

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/
Couverture de couleur

Coloured pages/
Pages de couleur

Covers damaged/
Couverture endommagée

Pages damaged/
Pages endommagées

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Cover title missing/
Le titre de couverture manque

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Coloured maps/
Cartes géographiques en couleur

Pages detached/
Pages détachées

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/
Transparence

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Quality of print varies/
Qualité inégale de l'impression

Bound with other material/
Relié avec d'autres documents

Continuous pagination/
Pagination continue

Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/
Comprend un (des) index

Title on header taken from:
Le titre de l'en-tête provient:

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

Additional comments:
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The Canadian Entomologist.

VOL. VIII.

LONDON, ONT., FEBRUARY, 1876.

No. 2

THE NORTH AMERICAN BLUE BUTTERFLIES OF THE GENUS NOMIADES.

BY SAMUEL H. SCUDDER, CAMBRIDGE, MASS.

Some years ago I proposed* the generic name *Glaucopsyche* for a group of blue butterflies of eastern N. America having a glaucous sheen to the upper surface of their wings: I had not then recognized its strictly generic alliance with a group of similar forms in Europe and on our Pacific slope, which do not all possess this peculiarity, and to which the older generic name *Nomiades* Hübn. must be applied. A recent study of their common structural features, however, shows that *Glaucopsyche* can no longer be retained. Finding that there has been some confusion, at least in the cabinet designations of the species of this group, a brief revision of the same, with comparative descriptions, is here offered.

The species belonging to this group, it may be remarked, all have but a single transverse series of spots upon the under surface of the hind wings (the extra-mesial row), the submarginal markings being wholly obsolete. In the six American species the upper surface of the wings of the male are always blue, more or less broadly and distinctly margined with dark brown, while the wings of the female have this surface dark brown, more or less amply suffused from the base outward with blue.

1. *N. XERCES* (*Lycæna Xerces* Boisd.) In this species the blue on the upper surface of the wings of the male is of a pale tender violet and the margin is neither so black nor so narrow as in the other species, and has a very faint extreme edge of black. The upper surface of the wings of the female is of a little paler brown than in the other species, has a decidedly white, untarnished fringe, and at the base scattered blue scales as in *N. Antiacis*, but extending further from the base; the black outer edge is more distinct than in the female of the other species. Beneath,

* *Syst. Rev. Am. Butt.*, 33.

the species is readily distinguished by its having all the spots large and white, with no black pupils; they are usually roundish subquadrate and those of the same series nearly coalesce to form a continuous band. California.

2. *N. ANTIACIS* (*Lycæna Antiacis* Boisid., *Lycæna Mertila* Edw.) The blue of the upper surface of the wings in the male of this species is much less pruinose than in the following two species, although it occasionally varies toward them in this respect; the normal color, however, is a deep violet and the black border of the wings is of the same depth of color and narrowness of extent as in these species. The upper surface of the female is almost entirely brown with a few scattered blue scales near the base of the wing running out toward the middle. Beneath, the wings closely resemble those of *N. Couperi*, but the sprinkling of hoary scales is nearly uniform over both wings. California.

Lyc. Mertila Edw. seems to me clearly referable to this species, since the only part of the description which does not fit it is the statement that, on the underside of the fore wings, "from the arc" (or transverse bar at the apex of the cell) "a whitish ray runs toward the base."

3. *N. COUPERI* (*Glaucopsyche Couperi* Grote; *Lycæna Pembina* Edw. [Syn., nec. Proc. Phil. Acad.]* *Lycæna Lygdamus* Doubl. [List Brit. Mus. nec Entom.]) This species closely resembles the following, with which it has often been confounded; the two, indeed, would perhaps be universally considered geographical races of a single species, were they known to meet anywhere on common ground. The upper surfaces of the wings of the males of the two species appear to agree altogether. The upper surface of the wings of the female of this species is brown, rather heavily suffused with cœrulean blue on the fore wings as far forward as the upper limits of the cell, and to an equal distance toward the outer border; on the hind wings, the blue scales are more generally diffused, but in much less abundance. Beneath, the spots are much smaller than in *N. Lygdamus*, sometimes reduced on the hind wing to the merest black specks encircled with white; and the ground color is obscured, especially on the hind wing, by a rather abundant powdering of grayish hoary scales. A

* A prolonged study of all the species of N. American blues leads me to the conclusion that the true *Lyc. Pembina* Edw. has been twice redescribed; under the names *L. Lyceu* Edw. and *L. Rapahoe* Reak.

northern Atlantic-species, not yet found in the United States, but extending from Anticosti and Southern Labrador to Lake Winnipeg and the Saskatchewan.

4. *N. LYGDAMUS* (*Polyommatus Lygdamus* Doubl. Entom.) I have never seen the female of this species, but the wings of the male are pale glistening pruinose blue above, with a narrow, distinct, black border; beneath, the species is peculiar for the large size of the ocellated spots, the clearness of the dark slate brown ground color little obscured by any dusting. It is a Southern Atlantic species, ranging through the sea-board States of the Union from the valley of the upper Susquehanna to Georgia.

