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NEW MOTHS.

BY A. R. GROTE, A. M.

(Continued from page 167.)

Fota armata Grote.

This has somewhat the form of *Stilbia*: the fringes are long on secondaries. A second female like type in size has the black submedian dash wanting, and the filling on cell, but hind wings are like type in being pale fuscous. Base of forewings above pale ochrey shaded. Another has the primary all gray; *Armata* may be known by its larger size, fuscous secondary and different sculpture of clypeal armature.

Whether the following are really different I do not know; they appear to be so most certainly.

Fota minorata, n. s.

2 ♂, 2 ♀. Head above and collar pale ochre, paler than *armata*, and this form is $\frac{1}{3}$ smaller. Markings very like; a pale ochrey shade over submedian space. The grey primaries have all the markings of *armata*, without the broad black longitudinal shades; the median shade is, however, noticeable and the lines indicated. But the hind wings are pellucid white with soiled costa in both sexes. Armature of clypeus agreeing, except that the central arm has a cup-shaped depression at top; this I have again gone over and seems to me a good character. Wings a little silky.

Fotella, n. g.

This in form is like *Acosmetia*: fringes to hind wings long. Eyes naked. Clypeus with a navel-like expansion. Like *Fota* in the silky hind wings which are full, but the primaries are normally shaped, entire, widening outwardly. Body untufted, eyes unlashd, palpi with small third joint exceeding front a little; tibiae unarmed. Body slender. Wings full. A *Caradrina*-like form which seems allied to *Fota*; I think both genera may be related to *Stilbia* and *Caradrina*. Size of *Fota armata*.

Fotella notalis, n. s.

♀. Fore wings olivaceous blackish, something like *Pyrophila glabella*

in color, with a narrow irregular paler terminal space. Lines lost. Reniform marked in white, constricted, the white scales touching median vein. Hind wings fuscous, with paler fringes and paler at base. No markings beneath. Abdomen pale yellowish gray. Arizona. Coll. B. Neumoegen, Esq.

Plagiomimicus Grote.

I called attention some years ago in the Bulletin of the Buffalo Society to the resemblance between this genus and *Polenta*, in the spreading thoracic tuftings, the modification of the clypeus, the shape of the wing and the peculiar pattern of marking, which is so much alike that the two species would be considered congeneric by most observers. I since contradict Mr. Morrison's observation that the fore tibiæ are unarmed in *Polenta*; this was the best distinction. The discovery of new forms confirms me that the genera I have grouped under *Stiriinæ* are all valid, the modifications of structure being apparent and going closely with the pattern. *Stibadium* approaches *Telesilla*, in frosting and sheen (*aureolum*), and leads to this genus as before suggested. With the new species the group (without absolute value) may fall in between *Calpe* and *Plusia*.

Oxycnemis, n. g.

Vestiture flattened hairs; a tuft behind thorax of broad curved shining scales widening to their tips; abdomen short, untufted. Size small, body slender. Hadeni-form ornamentation. Eyes naked, unlashd. Fore tibiæ with the whole short broad joint corneous, terminating in a stout central claw or spine; the legs slender, otherwise unarmed. Notwithstanding its Hadeni-form look, the insect appears nearest to *Triocnemis*.

Oxycnemis advena, n. s.

♀. Gray, neatly lined, with the bright color and ornamentation recalling *Charadra palata*. T. a. line black, distinct, upright, attached to the large open claviform. Discal stigmata light gray, subequal, with included dots. T. p. line faint. S. t. line black with a following white shade, marked with black on costa, far from margin and easily taken for t. p. line, curved in inferiorly; veins terminally finely marked in black. Hind wings pale fuscous, whitish at base. A white costal shade on primaries above from inception of s. t. line over the disk. Size small. Arizona, Coll. B. Neumoegen, Esq.

Ripogenus pulcherrimus Grote.

This insect is so rare that I have never owned a specimen. Since describing it, twenty years ago, or nearly, I took a figure of it with me to England, and, comparing it there with *Eutelia*, I believed it belonged to an allied but different genus. At the time I described it I did not know the European species even by figure. Mr. Tepper has a specimen taken on Long Island which he showed me in his beautiful collection. I left it catalogued under *Eutelia* in my Check List till I could verify my belief and print this note for those who may be fortunate enough to have material to examine.*

Charidea Kirby.

