genus.



FIG. 4.

HÆMONIA, Latr.

The only North American species is *H. nigricornis*, Kirby, which resembles a small *Donacia* in form. Beneath, the body is blackish, the upper surface and the legs are reddish-yellow. The head, antennæ and tarsi are dark. The elytra are marked with ten long rows of punctures and a shorter one near the suture at base. Length, .20-.28 in. It is said to occur on *Potamogeton*.

TRIBE II.—SAGRINI.

The few species comprised in this group are remarkable for the plasticity of their characters and the difficulty of accurately defining their limits of variation. They are of small or moderate size and agree in having strongly punctured elytra, which are wider than the thorax. The mouth is rather prominent, the eyes very convex, giving the head a width

about equal to that of the thorax. The antennæ are moderately distant at base. The armature of the thorax will serve to differentiate the Canadian genera thus :—

- Sides of prothorax much rounded and rather suddenly narrowed behind, giving a somewhat bell-shaped appearance *Orsodachna*.
- Sides of thorax with large, distinct tubercle; small species. *Zeugophora*.
- Sides of thorax broadly angulate, more or less distinctly three-toothed; larger species. *Syneta*.

ORSODACHNA, Latr.

A single species of extreme variability (*O. atra*, Ahr.), belongs here. It is common on willow blossoms in spring, several colour-varieties often occurring together on the same tree. All intergrades are known, from entirely blackish individuals, through forms in which the thorax becomes red, with or without a central dark spot, to those with vittate elytra or even of an almost uniform testaceous. From the notes of Dr. Horn, the following key has been constructed as a guide to the best-marked varieties, but it must be borne in mind that numerous intergradations will be met with, not referable to any of these :—

A. Elytra blackish.

- Thorax blackish, legs dark. *atra*, Ahr.
- Thorax blackish, tibiae and femora testaceous. *tibialis*, Kirby.
- Thorax reddish, with central dark spot. *luctuosa*, Lec.
- Thorax entirely red. *hepatica*, Say.

AA. Elytra vittate or spotted.

- Elytra dark, each with narrow yellow stripe *vittata*, Say.
- Elytra yellowish, with sutural and lateral dark stripe. *trivittata*, Lac.
- Elytra dark, with humeral and apical yellow spot (Fig. 5) *Childreni*, Kirby.

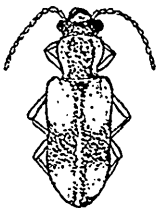


FIG. 5.

In general, they agree in these characters: The prothorax is somewhat bell-shaped, rather coarsely punctured, less so at the sides; the elytra are broad at base and with numerous closely placed, rather coarse punctures which show some slight tendency to a serial arrangement. Sides of elytra nearly parallel to about the apical third, whence they are rounded to tip. Length, .16-.28 in.

ZEUGOPHORA, Kunze.

Three are reported from Canada. They are small insects, somewhat of the form of *Orsodachna*, but proportionately shorter and more robust. The punctuation, especially of the elytra, is coarse and the prothorax has a large tubercle on each side. *Z. abnormis*, Lec., is black above, the antennæ and legs red; it reaches the length of .16 in. *Z. varians*, Cr. (Fig. 6.), is a trifle smaller (.13-.14 in.), and rather prettily coloured, the thorax being mostly piceous above, with a yellowish median stripe; the elytra are dark around the margins, the disk being occupied by a large oval or somewhat heart-shaped yellowish spot. Specimens of *Z. varians* from the Pacific slope seem tolerably constant in having the median yellow stripe of the thorax obliterated and the sides more broadly pale, while the elytra have, in addition to the usual spot, a smaller common sutural one of the same colour, near the tip. This is connected with the anterior one by a narrow yellow line. *Z. puberula*, Cr., differs from *varians* in having the thorax entirely yellow, the elytral yellowish area ill-defined. The punctures are close together, the outer joints of the antennæ black. A specimen has been sent from Toronto by Mr. Crew.



FIG. 6.

SYNETA, Esch.

Represented by *S. ferruginca*, Germ. (.30-.32 in.), a yellowish or reddish-yellow beetle of rather coarse sculpture. The thorax is angulate, with three more or less well-marked teeth on each side. The elytra are marked with four costæ of various degrees of distinctness. It is often beaten from hazel thickets.