5. *N. ORO*, nov. sp. This species has been referred in collections to the preceding species, with which it is no doubt closely allied, but from which it differs in several particulars. The upper surface of the wings of the male is almost entirely destitute of the pruinose bloom of *N. Lygdamus* and is of a much more delicate, tenderer blue, which permits all the spots of the under surface to be seen upon the upper side, a peculiarity shared with it by the following species only; the dark border of the wings is also narrower than in *N. Lygdamus*, but equally well defined though not so dark; the grayish white fringe of the hind wings is not in the least interrupted by blackish at the nervure tips, as it always is in *N. Lygdamus*. The upper surface of the wings of the female is mostly of the same blue as in the male, through which the spots of the under surface of at least the hind wings may be seen; the apical fifth or sixth of the fore wings is brown, generally merging gradually into the blue and never sharply defined from it; so the anterior portion of the hind wings is of the same brown as far as the subcostal nervure and its middle band, and a narrow line of brown follows the hind border; the apex of the cell is marked by a very narrow, sub-obsolete, transverse blackish bar. Beneath, the wings closely resemble those of the Californian *N. Antiacis*, but the extra mesial series of spots on the hind wings is more uniform, the distance between the second and third spots (from the costal border) being less than usual in this genus. I have only seen this species from Colorado.

6. *N. BEHRII* (*Lycæna Behrii* Edw.; *Lycæna Polyphemus* Boisd.) The upper surface of the wings of the male is of a blue, scarcely differing from that of *N. Oro*, but is not quite so delicate and is slightly darker, with all the veins slightly hoary and so more than usually distinct;

the base of the costal border is also distinctly marked with whitish scales; the dark bordering of the wings is narrower than in any of the other American species of *Nomiades*, narrowing on the fore wings from in front backward so as to be a mere line below the middle of the wing, and being but a mere line throughout the entire outer border of the hind wing; the tips of the nervules are narrowly blackish; the fringe is blackish at base, whitish beyond, most narrowly interrupted with blackish at the tips of the nervules of the hind wings. The upper surface of the wings of the female, an inspection of which I owe to the kindness of Mr. Mead, resembles that of *N. Couperi*, but the hind wings are more suffused with blue. Beneath, the ground color of the wing is paler than in our other species, being of a delicate pale French gray, slightly darker in the female than in the male; and it differs from the other species also in the contrast between the size of the spots on the fore and hind wings, though a similar but not so striking a disparity may sometimes be seen in *N. Couperi*; on the fore wing these spots, with their rather narrow white borders, occupy each an interspace's width, though the transverse bar at the tip of the cell is reduced nearly to a line; on the hind wings the bar at the tip of the cell would scarcely be noticed but for its white bordering, and the spots are of uniform size, the black pupils reduced to little more than dots with a pale bordering as broad as that of the spots on the fore wings. The only specimens I have seen come from the southern part of California; probably the species does not occur in the middle and northern parts of the State.

It appears highly probable that the species here described is the true *Lyc. Behrii* Edw., though not the species (*L. Maricopa* Reak.*) labelled *L. Behrii* in collections, from the later determinations of Mr. Edwards. It may also be considered the *Lyc. Polyphemus* of Boisduval, a name which Mr. Edwards has placed as synonymous with the *L. Behrii* of his later determinations, *i. e.*, *L. Maricopa*. In the specimens above described, however, the two upper spots of the extra mesial series of ocelli on the hind wing (to which it would seem that Boisduval referred) are not coalesced, devoid of ocelli, and their separation indicated by a dusky nervule. Boisduval's expression is "on voit à la place des deux petits points discoïdaux, une tache blanche cordiforme coupée transversalement par une petite ligne noire à peine sensible." He also speaks of the female as brown, without reference to the basal suffusion of the wings with blue.

* This species has sub-marginal markings on the wings.

DESCRIPTIONS AND NOTES ON CERTAIN MOTHS.

BY A. R. GROTE,

Director of the Museum, Buffalo Society Natural Sciences.

Among several interesting species of Noctuæ, which recent collections in the vicinity of Buffalo, N. Y., have brought to light, is a species of *Gortyna* Hübn. (= *Hydroecia* L.ed.) allied to *G. nitela* Guen. I have already called attention to the fact that the single European species of *Ochria* Hübn., to which Lederer would restrict the term *Gortyna* (as I believe incorrectly), is distinguished by a clypeal projection, easily perceived if a slender pin is passed along the front, without denuding the head of the insect. The Californian *Ochria Saualite* is also furnished with a clypeal horn; but the Eastern species are without it, and are all referable to the genus *Gortyna*. Many of the species of this genus are infrequently met with, as a rule; and, even in Europe, seem to be among the rarities. This is perhaps owing to their habits; the larvæ being internal feeders in the stems (*Gortyna* in part) or roots (*Apamea* Ochs. = *Hydroecia* Guen.) of plants. Mr. Norman has bred *Gortyna cataphracta* Grote from thistle stems. This latter species has a curious resemblance to the European *Ochria flavago*, but differs generically by the want of the clypeal horn.

Gortyna necopina, n. s.

