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The Canadian Entomologist.

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No. 5

DESCRIPTIONS OF NEW SPECIES OF NORTH AMERICAN BUTTERFLIES; ALSO, NOTES UPON CERTAIN SPECIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

ARGYNNIS HIPPOLYTA.

Male.—Expands 2 inches.

Upper side fulvous, obscured by brown at bases of wings; the discal area of each wing lighter than elsewhere; the black markings rather heavy; the marginal lines more or less confluent; the silver spots of second row indicated on upper side by oblong spots of a pale color.

Under side of primaries pale orange-fulvous at base, and in the P-shaped spot of cell; also along the branches of median; rest of wing pale buff, except hind margin and apical area, which are ferruginous; on the sub-apical patch two silver spots, and the four or five uppermost sub-marginal spots are silvered.

Secondaries deep ferruginous, very little mottled with buff; hind margin same hue as the disk; the belt narrow, buff, much dusted with ferruginous; all the spots well silvered; those of outer row small narrow crescents, with heavy ferruginous edging to upper side; the spots of 2nd and 3rd rows small, each edged on upper side by a few scales of black; a round spot in black ring in cell, an oval in ring below cell; shoulder and inner margin silvered.

Female.—Expands 2.25 inch.

More obscured at base, otherwise like male; the basal area of primaries beneath red-fulvous; secondaries as in male, but the belt is almost lost in ferruginous.

From 3 ♂ 1 ♀ received from Mr. G. M. Dodge, and taken in Oregon, but in what exact locality is not known. Another male was received from Mr. Henry Edwards, from Northern California.

The species equals *Egleis* and *Eurynome* in size, and is distinguished readily by the ferruginous under surface.

ARGYNNIS CHITONE.

Male.—Expands 2.25 inches.

Upper side dull fulvous, much obscured by brown at bases of wings; both wings edged by two fine parallel lines, between which are fulvous spaces; the crescent sub-marginal spots and the extra discal rounded spots small; the other markings rather slight.

Under side of primaries pale yellow-fulvous over basal area and posterior half of wing, the outer upper part of cell and the apical interspaces buff; the nervules on apical area broadly edged with ferruginous; the patch same color; the sub-marginal spots buff, with no silver.

Secondaries light ferruginous, considerably mottled with buff; the belt clear buff, broad; hind margin dark brown; all the spots small and but imperfectly silvered; the outer row narrow crescents, with ferruginous edging to upper side; the spots of second row, mostly sub-ovate, the first three from costa nearly same size, the fifth a broader oval; all edged slightly by black on upper side; those of third row more heavily edged by black; in cell a round spot in black ring, an oval in ring below; shoulder and inner margin buff.

Female.—Expands 2.5 inches.

Nearly same shade as male; the marginal lines more or less confluent on primaries. The spots of under side are sometimes well silvered, or the marginal only are silvered, the remainder buff, with a few silver scales; in some examples the ground of secondaries is deep ferruginous, encroaching much on the belt, and with very little mottling of buff.

From several examples received from Mr. B. Neumoegen, and taken in Southern Utah and Arizona.

ARGYNNIS NITOCRIS, Edw., ♂ Trans. Am. Ent. Soc., v., p. 15, 1874.

In the male this species is bright red-fulvous, the basal area darkened by brown. In markings it closely follows *Nokomis* male, which it equals in expanse of wing, 3 inches. The under side of primaries is cinnamon red, at apex ochre-yellow; of secondaries deep ferruginous, with a broad reddish-ochraceous belt; the spots same size and shape as in *Nokomis*. For a long time the species was known to me by the single male

described, a very fresh and perfect one, taken by Mr. H. W. Henshaw, in Arizona. In 1878, I received from Mr. C. E. Aiken, of Colorado Springs, several lepidoptera taken by him in Arizona; and among them was a second male *Nitocris*, in bad condition, and a female nearly perfect in color. This differs from the male as widely as does the female of *Nokomis* from its male. I give description of it.

NITOCRIS, female. Expands 3 inches.

Upper side blackish brown. Darker than *Nokomis*, the black markings of disk lost in the dark ground; the extra discal spots as in female *Nokomis*, being in transverse rows, and of a pale yellow color, the small submarginal spots whitish; the spots of secondaries narrower than in most examples of *Nokomis*, owing to the broad edging of brown upon each nervule; they are also much dusted with brown, and only on the outer part of the spots opposite the cell is the clear buff ground or pale yellow ground to be seen. Under side of primaries fiery-red over all the wing except the apical area, which is yellow; the sub-apical patch brown, and the nervules on that area are much bordered with brown; on the patch two small silvered spots, and the five or six uppermost marginal spots are small and imperfectly silvered. Secondaries have the ground of an uniform blackish brown, a little dusted by ferruginous next base and along the nervules; the belt yellow, divided into spots by the dark nervules, and the margin of each spot is dusted, so that the clear yellow is seen only in the middle; hind margin nearly black with an indistinct yellow stripe, broken at the nervules; the marginal spots small, silvered, surrounded by a jet black border; the other spots shaped as in the male and silvered.