TRIBE III.—CRIOCERINI.

A few Canadian beetles of neat form and usually striking coloration belong here. The thorax is much narrower than the elytra, which are punctate in rows. The two genera differentiate easily, thus, so far as the species under consideration are concerned:—

- Prothorax with a constriction about the middle, elytra striped.. *Lema*.
 Prothorax cylindrical, elytra spotted..... *Crioceris*.

LEMA, Fabr.

L. trilineata, Oliv. (Fig. 7), is the only Canadian species. It is of a



FIG. 7.

reddish colour, with two thoracic spots, the antennæ (excepting the first joint), tips of tibiæ and tarsi, blackish. The clytra are of a clear light yellow, or nearly white, with a common sutural black stripe, and each with a narrow submarginal vitta of the same colour. Length about .25 in. (Fig. 8: *a a*



FIG. 8.

represent the larva with its singular covering of excrement, *b* the last joints of the abdomen, *c* pupa, *d* the eggs.)

CRIOCERIS, Geoff.

Two imported European species are known from the adjacent regions, though but one of these seems to have been actually reported from Canada. They prey upon asparagus, and from the striking pattern of

coloration are easily known. *C. asparagi*, Linn., is from .16 to .24 in. long, of a greenish or bluish-black colour, the thorax red with two black spots of variable size usually present. The elytra are reddish-yellow, with a blue-black cross formed by the crossing of a longitudinal sutural stripe and transverse median band, and with an

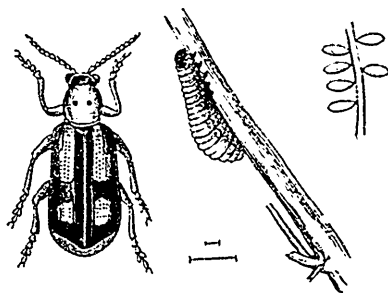


FIG. 9.

apical and basal spot of the same dark colour on each; or they may be blue-black with the outer and apical margin and three spots on each yellow. (Fig. 9 represents the eggs, larva and beetle much magnified.) *C. 12-punctata*, Linn., is .19-.24 in. long, dull red, each elytron with six black spots of variable size. The antennæ, knees, and tarsi are also black.

I desire to acknowledge the kindness of Mr. W. S. Cody, B. A., of Windsor, Ont., in contributing a Canadian specimen of *Argynnis Idalia* to the Society's collection. I am indebted to Mr. Wm. Lochhead, of Napanee, Ont., for the information that this handsome butterfly has been added to the Canadian List. J. ALSTON MOFFAT, Curator.

CANADIAN HYMENOPTERA, NO. 7.

BY W. HAGUE HARRINGTON, F. R. S. C., OTTAWA.

The object of this paper is chiefly to record some observations, made last summer, on a few parasitic forms, but mention is first made of two phytophagous species.

STRONGYLOGASTER? MARGINATA, Prov.

Selandria marginata, Prov., Add. Faun. Hym., 1885, p. 8.

Eriocampa marginata, Prov., Cresson, Cat. N. Am. Hym., 1887, p. 162.

Strongylogaster primitivus, MacG., CAN. ENT., 1893, Vol. XXV., p. 241.

Tenthredopsis primitivus, MacG., CAN. ENT., 1894, Vol. XXVI., p. 327.

Mr. MacGillivray has recently kindly sent to me one of his types of *primitivus* for comparison with that of Provancher's *marginata*, and I find, as was already evident from the description, that it is the same species. The generic position of the species is, however, not so readily determined; Mr. MacGillivray being now of opinion that it belongs neither to *Tenthredopsis*, *Strongylogaster* or *Taxonus*, but probably to some yet undescribed genus. It certainly does not belong to *Tenthredopsis* as adopted by Cameron in his monograph of the British Phytophaga, nor to *Selandria*, so that I have left it for the present in *Strongylogaster*, to some of our accepted species of which it is very similar in appearance. Several of the groups of our *Tenthredinidæ* require revision, the classification of species solely from wing venation being unsatisfactory, for in the phytophagous hymenoptera the venation is much more unstable than in the other divisions of the order. I fear, for instance, that Mr. MacGillivray's genus *Bivena* (CAN. ENT., Vol. XXVI., p. 327) has been founded upon the accidental occurrence of a supplementary marginal cell.

