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The Canadian Entomologist.

VOL. XXIV.

LONDON, MAY, 1892.

No. 5.

MISCELLANEOUS NOTES ON BUTTERFLIES, LARVÆ, ETC.

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

(Continued from page 56.)

2. *Argynnis Oweni*, n. sp.

MALE—Expands 2.25 inches.

Upper dull side red-fulvous, not much obscured by brown at base ; the markings rather heavy, the two marginal lines on both wings more or less confluent. Under side of primaries either yellow-buff from base to the row of rounded spots, the nervules being red-brown, or the interspaces are very lightly washed with this colour over the buff ground ; the subapical patch dark brown with a small imperfectly silvered spot ; the five submarginal spots also are of same character ; sometimes the silver is wholly wanting.

Secondaries dark brown and gray-buff, the brown prevailing on the disk, so that the second row of spots stand on a clear brown ground ; but above this to base the buff prevails, especially along the third row of spots, and below the cell ; but occasionally the mottled surface extends quite to the belt ; the belt red-buff, and very narrow, being much encroached on by the dark brown (almost black-brown) projections from the discal area, and by the wide brown edging of the submarginal spots ; these spots are small, semi-oval ; those of the second row small, sub-oval ; the outer row is generally well silvered, but all the others are imperfectly so in most cases, but occasionally one is well silvered throughout, or the outer two rows may be well and the remainder imperfectly silvered.

FEMALE.—Expands 2.4 inches.

The fulvous mottled with yellowish on both wings outside the mesial band, on secondaries the yellow corresponding with the second row of silver spots ; also in the cell of primaries the hue is yellow fulvous ; the black markings all very heavy ; the marginal lines nearly confluent throughout. Secondaries as in the male, except that the basal colour is

deeper, reddish ; mottled as in the male ; in all the specimens under view the spots are well silvered.

From 87 males and 6 females taken by Professor Edward T. Owen on Mt. Shasta, elevation 7,500 feet. These specimens have all been viewed by me. The upper side of the female is very close to *A. Behrensi* in colour and in weight of the black markings. In the male of that species the markings are much lighter than in the present one. On the under side both sexes of *Behrensi* have the ground of hindwings solid ferruginous, not mottled as in *Oweni*.

2. *Argynnis Cornelia*, n. sp.

MALE.—Expands 2.3 inches.

Upper side dark brown from base to the common mesial band, excluding the upper outer part of the cell of primaries, the space beyond the band light red-fulvous ; the black markings rather delicate ; the margins edged by two parallel fine lines. Under side of primaries cinnamon-brown (or sometimes a little reddish), from base to hind margin on inner half of the wing ; the interspaces towards apex yellowish ; the subapical patch red-brown, enclosing a small silver spot ; the hind margin red-brown, the five silver spots small.

Secondaries almost solid red-brown from base to the clear yellow-buff belt, broken only by a few short streaks of buff on the disk ; the spots all small, well silvered ; those of the marginal row subtriangular, edged heavily on the basal side by red-brown ; those of the second row mostly narrow sub-oval, very lightly edged at top with black, as are the spots of the third row ; two small spots next base, and one in the cell.

FEMALE.—Expands 2.5 inches.

Less bright red, the markings heavier ; the submarginal spots on primaries pale yellowish fulvous ; the marginal lines on same wings confluent on upper half. Under side of primaries red over inner half ; secondaries as in the male, the ground less red, more brown ; all the spots well silvered.

This species flies with *Electa* and *Hesperis*, at Ouray and Manitou, Colorado, and in the adjacent districts, where it has been taken abundantly by Prof. Owen. Mr. Bruce has taken it also at Crested Butte in the Ouray region. It is of same size as *Electa*, and resembles *Cybele*, especially the form *Carpenterii*, much as *Electa* resembles *Atlantis*, the basal area contrasting strongly in hue with the area beyond, as in *Cybele*.

Described from nearly forty examples sent me by Prof. Owen and Mr. Bruce. At the request of the Professor I name this species in memory of his deceased daughter, Miss Cornelia, formerly the companion of his entomological excursions.

3. *Limnitis Weidemeyerii*. Edw.

Mr. Bruce sent me fifteen eggs of this species from Hall Valley, Colorado, elevation 10,000 feet, and I received them 24th August, 1891. He wrote:—"I saw the female evidently trying to lay her eggs; caught and tied her on a small cotton wood close to my window. It rained for three days, and during this time she remained motionless on the under side of a leaf. By noon on the fourth day the weather had become fine and warm. On the fifth day she laid the eggs. I have before confined several females of the species without effect, and was not a little pleased at seeing the beautiful eggs." (I may say here that *L. Ursula* is almost the only species of butterfly which has persistently refused to lay eggs for me in confinement. *L. Disippus* will lay readily enough, but I never have seen more than two or three eggs of *Ursula*.) The eggs of *Weidemeyerii* are of same character as those of the allied species at the east, and the young larva at birth looks just like a young *Disippus* larva—the colour light brown. It makes a perch in exactly the same way. After the first moult, the colour was dark gray-black, the patch on middle segments sordid white, and the stripe at base along the last segments same; so was the dorsum on 3 and 4. The description of *Disippus* at this stage will cover the present species, except that the latter is more gray. After second moult the colour was mostly black, the patch and stripe yellow-white. The third moult I missed. After the fourth, length .8 inch, the shape and the processes were closely as in *Disippus*; the dark parts red-brown, a little mottled black; the patch yellow-buff; the basal stripe pure white, and running from 2 to 13; the dorsum and sides of 3 and 4 yellow-buff; the processes as in *Disippus*; length of the process on 3 .11 inch; head as in *Disippus*, red-brown, rough with tuberculations. Three days after fourth moult the dark parts turned to olive-green (just as in all the allied species). At maturity, measured 1.2 inch, lying straight on a stem. After four days more suspended, and the next day pupated. The pupa measured .9 inch in length, shape of *Disippus* and *Ursula*, the dorsal process possibly a little more circular than in *Disippus*; colour of the head case, and of ventral

side, and of the wing cases, blackish-brown, as is also the process; abdomen light-buff with a pink tint, mottled with olive-green, less so on the dorsal side; the end segments dark-brown; dorsal side of head-case and the mesonotum pale brown, the head-case obscurely silvered. I got but one pupa, and that died before imago, and of this Mrs. Peart made a coloured drawing. Only one larva went through all the stages, the others, after second moult, made cases, just as the allied species do, and I have them here, out in the weather, under a net to protect them from birds. The larvæ hatched 28th August; passed first moult 1st September, second moult 4th; one passes fourth moult 13th Sept., pupates 18th.*

4. *Argynnis Epithore*, Boisd.

This small species belongs to Group II. of my Catalogue, 1884, and its nearest ally on this continent is *A. Bellona*, Fabr. It flies in the Pacific States and to and through the Rockies. On 7th July, 1890, I received several eggs from Mr. Kœbele at Spokane, Washn., and they were hatching on arrival. The larvæ passed first moult on 11th July; second, 15th; third on 19th, and within two days thereafter all except one became lethargic after third moult, and before 27th July. The one passed its fourth 7th August, and was sent to Professor Riley for a drawing. It pupated while in his care, but I have not the date. The imago came out at Washington. Excellent coloured drawings were made of the adult larva and pupa. I attempted to carry the hibernating larvæ through the winter at Coalburgh, but they one by one died, the last about middle of February. The food plant was violet. The larva at birth resembled closely those of *Bellona* and *Freya* (which last I had feeding at same time), the segments 5, 7, 9, 11 being brown, as in those species, while the rest of the body was pale green. After first moult, length .14 inch; colour greenish-brown over upper part, greenish beneath; the spines short, stout, tapering, black; those on 2 no longer than in following segments.