♂ ♀. Of the same blackish olivaceous with *G. nitela* and *Stibadium spumosum* Grote, with paler hind wings. Everywhere there is an even sprinkling of white scales. These can be seen on the body parts and secondaries, as well as most prominently on the dark anterior wings. No markings on these latter whatever. All lines and spots obsolete. Only the reniform indicated by a deeper color. *The costal white ante-apical dots* are obsolete or extremely minute. Beneath both wings pale, like hind wings above, everywhere pulverulent with white. The legs and under body parts are everywhere powdered with white. This character is here not very conspicuous and becomes unnoticeable when the insect is rubbed, as is the case with my male example. It may be made out, however. The median space of primaries is more sparsely frosted. *Expanse*, ♀, 43 mil.; *length of body*, 24 mil. *Expanse*, ♂, 34 mil.; *length of body*, 17 mil. Collected by Mr. Fischer.

Differs from *nitela* by its less purely olivaceous color, the absence of the t. p. line and inconspicuous costal dots. The thoracic tuft behind the collar is prominent.

Lygranthoecia Meskeana Grote.

I learn that this species has been re-described under the name *Heliothis fastidiosa* Strecker.

Xylomiges hiemalis Grote.

I learn that this is the "*Dryobota Californica* Behr. MS.," too briefly described in Mr. Strecker's work for identification, and later than the above name in appearing. The eyes are hairy, not naked, as they should be were the insect a *Dryobota*.

Galgula subpartita Guen.

This species I have collected not uncommonly in Central Alabama. Mr. Belfrage has sent it from Texas, and Mr. Lintner from New York. It has also been sent from California by Mr. Hy. Edwards and Mr. James Behrens. From Illinois Mr. Thos. E. Bean has forwarded me a specimen authentically determined as "*Telesilla vesca* Morrison." This latter name is a synonym; the species of *Galgula* being also generically distinguishable from *Telesilla*.

Hadena quatesita, n. s.

This is closely allied to *lignicolor*, but a darker colored species. The ornamentation is similar, the stigmata more distinct, the reniform smaller. The median lines are faint, and seem to occupy similar positions with those in *lignicolor*, but here the t. p. line is more flexuous, being a little bent between veins 2 and 3. The hind wings are blackish fuscous, paler at base, with faint median line, reflected discal spot and light yellowish fringes. Beneath darker than in *lignicolor*. In the new species the color is more blackish brown; over the terminal space the color is, as usual, deeper, relieving strongly the pale W-mark. On a close comparison, the t. a. line is seen to be less strongly produced on submedian fold than in *lignicolor*; the reniform is narrower superiorly, smaller, and less constricted. Else the species might be considered at first sight as a very dark *lignicolor*, with the markings distinctly apparent. The orbicular is pale and reduced. *Expanse* 45 mil. Racine, Wisc., Mr. O. Meske,

Stiria rugifrons Grote.

This species is found to have been unintentionally omitted from the "Check List."

Tarache patruelis Grote. (743 of "Check List.")

A small species taken by myself in Alabama, and sent from Bastrop Co., Texas, by Mr. Meske. Referred here provisionally. Scaly. Fore wings triangulate, shaded ochreous and pale. The ordinary lines very pale and narrow. The most prominent ornamentation an oblique stripe (median shade?) running inwardly from costal angulation of t. p. line to middle of hind margin, and joining an apical streak so that it appears to issue from apex. The stripe is whitish, bordered inwardly with deep ochreous. Outside of it the narrow t. p. line runs divergingly to internal margin. Hind wings pale yellowish white, stained along external margin. The Texan specimen is smaller, more yellowish and paler than my type from Demopolis, which expands 16 mil.

The second part of my Check List of Noctuidæ is delayed by my not having as yet sufficient material in the Deltoids, and I venture to call the attention of my correspondents generally to this fact and to urge the collection of this group the present season. I shall be glad to receive collections of Deltoids from any quarter and will determine and return specimens promptly.

Hypenula, n. g.

The moth possesses characters which ally it to *Renia* and *Hypena*. The ♂ antennæ are setose and provided with two longer bristles on each joint. The ♀ antennæ are similar, but the bristles are shorter. The palpi are free, very long, curved, with elongate second joint, and extend upwardly above the head; they are flattened, rather shortly scaled and seem to be slightly longer in the male. Eyes naked, tibiæ unarmed, vestiture of allied genera. The wings are more elongate than in *Hypena*, much like *Renia*, with full-rounded secondaries not exceeded by the abdomen.

Hypenula opacalis, n. s.

♂ ♀. Entirely dusky blackish fuscous. Median lines fine, black, denticulate, single. T. a. line outwardly curved. Reniform with two superposed white dots (sometimes obsolete), small, yellowish or dis-

colorous. Orbicular small, discolorous, near the t. a. line. Subterminal line pale, denticulate, continued on hind wings. Terminal sub-continuous black line similar on both wings; fringes dusky. Hind wings blackish fuscous, but little paler than primaries, with a median black shade line. Beneath paler with double rivulous lines, the outer pale shaded; a discal streak on hind wings. *Expanse* 22 to 30 mil. Texas, in May (Belfrage, Nos. 185, 195, 196). Varies in distinctness of the pale shading to the subterminal lines, and by the t. a. line being in one specimen edged inwardly with whitish scales. There appears to be in fresh specimens a very sparse frosting of white scales over the fore wings.