CEPHUS PYGMÆUS, Linn.

The continued spread of this wheat-stem sawfly is evidenced by the occurrence of two males in a small collection made on 5th July, at Indian Head, Assa., by Mr. Fletcher, during his trip to British Columbia last summer.

PEZOMACHUS PETTITII, Cresson, CAN. ENT., 1892, Vol. IV., p. 61. ♀.

Pezomachus sulcatus, Prov., Add. Faun. Hym., 1885, p. 77. ♀.

Stibeutes Pettitii, Cr., Riley and How., Ins. Life, 1890, Vol. III., p. 154.

This is the commonest species of our wingless Cryptids, but I have noted only one mention of its having been bred, which is in the list published in *Insect Life* (*loc. cit.*) of bred parasitic hymenoptera in the United States National Museum, the record being as follows:— "*Bucculatrix* found on stone, Virginia, April 9th." The species is there referred to the genus *Stibeutes*, which in Cresson's synopsis is said to have the "Metathorax completely and regularly areolated," while in *Pezomachus* it is "not, or irregularly areolated." None of my specimens show any areolation, the indications of any metathoracic carinæ being of the feeblest nature. This insect has frequently been taken with the sweeping-net on foliage from June to September, and on one occasion in the latter month, as I was reclining under a pine tree near Aylmer, I observed numerous examples running about on the carpet of dead pine leaves which covered the ground. They had a remarkable resemblance to some of the ants which are always roaming around in such places. Last April I obtained, under a large flake of loose bark on an elm stump, a number of egg-cocoons of an undetermined spider. They were hemispherical in shape, and made of a very white silk, and were covered by irregular tent-like masses of the same flocculent, viscid silk, spun between the bark and the surface of the wood. On opening one of the egg-masses I found two hymenopterous larvæ among the yellow eggs, and therefore secured a number of the cocoons, which, when removed, adhered to one another and formed a sticky mass in the small box in which I had to place them. Two of the parasites emerged on May 19th and proved to be males of a *Hemiteles* not in my collection. Two days later a similar winged male appeared, and also three wingless males, which I saw belonged to *Pezomachus Pettitii*. Four wingless males, one winged male, and one female emerged the following day, and others followed until, in all, I obtained four females, seven wingless males, and six winged males. There can be no doubt that the winged forms, though differing in the shape of the thorax from those without wings, are specifically the same. This rearing confirms the opinion held by many authors [For example see Walsh, *CAN. ENT.*, Vol. II., p. 10.], of the identity of the genera *Hemiteles* and *Pezomachus*, and I have special pleasure in recording it at the present time, in view of the following recent reference to the subject by Dr. Sharp (*Cam. Nat. Hist.*, Vol. V. p. 556): "The little Ichneumons of the genus *Pezomachus* are quite destitute of wings, and somewhat resemble ants; they are quite common

insects in Britain. Only the female sex is known, and it is believed that the winged Ichneumons assigned to the genus *Hemiteles*, of which no females are known, are the males of *Pezomachus*. Repeated efforts have been made to place this beyond doubt, but they have usually failed, for when a brood of these parasites is reared the individuals generally prove to be either all *Hemiteles* or all *Pezomachus*. It is to be hoped that this interesting case will be fully elucidated." Of the American species assigned to *Pezomachus*, several are known in both sexes. Mr. Howard, for example, describes both ♀ and ♂ of *P. micariæ* (Proc. Ent. Soc., Wash., Vol. II., p. 194), bred by Mr. Emerton from the egg-cocoons of a species of *Micaria*. Individuals of *P. Pettitii* vary somewhat in colour and in shape of thorax, the anterior node of which is often sulcate, as in Provancher's type of *sulcatus*. Nearly all those taken in the field have the abdomen entirely dark, except the apex of first segment, while all the bred specimens have the apex of second segment also pale. The winged males appear slightly larger than the wingless, and have the abdomen slightly more elongate, but its markings are exactly the same. The fully developed thorax is black, and the wings have a large triangular stigma of a dark brown colour. The antennæ are darker, and apparently more slender.