I have recently received a male *Argynnis* from Dr. Jas. Bailey, of Albany, N. Y., much worn and broken, one of three which were taken at Elko, Nevada, which seems to me to be no other than *Nitocris*. It expands only 2.75 inches, and the limb of each wing is faded out. But the disk retains much of the natural fiery hue, and the markings show that the insect belongs to this sub-group. So also with the markings of the under side. What became of the other two examples taken Dr. Bailey does not know. Apparently the species was much out of its range at Elko.

PAPILIO BAIRDII, Edw., ♂. Proc. Ent. Soc. Phil., vi., p. 200, 1866.

I found the example described in a bottle, with cotton, at the Smithsonian, sent I think by Dr. Palmer. It was badly abraded, and the tails

and antennæ wanting. But the yellow-band was unusually well developed, and showed plainly that the species was not *Asterias*. Afterwards by some years both males and females were received among the collections made by the several Wheeler Expeditions, mostly in very bad condition. Recently Mr. Neumoegen sent me several examples of both sexes, some in fresh and beautiful state, and I shall find among them materials for a Plate in *But. N. A.*, Part viii. The males differ much in the discal band, some showing this to be more than twice its breadth in others. In some the spots are close together, forming a continuous band, divided by the nervules only; in others there is a wide black space between the spots. All have these spots fading gradually out on the basal side, instead of being clear cut; and on the outer side, or towards hind margin, nearly all on primaries are concave, sometimes a few straight, and rarely any of them convex. On the under side there is an absence of the fulvous color which characterizes all examples of *Asterias*, there being at most a slight ochreous discoloration on the outer edges of the spots of the band on secondaries, and sometimes this is wholly wanting, or is restricted to the two or three spots against cell. In fresh examples there is a belt of yellow scales on the black area between the marginal and discal spots of primaries, such as is seen in *Machaon*. The female shows only traces of the discal band, sometimes limited to three or four obsolescent spots on the upper part of primaries, or perhaps entirely across primaries. In one example under view these traces continue across secondaries, but in others they are absent. In all, however, there is a large spot of yellow more or less dense on costal margin of secondaries. So the spots of the marginal row on secondaries seem never to be distinct in the female, and often represented by a few scales only. In both sexes there is much variation in the extent of the blue clusters on outer limb of secondaries. In the original example, male, there is no blue except in a crescent over the anal spot; in other males there are slight clusters on the posterior half of the wing, and in others they extend quite across, but gradually diminish in size towards costa. In the female these clusters are larger and more dense, and reach from margin to margin. On the under side the discal band is always distinct on secondaries, and considerably more so on primaries than appears on upper side. There is a little more of the ochreous also on secondaries.

Mr. Strecker, *Cat.* page 72, has entered this species as *ASTERIAS*, var. e. *UTAHENSIS*, NOB., and puts *Bairdii*, Edw. as a distinct species, but

with the remark that if his recollection is right, *Bairdii* is very near or perhaps same as var. *Asteroides* (his var. d. of *Asterias*.) *Bairdii* and *Asterias* are two distinct and well marked, though allied species, and my description of the former was explicit enough. So far as yet appears, it is restricted to So. Utah and Arizona, but probably will be found in Mexico. *Asterias* is found also in Arizona (as well as Mexico), and I received several examples ♂ ♀ from the Wheeler Expeditions. They do not differ more from the northern form than individuals of a single brood (from one laying of eggs) are found to differ in W. Va. Invariably they are characterized by deep fulvous spots of under side.

P. ASTEROIDES, Reakirt, Pr. Ac. N. Sci., Phil., 1866, p. 43; not Strecker plate vi. fig. 4, and description.

Reakirt described this species thus: "*Marked nearly as in Asterias; the inner yellow macular row (i. e. discal band) upon the fore wings is almost obsolete, except the spot upon the inner margin, which is prolonged into a dash. Hind wings as in Asterias female, but the blue clouds are reduced to small rounded patches; tail not so long as in Asterias.* Below, a (discal) row of large fulvous sagittiform spots on fore wings. *Secondaries as in Asterias.*" I indicate the important part of this description by italics. The female was not described, and apparently Mr. Reakirt knew only a single male, from Mexico.

Mr. Strecker figures a female but describes both sexes. The male is said to have an inner (discal) band of *eight triangular yellow spots*, and as the contrary is not stated, it is to be inferred that this band is conspicuous, and not obsolete; secondaries a *yellow mesial (discal) band divided into seven parts* (or spots); blue clusters, &c., (which are always found in *Asterias* ♂); beneath the spots of discal band on primaries fulvous; secondaries same; *tails like Asterias.* *Female has the discal band of primaries a little broader and of same width throughout.* His ♂ ♀ are from Costa Rica. He also says that Reakirt's type ♂ has the spots of discal row of primaries much suffused with black, the last few near costa obsolete or nearly so. Nothing said of the remarkable mention by Reakirt that secondaries are like female *Asterias*, excepting in the size of the blue patches; which means that the discal band and marginal spots are as in *Asterias* female.

