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# The Canadian Entomologist.

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## THE CLASSIFICATION OF THE BOMBYCIDÆ.

(Third Paper.)

BY A. R. GROTE, A. M., BREMEN, GERMANY.

### Sub-family *Cochliinæ*.

A study of the American genus *Lagoa* in its various stages of growth shows a manifest approach to the present group, so that we are warranted in following the *Dasychirinæ* with the *Cochliinæ*. This sub-family is remarkable for its peculiar larvæ, called "slug caterpillars" or "saddle-backs." The first name is given on account of their snail-like appearance, the form being elliptical or oval, the false feet replaced by swellings on the abdominal segments, so that the larva lies flat and close to the leaf. The head is also retractile. The cocoon is egg-shaped or circular, firm and spun between the leaves. The moths are not unfrequently green and brown as are the larvæ, and the name "saddle-backs" is given in allusion to the bright green quadrate patch which covers the back in some species. Dr. Packard calls one species *monitor*, in allusion to the singular shape and armature of the larvæ. The moths are of various shades of brown, often with green patches, sometimes with darker lines and shades on primaries. The ocelli are wanting and the tongue is short. The North American genera fall into two series: one in which the male antennæ are pectinate, the other brush-like or sub-simple. To the first series belongs the typical genus *Limacodes* of Latreille, and to this series belong the two European species representing two distinct genera. As compared with Europe, our fauna is rich in *Cochliinæ*. We have two species belonging to the Asiatic genus *Parasa*, with grass-green thorax, and the fore wings largely green. The larva of *Parasa chloris* H.-S., is described by Mr. Henry Edwards, Papilio iii., 128; that of *Parasa fraterna* Gr., by the same author, Ent. Amer. iii., 169. (I here correct a statement of mine, that the sub family *Chloephorinæ* does not occur in North America. Mr. Henry Edwards describes *Earias obliquata* from Florida, a form unknown

to me, the genus belonging to this sub-family which I distinguish from the *Sarothripinæ*) I do not know any forms of *Cochliinæ* from California; if the sub-family is feebly represented there, it will be a fresh example of the resemblance between the West Coast fauna and the European. No Cuban forms were included in the collection described by me. The geographical distribution of the North American Bombycidæ merits attention. On the islands of the West Indies, there seem to be no typical Spinner moths, that is to say, no *Attacinæ*, *Ceratocampinæ*, *Platypteryginæ*, *Lachneinæ*. In the new Check List, I included the only West Indian form of this group known to me, *Heurtes picticornis* G. & R., the types of which are in the Royal Museum in Berlin. Fifteen other genera are included in my list, and although one or two of these are probably synonyms, not being identified by me, enough is shown to prove the richness of our fauna in this group. Sepp figures a South American species of *Empretia*. The group is probably widely distributed and belongs to the older forms of the family.

#### Sub-family *Psychina*.

The larvæ of the present group are still more curious than those of the *Cochliinæ* from their habit of living in a case. The thoracic feet alone are developed, and the undeveloped abdominal feet present a resemblance to the slug caterpillars, so that we have a reason for bringing the groups together. The cocoon-making habit is not alone displayed by the mature larvæ, for so soon as the little Psyche larva leaves the egg it fashions a tiny sack and begins its wanderings, dragging its shelter after it. In most of the genera, the females are apterous and worm-like, but in the North American genera with broad, falcate wings, *Perophora* Harris, and *Lacosoma* Grote, the females are winged like the males. Sepp figures a South American broad-winged form, and Herrick-Schaeffer, from the venation refers this section of the sub-family to the *Attacinæ*, notwithstanding the sack-bearing larvæ. The neuration will hardly guide us in this group, since certain European genera have apparently three internal veins on the secondaries like the Microlepidoptera. Perhaps they are wrongly reckoned here. Some of the moths resemble the *Dasychirina*. This resemblance is seen in *Psyche*; but the American genera *Thyridopteryx* and *Oiketicus* have long-bodied males with partly glassy wings and short antennæ, and look more like the *Cossinæ*. As compared with Europe, we have apparently very few species of *Psyche*; in fact only one species is well known, viz.,

*Psyche confederata* Gr., now described in almost all its stages. The life-history of almost any species in this group will be found replete with curious facts, and instances of parthenogenesis are recorded among the European genera. The moth *Phryganidia californica* Pack., is apparently incorrectly described as belonging to this sub-family, and Butler refers it to the *Dioptidæ*, a group not studied by me. The *Psychinæ* occur in the West Indies, and South America; the genus *Oiketicus* also in Ceylon. This group seems to be, with the *Cochliinæ*, of very general distribution, and to belong to the older forms of the family, retaining perhaps some characteristics of a primitive form of the moths. It may even be that the cocoon or sack was, in past geological ages, more common as a part of larval habit, and that it was later on restricted to the pupal condition. The *Sphingidæ* and groups making no cocoon may have been thrown off from the genealogical tree of the Lepidoptera at later periods. In North America there seem to be but few species of *Psychinæ*, generally distributed; the genus *Oiketicus* being tropical and sub-tropical, *Platæcticus* a Floridian form, the other genera ranging from Canada to the Southern States, while from the west a few species belonging to the more typical section of the sub-family have been indicated. The broad, falcate-winged genera seem to belong east of the Rocky Mountains, and are reported from the region east of the Andes in South America. Hence, their distribution is paralleled by that of the *Ceratocampinæ*.