PEZOMACHUS OTTAWAENSIS, n. sp.

Female, length, 5-6 mm. Rufous, with abdomen in part black. Head transverse, slightly narrowed behind; occiput concave; antennæ long and rather slender, 23-jointed; face subtuberculate, as also clypeus slightly; mandibles sometimes paler, with the teeth black. Thorax bimodose, the nodes subequal; the rounded metathorax not areolated, but with the posterior face flattened obliquely. Abdomen with a broad rufo-orange band covering nearly all the second segment, the petiole also rufous; the second segment narrowly black at base, and the following segments black, polished; ovipositor exerted about 1 mm., sheaths black at tip.

Described from 23 females bred, with two exceptions, from egg-cocoons of spiders. This is a large, handsome *Pezomachus*, very constant in coloration, especially of the abdomen. The base of petiole, posterior coxæ, and femora are darker in a few specimens, and the vertex of head is occasionally clouded; individuals may possibly occur with the head in part black. The egg-cocoons in which this species breeds are

flattened, scale-like objects, 10-12 mm. in diameter, adhering closely to stones, and often irregular in shape to conform to the uneven surface. When new, the silk of which they are spun is of a delicate drab shade, but weathered cocoons found in spring are of a dull, dirty gray. A single larva of the *Pezomachus* occupies each infested cocoon, and when it has devoured all the spider's eggs it spins its own elongate cocoon within that of its host. This insect must be a great check upon the increase of its spider-host, for of scores of cocoons examined in one locality last spring hardly ten per cent. had escaped infestation. Through the kindness of Mr. L. O. Howard, one of these cocoons has been examined by Mr. Nathan Banks, who pronounces it to be "almost certainly a Drassid cocoon, possibly *Micaria*, but more probably *Prosthesima*." The cocoons are sometimes found on the under surfaces of stones and pieces of wood, but more frequently on the upper surface of large embedded rocks.

HEMITELES OTTAWAENSIS, n. sp.

Male, length, 5 mm. Black, with segments two and three of abdomen yellowish. Head black; palpi pale; antennæ blackish, slender, about 25-jointed, scape, pedicel and base of third joint pale. Thorax black, finely punctulate or shagreened; tegulæ pale; legs rufo-testaceous, including coxæ; the posterior tibiæ and tarsi brownish; wings as usual, stigma brown; metathorax feebly areolate, the lateral and posterior transverse carinæ more distinct. Abdomen narrow, segments two and three yellowish, remainder black.

Described from one male reared from egg-cocoon of spider. The cocoon was one of a lot, gathered at same time and locality, which yielded several individuals of the previously described species, and the *Hemiteles* is probably the male of that species. I have, therefore, given to it the same specific name. As it differs, however, in the evident, though imperfect, areolation of thorax, and in colour of abdomen, etc., it may be better to separate it for the present. The abdomen is narrower and less robust than that of the winged males of *P. Pettitii*.

MASTOCHARIS WILDERI, Howard.

Twenty-two examples of this little Chalcid were bred from a hemispherical egg-cocoon of a spider, attached to the under surface of a hickory leaf. They issued, however, from the cocoon of an Ichneumonid, prob-

ably a species of *Pimpla*, which had devoured the spider's eggs. The greenish-blue reflections of the head and thorax of the females, and the bright coppery gleam of the smaller males, make these little creatures, when alive and hurrying to and fro with trembling antennæ, objects of considerable beauty. Mr. Howard records the species (Proc. Ent. Soc., Wash., Vol. II., p. 299) from James Island, S. C.; Brooklyn, N. Y.; Sea Cliff, L. I.; Washington, D. C.; and Los Angeles, Cal., showing a very wide distribution.

TELENOMUS, n. sp. ?

From two eggs found attached, and side by side, on the upper surface of a hickory leaf, I obtained thirty-one individuals (25 ♀, 6 ♂) of a *Telenomus*, which appears to be undescribed, but as the genus is such an extensive and difficult one I do not care to name it. The eggs, which are those of our beautiful pale green, swallow-tailed Luna moth, are round and flattened; white above and below, and surrounded by a dark brown band. They are about 2 mm. in diameter, and not much more than 1 mm. in thickness, so that when one was tenanted by at least sixteen larvæ, their quarters could not have been over spacious. It requires somewhat careful examination of the egg to find the minute hole from which the parasites issued.