Plainly here are two different insects described under one name, and Strecker's *Asteroides* is not at all that of Reakirt. The insect figured as a

female has the markings of a male, something never seen in *Asterias* unless in bi-formed examples, of which for aught I know this may be one. If it is not, a good species is wandering without name. The male is described as characterized by a single row of seven spots on secondaries, the usual (i. e. in *Asterias*) eighth spot at end of cell being absent. Now males of this type are common enough. I have repeatedly raised them at Coalburgh from eggs of the normal *Asterias*, and have them from many localities, even to Costa Rica. But I have never seen such wings attached to a female body.

I have lately received from Mr. F. H. Godman two males from Costa Rica, marked *Asteroides*, one of which answers Reakirt's description very closely. It has the discal band of primaries obsolete, represented only by little clusters of yellow scales, and extending across the wing. On secondaries this band is partly present, there being a small spot on costa, and spots in the four posterior interspaces; but of these last the one in upper median is almost gone. The clusters of blue are small and round, and the tails are shorter than *Asterias* perceptibly. On the under side the spots of discal row are distinct on both wings and as in *Asterias*; also they are fulvous. This is in agreement with Reakirt's type. In *Asterias* female there is often an imperfect row of yellow spots on secondaries, varying in fact from a complete row of distinct but small spots, to nil, except that the costal spot is always present. Therefore, when looking at the male I have described, Reakirt's general comparison to female *Asterias* seems natural. It is in respect of the discal band only, for he calls attention to the smallness of the blue clusters, which is a characteristic of *Asterias* ♂, while in ♀ they are always very large.

The other male from Costa Rica has the discal band on primaries absolutely wanting—not even a scale being there—on both surfaces; the marginal spots of both wings are very small. On secondaries the discal band is represented by a minute cluster of yellow scales on costa and in three posterior interspaces. On the under side this row is complete, but of smaller spots than I ever have seen in *Asterias*, and they are fulvous. The tails are not shorter than in *Asterias*. This absence of the discal band on both sides of primaries is so remarkable that this example may be of a distinct species, especially as there are other points of difference from *Asterias*. But the one I have first described is apparently Reakirt's *Asteroides*, and there is no evidence that it is a variety of *Asterias*. Till such evidence is produced it should be regarded as a good species.

ANTHOCHARIS THOOSA, Scudder, ♀, Hayden, Bull. iv., p. 257, 1878.

Male.—Expands from 1.25 to 1.4 inch.

Upper side white; primaries have a large orange apical patch, limited on basal side by a broad black bar, which extends from costa to inner margin; this is composed in part of the discal bar, which is broader than is usual, but there is no break in its course, and either no narrowing below the cell, or very little; and scarcely any difference in texture, the entire bar being coarse grained with rough edges; the margin from upper to lower end of the patch edged with brown narrowly, with a serration in each interspace. Secondaries have a few black scales on the edge of margin at each nervule; on the anterior half of the wing these become small clusters, but seem never very distinct.

Under side of primaries dusted over the apical area and down hind margin to median with brown scales, on a white ground at apex, but pinkish ground outside the patch; this is restricted, hardly half as large as on upper side, more yellowish; the discal spot confined to arc of cell, with an angular sinus on outer side. Secondaries white, much covered with gray-brown scales (like those of *A. Julia*) disposed in small clusters mostly, along the nervures and branches; these are connected by intermediate scales near the margin, making a sort of border to the wing.

Female.—Expands 1.4 inch.

Upper side white tinted with lemon yellow, deepest on disk of secondaries; the orange patch narrow; the apical and marginal area brown, enclosing a chain of yellow spots, which on lower part of margin cut through the brown border; the discal spot broad, blackish, arose on outer side, not extending below extremity of arc; on secondaries clusters of scales at ends of all the nervules. Under side scarcely different from male.

From 3 ♂ 1 ♀ sent me by Mr. Neumoegen and taken in Arizona, and 1 ♂ from same region by the Wheeler Expedition.

The single female described by Mr. Scudder was taken at Mokiak Pass, Arizona, "20 miles east of St. George; a pass in mountains between St. George and Juniper Mts., in a very broken and rough volcanic region." Scudder.

ANTHOCHARIS STELLA.

Male.—Expands 1.4 inch.