#### Sub-family *Notodontinæ*.

Although we have found some reasons for our sequence of the preceding groups, there is here somewhat of a break. For instance, the *Sarothripinæ*, *Nolinæ*, *Chloephorinæ*, make a similar cocoon; in the two first the labial palpi are elongated. The *Lithosiinæ* resemble these more or less in form and the absence of ocelli, but their colors and shorter palpi are more like the succeeding *Arctiinæ*; again the *Dasychirinæ* resemble the latter in their hairy larvæ and style of pupation. There is an approximation to the *Cochliinæ* in the Dasychirid genus *Lagoa*, and the *Cochliinæ* and *Psychinæ* approach by the rudimental abdominal feet of the larvæ; but the *Notodontinæ*, although they fit in with succeeding groups, differ greatly from the *Psychinæ*. I have described a Psychid genus from Cuba, which has something of the Notodontid form, which is that of the *Nocuidæ*, and which latter several genera of this group greatly resemble. Indeed, there seems to be some doubt as to whether the genus *Edema* is,

as I believe, a Notodontid, or a Noctuid. We may take also into consideration a certain similarity of the abdomen in *Limacodes* and *Ichthyura*, among the superficial resemblances which induce the bringing in of the *Notodontinæ* here; but the position chiefly recommends itself to me in that we obtain a better sequence for the ensuing groups.

In the *Notodontinæ*, the neuration of the secondaries approaches the *Noctuidæ* in that vein five of the hind wings is (when present) situated midway between four and six from the cross-vein. The form varies, but most of the genera have long wings, and the abdomen exceeds the secondaries. The costal vein of hind wings does not spring from the sub-costal or upper margin of the cell, but is free from the base. The head and thorax are usually thickly haired, the latter being sometimes peculiarly tufted at the sides. The male antennæ are usually pectinate, the female simple. The caterpillars are often naked, that of *Notodonta stragula* almost sphingiform. That of *Apatelodes* is hairy, and Abbot's figures induced the generic name. They have fourteen or sixteen feet, and sometimes the anal claspers are wanting (*Cerura*), and the body is terminated by two thin prolongations. It is this form of the larva which prepares us for the *Platypteryginæ*, in which the anal projection is single. This sub-family is known to English entomologists under the name of "Pebble Moths," in allusion to the ornamentation, which consists often of shaded spots or blotches. In repose, the wings are folded close to the body. In this position *Datana* looks like a broken twig, the shaded thorax, with its raised tufts at the sides, like the top of the twig at the break. *Datana* is related to the European *Phalera bucephala*; the same mimicry is displayed, but here the colors are paler, and the deception even more apparent.

The American genera are remarkable for their odd forms, and in some cases for the number of species. Among the most unusual is *Apatelodes*, closely related to the South American *Parathyris*. The fore wings are broad, curiously outlined, with sharp tips; and the soft gray color, the tufted abdomen, present a resemblance to the Sphingid genus *Cressonia*, so that I have called the species of *Apatelodes*: False Hawk Moths. The larvæ of several rarer Notodontids have been described by Prof. French, to whom we are much indebted for life-histories of our North American moths.

#### Sub-family *Platypteryginæ*.

The moths of this family are frail, geometriform, with falcate or sub-falcate primaries, with short maxillæ and palpi, and pectinate male antennæ.

The caterpillars have the anal claspers replaced by a single projection, have fourteen feet and make a cocoon between the leaves, and are probably double brooded, the pupa of the second brood hibernating. I have described the larva of *Dryopteris*; an allied genus has been described by Walker, from Japan, which I have not been able to compare critically with our two North American species of *Dryopteris*. Mr. Henry Edwards records the European *Prionia lacertinaria* from Canada, and it seems that we have a second species in the *Prionia bilineata* of Packard. We have two species of *Platypteryx* Lasp. (= *Drepana* Schrank) from the east, the one more whitish, Walker's *arcuata*, the other more of a buff yellow, my *genicula*. The European genus *Cilix* of Leach, is apparently absent in our fauna. In the shape of the wings this little group resembles the following *Attacinae*, if we may compare such frail species with the giants of the family. The neuration shows also some approach to the typical Bombyces. The hind wings have eight veins, but the inner of the two internal veins is incomplete; vein five is nearer to four than to six. The fore wings are twelve veined, and a certain look of miniature Attacids is due to the conformation of the wings. We have a Geometrid genus *Drepanodes*, which, with its pointed primaries, looks like *Platypteryx*, and it is possible that Stephens has so mistaken the species.

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#### STRAY NOTES ON MYRMELEONIDÆ, PART 5.

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

##### *Dendroleon pantherinum* Fabr.

*Myrmeleon pantherinum* Fabr., Mantissa, 249, 3—Ent. Syst. ii., 93, 3—Brauer Neur. Austr., 64.

*Myrmeleon ocellatum* Bork. in Scriba. Beitr. ii., 165, pl. 11, f. 5.

*Dendroleon pantherinum* Brauer, Wien. Z. B. G. xvii., 963, pl. 14, f. 3.

The species was described (1787) by Fabricius, from a specimen wanting prominent parts, antennæ and legs. The descriptions by Villers, Olivier, Gmelin, Latreille and Walker, are simply copies.