ACOLOIDES SAITIDIS, Howard.

From the same batch of spider-cocoons which produced the seventeen examples of *Pezomachus Pettitii*, there came forth, a few days later, a host of minute Prototrypids, which seem to belong to the species named as above by Mr. Howard (Ins. Life, Vol. II., p. 270), and constituted the type of his new genus; the type specimens having been bred from eggs of the spider *Saitis pulex*. My specimens differ from the description only in having the apex of the first abdominal segment yellowish. They commenced to appear on June 4th, and by the evening of June 6th there had issued 160, nearly all of which were females. The total number that came forth was 206, consisting of 162 ♀ and 44 ♂. Such figures might indicate this to be a very common insect, yet I had never met with it in my collecting. Previous records for the species are Lincoln, Neb., and Oxford, Ind.

CHRYSIS NITIDULA, Fabr.

One example of this beautiful green Chrysid was bred from an almost black cocoon, which was found in a cell of *Odynerus catskillensis*,

Sauss. The *Odynerus* cells were built of clay, upon the under surface of a stone, and formed a compact mass which could not be removed without rupturing the cells, as their silken lining adhered directly to the uneven surface of the stone.

CHRYSIS PARVULA, Fabr.

This pretty species very closely resembles the preceding, but is easily separated by the shape of the terminal segment of abdomen, which is truncate and tridentate (the central tooth strongest), instead of quadridentate, with curved emarginations separating the teeth. Two examples were bred from cocoons taken from the cells of *Pelopæus cementarius*, Drury, the slender-bodied wasp whose large clay-built groups of cells are so frequently seen under window-sills and other ledges in the city, and are placed under stones in the fields. The cocoon of the parasite occupies one end of the cell made by the industrious wasp as a home for its own young, and is almost identical in shape and colour with that of the other Chrysid. The insects emerged on June 2nd and 4th, the cells having been obtained some weeks previously. Mr. Ashmead has recorded (*Psyche*, Vol. VII., p. 79) the rearing of *C. perpulchra*, Cr., and *C. carulans*, Fabr., from the same host.

CEROPALES FRATERNA, Smith.

While searching, one day in early spring, for the potato-like galls which are produced by *Tribalia* upon the roots of wild roses, I found under a flat stone, slightly imbedded in the turf, about a dozen fusiform hymenopterous cocoons, about 15 mm. long. They were scattered on the surface of the soil, and some had already become mouldy from the dampness of the ground. From those which were not so affected I obtained in due time a female and four males of *Pompilus luctuosus*, Cr., which liberated themselves by neatly cutting off the large end of the cocoon. From one of the larger cocoons there emerged in the same manner, instead of the velvety-black *Pompilus*, a long-legged, yellow-banded *Ceropales*.

AGENIA ARCHITECTA, Say.

The mud cells of this pretty little blue wasp are not uncommon under stones in dry fields near woods. They are cylindrical in shape, and several may be found on the same stone, but they are not massed together and cemented into one lump, as are those of the mud-wasps previously mentioned. The wasps have been bred several times, but I have as yet reared no parasites.

ON THE STRUCTURAL AFFINITIES OF THE GENUS DEMAS.

BY J. W. TUTT, F. E. S., LONDON, ENGLAND.