At second moult, .24 inch; colour of dorsum black, with a pair of mid-dorsal gray lines; the sides mottled dull white and green; along base a narrow sordid white stripe from end to end; all the spines black, but in the dorsal rows, at bases of 2, 6, 8, 10, on outside, tubercle is pale, obscurely whitish.

* I am able to say, on revising these proofs, that I got two of the larvæ through he winter. One has passed two moults since waking up, the other still sleeps.

After third moult: length .3 inch; colour gray, the sides speckled white; a blackish mid-dorsal stripe; the outer side of the tubercles of the mid-lateral row now white, and this colour is diffused so as to give the appearance of a macular stripe the whole length of body.

After fourth moult: length .5 inch; general colour gray; the dorsum and lower part of side dark; the area between these dark portions streaked crosswise with black; the basal stripe red-brown; the spines mostly russet from tip to base, but those on 2, 3, and the lower ones on 13, are all black; those on dorsum of 4 and 13 tipped black; all spines short, slender, tapering, with short black hairs; head obovoid, shining black, with long black hairs. I can only describe the pupa from the drawing. Shape of *Bellona*; the ventral side and the wing cases pale brown, the latter, along the margins shading into whitish, and at the margin becoming pure white; head-case on the dorsal side, and the mesonotum, pale brown mottled with whitish, in the excavation quite dark brown, especially next the wings; abdomen whitish, finely mottled with pale brown, with a dark brown patch on either side the ventral line on 9, 10, 11.

This larva, in the later stages, is quite different in coloration from *Bellona*, as may be seen by comparing this description with Mr. Scudder's, of *Bellona*; and the pupa differs still more.

5. *Anthocharis Genutia* and *A. Ausonides*.

On page 52 of this volume, I said that I had one pupa of *Genutia* of 1890 living. I had, in fact, three pupæ of that age, but supposed two were dead. But March 9th 1 ♂, and on 13th 2 ♀s came out, beautifully marked, all of them, the orange of the male vivid, and all with unusually large, black edging to forewings, and black marks at tips of the nervules of the hindwing.

At same time a female *Ausonides* has come out of a pupa that I have had since May, 1890, a large, well-marked example, the hindwing very strongly buff colour. I am told that some collectors think that *A. Hyantis* is spring form of *Ausonides*. If so, it is a mistake. There is but one annual brood of *Ausonides*. In different years I have had four examples come from bred pupæ; all in the month of March; all typical *Ausonides*.

6. *Lycæna Lygdamas*, Doubleday.

On May 25, 1891, I received from Mr. A. D. Hopkins, the Entomologist of the Agricultural Station of West Virginia, four larvæ of this

species, found on *Vicia Carolinensis*. Mr. Hopkins wrote:—"The larvæ, when young, feed on the tender leaves and the flower buds; as they grow older they feed on the leaves and stems, eating the stems square off." The adult larva is very like that of *Pseudargiolus* in shape and appearance; length at rest .34 inch; breadth .05 inch; height .05 inch; long oval, the ends equally rounded; the dorsum high, a little flattened at top and sloping either way from about the middle; the last segment flattened; segment 2 is bent forward as in *Pseudargiolus*, and entirely conceals the head when at rest; it is depressed in the middle and thickened and cushion-like about the outer edge; colour pale green, the sides of the ridges marked by short, whitish, oblique bars, each bar crossing two segments; along the base a whitish stripe; on mid-dorsum of 11 is a cross slit, but I saw no fluid issue from it; on 12 the two cylindrical tubes and their tentacles were persistently thrust out and expanded. I got none of these larvæ to pupæ owing to a failure of food.

7. *Neophasia Menapia*, Felder.

Mr. Wright, in August, 1891, sent me eggs of this species obtained by him in vicinity of Mt. Shasta. They were laid 28th August, and I supposed would hatch immediately after arrival. But they have lived through the winter, and now, 15th March, look as fresh as when received. I was unaware that any species of Pierid hibernated in the egg stage. On 24th March, the day being warm, I brought the eggs into the house. On 4th April each egg had changed to white, and the black head of the young larva was visible through the shell. I thought they would soon hatch, but the larvæ died in the eggs. There must be two broods of the imago, and probably the eggs of the first one hatch a few days after laying.

8. *Colias Philodice*, albino male.

Since the issue of the March No. of C. ENT, I have received a letter from Mr. George A. Ehrman, of Pittsburgh, Pa., calling my attention to his report of the capture of an albino male of this species in Ent. News., Vol. 1, pp. 93 and 130. Since two males have been taken, it is to be inferred that others must exist in the proper season. Taking it for granted that all the white examples were female, I never searched for males, and so it has been probably with other collectors.

9. *Colias Christina*.

The first examples known of this species were described by me in 1863, and came from Great Slave Lake—3 ♂, 1 ♀—the males deep orange, the female yellow,

In 1872, I described *Colias Astræa* from a male taken by the Hayden Expedition in Montana. The upper surface was of a delicate buff. In 1883, Mr. Wm. M. Curtis, M. E., at Judith Mtn., Montana, took four males of the typical form; and, in 1890, Mr. W. G. Wright, at same place, took both *Astræa* and orange *Christina* in both sexes.

In CAN. ENT., XV., p. 221, 1883, Captain Gamble Geddes gave a list of butterflies taken by him, and among these was *Astræa*, and also *Christina*, both from Red Deer River. I saw these examples, and they embraced not only typical individuals but others of varying shades of colour, connecting the two supposed species; and with these lemon-yellow examples that seemed to belong to the same species with the others.

Within the last two years, Mr. Burrison and Prof. Owen have collected at Banff, and found all these forms—the orange, the buff and the yellow, with intermediate grades in great variety. Mr. Bean, at Laggan, has not only taken numbers of the same forms, but has carefully bred from the egg, and established the unity of the species *Christina* with *Astræa*, and the yellow form; and in due time we may look for a full account of his observations. From a small lot of larvæ of *Christina* just out of hibernation, sent by Mr. Bean, and received 28th May, 1891, I got four pupæ. On 19th June, emerged a green-yellow male; on 21st, another male, same form; on 22nd a green-yellow female; on 24th a yellow female with orange on the disks of the forewings. At the fourth (and last) moult the larva was .8 inch long; colour dark yellow green; along base a white stripe, within which, a few hours after the moult, a yellow stain began to show itself; no subdorsal white stripe; the under side light yellow-green; whole upper surface thickly covered with fine tubercles and short hairs of light colour; head yellow-green. At maturity the length was 1.4 inch; the yellow had become red in the band, but it was not in a continuous line as in many species of *Colias*, there being only a short red dash behind each spiracle.

The pupa was similar in shape and appearance to that of *Philodice*. Length, .78 to .8 inch; breadth, both across mesonotum and abdomen, .2 inch; the greatest depth, .24 inch; colour yellow-green, the ventral side of abdomen less green, more yellow; a broad yellow stripe from 13 to wing cases on mid-side, and continued, but in diminished breadth along the dorsal edge of wing to end of the beak; on the side of the abdomen below the yellow stripe a narrow stripe of red-brown crosses three segments from the wing case. Duration of the pupa stage about seven days.