McLanomma auricinctaria Grote.

I have received from Mr. E. J. Graef the second specimen I have yet seen of this little moth. I find that it has ocelli. Notwithstanding its rounded wings, pectinate antennæ, and gray, geometridous ornamentation, it must be referred to the Pyralidæ. It is possibly allied to the Brazilian genus *Cryptocosma* of Lederer; the shape of the wings is, however, quite different. The species can be easily recognized by the black cellular spot, which beneath shows a yellow iris, and by the subterminal line of gilded scales. The tapering smooth abdomen and elongate palpi assist us in referring the moth to the Pyralidæ, while the neuration has not been examined. It appears to be of rare occurrence in New York and Pennsylvania.

Euproserpinus phacton G. & R.

Dr. Boisduval (Suites a Buffon, 1874, 363) says as to the species which he calls *Macroglossa phacton*, quoting Grote and Robinson's original description, that he does not know by what chance we changed the name of this species from *erato* to *phacton*. This remark is based on a misunderstanding. We first described this species as *Euproserpinus phacton* in our Synonymical Catalogue, Nov., 1865. It had not been previously described. A colored drawing was shown us by Mr. S. Calyerley (who had had it engraved with the name), with the information that the insect had received the name of *Proserpinus phacton* Boisduval in manuscript. We preserved Dr. Boisduval's name, giving him in our paper credit for the species. Afterwards, in 1867, we had a specimen kindly loaned to us by Dr. Boisduval, *two years later*. On this specimen we gave a re-description of the species (under the same name) in September, 1868, Trans. Am. Ent. Soc., giving our views on the structure of

the genus. At about the same time Dr. Boisduval published the species under the name *erato*. This was the first known to us of any other name for the insect. In his last work Dr. Boisduval disavows the authorship of *phaeton*, but adopts the name for the species on our authority. I come to the conclusion that the name "*phaeton*" was transferred from some other species by Dr. Boisduval's Californian correspondent, or that the name "*phaeton*" was originally proposed by some other naturalist, perhaps Dr. Behr or Lorquin.

Oncocnemis Saundersiana, n. s.

Fore tibiae with a terminal claw. Allied to *Oncocnemis occata* from Texas and California. Differing as follows: Head and thorax black. Median space darker than basal and terminal spaces, which latter are washed with white. Median lines twice further apart inferiorly than in *occata*. Median lines *even*, not scalloped. Median shade black, not very diffuse. Ordinary spots larger; orbicular with an evident dark centre. The dentations of the s. t. line connected, followed by a vivid white line. Fringes wholly black, not checkered as in *occata*. Hind wings much as in *occata*; a terminal vague broad blackish band, within which is seen the median line; fringes white. Beneath less brown than in *occata*. *Expanse* 28 mil. Grimsby (Mr. Pettit). Two specimens.

This is a very handsome, distinctly marked species, easily recognized by the above contrast with its ally. Named for Mr. Wm. Saunders, of London, Ont.

Hadena illata.

Agrotis insignata || Walk., C. B. M., 353.

Agrotis illata Walk. *ibid*, 742.

From a specimen in the D'Urban Collection, in the cabinet of the Ent. Society of Ontario, determined as "*Agrotis illata*" by Mr. Walker. I find that the insect is a common *Hadena* which I had not hitherto identified with certainty. Whether this name can be sustained for the species I am doubtful, Mr. Walker's description being vague and even contradictory, except as to color.

TINEINA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

POLYHYMNO.

Instead of "extreme tip hooked backwards," as in the generic diagnosis, it would be better to say extreme tip curved outwards.

P. fuseostrigella. *N. sp.*

On page 247 of volume six, I have described a species as *P. luteostrigella*, which is scarcely an appropriate name, as the streaks are golden rather than luteous. The markings in this species are identical with those of *luteostrigella*, except that the streaks are fuscous instead of golden, though each of them becomes yellow before the apex. In the description of *luteostrigella* it is stated that the streak within the dorsal margin and the inferior branch of the median meet in the apical part of the wing, and then immediately separate and meet again at the apex; perhaps it would be more accurate to say that they cross each other instead of meet and separate, and in some specimens they simply meet and pass around the dorsal margin to the apex together (being margined along the base of the ciliae with yellow); in such cases the space between the two branches of the median streak is streaked with fuscous, which seems to be a continuation of the intro-dorsal streak which has become confluent with or interrupted by the dorsal branch of the median. In both species the third and fourth costal streaks are very oblique, the third pointing backwards and the fourth forwards and converging to the same point, and behind the fourth are two short oblique dark brown streaks pointing backwards to the extreme apex. The account of these streaks in the description of *luteostrigella* is slightly inaccurate and represents one more streak than actually exists. The above account is correct for both species. All of the streaks are confluent before the apex, and all become yellow at or before their confluence, and the caudate tip is yellow, becoming brown at the apex; beneath the caudate tip and opposite to the fourth costal streak is a black dot (not mentioned in the description of *luteostrigella*), and there are in this species two other minute and indistinct ones before it in the base of the ciliae, which at this part

(beneath the caudate tip) have a metallic lustre. *Al. ex.* $\frac{1}{2}$ inch. This species is so similar in the position of its markings to *luteostrigella*, that it may prove to be the same species, but its greater size and fuscous instead of golden markings induce me to consider them as distinct. Texas; Belfrage.