In the Journal of the New York Entomological Society, Vol. III., pp. 130-131, Mr. Harrison G. Dyar writes as follows: "Prof. E. B. Poulton has shown that dorsal eversible glands are of general occurrence throughout the *Lymantriidæ* (Trans. Ent. Soc., Lond., 1887, p. 300) on the tenth and eleventh joints (segments), or rarely only on the eleventh joint (*Dasychira pudibunda*). Probably these structures are characteristic of the family, but Prof. Poulton did not find them in *Demas*. This genus has been considered to belong to the *Noctuidæ*, but English authors assume it to be a Lymantriid. Mr. J. W. Tutt remarks, in speaking of Prof. J. B. Smith's recent 'Catalogue of the Noctuidæ' (Ent. Record, VI., p. 70):—"The obsolete position of *Demas* among the *Noctuidæ* is retained." Now, is this position 'obsolete?' The absence of the retractile tubercles certainly throws doubt on the matter. Now, I have shown a characteristic difference in the arrangement of the thoracic tubercles between the *Lymantriidæ* and the *Noctuidæ* (Trans. New York Acad. Sci., XIV., p. 57), and *Demas* shows the Noctuid structure. Therefore, on all essential larval characters *Demas* is a Noctuid. It might, indeed, be an Arctian, as far as the larva goes, but not a Lymantriid. As concerning the structure of the imago, *Demas* seems to have greater affinity with the *Noctuidæ* than any other family; in fact, it appears to me that the placing of *Demas* among the *Lymantriidæ* may properly be characterized as premature." Further, Mr. Dyar writes as follows:—"Pupa, shining dark brown with a large wrinkled cremaster and three movable incisures. Of the usual Noctuid appearance (quite unlike *Orgyia*) and passing the winter." This statement regarding the pupa must be read carefully in connection with the remarks of Dr. Chapman quoted below:

Now, I would call Mr. Dyar's attention to the following statements made by Dr. Chapman some two or three years ago. He writes:—"We now come to the two species, *Demas coryli* and *Diloba caeruleocephala*, that are certainly not very much related to each other, and though they have some indications of affinity with *Acronycta*, are not near enough to be placed in the same family. *D. coryli*, I should certainly restore to its old place in the *Liparidæ*, to which it is far closer than to the *Acronyctas*. . . . But neither of them seemed to me to be nearer to *Acronycta*

than is *Arctia* or *Liparis*, or *Orthosia*, or *Xylina*, which appear to be perhaps the families nearest to *Acronycta* in different directions" (Entom. Record, Vol. III., p. 249).

Dr. Chapman then gives (Ibid. pp. 249-251) a most exact and scientific description of the egg, the newly-hatched larva, and the larva after each change of skin, of *D. coryli*, annotating his description throughout by comparison with the *Liparidae* (or *Lymantriidae*, as it appears to be called by American lepidopterists).

After thus exhaustively dealing with the structure of *Demas* in its various stages, Dr. Chapman concludes:—"The larva of *D. coryli* is clearly a Liparid, not, therefore, perhaps so very remote from *Acronycta*. but, still, distinctly a BOMBYX (if that name still has a definite collective meaning) and no. a NOCTUA. The pupa of *D. coryli* is not that of a NOCTUA, though the character of the anal armature has some resemblance to various NOCTUA forms" (Entom. Record, Vol. IV., p. 97). The larva is excellently drawn and figured in the same volume of the magazine (Pl. IX., Fig. 2), where the newly-hatched larva is shown $\times 20$ diams., and compared with the Acronyctids, with which it has been suggested to have certain affinities. The pupa is also figured in the same plate (Fig. 5, pupa of *D. coryli*, nat. size; Fig. 5a, pupa of *D. coryli*, showing dorsal view of armature; Fig. 5b, pupa, showing ventral view; Fig. 5c, pupa, showing lateral view;—the three latter $\times 15$ diams.

It is clear that neither Prof. Smith nor Mr. Dyar have ever seen these excellent papers by Dr. Chapman. It is equally clear that it should be the business of every lepidopterist of repute to do so. One of the greatest complaints that I have to offer against critical writers on American lepidopterology is their general ignorance of British work. Surely the *Transactions* of our leading Entomological Societies and the leading magazines should be a part of every entomologist's monthly or quarterly pabulum. If they were, one would have to complain less of misunderstanding due to a want of knowledge of all the facts bearing on the case.

I trust if Mr. Dyar or Prof. Smith should be inclined to challenge the above facts, they will read Dr. Chapman's articles first. The above are necessarily brief excerpts, and the whole bearing of Dr. Chapman's position can only be understood by reading his complete essays.

A NEW COCCID FROM TEXAS.

BY T. D. A. COCKERELL, NEW MEXICO AGR. EXP. STATION.

Aulacaspis texensis, n. sp.—♀ scale circular, 1.25 mm. diameter, very slightly convex, dull brownish-gray or sepia-brown, becoming transparent at the edges; sometimes entirely whitish. Exuviae exposed, sepia-brown, not far from central, 1st skin to one side of 2nd, but wholly on it, with some white secretion extending over the centre of the 2nd.