TWO DISTINGUISHED SETTLERS.

BY W. HAGUE HARRINGTON, OTTAWA.

In the March number of Entomological News Dr. Horn records the capture at St. John, N.B., of *Carabus nemoralis*, Mull., by Mr. C. B. Riker, in April or May, 1891. I can confirm the occurrence of this species in the locality mentioned and can add from it a second species to our lists. On the 6th Sept., 1891, having the forenoon to spend in St. John I made a visit to the celebrated falls which pour up or down the river, according to the state of the tides, for which the Bay of Fundy is noted. I spent about half an hour searching for Coleoptera, and among the Carabidæ found under drift wood were two species of *Carabus*. As I had never captured specimens of this genus before, I was much pleased to find them, especially as they were different from any American species in my collection. For some time I could not identify them, but they proved to be *C. nemoralis*, Mull., and *C. granulatus*, Dej. Of the former I obtained five individuals (4 ♂, 1 ♀), and of the latter three (2 ♂, 1 ♀), besides a specimen which had the elytra so deformed that I let it remain, to be perhaps the progenitor of a new variety. As *C. cancellatus* had been recorded (although it has not yet been placed in the list) by Dr. Horn in Trans. Am. Ent. Soc., Vol. X., 270, 1883, as found at Wilmington, N.C., I thought for a time that my three specimens might belong to that species. I have now, however, after carefully examining Dejean's description and figures, and also by comparison with European specimens received as *C. granulatus*, satisfied myself that this is the species taken. The capture of this species recalls a specimen, dead and somewhat mutilated, which I picked up in Truro, N.S., some years ago, and which I then supposed to be a variety of *mæander*. The specimen was not kept as it was too much injured to be available for my cabinet, but from my recollection of it I think it must have been *granulatus*. Unfortunately there are few collectors in our Maritime Provinces, so that our knowledge of the occurrence and distribution of species is very small.

NEW NORTH AMERICAN HOMOPTERA—IV.

BY E. P. VAN DUZEE, BUFFALO, N. Y.

Gnathodus impictus, n. sp.

Green, or yellowish green in the dried specimen; scutellum and all beneath quite strongly tinged with yellow. Corium whitish hyaline, nervures green and strong, especially in the male. Wings white, iridescent, nervures pale. Eyes blackish. Antennæ and legs soiled yellow tinged with green, especially on the posterior tibiæ. Otherwise immaculate.

Genital characters. Male: Valve short, hind edge but feebly arcuated. Plates broad and short, outer edge rounded, with a few short, stout, white spines; tips abrupt, narrow whitish, about one-half as long as the disc of the plates, placed nearly their own width from the sutural edge and approximated at apex. Pygofer moderately surpassing the plates, their leaf-like apices commencing at the extreme tip of the plates, where they are quite widely separated, and approaching posteriorly. Female: Last ventral segment long, slightly narrowed posteriorly and truncated at apex. Pygofer narrow, scarcely swollen at the middle, equalling in length the stout oviduct, disc armed with stout spines nearly to the base. Length $3\frac{1}{2}$ mm.

New Jersey. Described from a single pair received from Prof. J. B. Smith, and labelled "New Brunswick, July 20."

Gnathodus abdominalis, n. sp.

Smaller than the preceding. Green, disc of the tergum brown, venter brownish green. Pronotum with three nearly obsolete longitudinal fulvous bands, continued over the basal field of the scutellum, where the lateral ones appear as fulvous-brown spots within the basal angles. Elytra whitish tinged with smoky on their apex, nervures concolorous but distinct. Wings slightly enfumed, nervures brown. Tibial spines pale; claws brown. In faded examples the colour becomes whitish or yellowish green with the fulvous bands obsolete, or nearly so.

Genital characters. Male: Valve large, as long as the two apical ventral segments taken together; apex angled, subacute. Plates but little surpassing the valve, narrow and pointed, fringed with stout spines. Pygofer long, their expanded tips slightly separated at base but approximated beyond. Length, 3 mm.

New Jersey: Described from two male examples received from Prof. Smith, and taken at New Brunswick, July 20th, and Jamesburgh, July

15th. This species differs from the preceding by its smaller size, the discoloured abdomen and the very distinct form of the male genitalia.

Athysanus comma, n. sp.

Form of *A. obsoletus*, Kirsch. Pale yellowish lineate with black and fulvous, anterior edge of the head with four black spots. Length 5 mm.

Female: Vertex flat, very slightly impressed within the obtuse anterior edge; apex less acute than in *obsoletus* or *plutonius*. A spot below each antenna, four on the anterior edge of the head, and a smaller one on the hind edge either side of the median line, black. Pronotum short, obscurely wrinkled behind the anterior submargin, posterior edge straight, anterior feebly arcuated; disc with four equidistant longitudinal strong brown vittæ, which become black where they touch the margins, the two central continued across the scutellum. All the femora and the posterior tibiæ lineate with brown above. Limb of the connexivum, and a slender line at its base, a spot on the apex of the last ventral segment, the sides of the oviduct, a large comma-shaped spot each side on the dorsal aspect of the pygofer, and an abbreviated line on the apex of the tergum each side of the middle, black. Elytra pale; within the costal margin is a broad fulvous band which is continued around the apex and connects with a similar band within the sutural margin; claval suture marked by a slender black line, and exterior to this on the apical half of the corium is a similar and nearly parallel line.

Genital characters: Last ventral segment long, toward the sides thin and compressed around the base of the pygofer, hind edge with a broad, shallow concavity. Pygofer short and stout, their obtuse apex equalling the oviduct.

Iowa. One example received from Mr. C. P. Gillette.

Athysanus bicolor, n. sp.

Form of *A. Curtisii* but larger. Green, banded and lineated with black. Length, $3\frac{1}{2}$ mm.

Head as in *Curtisii*, well produced before and tumid; front swollen; clypeus quadrangular, its broad apex exceeding the tips of the cheeks and a little concave; outer angle of the cheeks rounded. Face black; a broad transverse band below the eyes and sometimes the apex of the clypeus, greenish yellow; vertex pale greenish, two large contiguous spots anterior to the middle or the entire apex, black. Pronotum yellowish green, black anteriorly between the eyes. Scutellum pale, with a broad

black band covering its basal field and the base of the elytra. Elytra yellowish green, nervures concolorous; apical areoles, a large costal cloud beyond the middle sometimes extended along the centre of the antiapical areoles, a line adjoining the claval suture, and the commissural nervure, blackish fuscous. Wings white, nervures slender, brown. Legs and all beneath black; rostrum, tips of the anterior, and intermediate coxæ, knees, tarsi, spines of the posterior tibiæ and the narrow edge of the ventral segments, pale; tergum black with a row of marginal pale spots; last ventral segment yellow, its sides and a heavy, double median line, not reaching its apex, black.

Genital characters. Female: Last ventral segment about the length of the preceding; hind edge feebly angularly concave and impressed toward the middle. Pygofer a little swollen at their middle; black with a broad yellow dorsal line. Oviduct far surpassing the pygofer, rufous.

Described from two female examples, one from Mississippi, kindly given me by Mr. Howard Evarts Weed, and a smaller specimen taken near Emporia, Kansas, by my brother Mr. M. C. Van Duzee.

In the pattern of its markings this species recalls the dark coloured specimens of *Deltoccephalus debilis*, Uhler, but may at once be distinguished by the banded head and pronotum and the more obtuse anterior edge of the vertex.