Upper side delicate lemon-yellow; primaries have a large bright

orange patch limited on inner side by the discal spot and a stripe in line with same, starting from hind margin and narrowing; sometimes this stripe is at first black and dense, but dissolves into separate scales as it nears the discal spot, or it is throughout but a long cluster of scales, becoming obsolete near the spot; this last is a narrow, straight and black bar, clear cut on inner side, but on outer side usually a little incised, widening somewhat on sub-costal and not quite reaching the edge of the margin; apex and hind margin to the stripe narrowly bordered with black, with inner edge serrated; sometimes on the margin this border is broken into spots. Secondaries have small clusters of black scales at the ends of the nervules, sometimes wanting; fringes of primaries yellow, very little orange tinted next the margin, a broad black space at end of each nervule; of secondaries yellow, slightly black at nervules.

Under side pale lemon-yellow; the apical area a little deeper tinted, and pinkish next the patch, all sprinkled with fine spots of grayish-green; the patch restricted, less bright; the discal spot bisected, the upper part being quadrangular, the lower triangular; secondaries have the nervures and branches yellow, just at base orange, or varying from yellow to orange; the surface much covered with little patches of grayish-green, disposed along the nervures, but extending well into the interspaces.

Female.—Expands 1.4 inch.

Deeper colored than the male; the orange patch not more than half the width in male, paler; the border brown, deeply serrated and having on inner side a series of connected yellow spots, serrated without, yellow; at the base of each of these, and partly lying on the orange ground a cluster of brown scales; discal spot as in male; the under side differing from the male only in the depth of yellow.

Mr. Morrison brought examples of this species from Nevada, 1878, and I have seen 12 or 14 of these. I have formerly received the same from Lake Tahoe, and other neighboring localities. Mr. Mead took about a score at Yo Semite, all which were examined by me. The size is that of *Reakirtii* and *Thoosa*. The color unlike either, being lemon-yellow in both sexes, whereas *Reakirtii* is sordid white in both and *Thoosa* white in male. The orange patch is brighter and the limiting band is not continuous nor of uniform density as in both these species. On the under side the color and shape and abundance of the spots on secondaries is nearest *Thoosa*. In *Fulia* these are larger, and cover considerably more

of the surface. *Fulia* is a smaller species than *Stella*, the male clear white. I have a variety of *Stella* taken by Mr. Morrison, in which all the dark markings are faded to the palest ashy-brown tint; the orange is also pale; on the under side the markings are almost obsolete.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

LITHOCOLLETIS.

L. argentinotella Clem.

This species varies in color from very pale golden yellow to reddish saffron, and in size from about one-fourth of an inch to about one-third. Likewise as to the size and distinctness of the marginal streaks on the fore-wings and as to the dark margins of these streaks. Sometimes only the second dorsal and costal will be dark margined, and these not very distinctly; and sometimes all, including the basal streak, will be distinctly dark margined. I add to Dr. Clemens' description as follows:—The tuft on the vertex is white in the centre, saffron on the sides; abdomen on the upper surface fuscous gray, anal tuft yellowish silvery; under surface and legs silvery white, the anterior surface of the legs marked with brown.

L. tritaniaella Cham.

I have a male (bred) in which the second fascia does not reach the dorsal margin by more than one-fourth of the width of the wing. The *al. ex.* ranges from $\frac{1}{4}$ to $\frac{1}{3}$ inch.

L. Bethuneella Cham.

Sometimes the opposite costal and dorsal spots are confluent, forming fasciæ. At least such is the case with some captured specimens which are not otherwise distinguishable from this species, and so also is a single bred specimen received some years ago from Miss Murtfeldt.

L. Fitchella Clem.

This species makes a mine on the under side of leaves of various species of Oaks, which is scarcely, if at all, distinguishable from the mines of *L. basistrigella* Clem. It is roomy, tentiform, elliptical or nearly circular, and pale ochreous yellow.

Formerly, before I had seen *L. quercitorum* Frey & Ball, and trusting to the published description of that species, I suggested that it was probably identical with *Fitchella*. I have since then bred it, and though they are more closely related than either is to any other known American species, yet they are quite distinct. *Fitchella* connects *argentinetella* Clem. with *quercitorum*, though the resemblance of the species is by no means close, and it is nearer *quercitorum*. It is less golden than *argentinetella*, less brownish golden than *quercitorum*; *argentinetella* has four, *quercitorum* three, and *Fitchella* two silvery white dorsal streaks; in all three the first dorsal is the largest, but it is much larger in *Fitchella* than in *argentinetella* and still larger in *quercitorum*; in *argentinetella* this first dorsal is nearly triangular, in the other two species its upper or anterior edge is rounded and the apex produced backwards so that the posterior edge is concave. The mine of *quercitorum* is larger and of more irregular shape than that of *Fitchella*, which resembles that of *argentinetella*, but is larger. *Fitchella* and *argentinetella* are of about the same size and smaller than *quercitorum*. There are other differences, and I have only alluded to the most striking. In each there are five silvery white costal streaks similarly placed and of nearly the same size. Dr. Clemens bred it in Pennsylvania, and I have bred it in Kentucky, and have also received it from Texas. *Argentinetella* is very abundant in Kentucky, but *quercitorum* I have met with only in Colorado.