GRACILARIA.

G. rhoifoliella. *N. sp.*

Face and palpi white, with the apex of each joint of both pairs of the palpi, and some scattered scales along the under surface brown. Anterior and middle tarsi white, with the joints faintly tipped with brown; tibiae of the hinder pair whitish beneath, and with white spurs tipped with brown; tarsi white. Thorax and primaries brown with a yellowish tinge, but becoming darker brown towards the apex and on the costa near the base, and with bright purplish reflections in some lights; along the extreme costa and sometimes on the fold is a series of dark brown dots; trigonal mark absent; ciliae fuscous; venter white, dusted with dark brown. *Al. ex.* $\frac{1}{2}$ inch.

My first specimens came to the light at the Bee Spring Camp of the Kentucky Geological Survey, near Mammoth Cave, but a few weeks later I bred it in Northern Kentucky from larvae mining the leaves both of the "Poison Oak" (*Rhus toxicodendron*) and the Sumach (*Rhus copalina*.) It mines either side of the leaf, and the mine, at first linear, is at some part of it widened and excavated like the tentiform mine of some species of *Lithocolletis*; sometimes the tentiform mine is not connected with the linear mine. After it has ceased feeding in the mine, it rolls the leaf rather clumsily downward from the tip.

G. inornatella. *N. sp.*

Palpi white stained with ochreous yellow towards the tip of the second joint, and with an ochreous yellow annulus before the tip of the third; head and antennae white, the antennae annulate with pale yellowish ochreous. Thorax and fore wings white, suffused with pale reddish ochreous, the basal part beneath the fold more whitish; and there is an oblique white fascia before the middle nearest the base on the costal margin. In some lights the wings show a purple gloss. The hind legs are missing in the single specimen before me; the anterior and middle pair are of the general hue on their anterior surfaces and white behind,

and the tarsi are whitish, with pale reddish ochreous annulations at the joints. Perhaps the general hue is more accurately designated pale yellowish or brick red, than reddish or yellowish ochreous, and this hue is as, or more, distinct on the under than on the upper surface of the fore wings. *Al. ex.* a little more than $\frac{1}{2}$ inch. Kentucky in May.

G. Sauzalitwella. N. sp.

Face pale sordid yellowish; vertex whitish mixed with reddish ochreous or rust red; antennae fuscous, in some lights tinged with red and faintly annulate with whitish; palpi, fore wings and thorax rust red, or perhaps as properly reddish brown, appearing in some lights deep reddish orange; the palpi a little sprinkled with white, and the dorsal margin of the fore wings from the base to the ciliae darker, almost fuscous; extreme costa white, with a row of minute brown dots along its entire length and extending around the apex, and a similar line of dots marks the more reddish anterior part of the wing from the darker dorsal portion, and the wing becomes darker towards the apex. The general color resembles that of *G. stigmatella* Fab. and *purpuricella* Chamb., but is darker, more lustreless, and there is no trigonal mark. The under surface of the thorax and the anterior surface of the legs are of the general hue, the tarsi being a little paler and annulate with white. Under surface of the abdomen sordid whitish dusted with brownish red. *Al. ex.* nearly seven lines. The neuration is that of *stigmatella* as figured *Ins. Brit.*, v. 3. Sauzalito, California; from Mr. James Behrens.

G. Behrensella. N. sp.

Orange yellow; the palpi a little brownish; the vertex a little pale and the antennae sordid yellowish white with fuscous annulations. There is a small spot on each side of the thorax before the tip, and on the fore wings there is an oblique white streak near the base from the dorsal margin to the fold; behind this is a rather narrow oblique fascia, nearest the base on the dorsal margin, and thence to the tip the wing is much mottled with small white spots, especially along the costal margin, and the yellow color becomes paler towards the tip. Under the lens the white spots appear to anastomose, forming a series of more or less interrupted white streaks, nine or ten in number, perpendicular to the margin and some of them crossing the wing. The apical part of the wing is sparingly dusted with brownish scales, as also are the ciliae, which are pale orange or stramineous. *Al. ex.* $\frac{1}{2}$ inch. California; from Mr. Behrens.