Athysanus obtusus, n. sp.

Form of the preceding. Head well produced, tumid, as wide as the pronotum, apex obtuse, vertex pentagonal; soiled yellow or fulvous, with two large square black spots anterior to the middle encircled by paler. Front with a few short arcs and a large squarish basal spot black; above this on the edge of the vertex is a concentric black band, interrupted in the middle by a square pale spot at the tip of the head; a large spot below the antennæ and sometimes the ocelli black; outer margins and apex of the face dusky or black. Eyes dark brown, edged with pale behind. Pronotum well arcuated before; surface strongly transversely wrinkled, omitting the posterior and broad anterior margins, the latter paler with about eight black marks more or less coalescent. Scutellum pale, an angular black spot within the basal angles and a few brown lines on the middle. Beneath deep blue-black with one or two spots on the pleural pieces and sometimes the narrow edge of the ventral segments pale. Tergum blue-black, spotted on the margin with yellow or rufous. Legs pale testaceous, lineate below with black. Elytra deep fulvous-

brown or fuscous, nervures distinct, pale, the commissural and those delineating the apical areoles heavy and brown. Wings whitish, highly iridescent.

Genital characters. Male: Valve small, black, edged with pale. Plates broad, but little longer than the valve, cut squarely off on their apex, with a few pale submarginal spines; yellowish, clouded with black beyond the valve. Pygofer nearly twice the length of the plates, blackish, fulvous at apex, with a broad pale yellow median band, their inner apical angles rounded off so as to expose the pale anal tube. Female: Last ventral segment short, hind edge feebly concave; pygofer broad, their pale acute tips much exceeded by the obscurely rufous oviduct.

Length, 3-3½ mm.

Mississippi. Described from one male and three female examples received from Mr. Howard E. Weed.

Deltocephalus flavocostatus, n sp.

Small; fuscous-brown; antennæ, legs, costal margin of the elytra, and a few small spots on the vertex yellow. Elytral nervures pale. Length, 3 mm.

Male: Head shorter, more conical, with the anterior edge more rounded and the vertex more convex than in the most of our species. Vertex marked with about ten yellow points, the apical four form a rhomboidal figure, two are on the ocelli, another pair are placed against the inner margin of the eyes, and on the middle of the basal margin are two elongated marks, in one example nearly obsolete. Face black, closely punctured; clypeus quadrangular, sutures straight; loræ well rounded outwardly, cheeks wide, forming a broad margin beyond the loræ and attaining the apex of the clypeus. Outer angles of the cheeks, a dot below each ocellus and sometimes a few short arcs on the front inferiorly, yellow. Pronotum nearly smooth; anterior submargin thickened and black, with about five yellow points indicating as many very obscure longitudinal lines; hind edge moderately concave. Scutellum black with traces of four longitudinal pale lines. Beneath deep black, the narrow edge of the ventral segments paler, propleura margined with yellow behind. Legs soiled yellow; claws and basal joint of the hind tarsi black. Tergum black, narrowly margined with pale. Elytra fuscous-brown; nervures pale bordered with blackish; costa bright yellow as far as the antiapical areoles with a blackish border within, which extends over the apical areoles and includes two crescentic white marks beyond the yellow costal vitta; extreme apex white.

Genital characters : Valve longer than the last ventral segment, obtuse, brown edged with pale. Plates about one half longer than the valve, narrowed at the apical third ; brownish yellow clouded at base, with a few long pale submarginal spines.

Mississippi. Described from two males received from Mr. Howard Everts Weed.

ENTOMOLOGY FOR BEGINNERS—PACKING INSECTS FOR TRANSPORTATION.

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

By request of Mr. Fletcher I add a few remarks to his article in the January number on "Killing, Preserving and Relaxing Insects," though the subject is so well treated there as to leave little room for additional comment.

The action of the cyanide bottle cannot be depended on as effectual in such a short time as Mr. Fletcher mentions, except in the case of the most tender insects, many Rhynchophora will live there for several hours unless the bottle is quite freshly prepared, and I know of one case in which a *Coelocnemis* remained alive all night confined in a bottle strong enough to quickly overcome the large southwestern species of *Cleonus*. For most northern and eastern insects, however, a short space of time in the bottle is sufficient.

The tubes spoken of should be made of tolerably stiff paper—old envelopes answer nicely—but it should *not* be coloured, as by the common mode of relaxing the insects while still in the tubes there is danger of staining the more delicate ones. Each tube should have a compact wad of cotton placed in the bottom, then the insects (if they are elongate species or have long legs and antennæ) should be carefully dropped or pushed in, head foremost, so as to reduce to a minimum the danger of breakage. Now place another wad of cotton on them and close up the tube, which may be easily done by tucking in the edges with the fingers. In the case of such insects as *Pterostichus* it is my practice to place four specimens, say the size of *mutus*, together in a bunch so that the heads all point the same way and the legs lie close together, the backs being outermost ; now by introducing the heads of all at once into the open end of a tube a little pressure on the posterior extremities will pack them nicely in place. After they are in, if it is desired to put another set of four in the same tube it is much better to place a small but firm wad of

cotton between the two in order to protect the antennæ of the second lot from interfering with and perhaps breaking the hind tarsi of the first. Round insects with short legs such as Byrrhidæ and Histeridæ need no such care. They may be dropped in one after the other only taking care that the cotton is packed tightly enough to prevent any rolling around.

In relaxing insects that have been put up in tubes I much prefer to remove them first, as wet cotton clings to legs and claws so much more tenaciously than dry. Others, however, may find it easier to disengage them from this sticky cotton than to handle them dry.

Never pack these tubes, containing insects, in a tight tin box for they are almost certain to mould and spoil. Be also careful not to pack insects loose in cotton unless you want to leave most of the antennæ and legs behind. I remember that during the first year spent in the south-west I put up a lot of *Eleodes*, *Embaphion*, etc., in cotton—simply putting first a layer of cotton in the box and then one of insects—and hardly a specimen came out whole.

The method I now use, in packing for transportation insects of considerable size, when taken in numbers, is that recommended by Drs. Leconte and Packard. Taking a box of the right size (thread boxes do nicely for insects the size of *Nyctobates* or smaller) a layer of cotton about one-eighth of an inch in thickness is first laid neatly on the bottom. Over this a piece of thin tissue paper is placed; next I take a wisp of cotton and roll it between my hands, making a roll long enough to reach along one side of the box, with two more, one for each end. Now, beginning at one end of the box place your beetles in an even row all along one side, having first laid the roll of cotton in to keep the heads from touching the box. When that row is full make another roll of cotton, place it carefully back of these beetles, to keep the next row from touching them, and put in more beetles as before. When one whole layer is in position on the tissue paper, cover them first with another piece of paper, then another layer of cotton, then more paper, followed by another layer of beetles. From a written description this seems a tedious process, but it is much quicker than putting them in tubes, and is absolutely safe. Specimens of beetles are bound to carry if packed thus in wood or pasteboard boxes strong enough to withstand such pressure as they may be subjected to—but never use tin.

My remarks apply chiefly to beetles, and I do not recommend these modes of preparation for soft-bodied or delicate insects like the Neuroptera or Lepidoptera.

NOTES ON NORTH AMERICAN HESPERIDÆ.

BY EUGENE MURRAY AARON, PH. D., PHILADELPHIA, PA.