L. corylicella Cham.

Either by a slip of the pen or by a typographical error, the name of this species is sometimes mis-printed—sometimes *corylicella*, sometimes *corylisella*. *Corylicella* is the name intended, though perhaps it is too near *corylella* H. Sc., *coryli* Nic., and *corysoliella* Haw. The statement in the original account, Vol. 3, that it *only* differs from *guttifunitella* Clem. by having one more dorsal streak near the base is too broad. That is the most striking difference, but there are others more minute. This dorsal streak is there said to be dark margined *internally*; it should read *externally*. The species mentioned v. 3, p. 166, as mining leaves of Water

Beech (*Carpinus Americana*), is this species. In all the specimens, whether bred from Hazel, Iron-wood or Water Beech, the fasciæ are scarcely or not at all curved, but are placed obliquely across the wing and are nearest to the base of the wing on the dorsal margin. I have found it more abundant on the Water Beech than on either of the other food plants. It, and indeed all the species feeding on these plants, are very different from the European species feeding on allied plants and mentioned above, and from *Carpinicolella*.

L. Clemensella Cham.

The suggestion elsewhere made that the mine and larva of this species in Maple leaves might perhaps be distinguished from those of *L. lucidicostella* Clem., by finding that this species pupates in a cocoon of frass, is not supported by the facts. I know of no way in which the species can be distinguished in their early stages.

L. ostryæfoliella Clem.

Dr. Clemens' description of this species is exceedingly inaccurate, so much so that captured specimens would scarcely be recognised in it. The same is true, likewise, of his description of *L. obscuricostella*. Both of these species make small tentiform mines on the under side of Ostrya leaves. No other species is known to make similar ones in these leaves. Bred specimens may therefore be recognised in the descriptions.

L. juglandiella.

Dr. Clemens bestowed this name upon a species known to him only by the larva and mine, suggesting that it might not be different from *L. caryæfoliella* Clem.; and in a former volume I stated that it was *caryæfoliella* in my opinion. Since then I have succeeded in rearing the imago, and find that we were not in error in this respect. It is *caryæfoliella*. *Caryæfoliella* is a very variable species, as I have stated in Vol. 4, and is very difficult to rear, especially from the Walnut-feeding larva.

L. ornâtella Cham.

I have bred great numbers of this species and find no variation in the fasciæ and marginal streaks, though the ground color of the wings varies from those in which the basal portion is maroon brown, as stated in the description, to those in which the entire wing (except the dark margins of the streaks and fasciæ) is bright golden.

L. trifasciella Haw.

L. Mariaella Cham., *Cin. Quar. Four. Sci.*, v. 2.

I am convinced that *Mariaella* is *trifasciella*, though there appear to be some minute differences between them. The latter was not known to me when I described the former, and strangely enough, the relationship of *Symphoricarpus* to *Lonicera* did not suggest to me that the species might be the same. I have never yet met with a *Lithocolletis* mining leaves of Honeysuckles, and have not bred this species from *Symphoricarpus*. It was described from specimens bred from *Symphoricarpus* in Missouri by Miss Murtfeldt. *L. symphoricarphaella* Cham. is the only species that I have bred from that food plant in Kentucky. It is very distinct. As stated above, I have never met with any Honeysuckle species in the U. S. Prof. Riley, however, informs me that he bred a species, most probably *trifasciella* Haw., from that plant in Illinois, and Frey & Ball doubtfully refer an American Honeysuckle species to *trifasciella*.

L. obscuricostella Clem.

L. virginella Cham.

In a former Vol. of the CAN. ENT. I have mentioned that there is no such species as *L. virginella*. It was described from a few specimens bred from *Ostrya* leaves. The specimens were a little worn, and owing to this, and to the very defective character of Dr. Clemens' description of *obscuricostella*, which I had not then seen, they were supposed to belong to a new species, to which I gave the name of *virginella*. Since then I have seen and have bred numerous specimens of *obscuricostella*, and recognise *virginella* as the same species, which probably I should never have done by Dr. Clemens' description. I was also in part led into the error by the mines from which *virginella* was supposed to come. No mines of *obscuricostella* were observed in the leaves, but there must have been a few which escaped notice, and which produced the species. The mines which were observed in the leaves, and which were supposed to be those from which *virginella* came (no others having been observed in the leaves) prove by subsequent experience often repeated to be the mines of *L. tritaniaella* Cham. A large gathering of these mines produced on that occasion nothing, while a few mines of *obscuricostella* in the collection which escaped observation produced *obscuricostella*, which not being recognised in Dr. Clemens' description, and coming apparently from new mines,

was described as "*L. virginella*, n. sp." The mine is described correctly in Vol. 4.