Borkhausen, in 1791, described the same species as *M. ocellatum*, from a specimen found in Darmstadt, Hesse. The description and figure are good, and Burmeister believed the N. American species to be identi-

cal. Prof. Brauer has given a new description in *Neur. Austriaca*. The species is a very rare one, found, besides in Austria and Hesse, fifty years ago in Silesia and Hungary. The discovery of the larva in the Prater, near Vienna, on trees, and the raising of the imago by Prof. Brauer is one of his numerous splendid discoveries. He made for the species the new genus *Dendroleon*. Both species are recorded as *Glenurus* Hag. in my *Synopsis Hemerob.* This genus was proposed exactly at the same time with *Dendroleon*, but the latter one should be retained for those species.

The N. American species and the European are very similar, but the rarity of both prevented the exact knowledge of their differences. I have seen of the European species only three specimens, one from the Rhein Mus. Berol., one from Austria, and one from Hungary in Frivaldsky's collection. The latter one I have compared carefully with Burmeister's types in Winthem's collection in 1852. As since this time nothing is published about the differences of both species, I give here my manuscript notes.

*D. pantherinum* is of the same size, but a little more robust; prothorax plain-luteous, without the fine black granulation of *D. obsoletum*; a large black dorsal band on metathorax and basal segment of abdomen; *D. obsoletum* has mesothorax, metathorax and basal segment above in the middle only with a very dilute blackish color. Abdomen with segment second and third black, the fourth and fifth above light brown; *D. obsoletum* has on all segments, or at least on second and third, a transversal yellow band. Legs yellowish brown; fore legs with a ring around the apex of femur, middle of tibiæ, and third and fourth joint of tarsus all black; middle and hind legs with a broad dark ring before the middle of femur, which is externally nearly connected with the apical ring; the apex of tibia and a median ring, which is wanting on hind legs, black. The coloration of *D. obsoletum* is very different, as stated in the description. Wings with the venation less close, the areoles larger; veins in both wings more fuscous; front wings in the basal third of the space between fourth and fifth longitudinal vein with four fuscous spots, the most apical one longest, about 3 mm. (wanting on *D. obsoletum*); the ocellate spot on the hind margin is complete (*D. obsoletum* wants always the apical half of the iris around the spot); hind wings with a quadrangular (round in *D. obsol.*) spot near the costa, and ring of spots on the apex of hind margin.

*Dendroleon obsoletum* Say.

*Formicaleo obsoleta* Say., Journ. Acad. Philad. viii., 44, 1—Say, Ed. Lec. ii., 413, 1.

*Myrmeleon obsoletus* Hag., Syn. N. Am. Neur. 225, 2.

*Myrmecoleon ocellatus* Burm. ii., 995, 1—Walk. 401, 172.

*Myrmeleon nigrocinctus* Rbr. 398, 20—Walk. 361, 101—Glover Ent. Amer. Neur., pl. v., f. 15 (the figure is a fair one).

Body slender, abdomen little villous. Head narrow, face luteous, between the eyes a broad shining black band, notched on the inferior margin; vertex luteous; antennæ as long as head and thorax, slender, elongated, clavate on tip, blackish fuscous, pale in middle; palpi short, pale; maxillary ones with the three apical joints equal; labials not longer, apical joint fusiform; prothorax elongated, narrower anteriorly, luteous, faintly granulated with black; thorax dull luteous, above darker; on each side above the legs a broad black longitudinal band; below pale; abdomen shorter than the wings (I believe I have not seen a male), blackish brown, with a yellow dorsal, transversal band on the middle of each segment, or at least on the second; the parts in the last segment light brown, with black hairs; above split longitudinally; below on each side a short, flat appendage; legs very long and slender, with short hairs, shining black; anteriors with base of femur and tip of tibia brown; hind legs with a luteous band before the tip of femur, or luteous, tip black; tibia pale, black on tip and after base; or black, pale at base; tarsi long, black; the basal joint sometimes luteous; spurs luteous, as long as the two basal joints; apex incurved; claws luteous; wings hyaline spotted with fuscous; front wings with the inner half of an ocellate spot on the middle of the hind margin; a double spot at the pterostigma, an apical interrupted series, and some dots along the mediana; hind wings with a larger orbicular spot before the pterostigma, and some spots near the tip and the apical part of the hind margin; venation white, some of the forks and the longitudinal veins interrupted with fuscous. Length of body, 20 to 26 mm; exp. al., 46 to 67 mm.

Mr. Sanborn, Mass. Agric. Rep., 1862, p. 161, states:—"Specimens of this insect are sometimes found which differ either with the wings not spotted, but hyaline or sprinkled with fuscous, or costal space with a double series of areoles, or without spurs." Apparently Mr. Sanborn has here confounded several species.

Habit.—Canada, Ontario, Mr. Saunders ; southern peninsula of Michigan, Mr. Harrington ; N. Hampshire, Mr. Leonard in T. W. Harris's coll. There is a very indifferent figure of Harris's specimen by F. J. Sanborn (it is reproduced in Dr. Packard's Guide, f. 604), in his Rep., 1862, Mass. Agric., p. 160. Mr. Sanborn, who had a most general and reliable knowledge of insects in this country, says :—"It is of common occurrence throughout the country, and this is the only well-known ant-lion in N. England." But I have to state that Harris's specimen is till now the only one from N. England seen by me ; N. York, in Winthem's coll. and by Mr. Akhurst ; Missouri, St. Louis, Mr. Engelmann ; Illinois, Galena, Mr. Bean ; Maryland, Mr. Uhler ; N. Carolina, Morganton ; S. Carolina, Aiken ; Virginia ; Georgia, June 7 and August 21, in pine woods, rare, in Abbott's figures in the Brit. Museum ; Alabama, figured by Mr. Gosse in his letters from Alabama, p. 242 (I have not seen this book) ; Liskiyon, Cala, Mr. Behrens. Mr. Th. Say states only, "this species is rather common."