♀ alive, plump, dull pale greenish-orange. When dead and dry dark yellowish-brown, remaining so when boiled in soda. Outline circular, pygidial portion striated; anal orifice rather small, as far behind level of caudolateral groups of glands as they are behind cephalolateral. A marginal row of 3 or 4 longitudinally elongated pores; and a sub-marginal row of pores, the two caudad longitudinally elongate, the 3 cephalad small and round; 5 groups of ventral glands, caudolaterals 10, cephalolaterals about 16, median about 8. Median lobes wide apart, with a slight prominence between them bearing a pair of small spines. Median lobes oblique, much as in *A. bromeliæ*, but the long inner slope convex, with 5 very distinct serrations, counting the one which forms the tip: outer short margin with one serration. Immediately outside each median lobe, and touching it, is a spine-like plate, its tip about or hardly on a level with the tip of the lobe. Then comes a very small and low, strongly bifid 2nd lobe, then a spine, then a rather large spine-like plate, then a very low and broad trifid lobe (one might almost as well say 3 serrations on the margin), then a spine, then a spine-like plate, then two serrations, and a very rudimentary third (sometimes all three obscure), then another spine-like plate, and after a short interval another, then after a short interval a pointed prominence followed by a notch, then 3 spine-like plates at rather long intervals.

♂ scale 1 mm. long, white, tricarinate, but the lateral carinae rather feeble; exuviae very pale ochreous. The ♂ scales occur in patches on the leaves, much as in *Chionaspis exercitata*, Green.

Hab.—San Antonio, Texas, Nov. 27th, 1895, on both sides of leaves of *Sophora secundiflora*. [C. H. T. Townsend.]

The species was first collected by Mr. Schwarz; and afterwards Messrs. Howard, Schwarz, and Townsend found it very abundant near San Antonio. The plant was determined by Mr. Coville. This is the first native North American *Aulacaspis*.

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A large percentage of the half-tone reproductions from photographs, for illustrating Experiment Station Bulletins, are greatly reduced in value because of a lack of detail caused by heavy shadows, resulting from the use of opaque backgrounds near the objects photographed. To overcome

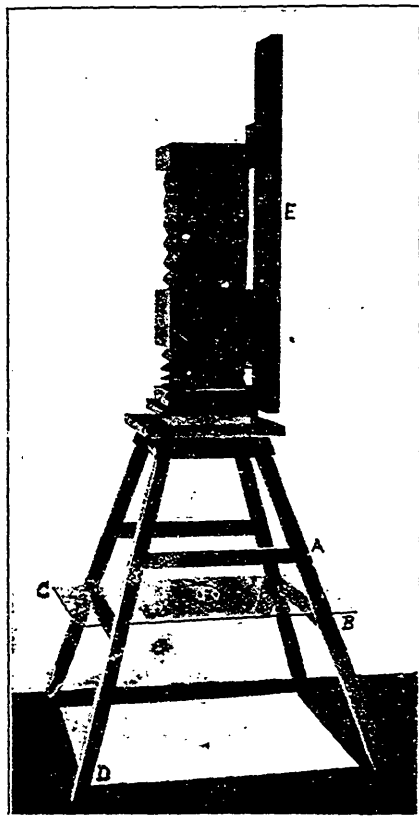


FIG. 10.

Dr. Holland, of Pittsburgh, Pa., a Lepidoptera specialist, on a recent visit to our Station, saw the arrangement and was much pleased by the advantages it offers to any of his plans for obliterating shadows in photographing butterflies and moths.

Pictures being more easily understood than descriptions, we have made a photograph of the outfit shown in figure 10, and also one showing a butterfly taken with the device. figure 11.

this difficulty and to make such pictures of more value to specialists working in the fields of entomology, botany, and horticulture, a device, which is the outcome of combining several well-known principles, is here represented.

Many details can be easily photographed and reproduced by this arrangement which are usually obtained by pen and ink drawings, and the personal equation entering into such work is thus eliminated.

The salient features of the device are: no shadows, accuracy of colour values and form details and time are saved. All these features are evident from glance at figure 11, except, perhaps, the saving of time; but after a second thought, this is also obvious, as the objects to be photographed are simply laid on a horizontal plane instead of being fastened to a perpendicular surface.