LEUCANTHIZA.

L. amphicarpæfoliella Clem.

L. Saundersella Cham. is the same species. There is probably sufficient reason for separating it from *Lithocolletis*, though the propriety of so doing is not altogether unquestionable.

BUCCULATRIX.

B. luteella Cham.

I have received from Texas (Belfrage) specimens which I refer to this species, but as they are all slightly worn, and yet appear rather more deeply colored—that is, more of an ochreous yellow—it is barely possible that they may belong to another species.

NEPTICULA.

N. serotinælla ? Cham.

A single captured specimen received from Mr. Belfrage, in Texas, seems on comparison indistinguishable from this species. Yellowish silvery would perhaps characterize the eye-caps and occiput better than golden, as I have described them. In a series of specimens no material difference is found in the width of the fasciæ; the antennæ are black and the under surface of the body and the legs are dark plumbeous.

N. quercicastanella Cham.

The palpi, eye-caps and occiput are perhaps better described as pale ochreous than white. The abdomen and under surface of the thorax have a decidedly greenish tinge.

ON A MITE PREYING ON THE ORANGE SCALE INSECT.

BY WM. H. ASHMEAD, JACKSONVILLE, FLORIDA.

About the last of March my friend, Mr. Allen Curtiss, a botanist, brought me some Orange twigs infested with the Orange Scale Insect (*Aspidiotus Gloverii*). On examining them with my pocket lens, I was

surprised to see numerous small black mites running in and out of the scales, and which no doubt prey upon the eggs of the Scale Insect, and probably prevents their increase. Since then I have been enabled to examine them with a more powerful microscope, and I think they are entirely new to science. As far as I can find out, they belong to the family Oribatidæ Nicolet, and resemble very much Packard's *Nothrus ovivonis*. I submit the following brief description :

Oribates ! aspidiotti, n. sp.

Elongated, flattened, narrowing towards head, dark reddish-brown color ; abdomen pubescent, with two oval capitate processes, the first in centre just back of thorax, the second just below middle of abdomen, and both striate ; outer edge slightly serrate ; four legs, stout, and with but one claw curved inwards, with three or four basal hairs. Length about .02 inch.

It is easily distinguished by the two oval processes.

ON A NEW SPECIES OF POLIA.

BY A. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

In the collection before me are the following species referred to *Polia*, but in the absence of a series of the European forms I am not clear that they are finally to be left in this genus. I have separated under the name of *Pachypolia atricornis* a stout and shaggy species, taken by my friend, Mr. Westcott, which has strongly pectinated antennæ, a character not accorded by Lederer to the European species, but one which is only doubtfully of generic value. To distinguish these species from *Hadena* is certainly difficult. They have less prominent, almost obsolete, tuftings, and are usually gray in color with admixture of yellowish (*pallifera*) or blackish (*perquiritata*?, *acutissima*), or even brown (*medialis*), and again one (*diffusilis*) is bluish gray, darker than *Apatela americana* and approaching in tint to *Lithophane capax*.

The new Western species here described agrees with *Pachypolia* in the pectinate antennæ of the male, but is much less shaggy and more slender.

In *diffusilis* the male antennæ are brush-like, perhaps sufficiently serrate to be called pyramidal-toothed (*pyramidalzahnig*). Of *pallifera* I have only the female type; the abdomen is more noticeably tufted than in the other species. I am doubtful about my determination of *perquiritata*, and it is probable that I do not know any of Mr. Morrison's species of *Polia*. In *medialis* the male antennæ are bi-pectinate, but the pectinations are very short. In *accutissima* the male antennæ are also shortly bi-pectinate. In *Pachypolia atricornis* the head is more sunken and the male antennæ are lengthily bi-pectinate. I do not know at this writing either Mr. Morrison's *confragosa* or his *speciosa*, and from his descriptions do not think that I have seen them.

I am not certain that the eyes are unlashd in our species, but I can not make the lashes out with certainty. Lederer calls the eyes unlashd in *Hadena*, and lashd in *Polia*. So long as the corporal tuftings are used as generic characters we shall have some uncertainty as to the best position of many species belonging to the Hadenoid group, until we have series of bred specimens of our species.

Polia illepada, n. s.

♂ ♀. The male antennæ are bi-pectinate, ciliate. Thorax with inconspicuous tuft in front and behind. Abdomen apparently without tufts. Eyes naked, unlashd (?); tibiæ unarm'd. Size rather large; wings elongate. Hind wings of the male white or whitish; of the female gray or smoky; an even mesial shade band more or less apparent; veins a little darker; a terminal line. Beneath whitish or gray with obsolete marks. Fore wings dark gray. Reniform rather large, curved, sometimes a little brighter tinged, pale gray, with an interior darker shading, ringed with dark; orbicular pale gray, spherical, rather small, not constant in size, blackish ringed. Lines even or very little denticulate, single, more or less indistinct and obliterate, except the subterminal, which is blackish, jagged, running obliquely inwardly from below apex to between veins 4 and 5, thence outwardly, and from vein 3 again inwardly to within internal angle. T. p. line followed by a pale gray shade. Fringes of primaries gray, paler at base; a fine dark terminal line and small blackish points.