The range of this species is very large, and probably a larger one to the south and west. The size is not very variable, except one specimen from South Carolina, and one from Cala., to which belong the smallest given dimensions. Very probably the larva ascends trees as the related European species ; and the larva from Washington, D.C., described by me years ago, probably belongs to this species. (Stett. Ent. Z., 1873, p. 271, n. 7.)

*Myrmeleon immaculatus* De Geer.

*M. immaculatus* De Geer iii., 564 (365), pl. 27, f. 8—Retzius 59, No. 202—Walker 401, n. 174.

*M. melanocephalum* Oliv. Encycl. viii., 127, No. 33.

*M. immaculatus* Hag., Syn. N. Am., 231, 14, partim.

Face shining, black ; epistom and mouth yellow ; the black color covers sometimes more or less the epistom, notched anteriorly ; a fine yellow ring around the eyes, more or less interrupted near the antennæ, and enlarged below near the mouth.

Labrum short, twice as broad as long, rounded laterally, largely notched anteriorly.

Palpi light brown, darker in more adult specimens ; maxillary moderately long ; thin cylindrical ; three apical joints sometimes black, with a

small yellow basal ring ; last joint cylindrical, truncate on tip ; labial about as long, second joint arcuate, thin, enlarged on tip ; last joint of the same length, subarcuate, largely fusiform above, shining black, tip thinner, yellow.

Antennæ a little shorter than head and thorax, clavate, dull black, more or less annulate with yellow, basal joint above yellow, below the basal joints shining black.

Head broad ; vertex transversally ovoid, elevated ; anteriorly finely rugose ; a number of very fine elevated lines originating together between the antennæ, and then diverging ; the color and pattern of the vertex varies much ; the main color is dull black, with a yellow transversal band, which is entire or more or less divided and may be wanting entirely ; two pitchy black transversal bands are divided by a middle longitudinal band, consisting of two anterior and two posterior approximate twin spots, all these pitchy black shining flat spots and bands may be differently shaped ; besides there is on each side near the eyes on the vertex a posterior linear flat spot, and another behind this on the occiput ; the yellow transversal band fills the space between the two pitchy black bands, and is always interrupted in the middle by longitudinal band ; the yellow band is entirely wanting in the N. England, Michigan and N. York specimens, it is more or less indicated in the specimens of the Southern States, and always present in the Western States and Colorado.

Prothorax short, nearly once broader than long ; sides, about straight ; front margin semi-circular, dull brown ; the front margin, two large spots on the part before the transverse sulcus, and two smaller ones after the sulcus, and the membrane between the prothorax and mesothorax luteous or yellowish ; some black hairs on the sides of prothorax ; thorax pitchy fuscous to black above and below ; the margins sometimes a little luteous.

Abdomen of female much shorter than the wings ; of the males less shorter and more slender ; pitchy black ; the basal half principally of the females or newly transformed specimens with a large dull luteous spot, covered with short and fine whitish villosity.

Female genitals the same of *M. mobilis*, but the black appendages a little shorter and thicker, with very long black hairs ; male genitals similar, but the spoon-shaped part a little shorter.

Legs of the Southern specimens similar to *M. mobilis*; the specimens from the Northern and Eastern States and the Rocky Mts. much more black; the anterior tarsi and larger parts of tibia entirely shining black, but all intermediate colors are to be found; spurs and sometimes the claws brown.

Wings similar, variable in size, shape and coloration; the most striking difference is the hind margin of the hind wings, which is never (in 30 specimens) sinuate in the apical half, but performs a flattened curve, a little more incurved on tip; the mediana and subcosta are darker and the space between them is blackish, where they are not interrupted with yellowish; sometimes the transversals below the mediana and some other veins are fumose; pterostigma white.

Length of body, 25 to 36 mm.; exp. al., 60 to 76 mm. Breadth of hind wing, 5 to 7 mm. The smallest specimens are from Colorado.

Habitat.—30 specimens male and female are before me; Ludington, Mich., Mr. Pierce (raised); Keene, N. H., Mr. F. H. Foster (raised); Peabody, Mass., Mr. G. H. Emerton (raised); Albany, N. York (raised by myself); Maryland, Mr. Uhler; Virginia, Alleghany Mts., and Washington, D. C., O. Sacken; Morganton, N. Carolina, Mr. H. Morrison; Waco, Texas, Mr. Belfrage; Denver, Golden City, Manitou, Colorado, by O. Sacken; Wasatch Mts., Utah, Rocky Mts. Dr. Anderson; Lake Tahoe, Cal., O. Sacken; Sylvania, Cal., Mr. Ricksecker (raised); Oregon, Mr. H. Edwards; Washington Terr., Yakima River, Mr. S. Henshaw.

The imago appears everywhere in June and July. The larva hibernates and transforms in the pupa about May.

The description and the figure by De Geer, though both not sufficient, proved that his species was the one here described; there is no N. American species known, which makes this determination doubtful. There can be no doubt that *M. melanocephalum* Oliv. is the same species. Olivier's specimen was collected by Bose near New York, De Geer's in Pennsylvania. Burmeister's type, now before me, is *M. mobilis*. It would be useless to speak about two species described by Walker, without comparing his types. The same applies to Prof. Taschenberg's species.