G. basquella. N. sp.

Very near *G. (Parcetopa) robiniella* Clem., but still quite distinct. Head and thorax white with an indistinct narrow brown line from the anterior margin of the thorax to the apex; palpi pale grayish or grayish white; antennae brown; legs brown, the tarsi annulate with white; abdomen brown; anal tuft whitish. Fore wings brown, the apical half dusted with white, the dusting becoming more dense towards the apex; there are three costal white streaks, the first near or a little behind the basal fourth; the second is a little larger, and just beyond the middle both of these are oblique and the second is a little curved; the third before the ciliae is smaller and perpendicular to the margin. There is a basal streak just within the dorsal margin, and which extends to the basal fourth of the wing length; a little beyond this and opposite the point of the first costal streak is a rather large obliquely curved white dorsal streak; the second dorsal streak is opposite the end of the second costal and the third dorsal is small, perpendicular to the margin and opposite to the third costal, *from which it is separated by a straight brown fascia*, which appears very distinct in the dusted portion of the wing. Ciliae white with a wide dark brown hinder marginal line extending around their base and another beyond the middle, and a short brown "hook" at their apex. *Al. ex.* $\frac{3}{8}$ inch. Collected by Mr. Belfrage in Bosque Co., Texas.

G. sassafrasella. N. sp.

Ochreous yellow; the head and long slender palpi inclining to brownish; the outer surface of the third joint brown except at base and tip, and the fore wings with a purplish gloss; antennae longer than the wings, brownish, faintly annulate with pale ochreous. Fore wings with small black dots chiefly along the margins; three of these are conspicuous, one not far from the base, one near the middle and one near the apex on the costal margin, and opposite the space between the first and second is another on the dorsal margin, and the extreme apex is suffused or dusted with brown. Two (or three?) dark brown hinder marginal lines in the ciliae. The wings are very narrow. Hind wings and upper surface of the abdomen dark slate color. The dorsal portion of the fore wings shows the purple hue much more strongly than the costal. First and second pair of legs brown with white tarsi, which are faintly annulate with purple at the joints; third pair of legs a little paler, with ochreous tarsi and base of femora white. Under surface of abdomen and anal tuft ochreous. *Al. ex.* not quite $\frac{1}{2}$ inch.

For many years I have searched the leaves of the *Sassafras officinale* for "Micro" larvæ, but have never found a trace of one until this summer (June, 1875), when the larva of this species made its appearance in great numbers. It is an ordinary white *Gracilaria* larva, which makes a linear crooked mine, ending in an oblong tentiform mine along the midrib on the under side of the leaf. When about half grown, the larva leaves the mine and rolls the leaves (chiefly the very young ones) downwards into a clumsy imitation of a cone. It pupates in a yellow cocoon on a leaf.

LYONETIA.

L. gracilella. *N. sp.*

Snowy white with a silvery tinge. Antennæ dark brown above, becoming deeper towards the apex, and paler below; palpi white, *stained externally with fuscous*; fore legs with the anterior surface of the tibiae and tarsi fuscous, and the joints of the tarsi of the middle and hind legs annulate with fuscous; upper surface of the abdomen *pale* silvery fuscous. Hind wings and under surface of the fore wings brown, with short yellowish white lines along the course of the fold on the under-surface of the fore wings; ciliae of the hind wings and dorsal ciliae of the fore wings *nearly to the tip brown, with strong purple reflections*; behind the middle of the wing length, along the middle of the wing, is a short brown streak, in some lights golden brown, which presents an obtuse angle towards the costa, and the point of which intersects in the middle a brown or golden brown streak or narrow fascia, which crosses the wing at the beginning of the ciliae, is a little concave towards the base, and is extended along the extreme costa to the base of the wing, and on the dorsal margin encloses a small white spot; behind this fascia is an orange yellow patch which extends to the rather large circular velvety black apical spot; behind the fascia are three short blackish costal streaks in the ciliae, perpendicular to the costal margin, and equally distant from each other; *opposite the last of these, and separated from it by the point of the orange patch, is a rather long and narrow dorsal black streak also perpendicular to the margin, and between this streak and the fascia is a short broad fuscous hinder marginal line at the base of the dorsal ciliae*. Costal and apical ciliae silvery white, and *behind the apical spot is a transverse fuscous line across the middle of the ciliae, which sends back through the tip a short and rather indistinct fuscous "hook."* Al. ex. a little over $\frac{1}{2}$ inch. Kentucky in June.

It is quite distinct from *apici-strigella* Cham., and seems to be between *clerkella* and *padifoliella* as described in *Ins. Brit.*, v. 3. The italics show the points in which it seems to differ from *clerkella*, which is nearer to it perhaps than *padifoliella*.

NEW CALIFORNIAN AND TEXAN MOTHS.

BY LEON F. HARVEY, A. M., M. D., BUFFALO, N. Y.

Arsilonche album, n. s.

An easily described species. It differs from *A. absidum* Harvey, which is received in several examples under the number 2734, from Oregon, by being totally white. Expanse 34 m. m. No. 5993, Oregon, Mr. Hy. Edwards' coll.

The synonymy of the several species of this genus is as follows :

1. *Arsilonche albovenosa* Goeze Btr., 3-3 251 (1781.)

Simyra venosa Bkh. iv, p. 716. 1792.

Leucania Henrici Grote, Bul. Buf. Soc. N. S., vol. 1, p. 10 (1873).

Leucania evanida Grote, Bul. Buf. Soc. N. S., vol. 1, p. 10 (1873).

Ablepharon Henrici Grote, Bul. Buf. Soc. N. S., vol. 1, p. 112 (1874).