Thorax gray, without marks; abdomen paler, in the female terminating somewhat squarely.

Expanse 40 to 42 mil. *Habitat* Nevada, Colorado (Dr. Bailey and Mr. Graef.)

Except in the antennæ, and possibly the unlashd eyes, this species seems to agree with Lederer's definition of *Polia*. It is to be recognized by the even median lines, the jagged angulated subterminal line, the difference in the tint of the hind wings in the sexes, and its effaced and inconspicuous ornamentation.

ON THE LARVAL CHARACTERISTICS OF CORYDALUS AND
CHAULIODES AND ON THE DEVELOPMENT OF
CORYDALUS CORNUTUS.

BY PROF. CHAS. V. RILEY.

(*Abstract.*)

The paper relates to the development of one of the most singular and interesting of North American insects—the largest of the Order Neuroptera. In its perfect state this insect is a great, clumsy, nocturnal fly, popularly called Hellgrammite, and characterized by the jaws of the male being converted into a pair of long, curved, cylindrical and tapering prehensile organs, like the finger of a grain-cradle. In the larva state it is aquatic and much esteemed as fish-bait by fishermen, who call it a "crawler," "dobson," etc. Indeed, one of the most popular artificial fish-baits is a patent india-rubber imitation of it. This larva is very peculiar in having in its latter stages three distinct sets of breathing organs, viz.: the ordinary spiracles, a lateral series of long, single bronchial filaments, and a ventral series of spongy branchiæ, composed of numerous branching and tractile filaments. The eggs of this insect are laid, to the number of about three thousand, in curious masses on the leaves and branches of trees, or upon any other object overhanging water, and were first described by Mr. Riley at the Buffalo (1876) meeting of the Association. After comparing the eggs with those in the female abdomen, and the newly hatched with the mature larva, he felt quite

certain as to the parentage of the curious eggs. Yet the newly hatched larva which he described differed from the mature larva in lacking the ventral branchiæ, resembling in this respect the mature form of another aquatic larva of an allied genus (*Chauliodes*), and as some leading entomologists believed that the eggs described by Mr. Riley might belong to this last genus, further evidence as to the real nature of said eggs was desirable. The paper presents this evidence and confirms the previous determination. The *Corydalus* larva is traced through its stages of growth and then compared with that of *Chauliodes*. Several interesting scientific facts are brought out. The larva undergoes about six moults. The double nature of the thoracic tracheæ in *Corydalus* appears in the first larval stage, and the branchial nature of the lateral filaments is proved by the tracheæ leading to their tips. The ventral branchiæ first appear in the second stage (after first moult) and from three main stems each with bifurcate or trifurcate filaments. The branching filaments become more and more numerous and complex with each moult. The tracheæ also lead more and more strongly to these ventral branchiæ and less strongly to the lateral ones, with age. The stigmata are obsolete in the first three stages and in the fourth are only clearly distinguishable on the four or five larger abdominal joints, being still obsolete on the terminal ones.

The motion of the larva is invariably backwards. When newly hatched it moves actively about in the water by sudden sweeps of the abdomen beneath, very much as a lobster is known to do; and even when full grown a somewhat similar motion is employed in swimming. In the water a constant motion of the ventral branchial tufts is kept up, the main stem being first moved quickly backward and upward so as to bring the whole tuft close to the body, the filaments of which it is composed being then closely appressed to each other. The main stem is then brought more slowly down in the opposite direction, when the filaments spread and enlarge the whole to its utmost. In pure water the motion occurs about once a second; as the water becomes impure the motion becomes more rapid, and the larva issues from the water as soon as possible, being able to live out of water for several days even when only a few months old. Well developed ova are found even in the larva when only two-thirds grown.

The paper gives detailed comparative descriptions of the *Corydalus* and the *Chauliodes* larvæ. This last may always be distinguished from the former by having a smooth and unarmed skin; that of *Corydalus* has

a skin roughened with granulations and capitate or clavate projections (overlooked by previous describers), the little projections being visible even in the first stage, at which time they are less capitate. The *Chauliodes* larva has the last pair of spiracles on the tips of a pair of contractile filaments described as setæ by Walsh, who failed to apprehend their real nature and wrongly described the *Chauliodes* larva as having one pair of spiracles less and one abdominal joint less than that of *Corydalis*, whereas both larvæ have the same number of joints and spiracles, and both possess the rudimentary mesothoracic spiracle, which Mr. Riley finds more common in insects than is generally supposed. In other structural respects, as well as in habits and transformations, the two larvæ greatly resemble each other. The eggs of *Chauliodes* have a longer tubercle or stem on the top, and are not covered with white albuminous material as are those of *Corydalis*. Mr. Riley has obtained large additional numbers of the egg masses of the latter during the past summer, finding them not only on the leaves as described in his former paper, but on the stems of different trees, as well as on rocks overhanging water. He has had as many as twenty egg masses on a single maple leaf, both sides of the leaf being completely plastered up by them; and as a large number of these masses will generally be found in some one particular locality, or on a few branches of the same tree, the assumption is that the females congregate for purposes of oviposition. The white, albuminous substance covering these eggs shows by analysis that it has all the physical properties of wax.