The European species catalogued by Lederer under this genus are not congeneric. I have separated *Pyrrhia*, which has one or two European and three American species, all closely allied and agreeing also in style of markings and color quite closely. Our only true *Charidea* seems to me to be *Pernana*. *Cirrhophamus triangulifer*, again examined since my return home, differs by the want of tibial armature, as to which I was uncertain, and in the clypeal structure, as observed by me. The ornamentation is, however, similar, and the untufted abdomen proportionately slender. Figured in my Essay—plate 3.

Trama Griseipennis, n. s.

Larger than *arrosa*, of a pearly gray. The male shaded with fuscous before the curved, flexuous, pale s. t. line. T. a. line broken, dark. Reniform small, indicated. T. p. line followed by a pale shade. Both outer lines continuous on hind wings, divergent. Fore wings pointed at tips. Color and appearance of both wings similar. In male the dark shading continued within the outer line on secondaries. A festooned dark common terminal line, fringes pale gray. Beneath darker, somewhat brownish; faint traces of double outer common lines. Arizona; Coll. B. Neumoegen, Esq.

Anytus Sculptus var. *Planus*.

This is a form of *Sculptus* of which I have now seen two or three examples, one in Mr. Hill's extensive collection, in which the median lines

* Since writing this I have Mr. Smith's valuable observations on the genera of *Noctuidæ*, and note his remarks on this genus. I do not see or receive the Bulletin in which it appeared, but am indebted to Mr. Smith's kindness for the copy.

are lost and the wing is longitudinally shaded with whitish on median space along internal margin, and diffusely beyond the reniform. New York.

Agrotis Hospitalis, n. s.

Allied to *baja* by the black mark, inaugurating s. t. line. Yellow-brown. Half-line black, single; t. a. line black, single, broken, irregularly trembled or denticulate; a dot between these lines on median vein. T. a. line marked on costa: t. p. line appearing as a pale even shade, preceded by broken black scallops not evident, the line itself. Orbicular large, round, paler than the wing, ringed with black, the costa above it pale like the spot itself. Median field shaded with darker brown behind. Reniform ringed with black, kidney-shape, paler than wing, dark or black inferiorly. An interrupted dark terminal line. Fringe concolorous. Hind wings rather pale, silky, concolorous. Palpi dark brown at the sides, tipped with pale brown like front in color. Mr. Hill's collection, N. Y., July at sugar.

Gortyna Impecuniosa Grote.

This is a dark species, almost recalling *nebris*. Dark purple brown with the median field rusty. Stigmata darker-ringed, concolorous, all indicated. A faint apical yellowish patch, inaugurating s. t. line, which is lost or fragmentary. Hind wings dark fuscous. A sharp tuft behind the collar. Mr. Hill's collection, Centre, Sept. 25.

This is allied to *Harrisii*, etc., but, I think, distinct. It is the most obscurely marked of any of the purple-brown species. One male. Size of *Harrisii*.

Rheumaptera Immediata, n. s.

Pale gray with all the transverse markings indistinct except the two black shaded median lines distinct, enclosing the reddish brown median space. Inner line *curved*. The lines are rather neat. The outer with a strong submedian curve, projected somewhat narrowly at median vein. Costal dots distinct. Basal line fine, not very noticeable. Beneath with an evident angulate common outer line, sub-punctate, terminal space shaded outwardly and especially over apices with brown. Discal dots and, on fore wings, a costal dot, marking inner line. Hind wings above pale, with a mesial sinuous line. Under surface darker than upper. Expanse 26 mil. Two specimens, Mr. Hill, New York.

Thamnonoma Quadraria, n. s.

♂. Body slight, wings ample, entire, apices pointed, external margin very moderately rounded. Gray. Median lines sub-parallel, straight, blackish; inner line broken, a little curved, outer straight; the lines tolerably near together; subterminal line most prominent, diffuse, black, edged inwardly by a brownish red shade, its outer edge jagged, denticulate; the line itself runs inwardly opposite cell and approaches outer median line at median vein, thence running parallel with it and approximate to internal margin. A black apical mark; fringes gray. Hind wings light gray. Discal dots distinct on both wings, both above and below, black. Under surface gray, lines obsolete. Expanse 31 mil. Colorado, Dr. Bailey.

This species may be known by the well pectinate male antennæ, the non-falcate primaries and the singular course of the distinct subterminal line and its form and color. It approaches the genus *Lozogramma*, but I think is correctly referred here.