From time to time for the past ten years I have been in the habit of receiving, from various collectors in this country and Europe, specimens of North American *Hesperidæ* for comparison and identification with my large collection, which has been justly famous for its completeness. As this collection is now no longer in my possession, being now the property of my friend C. B. Aaron, of Philadelphia, and as I have transferred my allegiance from entomology to ethnology it has occurred to me that it will be well for me to give here to the students of the *Hesperidæ* the benefit of such tables, notes and compilations as have, in years past, been of value to me in the identification of the species in this difficult family.

KEY TO SOME OF THE GENERA OF HESPERIDÆ.

- Knob of antenna bent or curved..... A.
 Knob of antenna straight..... B.
 A. { Knob abruptly bent..... C.
 { Knob curved..... D.
 { Bent portion of knob not over $\frac{1}{2}$ entire length..... E.
 C. { Bent portion of knob a long fine point, often as long
 as remainder of knob..... *Eudamus*.
 E. { Abdomen reaching or surpassing the anal angle. *Pamphila* (1)
 { Abdomen scarcely reaching anal angle..... *Amblyscirtes*.
 D. { Knob of antenna elongate or ovoid..... *Pyrgus* (3)
 { Knob of antenna spindle-shaped..... H.
 H. { Hind wings angulated or crenulated..... *Systasea*.
 { Hind wings not angulated or crenulated..... K. (2)
 K. { Two basal joints of palpi bright coloured
 beneath..... *Pholisora*.
 { Two basal joints of palpi black or fuscous
 beneath..... *Thanaos*.
 B. { Tibiæ with spurs..... M.
 { Tibiæ without spurs..... *Carterocephalus*.
 M. { Last joint of antenna rounded, no spine..... N.
 { Last joint of antenna with short slender spine... *Ancyloxypha*.
 N. { Antenna $\frac{1}{3}$ length of primaries, tibiæ nearly naked. *Copæodes*.
 { Antenna $\frac{1}{2}$ length of primaries, tibiæ with long
 hairs..... *Thymelicus*.

It must be remembered in using this table that it is arranged largely to aid in the differentiation of species along the generic lines at present accepted by most American Lepidopterists. The following remarks will

show wherein it is believed to be defective in nature. The numbers refer to those used in brackets in the table :—

1.—Speyer has pointed out, in the first edition of Edwards's Catalogue, the variability in the antennal knob in the genus *Pamphila* as at present characterized. Close examination will show that in *Leonardus*, *Nemorum*, *Phyleus*, *Uncas*, *Comma*, et al., the bent portion is not more than $\frac{1}{4}$ as long as the basal portion of the knob, and in *Leonardus* it is often a thick cone-shaped piece. In an example of *Metea*, in the collection of the American Entomological Society, the same cone-shaped termination is present, while in a species in the collection formerly in my possession, the terminal spine was nearly as long as the basal portion. Speyer accredits to *Metea* a thick blunt cone.

2.—In describing the new genus *Luitneria* (now *Systasea*), Speyer compares it with *Thanaos* (*Nisoniades*) and I have here, consequently, used the crenulation of the wings as a differentiating character. This, however, will not do in the case of *Nessus*, which Mr. Edwards now strangely places with *Pyrgus*. In my opinion both *Zampa* and *Nessus* belong to one genus, and the erection of the genus *Systasea* was an unnecessary burden to the synonymy.

3.—I have made no allowance for the genus *Leucochitonea* for the simple reason that I do not believe it can be separated from *Pyrgus* along any lines so far accepted by Speyer and others as affording generic demarkation. A specimen of *Pyrgus oceanus*, formerly in my possession, has one antenna true to Speyer's rule, while the other is distinctly as in *Eudamus pylades*. This might be taken to be a sport were it not for the fact that it is along this line that the species of the genus, otherwise closely related, are divergent.

The genera *Pyrrhophaga*, *Erycides* and *Megathymus*, I have not attempted to define here. It has been my purpose simply to compile a table that would aid in the separation of those species commonest in American collections which my acquaintance with such collections leads me to know are most frequently misnamed and misplaced. In subsequent papers I shall discuss certain specific differences which are most likely to be confusing to students of this little-understood family.

NEW NORTH AMERICAN MICROLEPIDOPTERA.

BY PROF. C. H. FERNALD, AMHERST, MASS.

Teras comandrana, n sp.

Expanse of wings 13 mm. Head, palpi, thorax, and basal half of forewings, light yellowish-brown or fawn coloured. A large cinnamon-brown triangular spot rests on the costa, extending from the middle to the outer fourth, and the apex extends nearly half way across the wing. The outer part of the wing is light cinnamon-brown, and the whole surface is crossed by numerous oblique, irregular, metallic bands, which are visible only in an oblique light. A row of minute black tufts along the inner side of the costal spot, two or three more near the fold below, one on each side of the fold at the basal third of the wing, and three near the middle of the wing at the outer fourth. Fringe concolorous with the outer part of the wing.

Upper side of the abdomen, hindwings above and beneath, and the underside of the forewings, light steel gray, with a silky lustre. Fringes lighter.

The larva of this species which was found in Amherst, Mass., May 24, 1890, feeding on *Comandra bellardi*, is light green above and much lighter beneath. The head and thoracic shield are jet black, with the usual scattering hairs; the other segments have the usual protuberances of a whitish colour. This larva pupated June 11th, and the moth emerged June 21, 1890.

Described from three examples, one from Amherst, Mass., and two from Pennsylvania. I have two others from Texas which differ from the above description only in being much lighter in colour.

Cacoecia magnoliana, n. sp.

Expanse of wings from 21 to 25 mm. Head, thorax and forewings, fawn coloured, the last somewhat darker and with purplish reflections on the middle field. The costal fold of the male, and the costal spot are cinnamon coloured; and there is an oblique, elongated, reddish-brown spot arising from near the base of the hinder margin, a similar spot rests on the fold below the outer part of the cell, and a smaller, elongated spot of the same colour lies in the outer part of the cell. These three spots are dimly outlined with whitish scales. The outer part of the wing is dull whitish, and crossed by a somewhat ill-defined, smoky-brown, curved band, extending from the costal spot to the anal angle. The outer edge

of the wing is marked with black reticulations from the apex, where they are widest, nearly to the anal angle.

The hindwings and abdomen above are pale fuscous. The under side of the forewings is pale fuscous, lighter along the costal and hinder margin. The under side of the hindwings is pale yellow with fuscous reticulations at the apex.

Bred from *Magnolia acuminata* by Mr. M. V. Slingerland at Ithaca, N. Y.

Pyrausta magdalena, n. sp.

Expanse of wings 16 mm. Head ochre-yellow with a whitish line over each eye. Labial palpi, nearly as long as the head and thorax, porrect, laterally compressed, slightly bushy, whitish within, ochre-yellow along the middle of the outside, and fuscous along the edges and at the end.

Thorax, ochre-yellow with a metallic stripe on each side, extending from the head back across the patagium.

Forewings ochre-yellow with a very slight reddish tinge along the costa. Three metallic stripes extend outward from the base of the wing, one along the costa, and one along each margin to a similar stripe which starts from the basal third of the wing and curves around to the middle, where it joins the central stripe, then runs obliquely across to the middle of the hinder margin. Two parallel curved stripes cross the wing near the outer margin, the inner one of which is more or less bent inward on vein 2. All these stripes are metallic and edged on each side with black scales.

Described from three examples, one from Texas and two from Florida.

I take great pleasure in naming this beautiful little moth for a most estimable lady, the wife of Rev. Geo. D. Hulst.