When I published the Synopsis N. Am. Neur., I knew only three specimens, which are still before me. I had them separated in two

species, but the insufficient material seemed to make it more prudent to unite them provisionally. Both species are very similar, and the only palpable difference is the hind margin of the hind wings sinuated in the apical half of *M. mobilis*, and convex in *M. immaculatus*. I have raised myself both species, and have the full grown larvæ in alcohol.

(To be Continued.)

## THE CHALCID GENUS RILEYA.

BY L. O. HOWARD, WASHINGTON, D. C.

An interesting interference in the adoption of the generic name *Rileyia* has recently taken place between Mr. Ashmead and myself, and, as I am of the opinion that this name should apply to the genus of Encyrtinæ defined by myself, rather than to the genus of Eurytominae defined by Mr. Ashmead, I state in this note the circumstances of the interference, and print in full the paper in which my description occurred.

At the meeting of the Entomological Society of Washington, held June 7, 1887, I read the paper in question and handed the manuscript, after reading, to Mr. Smith, the Secretary, with the request that he publish the generic description in full in his abstract of our proceedings in *Entomologica Americana*. June 9 this periodical for June was received, and I found upon reading Mr. Ashmead's "revised generic table of the Eurytominae," published upon pages 41 to 43, that he had decided to use the same name for a genus of that sub-family. The name is there given, *not as a new genus*, but as one already described, and the few words given to it in the table fail to sufficiently characterize it. Noting these points, I did not recall my description from Mr. Smith, and it was published in the July number of the same periodical (received July 5). I inferred from the fact that Mr. Ashmead entered the genus as "*Rileyia* Ashm.," and not "*Rileyia* n. g.," that his description had been sent away for publication, but had not appeared, and this inference was shown to be correct when upon July 14, first copies were received of Bulletin No. 3 of the Kansas Experiment Station, which contained in an appendix Mr. Ashmead's full description of this genus.

I am individually inclined to think, therefore, that as Mr. Ashmead

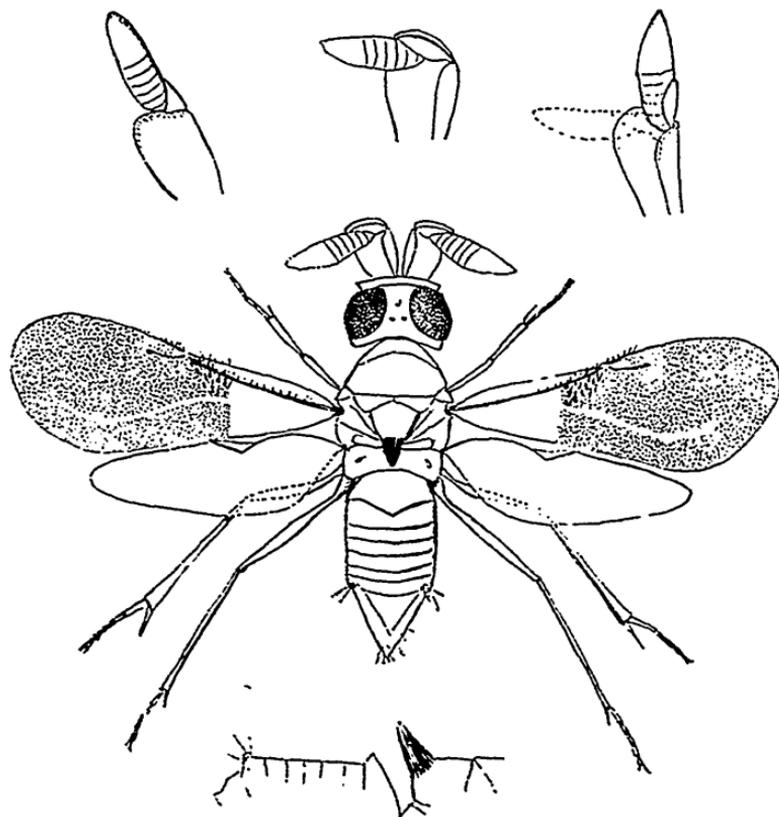
did not give his few words in the generic table to *Rileyia* as a new genus, his mention of it there amounts simply to the mention of a manuscript name, and as the full description of *Rileyia* Ashmead as a new genus was not published for some days subsequent to the publication of my genus, the latter should bear the name. Were this a mere matter of credit for a genus, I would not waste words upon it, and were it any other name I would give way without hesitation to my friend Mr. Ashmead, but my desire to establish the genus in Professor Riley's name, and to apply it to this extremely interesting and beautiful form, is so great that I am led to assert my claim, which of course will stand or fall upon its merits.

The original paper as read before the Entomological Society of Washington, June 7, is as follows :—

“One of the most beautiful insects I have ever seen was sent in considerable numbers to Dr. Riley, from California, by Mr. Koebele, in 1886. It was captured by Mr. Koebele, as stated in his notes, while searching for a species of *Dactylopius*, which lives upon the Passion Flower at Los Angeles. His account of the actions of the little parasites upon this plant is interesting enough to quote : ‘A number of the parasites were collected on a plant, and some of them were noticed depositing their eggs. Busily they ran up and down the branches, and if they met with a grown insect, this was touched from behind with their antennæ from five to fifteen seconds ; then either the parasite would run off or turn around and thrust an egg into the insect, which, when the parasite approaches, keeps perfectly quiet ; but if operated on, will turn the posterior part of its body rapidly around in a circle, and its enemy will, after the egg is left, walk quietly off without facing its victim again.’