Thamnonoma Perpallidaria, n. s.

♂. Antennæ pectinate. Pale fady ochrey. Two parallel, even, dark ochre median lines, starting from brown costal dots. Subterminal line broken, diffuse, dark. Hind wings very pale, with mesial line indicated at internal margin. Beneath pale ochrey, without marks. Body pale ochrey. Expanse 27 mil. New Mexico. No. 993, Prof. Snow. Smaller and differently colored, but allied to *T. Quadraria*.

Homopyralis Miserulata, n. s.

Small and slight bodied. Dull brown. Median shade black, distinct, waved, upright, touching the small black reniform. Wing paler over median space beyond the shade. T. p. line rounded opposite cell. Before the s. t. line the space is shaded with blackish. Fringes pale dotted. Hind wings concolorous with two divergent mesial lines. Beneath paler, with the discal dot contiguous to the inner of the two divergent lines on hind wings. Body brown. Expanse 20 to 22 mil. Three specimens. New Mexico, Prof. Snow.

Tornos Interruptaria, n. s.

♀. Light gray, a little larger than *Rubiginosus*. The fine black median lines make an oblique loop open to internal margin. Above they make another larger, less distinct loop, its pointed apex curving up to median vein. Hind wings light gray; indication of lines on internal mar-

gin. Body gray. Beneath without dots, light gray or whitish, with dark powderings. Arizona. Coll. B. Neumoegen, Esq.

Tornos Escaria, n. s.

♂ ♀. Fore wings fuscous gray, with a blackish discal lunule. Median lines hardly visible, apparently sub-parallel, oblique, accented on submedian fold by dots. Hind wings whitish on disc. A mesial dot; a fuscous outer band; internal margin grayish, showing commencement of mesial lines. Head and thorax dark gray; abdomen centrally somewhat ochreous; terminally gray. The male is smaller and darker, grayish fuscous; the dots on disk evident. Arizona. Coll. B. Neumoegen, Esq.

Tornos Ochrofuscaria.

♀. Allied to *Interruptaria*, without discal dots. Wholly sordid ochrey fuscous. The lines fine, sub-obsolete. Beneath the hind wings are somewhat whitish, powdery with dark. The entire insect is of this obscure ochrey color, above and below, and should be known by this and the apparent absence of determinate markings. Of *Interruptaria* I have two specimens; when the curious median lines are effaced, the species is known by its gray color and want of discal dots. Of *Escaria* I have two females, one the smaller; the smaller and darker male agrees in the accented median lines on submedian fold and discal dots. Of *ochrofuscaria* I have only one female. Coll. B. Neumoegen, Esq. Arizona.

Glaucopteryx Aurata.

Forewings like *Cumatilis*, with transverse lines and olive shading, but hind wings pure orange. Both wings reddish beneath. It is of the same size as *Cumatilis*, and the markings of primaries, while darker, are so alike that a detailed description is quite unnecessary.

Tamila Tumida Grote.

Notwithstanding its aberrant color, this species belongs more naturally here, as I find from a specimen in Mr. Neumoegen's collection.

Heliothis nuchalis Grote.

I can find no difference that seems to me important between this and the European *Scutosus*.

Hydriomene Replata, n. s.

♂ ♀. Male antennæ ciliate; palpi prominent. Size of *Speciosata*. Fore wings sordid gray with distinct black lines. Extreme base black; a slightly waved and outwardly oblique black sub-basal line. A wide black

band, fainter above, broken and angulate at cell, broader and blacker below median vein, the most prominent marking of the wing. Near to this the inner median line, subsinuate, projected and broken just before internal margin. Outer line roundedly projected over median nervules; the sub-terminal line runs parallel with this, and is joined by a black apical line. Fringes black dotted; a more prominent black mark at end of veins 2 and 3. Hind wings pale fuscous, with whitish, fuscous-dotted fringe, and two faint extra-mesial lines. Beneath pale. Arizona. Coll. B. Neumogen. This species exceeds 30 mil. in expanse, and cannot be confounded with any other. Very different from any of the forms of *Sordidata*, which I unite in the "New Check List," and cannot distinguish.

Hydriomene Reflata is a stout species, which can be known by its whitish ground color of primaries showing a slight sprinkling of brown scales, by the presence of an inconspicuous white spot outside subterminal line opposite the disk and by the wide black band before the inner median line, interrupted or angulated on the cell and less prominent above it on the costa. All the examples agree perfectly.