I formerly supposed this species to be *Botis plumbofascialis*, Led., which he said was from North America; but this was a mistake, as his type is labelled "S. Africa," and proves to be the same as *Botis plumbatalis*, Zell. Mic. Caff. p. 47.

Coleophora fletcherella, n. sp.

Expanse of wings from 10 to 12 mm. Head, palpi and basal joint of the antennæ, yellowish steel gray. Body, legs and wings above and beneath, plain steel gray, much more intense in fresh specimens.

The palpi are without tufts, the basal joint of the antennæ with a

slight tuft, and the remaining joints of the antennæ and also the joints of the tarsi are steel gray annulated with white.

The cases are brown, composed of a portion of the leaf, cylindrical or fusiform, slightly compressed laterally, and with a more or less distinct ridge above and beneath. The mouth is more or less oblique, with the edge flaring out slightly. One side of the case is covered with fine hairs while the other is smooth, showing that the larva constructs its case from the upper and under sides of the leaf.

Described from three specimens received from Mr. James Fletcher, for whom I name this species, and who bred it from apple. I have also received the same species from Prof. Lintner who also bred it from apple.

NOTES AND DESCRIPTIONS OF BOMBYLIDÆ.

BY D. W. COUILLETT, LOS ANGELES CAL.

Exoprosopa, Macq.—At the present time no little confusion exists in regard to those species in which the brown of the wings does not form crossbands, and I am unable to give a table for separating these species that would be of much use to the student. Those species from the United States which possess crossbands of this kind, and which always have the anal and axillary cells more or less brown, may be tabulated as follows:—

1. Wings brown, the apex broadly, and a large spot in the discal cell, hyaline.....*emarginata*, Macq.
Wings not marked like this.....2
2. The brown crossband at apex of discal cell reaches the hind margin of the wing.....3
The brown crossband does not reach the hind margin.....4
3. A pure hyaline crossband near base of wing..... { *caliptera*, Say.
A yellowish but never pure hyaline crossband near base of wing..... } *dorcadion*, O. S.
.....*decora*, Lw.
4. Extreme apex of marginal cell hyaline.....5
Extreme apex of marginal cell brown.....*fascipennis*, Say,
5. With a brown spot at base of vein between the second and third posterior cells.....6
Without this spot, the wing at this point being pure hyaline.....*grata*, n. sp.
6. Base of discal cell more or less hyaline.....7
Base of discal cell wholly brown.....*eremita*, O. S.
7. First posterior cell open, or closed near the margin of the wing.....*doris*, O. S.
First posterior cell closed and long petiolate.....*iota*, O. S.

Exoprosopa grata, n. sp.—Black, lower part of front, face except in the middle, sides of anterior half of oral margin broadly, scutellum except its extreme base, sides of abdomen on basal half, venter except sometimes at the apex, reddish, legs sometimes also reddish. Tomentum of front and face brassy yellow, the pile black; face concave, considerably produced below; proboscis never projecting more than the length of its labellæ beyond the oral margin; first joint of antennæ three times as long as the second and about equal to the third, the latter in profile gradually tapering from base to apex, about twice as long as the terminal style; tomentum of occiput silvery white. Tomentum of thorax mixed black and brassy yellow, pile of dorsum black, that of ends and sides yellowish, the bristles black; pile of pleura light yellow, that above the middle coxæ white, on all the coxæ mixed yellow and black. Pile and bristles of scutellum black, the tomentum mixed black and brassy yellow. Tomentum of abdomen black and brassy yellow, the yellow forming a crossband at base of the second segment and a large spot on each side of the third, fourth, fifth and sixth segments, most extended on the fourth where it forms a broadly interrupted crossband; tomentum of the seventh segment silvery white; pile of sides abundant, that on the first segment and anterior third of the second yellowish, on rest of abdomen black; tomentum of venter white, mixed with a few black ones posteriorly, the pile yellowish and black. Tomentum of legs mixed black and brassy yellow, front tibiæ destitute of bristles, claws of front tarsi scarcely perceptible. Wings hyaline, costal cell yellowish, base of wing to beginning of basal cells brown, the hyaline part with two brown crossbands; the first one begins at costal cell in base of the marginal, fills apical half of the first basal, apical fourth of the second basal, base of discal and extreme base of the third posterior, basal third of the fourth posterior, last half of the anal cell except its extreme apex, also fills last three-fifths of the axillary cell, besides forming a border to the extreme base of the second vein; the second brown band fills the middle third or more of the marginal cell reaching apex of the costal cell, crosses the first submargin: 1 and first posterior cells near the middle of each, fills extreme apex of the discal and the upper corner of base of second posterior cell, not reaching the third posterior cell. Length 13 to 16 mm. Merced County, California, and Washington. Four specimens; in July.

Nearest related to *eremita*, O. S., but readily separated from it, and from *doris*, O. S., by the second brown crossband of the wings never

reaching the third posterior cell, and also by the fact that the crossband of light coloured tomentum on the fourth segment of the abdomen is always broadly interrupted in the middle.

Exoprosopa iota, O. S.—Originally described from Mexico. I have specimens which I collected in Los Angeles county, California. It is almost certain that this is simply a form of *doris* in which the first posterior cell is closed and petiolate. In the CANADIAN ENTOMOLOGIST for January, 1887, pages 12 and 13, I called attention to the variability of this character in specimens of *doris* captured at the same time and place, stating that in view of this fact Rondani's proposed genus *Argyrosipila* must be rejected—an opinion previously expressed by the learned Austrian Dipterist, Dr. Schiner, but which fact I was not aware of at the time of writing the article above mentioned.

Geron, Meigen.—Up to the present time but a single species belonging to this genus has been reported from the region west of Texas; this is *albidipennis*, Loew., which is not rare in Southern California. My collection contains two other as yet undescribed species from this State, both of which will be readily distinguished from the above species by the form of the third antennal joint. In the latter this joint when viewed from the side is seen to taper very gradually to the tip, the outline being narrowly lanceolate, about six times as long as broad. The other two species may be characterized as follows:—

Geron fasciola, n, sp.—Head black, front and face silvery white pollinose in the ♂, light grey in the ♀, very short, sparse white pilose; first joint of antennæ one and a fourth times as long as the second, the third joint one and a-half times as long as the first two, in profile scarcely more than twice as long as broad, tapering slightly to the apex, which is obliquely truncated and bears a small tubercle which extends obliquely upward; proboscis, excluding the labellæ, one and a-fourth times as long as the head, tip of palpi reaching its middle, occiput light grey pollinose, and sparse white pilose. Thorax black, the margins light gray pollinose, that in middle of dorsum brown, continued in two median lines anteriorly; very short sparse white pilose; pleura, coxæ and scutellum light gray pollinose and sparse white pilose. Abdomen black, hind margin of each segment white, most extended on the first segment; entire dorsum light gray pollinose and sparse white pilose; venter white, sparse white pilose. Legs black, light gray pollinose, apex of each femur narrowly, basal half or more of each tibia, and base of each metatarsus, yellow, the

pile sparse, white; no bristles nor spurs. Wings pure hyaline, veins yellow, the costal from apex of auxiliary to apex of fourth vein brown; small cross-vein at or slightly before the middle of the discal cell, great cross-vein straight, last two sections of the third vein subequal in length, apex of second submarginal cell half as long as the last section of the third vein. Length $2\frac{1}{2}$ to 4 mm. Merced County, California. Five males and four females in August.