Ablepharon evanida Grote, Bul. Buf. Soc. N. S., vol. 1, p. 112 (1874).

Ablepharon fumosum Morr., Bul. Buf. Soc. N. S., vol. 1, p. 275 (1874).

This synonymy is given by Mr. Morrison after Dr. Staudinger has identified the American *Henrici* as the same with the European *albovenosa*.

2. *Arsilonche absidum* Harvey.

Ablepharon absidum Harvey, Bul. Buf. Soc. N. S., vol. 2, p. 275 (1875).

This species is lemon yellow, with the t. p. line continued on the secondaries, variably indicated by dark dots. It is very distinct.

Arsilonche album Harvey.

Faspidea viridata n. s.

Fore wings light green, with distinct black lines. Orbicular with a black annulus and central spot. Beneath this is the large claviform, black

margined and with a black dot; these two form a combination like the figure of eight. Cell black powdered between the spots. Reniform large, with green centre, edged with white and with a black annulus, irregular, medially strangulated. Above it the t. p. line seems to join its outer margin, but in reality is obsoletely produced beyond it, appearing below it dentate to internal margin. Terminal space light green; s. t. line obsolete opposite the cell, below black, dentate. Fringes checkered with black. Hind wings white, with lunule distinct beneath and double exterior shade lines and distinct black edging. Thorax scaly; green with black spots on teguæ.

Expanse 30 m. m. No. 5605, San Diego, Cal., Mr. Edwards.

Agrotis aequalis n. s.

♀. Allied to *Wilsoni* and especially resembling some of the varieties of that species, but distinguishable by the subterminal line not being twice more prominently indented, but pale, dentate throughout its length, and by the concolorous terminal space and larger stigmata. Hoary olivaceous fuscous with a tinge of brown; claviform indicated; orbicular large, irregularly elongate; reniform wide; the cell shaded with brown; t. p. line geminate, regularly lunulate. Fringes brown, discolorous. Hind wings fuscous, deepening in tint outwardly, with pale, faintly interlined fringes and long narrow discal streak; beneath whitish, irrorate on costal region, with faint terminal shade and discal mark; primaries fuscous. Thorax and head concolorous with fore wings.

Expanse 38 m. m. California. No. 101, Mr. Hy. Edwards' Coll.

Agrotis satis, n. s.

♀. A small species resembling *aequalis* in coloration; fore wings more deeply tinged with red brown. A sub-basal brown streak; median lines geminate, denticulate; t. a. line perpendicular; t. p. line rounded opposite cell and there denticulate. Some black dots before the s. t. line; terminally the wing shows a deeper shade; the paler fringes broadly interlined. Hind wings fuscous, without marks, with pale interlined fringes. Beneath fuscous with common line determinate on veins and discal dots; that on primaries contiguous to the line. Collar with a marginal brown line; head and thorax concolorous with wings.

Expanse 28 m. m. No. 3486, California, Mr. Hy. Edwards' Coll.

Agrotis choris, n. s.

♂. Hind wings pellucid white, a little stained; veins marked. Fore wings uniform dull gray; veins obsoletely marked. T. a. line geminate, denticulate, fine, black. Orbicular black ringed, small, rather elongate. Reniform narrow, curved; claviform obsoletely indicated. T. p. line obsolete, marked on the veins. S. t. line faint, near the margin; terminal line black, interrupted; fringes concolorous. Antennae brush-like; head and thorax like fore wings; palpi darker at the sides.

Expanse 36 m. m. Nevada, No. 2626, Coll. Mr. Hy. Edwards.

Agrotis Sierræ, n. s.

♀. Allied to *haruspica*; differs by the paler secondaries and more slender habit. Body and fore wings uniformly fuscous; lines black illegible. Both stigmata present: orbicular rounded; reniform elongate lunate. Hind wings beneath with discal mark and shade line; above immaculate, pale, pellucid, fuscous. Abdomen as dark as thorax.

Expanse 45 m. m. No. 2623, Sierra Nevada, Cal.; Mr. Hy. Edwards Coll. I regret that I have not been able to compare this form with the European *augur*.

Agrotis recula, n. s.

♀. The smallest species of the group of *f-dentata* and *cicatricosa*. Hind wings white, soiled with fuscous. Fore wings nearly black, with a yellowish stripe from the base outwardly below costa to above the prominent yellow stigmata. Orbicular spherical; reniform of the usual shape, rather broad, approximate to the dotted t. p. line. A splash of yellowish below median vein to the s. t. line, which is black dotted, followed by yellow with two yellow teeth to veins 3 and 4. Beneath whitish with the spots reflected on primaries.

Two specimens. Oregon, No. 5969, Mr. Hy. Edwards' Coll.

Agrotis pyrophiloides, n. s.

A species with slender body and wide wings, and looking like a *Pyrophila*, but with spinose hind tibiae. Greasy; fuscous and dirty ochre, with wavy blackish lines. Orbicular of the ochreous ground color, concolorous, rounded; median shade blackish, heavy; reniform concolorous; t. p. line geminate, with pale included space, denticulate. Costal dots distinct on the blackish subterminal space. A terminal festooned ochreous line, cutting the black line at base of fringes. In one

specimen the ornamentation is obliterate. Body concolorous; hind wings fuscous, paler at base. Beneath paler with common line and discal marks, that on primaries elongate and near the line.