Eustrotia Flaviguttata, n. s.

A small species comparable with *Secta*. Uniformly mouse gray sprinkled with brown dots which, under the glass, take the course of angulated transverse lines running first outwardly from the brown costal dots. The only marking of prominence is the brown mesial shade which encloses a small yellowish spot on the cell and another less noticeable on submedian fold. A brown costo-apical shade patch enclosing a pale costal dot. A terminal dotted line. In the place of the reniform is a dark dot. Hind wings fuscous. Expanse 16 mil. Texas, in my collection.

Eupseudosoma floridum, n. s.

Allied to the Cuban *E. niveum* Gr. Head dark yellow above; clypeus white; a dark line dividing the yellow vertex from the white front. Collar and thorax immaculate white. Fore wings white, slightly iridescent; costal edge dark fuscous. Abdomen scarlet above with dorsal white line; anal segments white. Hind wings reduced, white, a few basal scarlet hairs. Beneath white, fore legs dark outwardly. Florida, A. Conradi, Esq.

This may be same as the Cuban form, but there are no black spots on head or wings. The costal edge is smoky.

Eupethecia Gypsata, n. s.

Clay white. A large brownish-black patch on costa over the cell enclosing discal mark. A costo-apical dark divided patch. External margin marked with brownish twice: opposite cell, and above internal angle. Fringe dotted. Costal edge at base marked with dark brown. Beneath a s. t. pale band, edged with brown bands marked on costa. A discal dot. Fringe of fore wings pale, dark dotted. Hind wings whitish, with the terminal border broken into lines: mesial lines incomplete; a discal dot; beneath with the mesial lines more continuous. Thorax pale; collar a little darker. Two specimens. Arizona. Coll. B. Neumoegen, Esq. This distinct species is of the size of *Nevadata*.

Pleonectyptera Historialis, n. s.

Allied to *Phalaenalis*. Fore wings varying from olivaceous to ochrey reddish. Hind wings reddish outwardly, pale at base. Beneath washed with red with costa of primaries yellow. Above the fore wings have a large, black, irregularly rounded reniform; two large black dots on costa inaugurate the pale median lines, which are very faint. S. t. line faint. Arizona. Coll. B. Neumoegen, Esq.

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This finishes, for the present, the notes and descriptions I have drawn up for the past year, and part of which I had intended using in my "New Check List." With the latter I tried to make as few changes as possible from existing references at the time (May, 1882) of its being given to the printer. As stated in the Preface, there will be many necessary changes in the future, but the nomenclature is becoming more settled and I issued it in response to many enquiries and requests, and I am glad it has been well spoken of here and abroad. In the *Noctuidæ* there will be here and there species to be degraded to varieties, some genera probably drawn in or their characters more clearly limited, and the position of certain genera changed. In a linear arrangement the sequence must be always not entirely satisfactory. Any improvements based on structural studies must be always welcome. As a whole I think the arrangement in the "New Check List" is more satisfactory than that in previous ones from first to last. As soon as warranted, a new edition will be prepared.

DESCRIPTION OF THE PREPARATORY STAGES OF GPAPTA
COMMA, HARRIS.

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

EGG.—Conoidal, the base flattened and rounded; marked by 10 vertical ribs which near the base are low, but on upper third are considerably elevated, increase gradually in prominence and terminate abruptly around a small flat space at summit; these ribs are thin and their sides are cut by grooves perpendicular to the surface of the egg; the spaces between them crossed by many fine striæ; color green. Duration of this stage 5 days in April, 4 in July.