Geron capax, n. sp.—Black, light gray pollinose, that in middle of dorsum of thorax brown, in the ♀ continued anteriorly as two median lines, but in the ♂ the entire dorsum is brown, with the exception of two indentations on the front end and a smaller one each side, situated on the thoracic suture; pile of entire body sparse, whitish. First joint of antennæ nearly twice as long as the second, the third joint twice as long as the first two, in profile four times as long as wide, of nearly an equal width, the upper corner cut away for half the width of the joint, leaving the lower half projecting far beyond it, the apex broadly rounded. Proboscis, excluding the labeliæ, one and a-half times as long as the head, tip of palpi reaching its last third. Base of each abdominal segment darker than the remaining portion. Wings hyaline, apex of subcostal cell yellow, the veins brown; small cross-vein slightly before middle of discal cell, great cross-vein bisinuate, last two sections of the third vein subequal in length, apex of second submarginal cell one-third as long as the last section of the third vein. Length 6 mm. Orange County, California. Two males and three females.

The colour of the halteres is not the same in any two specimens. The relative length of the proboscis is also variable; in one of the males it is fully two and a-half times as long as the head.

A SARCOPHAGID PARASITE OF CIMBEX AMERICANA.

BY C. H. TYLER TOWNSEND, LAS CRUCES, NEW MEXICO.

Recently Professor Aldrich, of Brookings, So. Dakota, sent me two specimens of a Sarcophagid which he had bred from *Cimbex*. They prove to belong to the old genus *Sarcophaga*, and are described below. It seems impossible to identify them positively with any of the published descriptions.

Sarcophaga cimbicis, n. sp. ♂.

Eyes dark brown, bare; front one-fifth width of head, silvery white,

frontal vitta slate-black, about one-half width of front ; sides of face and facial depression silvery white, with a brassy lustre, the sides of face with a row of bristles below near the eye-margin ; cheeks silvery, wide, bristly : vibrissæ stout, decussate, inserted on oral margin, facial ridges bare except several short bristles above vibrissæ ; frontal bristles descending to base of third antennal joint, two posterior pairs directed backward, no orbital bristles ; antennæ blackish, third joint hardly twice as long as second, moderately wide ; arista concolorous, 3-jointed, thickened on basal third, plumose on basal half or more ; proboscis brownish, almost as long as height of head, stout ; palpi blackish, moderately stout, bristly ; occiput silvery white, covered with black bristles. Thorax silvery white, with three heavy black vittæ ; scutellum silvery white, with a subapical divergent pair of macrochætæ, a very weak decussate apical pair of bristles between them, a decussate weak subdiscal pair of bristles, and two lateral pairs of macrochætæ. Abdomen about as wide as thorax, silvery, marbled with gray, with a more or less distinct median dark line ; hypopygium rufous yellow ; first and second segments with a lateral macrochæta ; third with about three lateral, a median marginal pair, and some shorter marginal bristles between ; anal with a marginal row of about twelve. Legs blackish, femora silvery white, tibiæ bristly, claws and pulvilli elongate, pulvilli smoky black. Wings grayish hyaline, longer than abdomen ; apical cell widely open before tip of wing, fourth vein with wrinkle and slight stump at bend ; apical cross-vein deeply bowed in, hind cross-vein sinuate, nearer to bend of fourth vein ; tegulæ nearly white, halteres tawny yellowish.

♀. Differs as follows : Front nearly or quite one-third width of head, frontal vitta about one-half width of front ; three hind pairs of frontal bristles directed backward, the hindmost pair much the longest and the forward pair of the three much the shortest ; two stout orbital bristles directed strongly forward. The weak decussate apical pair of bristles on scutellum is apparently wanting (there are no scars apparent), the weak subdiscal pair of bristles are not decussate. Abdomen broadened, much wider than thorax, macrochætæ nearly the same ; anus rufous-yellow, fringed with marginal bristles. Claws and pulvilli much shorter.

Length of body, 7 to 8 mm.; of wing, $6\frac{1}{2}$ to 7 mm.

Described from one male and one female, bred by Professor J. M. Aldrich from cocoons of *Cimbex Americana*. Issued May 30 and June 2. Brookings, So. Dakota.

OVIPOSITING IN THE GENUS ARGYNNIS.

BY HENRY SKINNER, PHILADELPHIA, PA.

I wish to make a contribution to the literature of the subject of "egg dropping," and place on record in an entomological journal an observation I made nine years ago. I do this with the object of calling general attention to this subject, which I think an interesting one, and in hope that lepidopterists may be on the look out for this method of ovipositing in all the species of the genus. In the Proc. Acad. Nat. Sci., Phil., vol. 35, p. 36, I called attention to the fact that *Argynnis cybele* deposited its eggs while on the wing, or in other words, dropped the eggs from a height to the herbage below. Mr. Scudder in Butt. East. U. S. and Can., vol. 1, p. 560, says: "The eggs are laid upon the leaves and stalks of the food plant, and not, as stated by H. Skinner, dropped from a distance upon the herbage." He further says: "It is not an altogether uncommon thing for an egg to become attached to the scales at the top of the abdomen of a butterfly, or upon one of the hind legs; and it is possible that in the movement of the wings in flight or poising, such an egg might have been swept or brushed off during Mr. Skinner's observation." Mr. Scudder tries to disprove my statement by a very ingenious supposition. I call attention to the method of ovipositing he describes, to see if anyone has ever observed it. I did not state that *Argynnis cybele* invariably dropped its eggs, but I have since learned that this method is by no means uncommon in the genus. I have repeatedly observed *A. myrina* hovering over wet fields, where violets grew in the herbage, dropping its eggs indiscriminately about. In this journal, vol. XXI., p. 130, will be found some remarks on this subject, and in a foot note it is stated that Mr. Aaron has observed the same habit in *A. bellona*, and is strongly of the opinion that strange motions frequently observed in *A. diana* in Tennessee are to be accounted for in the same way. The subject under discussion was brought fresh to my mind by reading the very interesting article by Mr. Wright (Mar. No., vol. 24) who says:—"Different species of *Argynnids* have different methods of ovipositing, but none that I know of require a plant. Other species, as *semiramis*, oviposit on the wing without ever alighting, but hovering over suitable places dropping the eggs at pleasure." I was greatly pleased too, on reading the above, to find my early observation confirmed by such an acute observer. I can give no reason for this method, and Mr. Wright's reason for such actions would hardly hold good here. He says:—"The reason

for this peculiar habit seems to be to avoid small lizards which abound and which are alert to seize any flying insect." The species which have been observed dropping their eggs are *cybele*, *semiramis*, *myrina*, *bellona*, *diana* (?). Are there others?

NOTES ON MELITTIA CETO, WESTW.

BY JOHN B. SMITH, NEW BRUNSWICK, N. J.

The notes on this species by Dr. Kellicott, in the February number of the CANADIAN ENTOMOLOGIST, induce me to place on record some of the observations made by me during the past year and used in my annual report; and also to call attention to a very old record that in part answers the question—Is the species double-brooded? Looking over the MSS. drawings by Abbot in the British Museum, I found a picture of this species, and to it the following note:—"The caterpillar of this sort lives in and eats the stalk of Cymbing vines, pale brownish white, resembling a maggot; spun up in the ground 16 July, bred 11th Aug. Also taken 19th July. It flies in the day, frequents cymbing and pampion vines; not common."