Expanse 38 m. m. No. 5662, California; No. 5624 var., Mr. Hy. Edwards' Coll.

(To be Continued.)

ADDENDA TO LISTS OF DIURNAL LEPIDOPTERA,
SPHINGIDÆ AND ZYGAENIDÆ OCCURRING
ON THE ISLAND OF MONTREAL, P. Q.

BY F. B. CAULFIELD, MONTREAL, P. Q.

RHOPALOCERA.

Colias philodice Godart, var. *laurentina* Scudd.

In the end of July, 1874, I took a *Colias* on Montreal Mountain, which appeared to me to be different to anything I had hitherto seen. I sent it a short time since to Mr. Scudder, who kindly determined it for me as a Gynandromorphic ♀ of his var. *laurentina* of *philodice*. A second example, also a ♀, was taken by Mr. Pearson the same season.

Thecla agustus Kirby.

One specimen taken by Mr. Kollmar, May 24th, 1875.

Lycæna neglecta Edw.

I took a ♂ of this species June 26th, 1875. It was in beautiful condition, evidently fresh from chrysalis, and is the only example I have seen from this locality.

Euphyes metacomet Harris.

The *Hedone orono* of my List, CAN. ENT., vol. vii, p. 89, must be referred to this species. I received both these species from Mr. Herman Strecker, of Reading, Pa., along with some other material, accompanied by a list giving the names. Unfortunately, when referring the examples to the list I mistook the numbers, and gave *orono* instead of *metacomet*

I have, however, taken *orono* here, as Mr. Strecker wrote me that there was a specimen of it in a box of Lepidoptera that I sent to him in 1872. It is very rare, as I have not met with it since.

HETEROCERA.

SPHINGIDÆ.

Lethia gordius Cram.

One example ; Mr. Pearson.

ZYGAENIDÆ.

Alypia Maculochii Kirby.

Two examples ; Mr. Knetzing.

CORRESPONDENCE.

DEAR SIR,—

In the October No. I find an account of Mr. Dimmock's method of denuding the wings of Lepidoptera. From the account given, it seems to me that it will take as much time, though perhaps less trouble, than the old way of denuding them with a moistened brush. It may, however, answer for butterflies and the larger moths, but for Tineidæ, Tortricidæ, Pyralidæ, and the smaller moths generally, the plan of which I have given an account in a previous volume of this magazine seems to me preferable. It is as follows : Take a piece of glass about one inch by three in size (say a glass "slide" of a microscope), place the wing on it, in from one to three or four drops of strong solution of potash, according to the size of the wing ; cover with one of the thin pieces of covering glass of microscopists (do not use enough fluid to float the cover glass) ; hold, with a clothes pin or other small forceps, the large glass over a lamp chimney until it begins to boil, removing it at the first sign of ebullition, when the wing will be found denuded if it is a fresh and small specimen ; if large, or old and dry, a little longer boiling may be necessary. The fluid may then be drained off by tilting the glass a little, and all traces of the potash removed by adding a few drops of water ; and the cover glass being removed, the wing may be mounted on the same glass or floated on to another, or it may be at once accurately sketched by the microscope and

camera lucida. The whole process of mounting may be accomplished in a minute or little more, or it may be mounted and sketched in five minutes or less. In this way I have mounted and sketched hundreds of wings of Tineidæ, which I hope some day to publish in the pages of the CAN. ENT.

V. T. CHAMBERS.

Colorado Springs, Colorado, Feb., 1876.

ENTOMOLOGICAL NOTES.

DEAR SIR,—

Ceratonia quadricornis.— I have during the past season, and for the first time in my life, taken a number of the larvæ of *Ceratonia quadricornis* Harr., of a brown color. Out of five taken in one locality, four were of a deep brown. The fifth was of the usual green hue. These larvæ were about half grown when captured. This was early in September, but since then I have taken several other specimens, the majority of which were brown. I should like to learn whether any of your readers have, at any time, made similar captures.

Doryphora 10-lineata.— A safe and effective method of destroying this beetle is to drag an ordinary butterfly net over the haulm when the larvæ and beetles are feeding. By this method, and without making any particular effort, I captured on Long Island, this year, over five hundred specimens in about as many minutes. By making a sort of drag net, large enough to be worked by two boys, a much larger number could of course be captured in a given time. I have no doubt that Long Island will be plentifully supplied with *10-lineata* next year; for, although thousands were drowned and washed up on the beach at Coney Island and elsewhere, the number that escaped must have been great. But, although admitting the desirability of ridding ourselves of this pest, I by no means admit that it is the scourge talked about by some Entomologists. As I intimated before, we had plenty of them on this Island, but no one complains of a small crop of potatoes in consequence.

W. V. ANDREWS.

36 Bøerum Place, Brooklyn.

ERRATA.—On page 16, line 7 from top, for *Heliophila renipuncta* read *H. unipuncta*.