“This little parasite, although only about a millimeter and a-half in length, is a perfect gem in color. It is a fleck of brilliant green-gold, and its structure is very strange to one not familiar with the peculiar group of genera to which it belongs. The remarkable antennæ, with their concave leaf-like scape, peculiar pedicel, and broadly flattened flagellum carry to an extreme a conformation seen only with the three genera—*Mira*, *Anusia* and *Cerapterocerus*—of the sub-family *Encyrtinæ* of the *Chalcidide*. I have always supposed that the preliminary tapping of a Bark-louse, with the antennæ, as described by Mr. Koebele above, and as often noticed with other parasites, was for the purpose of ascertaining by a tactile sense

or by sound whether the Bark-louse was already inhabited by a parasitic larva, and it is altogether likely that this extraordinary development of the antennæ in these genera is of use in this direction, and was developed in response to some such need, for it will be noticed that this conformation occurs in the female sex only, and that the males of such of these genera as have known males have antennæ of the ordinary pedicellate whorled type.



RILEYA SPLENDENS.

“The relationships of this California parasite, although it forms a new and in some respects abnormal genus, are plainly with the European genus *Cerapterocerus* of Westwood (*Telegraphus* Ratz.), of which two species have been described, viz., *C. mirabilis* Westwood, and *C. corniger* Walker, of both of which we have authentic specimens in the collection of the National Museum, through the courtesy of Dr. Mayr, of Vienna. The

former has been reared from a *Lecanium* on peach by Tschek, from a *Lecanium* on plum by Kollar and Rogenhofer, and from coccids on grass by Kollar and Kriechbaumer; while the latter has been reared by Kriechbaumer from coccids on plum and grass.

"I have, with Dr. Riley's kind permission, dedicated this remarkable and beautiful genus to him, in acknowledgement of the work which he has done in making known the life-histories of American hymenopterous parasites, not less than in acknowledgement of the opportunities he has given me, and the assistance and encouragement he has rendered me in the study of the interesting family to which it belongs.

"*Rileyia*, Gen. nov. Female. Moderately stout, resembling somewhat *Cerapterocerus* Westwood (see Mag. Nat. Hist. vi., 1833, page 495; see also Snellen van Vollenhoven, Schetsen, Tab. vii; see also Mayr, Die Europäischen Encyrtiden, Verh. d. k. k. Zool. Bot. Ges. Wien, 1875, page 747; see also Ratzeburg, Ichn. d. Forstins. ii., 1848, page 152, under name *Telegraphus*), but differing as follows: The face is not elbowed in the middle so as to give a triangular profile to the head, but is gently rounded, and has a strong glistening transverse clean-cut ridge just above the insertion of the antennæ, which are stouter and with a more concave scape than with *Cerapterocerus*. The mesoscutellum has a strong tuft of erect black hairs as in *Chiloncurus*, but which is lacking in *Cerapterocerus*. The stigmal vein is given off immediately at the juncture of the submarginal with the costa, and is a trifle longer than the postmarginal. The submarginal is three and one-half times as long as the stigmal. The postmarginal, the distal third of the submarginal, and the wing disc below this last heavily clothed with short stout bristles. The body is highly polished and the wings are not hyaline. The metanotal spiracles are large, long-oval and oblique, and the abdominal spiracles are very prominently tufted. The ovipositor does not protrude, except in specimens killed in the act of oviposition.

"*Rileyia splendens*, Sp. nov. Female. Length, 1.63 mm.; expanse, 3.8 mm.; greatest width of fore-wing, 0.53 mm. Front with a delicate round-oval punctation; cheeks with delicate longitudinal striation, and a perfectly smooth band bordering the eyes; mesoscutum very delicately shaggreed; scutellum and scapulæ smooth; mesopleura and abdomen smooth. General color metallic green, the most brilliant reflections given off from the cheeks and the proepimera; antennæ also with metallic reflections,

but darker in general effect ; mouth-parts honey-yellow ; abdomen bluish-metallic below ; all legs metallic ; joints 2, 3 and 4 of tarsi honey-yellow. Distal two-thirds of wings (fore) dark brown ; the proximal limit of the color very definite, and the color deepest at this point, becoming lighter at tip of wing ; a narrow, longitudinal, slightly curved, hyaline line arises at the middle of the proximal border of the infuscation, and extends rather more than half way to the tip of the wing. Described from many female specimens. Los Angeles, Cal., A. Koebele."

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#### ANNUAL MEETING OF THE ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual gathering of the Entomologists of North America, in connection with the meeting of the A. A. A. S., took place this year in the city of Cleveland, Ohio. While much regret was felt at the absence of many eminent Entomologists who have always taken an active part in the work of the Club, and at the consequent smallness of the attendance, the meeting was much enjoyed by those who were present, and the valuable papers read were received with great interest.