This record refers to the vicinity of Savannah, Georgia, and is definite enough to prove that an early brood comes to maturity in July and August, leaving quite a sufficient time for a second brood of larvæ to mature in early October. I believe the occurrence of Dr. Kellicott's specimen in late August to be abnormal, and not a usual thing in that locality. In New Jersey I feel convinced that we have but a single brood, one that has a long period of flight and is of slow growth in the larval stage. Near New Brunswick, N. J., the moth does not appear until the middle of June, and on Long Island, as I am informed, the latter part of June and early July is the date of the first appearance. A much earlier date would be destructive to the species since squash vines are not planted here until about the middle of May or later, and do not begin to be of size to support larvæ until June or July. On the 26th of June I found eggs numerous, but not until July 6th did the first larva appear, and the last of the eggs collected on the 25th June, hatched on July 11th, giving at least a 15 day period for the egg. Moths were still flying at that time and continued for some days later. It is interesting to note that just about the time eggs begin to hatch generally in New Jersey, Abbot records his larva as full grown and ready to spin up. The record of the

capture of the imago on July 19th raises the other question:—Were these belated individuals of the spring brood, or abnormally early specimens of the summer brood?

Eggs laid at about the middle of July would not hatch until early in August, at a time when those first hatched would already be nearly one month old. In September I found full grown and less than half grown larvæ together in one stem, and the full grown larvæ were getting ready to spin up. Those half grown at that time increased very slowly, and up to the first weeks in October were still feeding. Meanwhile, the larvæ that spun up early in September were quiescent within the cocoon, and up to date—February 23rd—none of them have transformed to pupæ. To get two broods into one season, all the periods must be considerably shortened and the development must be much more rapid.

For these reasons I believe that we have in New Jersey and northward one brood only; that the time of appearance of the imago extends over nearly if not quite one month, and that six weeks may be the period of flight; that at least 15 days are required for the eggs to develop; that the larva requires from seven to eight weeks to come to maturity; that the larva remains unchanged within the cocoon during the winter. The date of pupation and the period passed in that stage has not yet been ascertained. I hope Dr. Kellicott will be able to ascertain this positively, and thus complete the life history of the insect. The economic problem of how best to deal with the species need not be discussed in this connection, but is much simplified by the better knowledge we have of its habits.

OBITUARY.

THE ABBÉ PROVANCHER.

It is our painful duty to record the death, in his 72nd year, of the Abbé Léon Provancher, who for many years, despite great discouragements and disadvantages, laboured zealously and assiduously to develop and disseminate a knowledge of the natural history of Canada, and especially of his native province. He was born in 1820, at Becancour, Que., and for some years was Curé of Portneuf, and one of his earlier entomological writings was a list of the Coleoptera of that district. Compelled by enfeebled health to relinquish the regular and more active duties of the ministry, he removed to Cap Rouge, near Quebec, and

devoted his remaining time and strength almost entirely to the study of the natural sciences. In 1869 he commenced the publication of the *Naturaliste Canadien*, and, notwithstanding many discouragements, completed in 1891 the twentieth volume, when its issue had reluctantly to be abandoned, through the Quebec Government refusing to continue the scanty annual grant it had received. As early as 1858 Provancher published an elementary treatise on botany, and in 1862 his *Flore du Canada*. Subsequently he devoted his attention specially to entomology, and in 1874 commenced his *Faune Entomologique du Canada*. Vol. I., treating of the Coleoptera, was completed in 1877, with three supplements in 1877, 1878 and 1879. Vol. II. was commenced in 1877 and completed in 1883, and contains the Orthoptera, Neuroptera and Hymenoptera. In 1885-1889 he published *Additions aux Hymenopteres*, and issued Vol. III. upon the Hemiptera, which was completed in 1890. He was also an enthusiastic conchologist, and his last publication was a treatise upon the univalve molluscs of the Province of Quebec. His writings include the account of a pilgrimage to Jerusalem, an excursion to the West Indies, treatises on agriculture, etc. He will be best known, however, by his entomological work, and as he described a large number of new species and genera, particularly of Hymenoptera and Hemiptera, it is sincerely to be hoped that his collections may be placed where the types will be carefully preserved and be accessible to students of entomology.

There is a disposition on the part of some American students to ignore the work of Provancher, and to accuse him of want of care, etc., in the determination of genera and species. The enormous disadvantages under which he laboured must, however, be considered, for he was remote and isolated from libraries, collections and fellow-workers, and in his writings he often laments the fact that so few could be found to take any active interest in his pursuits, or to assist him in his labours. His entomological work would have been more exact and complete had not the publication of the *Naturaliste* greatly interrupted his investigations, and forced him to spend much of his time in other directions. His labours had the result of starting natural history collections in some of the colleges in the Province of Quebec, but our French citizens do not appear to have any special leaning to the sciences he loved, and he has left behind him no entomological student of any distinction. Above all Provancher was an ardent Canadian, strongly imbued with love of his race, language and religion, and often in his writings he impresses these sentiments upon his readers. A few years ago he was elected a Fellow of the Royal Society of Canada, and he was also a member, active or honorary, of many other societies.

W. H. H.

A NEW ISCHALIA FROM VANCOUVER ISLAND.

BY W. HAGUE HARRINGTON, OTTAWA.

Ischalia Vancouverensis, n. sp. Length $7\frac{1}{2}$ mm. Flavo-testaceous, abdomen, disc of elytra and middle of antennæ purplish-black. Head deflexed, polished, prominently rounded between antennæ; eyes moderate, emarginate, coarsely granulated; antennæ reaching to apex of humeral pale spot, stout, first joint swollen, second small, remaining joints more elongated, gradually shortened, terminal joint acutely pointed, three basal and two terminal joints rufo-testaceous, intervening six blackish or piceous. Thorax bell-shaped, about as broad as long, rounded and elevated anteriorly with a shallow median sulcus, from which a carina runs to the posterior margin and projects in a sharp point; a deep transverse impression in basal third; base biemarginately truncate, with angles produced in blunt points; scutellum prominent, rounded at apex. Elytra with disc depressed, flattened, strongly confluent punctured, a prominent humeral costa extending nearly to apex, marginal costa prominent, acute, disc purplish-black, elongate humeral spot and all the margin testaceous. Abdomen purplish-black, alutaceous.

Described from six males from Comox, Vanc. Isd., received from Rev. G. W. Taylor in a very interesting and valuable collection of Coleoptera of Vancouver Island. Differs from *Ischalia costata*, Lec., in having the head unicolorous with thorax and legs, the abdomen entirely purplish-black, etc.

CORRESPONDENCE.

THE CUCUMBER MOTH.

Dear Sir,—I have the pleasure of announcing the addition to the Canadian list of that attractive Pyralid *Eudiotis nitidalis*, Cram., captured by Mr. T. H. Hill, of this place, in his garden last summer. It is known as the Cucumber Moth, in distinction to its congener the Melon Moth, *E. hyalinata*, Linn., both of them reported to be at times quite destructive to these crops in the Southwestern States. It is now over ten years since I captured the first known Canadian specimen of *E. hyalinata*, and it has been rarely taken since, and it is not known to be spreading, so that *E. nitidalis* may never become to us anything more than an exceedingly desirable cabinet specimen. Mr. Hill has kindly surrendered his unique to the interests of the Society. He has also most generously contributed his only specimen of that rare beetle *Hydrophilus ovatus*, which was wanting in the Society's collection.

J. ALSTON MOFFAT, Curator.

London, Feb. 18, 1892.

Mailed April 28th.