The apparatus consists of a four-legged stool, in this case $2\frac{1}{2}$ feet high, with an opening in the top and a copying camera placed over the hole. A pane of glass (C) is now placed on the upper or lower rounds of the stool (A or B), according to the distance you wish your object to be from the lens. The objects to be photographed are placed upon the glass, and for a background a sheet of paper or other material is laid on the floor (D) under the glass. In this case a white background is used because the butterfly is principally of a dark colour. By a glance at figure 11 you will see that the objectionable shadows are obliterated.

In photographing pinned insects it is necessary to have some scheme for holding them on the glass in the position desired. This is easily done by gluing a small piece of cork on the glass surface in which to insert the pin holding the insect. It is necessary to have the cork small enough so that it does not protrude beyond the specimen when looked at through the camera.

This device can be easily modified to suit an ordinary view camera by simply adding a piece of board to the top of the stool and letting it extend in a perpendicular manner similar to E in figure 10. By having a hole in this board one can fasten a camera in place with a thumb-screw, precisely as it is fastened to a tripod, with the exception that the lens is directed downward.



FIG. 11.

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A NEW TYPHLOPSYLLA FROM MEXICO.

BY CARL F. BAKER, FORT COLLINS, COL.

Belonging to that group of the genus having head combs arising in front of the antennal grooves in a line nearly perpendicular to the long axis of the head, instead of along the lower margins of the cheeks, and which includes the two species *gracilis* and *fraterna*.

Typhlopsylla mexicana, n. sp.—Female. In form resembling *T. musculi*. Head rather strongly pointed, face receding. Bristles on head numerous, strong and spine-like, one on either side of extreme tip, short

and stout. Antennal groove open, spines on second joint equalling tip of joint 3. Head comb of four short, heavy spines, their tips very obtuse and sides nearly parallel; the second from above reaching as far back as tips of antennæ, and slightly longer than the others, which are nearly equal in length. Maxillæ very acute, rather broad at base. Maxillary palpi stout, the joints decrease in size in the following order: 1, 4, 2, 3, the third being shortest, the fourth narrowed to a slender tip. Mandibles reaching two-thirds length of anterior coxæ. Pronotal comb of twenty-two close-set spines. Bristles on dorsal abdominal segments in two rows, the second of ten to fourteen long and strong bristles, on ventral segments in single rows of four to eight similar bristles, the tuft on apical ventral segment rather large. Legs rather strongly spined, close-set even rows of spines on posterior margins of all tibiæ being especially conspicuous. Apical spines on hind tibiæ extending nearly two-thirds the length of first tarsal joint. In middle tarsi joint 2 equals 5, 3 is half of 1 and three-fourths of 5, 5 is twice 4. In hind tarsi joint 1 is as long as 2, 3, and one-half of 4 together, and about three times the length of 3, 2 equals 4 and 5 together, 3 nearly equals 5. Colour pale brownish. Length 2.5 mm.

Described from a single female taken from "*Mus rattus*" at Guanajuato, Mexico, by Dr. Alf. Duges. This very distinct species is easily separated from either *gracilis* or *fraterna* by the above description.

BOOK NOTICE.

Mittheilungen aus dem Roemer-Museum, Hildesheim. No. 3.—Januar, 1896. DIE APATELIDEN, von A. Radcliffe Grote, A. M. (Mit 2 photographischen Tafeln und 3 Zinkographien im Texte.)

Mr. Grote here defines the family Apatelidæ and gives a list of the species which can be referred to it with reasonable certainty in the present state of our knowledge. The subdivision of the genus *Apatela* on larval and on pupal characters is discussed at some length, and 15 subgeneric names are recognized, including both European and American species. Two of these names are new, and one new species is described, *Pantlha portlandia*, Grote. The two plates represent a number of typical European Apatelidæ. The moths are excellently done, but the larvæ are only imperfectly shown, as their cylindrical bodies fail to focus sharply in the photographs.

This paper may also be consulted for a concise statement of the classification of the Lepidoptera on larval characters (page 3), and a continuation of the discussion of the generic term *Noctua* (p. 4).

HARRISON G. DYAR.