The first session was held at 9 a.m. in a class-room of the Central High School Building on Wednesday, August 15th ; the President, Mr. John B. Smith, of Washington, in the chair. In the absence of the Secretary (Prof. A. J. Cook, of the Agricultural College, Mich.) Professor Herbert Osborn, of Ames, Iowa, was requested to act in his place. Owing to the smallness of the attendance the Club adjourned till 1.15 p.m., when the President read his annual address on "Entomological Collections in the United States." In this interesting and valuable paper, which, as well as the other papers read at the meetings of the Club, will, we understand, be published in full in *Entomologica Americana*, the writer gave an account of all the great collections, both public and private, in the United States. Among general collections he especially mentioned those of Mr. Bolter, of Chicago, and Mr. Henry Edwards, of New York ; in Coleoptera he specified the collections of Dr. Horn, of Philadelphia, Mr. Ulke, of Washington, and Messrs. Hubbard and Schwarz, and Lieut. Casey ; in Lepidoptera those of Messrs. Henry Edwards, Neumogen,

Strecker, Graef, Tepper, Holland, W. H. Edwards, Lintner, Bailey, and Meske; in special departments of Lepidoptera those of Mr. W. H. Edwards, Rev. Dr. Holland, and Mr. Bruce in Butterflies; in the Hesperidæ that of Mr. E. M. Aaron, of Philadelphia; in the Sphingidæ that of Mr. E. Corning, of Albany; in the Geometridæ that of the Rev. G. D. Hulst, of Brooklyn; and in the Tortricidæ that of Prof. Fernald, of Amherst, Mass. He also noticed many other collections in various orders for which we must refer the reader to the address itself.

After hearing the address the meeting adjourned till the next day. The following persons were in attendance during the sessions:—John B. Smith, Washington, D.C.; Prof. H. Osborn, Ames, Iowa; Prof. F. M. Webster, Lafayette, Ind.; Dr. D. S. Kellicott, Buffalo, N.Y.; Mr. and Mrs. O. S. Westcott, Chicago; L. O. Howard, Washington; J. Mackenzie, Toronto; A. B. Mackay, Agricultural College, Miss.; D. A. Robertson, St. Paul; S. H. Peabody, Champaign, Ill.; Dr. C. V. Riley, Washington; S. B. McMillan, Signal, Ohio; Rev. L. C. Wurtele and Miss Wurtele, Acton Vale, P.Q., and others.

The Entomological Society of Ontario was represented by its President, Mr. J. Fletcher, of Ottawa, and the Rev. C. J. S. Bethune, of Port Hope.

On Thursday, August 16th, the Club met at 1 p.m., and entered upon the consideration of the President's address; this naturally led to a discussion upon the best materials for boxes, &c., in which to preserve collections. Mr. Howard stated that the boxes in the Museum of Comparative Zoology at Cambridge, Mass., had their bottoms made of Italian poplar. Mr. Fletcher asked for the experience of members with poplar, tulip-tree and other woods as regards cracking and splitting. Dr. Riley said that there was no wood that would not split, warp or crack; the only remedy was to have the materials kiln-dried and then soaked in shellac and alcohol. He adopted the form of boxes used in Washington for the sake of convenience rather than otherwise. The cabinets in Europe were not subjected to the same dry heat as in America, and were consequently not a guide to us in this respect.

Mr. Fletcher stated that there are only two noteworthy collections of insects in Canada: (1) that of the Entomological Society of Ontario at London. It is not very large, but is very good as representative of the

Canadian fauna, while it contains many specimens from the United States and other countries. The collection of Lepidoptera is especially good and well named, having been revised by Mr. Grote before it was sent to the Philadelphia Exhibition, in 1876. In Coleoptera and other orders great care has been taken to have the specimens well named. The collection is open to any one who desires to examine it. (2) The collection of Lepidoptera in the National Museum at Ottawa is very good. The nucleus was formed by the purchase of about 8,000 specimens from Captain Gamble Geddes, of Toronto. It is now being added to by the officers of the Geological Survey, who bring to it from time to time rare specimens from out-of-the-way and little known regions. There are several private collections of value, but it is unnecessary to specify them. Mr. Fletcher agreed with Mr. Smith that "types" of new species should be placed in some national collection where they would be accessible to all students. For his part he should always be glad in future, as in the past, to place "types" whenever possible in the National Museum at Washington.

A discussion then arose as to what is meant by a "type." Mr. Fletcher understands the term to mean all the specimens actually before a describer when he is making out his description of a new species. Some writers, however, call all specimens types that may afterwards be identified by the describer as agreeing with the originals. Mr. Howard agreed with Mr. Fletcher that only the material before a describer at the time is to be called "type;" other specimens should be marked "determined by the author." Dr. Riley thought that all the materials determined by an author might be called "types of that species," provided that they do not vary from the original specimens. Prof. Webster considered that all typical material should be placed in some national depository where it would be perfectly safe, and instanced the loss of the Walsh collection by fire as a calamity to science; collectors should be willing to sacrifice their types for the general good of science. Mr. Smith was also of opinion that only the specimens before the author at the time of making the description are "types," and that specimens determined afterwards are not really "types." Mr. Fletcher referred to *Chinobas Macounii* as an example. Mr. W. H. Edwards had eleven specimens before him when he described the species; these are types, though most of the specimens were imperfect. During the past summer the speaker

had obtained from the original locality a good supply of specimens in perfect order, and although these agreed with the original description perfectly, they should only be labelled as "typical," and he was of the opinion that the describer even would not be justified in labelling them "type." Professor Osborn agreed with the last speaker.

(To be Continued.)

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## CORRESPONDENCE.

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### NOTES ON IPS.