HOW DO CRICKETS PRODUCE THEIR SOUND?—I have frequently tried to find out how crickets produce their well-known chirrup; but only on one occasion did I succeed in inducing a cricket to exercise itself in that direction, they having apparently a great objection to "sing" in captivity. On the occasion I refer to, I put two crickets—a pair—under a tumbler, whereupon the male immediately raised its elytra and shuffled them together, producing a noise which would be best represented by the word "shilly." It repeated this several times with its head towards the female, who probably considered herself insulted, for she literally clawed his face with one of her hind feet, supplementing this action with a sudden and violent kick, and from that time the male took no more notice of her.—
J. P. B., in Science Gossip.

OTTAWA FIELD-NATURALISTS' CLUB.

We are glad to learn that the Naturalists resident in Ottawa have organized under the above heading, with the avowed object of paying special attention to the Natural History of the Ottawa District. The Club is under the patronage of His Excellency the Governor-General, and has an efficient staff of officers; among them we observe the names of two of our esteemed contributors, J. Fletcher and W. H. Harrington, both enthusiastic Entomologists, and we are pleased to see Entomology so well represented in this connection. It is intended to have occasional excursions during the summer, and evening meetings during the winter for the pursuit and discussion of Natural History subjects. Already the Club has had one very successful excursion, the party numbering in all, ladies and gentlemen, about forty. We should like to see such clubs organized in every city in our Dominion. There is a growing fondness for this interesting study, especially among our young people, and a little stimulus of this sort would materially aid in developing it.

PERSONAL.

A WELL-MERITED HONOR.—We learn with much pleasure that our eminent American Coleopterist, Dr. John L. LeConte, of Philadelphia, has been elected an honorary member of the Société Entomologique de France. The honorary membership in this Society being limited to twelve, and the only other representatives of the English speaking races being Darwin and Westwood, we feel that a high compliment has been paid to American Entomologists by this selection, and a deserved appreciation shown of the unceasing efforts of this distinguished author in his endeavors to promote the interests of Entomological Science.

Mr. B. Neumoegen, of New York, an enthusiastic Lepidopterist, is anxious to obtain as large an amount of material as possible in his department from the northern portions of America, and will be glad to hear from any one who will collect for him in any part of British North America, especially in the north-west, and in the Island of Anticosti. Mr. Neumoegen's address is P. O. Box 2,581, New York.

Dr. Henri de Saussure, of Geneva, Switzerland, wishes to procure specimens of a small parasite found on the Beaver, and which, he says, is only to be obtained in Canada. It is the *Platyssyllus castori*. We trust that some of our readers may have an opportunity of procuring specimens of this insect, either from hunters or from the dry skins in commerce, in which dead specimens may occasionally be found. They may be preserved in a small bottle with a little brandy.

CORRESPONDENCE.

DEAR SIR,—

Dr. Sharp writes me that he finds among our American *Graphoderes fascicollis* Harris, considered by Crotch as the European *cinereus*, several distinct species. Now this form is not uncommon at the North, though both Dr. Horn and myself have very insufficient sets. Could you ask some of our Canadian friends to send me all their specimens for examination? I will return named sets, *all*, if desired, but would like to keep two or three specimens for Dr. Horn and myself. This form has a very wide distribution through Canada to Hudson Bay Territory and California, and I would like to see as many as can be brought together.

JOHN L. LECONTE, M. D., Philadelphia.

DEAR SIR,—

I enclose the wing of a moth which I left with some other choice specimens on my setting-boards while I was absent in Nova Scotia last summer. I thought they were safe enough for three weeks, but you may imagine my dismay when I found on my return a number of *Dermestes* larvæ rioting on my insects. Some were quite destroyed. I at once cleared them off, smeared the boards with tallow and replaced the insects which remained. The larvæ I placed in paste-board boxes. In one I put a bit of tallow, and in the other some worthless specimens. Before twenty-four hours the former had eaten a hole through the box and escaped, and the others matured, passed through the pupa state and in due time became beetles. By this experiment I have made "assurance doubly sure."

Respectfully yours,

CAROLINE E. HEUSTIS, St. John, N. B.

[The wing enclosed is that of *Pheosia rimosa* Packard.—ED. C. E.]