In vol. xvii., p. 46, of the CAN. ENT., Dr. John Hamilton gives some notes on *Ips fasciatus* and allied forms. He says:—"The form *fasciatus* is the most common here (Allegheny, Penn.), and is that into which all the others are resolved; in it the elytra are black with an irregular broad basal, and a sub-apical fascia, yellow; individuals are met with totally black without any spot; others have only a small basal and sub-apical spot yellow (more often reddish); others add to these a humeral lunule; others have various other spots, and by the gradual dilation and coalescing of these through a series of specimens, the full form *fasciatus* is reached." He further says that he has never met with these black and spotted forms at any other time than in early spring, usually during April. As the season advances these entirely disappear and the fasciate form alone remains, continuing till autumn. Judging from my observations of these forms at Montreal, I cannot quite agree with Dr. Hamilton's opinion. I find that in the fasciate form the colour is bright clear yellow, while in all the spotted specimens that I have seen the colour is very pale yellow, almost white; the difference in this respect being very marked. With respect to seasons, I find that the spotted form, or what I take to be *4-signatus*, occurs during summer as well as in spring, as the following notes will show:—April 24th, 1886, found *Ips fasciatus* and the spotted forms common at a bleeding stump on Montreal Mountain, *4-signatus* being most abundant. June 12th, 1886, found several specimens of *Ips 4-signatus* in a small hole in the bark of an oak tree, where the sap was oozing out. August 5th, 1886, found a specimen of *Ips 4-signatus* on a tombstone in Mount Royal Cemetery. August 15th, 1886, found a specimen of *Ips 4-signatus* on a tomato on the breakfast table. July 26th,

1888, found a specimen of *Ips 4-signatus* in a jug of milk. The last "find" was a rather curious one, but the specimen was quite fresh, and had evidently been "supplied" with the morning's milk. No specimens of *fasciatus* were observed during the summer months, so that my experience appears to have been just the reverse of Dr. Hamilton's.

F. B. CAULFIELD, Montreal.

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#### INSECTS FEIGNING DEATH.

Dear Sir: I have read with much interest Mr. A. R. Grote's communications upon the subject of "Insects Feigning Death," glad always of the opportunity of learning from the older members of the entomological fraternity. But in this case I am not sure that I comprehend the gentleman's meaning. In the June number of the CAN. ENT. he expresses a doubt in regard to insects possessing any knowledge of death, and hence considers that they are not mentally capable of feigning death. In the August number he again takes up the subject and says, "It is probable to me that their attitudes of repose are assumed from the experience they have gradually acquired, that in a state of quiet they will best avoid the immediate dangers which beset them, etc." Immediate dangers of what? Physical pain, a knowledge of which they have gained by frequent captures and escapes? It strikes me that it is not only not this, but death itself which they seek to avoid. With no knowledge of death, as such, why should they seek to avoid it? Is it not true that all animal life is doomed to die sooner or later? And is not a knowledge of the fact that it is something to be feared and avoided as long as possible, necessary to the perpetuation of species? Surely even insects would not seek to avoid that of which they have no knowledge. Does not the very presence of the sense of fear presuppose a knowledge of death, in the sense of annihilation? If the larva of a *Geometer* has learned, no matter whether by experience or instinct, that by assuming a certain rigid position resembling a portion of the twig upon which it is itself located, it is thereby enabled to escape destruction in common with the twig; might not another species, by the same course of reasoning, learn that, to assume the same inanimate position as a dead companion who is not carried away, it also might escape? Beetles belonging to the genera *Chlamys* and *Exema*, of the family *Chrysomelidae*, will often drop from a seemingly

safe position on the stem of a plant to the exposed upper surface of a leaf of the same, remaining there perfectly quiet without making any further attempt to escape, their only protection being the form and color of their bodies, which very strongly resemble the excrement of caterpillars. After all have we not reason to believe that life, to an insect, embodies all that is precious; the alpha and omega of all that is worthy of being cherished and protected? Knowing as we do the great variety of methods by which insects seek to protect this life, is it so highly improbable that they should hit upon the plan of feigning its absence? The question is an interesting one, though difficult, and, perhaps, impossible to solve; yet it certainly involves nothing that should lead us to forget that we are fellow-workers.

F. M. WEBSTER, Lafayette, Ind.

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DANAIS ARCHIPPUS.

*Dear Sir:* In view of the discussion now going on respecting this insect, it may not be amiss to give some observations from this locality. *D. archippus* (alias *plexippus*) is an exceedingly common butterfly in Custer Co., Colorado, from the end of April throughout the summer. At the present time it is abundant near my house, at about 8,400 feet alt., especially frequenting the flowers of *Oxytropis lamberti*, and also seeming much attracted by a patch of *Trifolium pratense* that has sprung up in a timothy field. But the peculiar thing is, that so far as I know, *Asclepias*, the food-plant, does not occur nearer than some four or five miles away, and at perhaps nearly a thousand feet lower elevation. The only larva I have seen here was an immature one brought to me July 3rd, which had been found on *Asclepias* at about 7,300 feet alt., some six miles from here. Yet the specimens of *plexippus* found up here at 8,400 feet are perfectly fresh and undamaged (much more so than *Papilio asterias*, which breeds up here), and further, are frequently to be seen paired.

July 22nd.

T. D. A. COCKERELL, West Cliff, Colorado.

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NOTICE.—The Annual Meeting of the Entomological Society of Ontario will be held in the City Hall, Ottawa, on Friday, October 5th. It is hoped that there will be a full attendance of members.

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Mailed October 3rd.