YOUNG LARVA.—Length .08 inch; cylindrical, even from 2 to 7, then tapering slightly to extremity; on 2 is a dorsal chitinous patch on which are six tubercles, three on either side the medio-dorsal line, each with black hair; below the patch two tubercles, one above, the other below spiracle; on segments 3 to 13 are two dorsal rows of large tubercles, one to the segment, on the anterior part of same, each with long curved hair, from 3 to 7 turned forwards, the rest recurved; next, a row of small tubercles from 3 to 13; on 3 and 4 these stand in vertical line with the dorsals, but on the other segments they are back of the line of dorsals; a third row from 5 to 13 of small tubercles, in vertical line with the dorsals, and on 2 to 4 these are continued a little below the line of the other segments; on 3 and 4 is a short row, in line with the spiracles, and a corresponding tubercle appears in 13; and below spiracles, from 5 to 13, on the posterior part of each segment, is a minute tubercle; finally, along base of body is a row of minute tubercles from 2 to 13, on 2, 3, 4 one to each segment, also on 13, but on the other segments two to each; from all these tubercles proceed hairs, those of basal row turned down, but of the others, from 2 to 7 turned forward, the rest recurved; color whitish-green; feet and legs green; head rounded, bilobed, the vertices rounded; color dark brown; many black hairs scattered over the surface, curving down. Duration of this stage 4 days in April, 2 days in July.

After 1st moult.—Length .13 inch; color either brown-black, or black with whitish lines at the junctions of the segments; armed with seven rows of branching spines (disposed as described under mature larva); these spines are short, stout, black, and beset with short divergent bristles; in the examples which have white lines, on segments 4, 6, 8, 10, the spines spring from whitish tubercles, on the other segments from black;

in the black examples all tubercles are black ; on 2 is a chitinous band with four small spines in cross row ; besides the seven principal rows, there is a row of minute spines over legs and feet ; feet black ; legs olivaceous ; head round, depressed at top, the vertices a little produced, each bearing a short, thick process, with short spines at top ; color of head and processes dark brown ; many black hairs over surface springing from fine tubercles. Duration of this stage 3 days in April, 2 in August.

After 2nd Moulting.—Length .3 to .33 inch ; same shape ; color dark olive-brown or black-brown or reddish-brown, individuals varying ; the spines longer, and at one-third from the top give off branches ; the posterior end of each segment after 2 crossed by two or three fine white lines ; in front of the medio-dorsal row of spines are two oblique divergent whitish bars, one such bar from base of each spine in 1st lateral row on outer side ; the spines vary largely, some larvæ having all the spines black, some have the dorsal and 1st lateral rows on 5th, 7th, 9th segments white, the rest black ; some have white from 4 to 11 ; some have white on 9 only ; on 2 a collar of black simple spines ; head broader than high, the top rather square, not much depressed, the processes larger, but similar to preceding stage, crowned with six points, one in middle, the rest about it ; surface glossy black, with many simple spines, of different sizes, usually all black, but some examples show a few white among the black ; each with long hair. To next moult, in May 3 days, in August 2 days or somewhat less.

After 3rd Moulting.—Length .38 to .4 inch ; color black, crossed on the posterior end of each segment with two or three lines or stripes of white, sometimes more or less macular ; according to the breadth of these bands the larva is quite white or otherwise ; the oblique marks on dorsum as before, more conspicuous ; a yellow band runs along base in line with lower lateral spines, and the posterior part of each segment above this band shows an oblique bar, and some white spots and points ; spiracles black in broad white rings ; the spines long, and branching as before ; the medio-dorsal row are always white ; those of 1st lateral row are usually white, but sometimes on 3 are black, or partly black ; some examples have the 2nd lateral row wholly black, others white, or some of the last spines are parti-colored ; on 2 is a collar of simple white spines ; head as before, the white spines predominating largely. To next moult in May 3 days, in August 2 days or somewhat less.

After 4th Molt.—Length .8 inch ; in three days reaches maturity.

MATURE LARVA.—Length 1 inch ; cylindrical, stout ; armed with seven rows of long, tapering spines, one medio-dorsal, and three on either side ; the dorsals beginning at 5 and ending at 12, the upper laterals run from 3 to 12 ; the second laterals from 3 to 13, but on 4 the spine is below the row, and in line with the spiracles ; the lower laterals from 5 to 12 ; from a little below the summit of each spine rise from three to five slender branches, about a central one which is a prolongation of the spine itself ; the spines of the dorsal and upper lateral rows are largest and longest, and each has five branches, besides one or two lower down, of medium length, and some small spines, each branch and spine ending in a bristle ; the spines of second lateral row are of medium length, with four branches ; and those of the lower row are shortest and have three and four branches ; in the green and white varieties of the larvæ all the spines are whitish or yellow, as well as the branches ; in the black, the spines are yellow, mostly black-tipped, the branches as well, but the spines of the first lateral row are sometimes black to their bases ; so those of second row are sometimes wholly, sometimes but partly black ; 2 has a collar of six simple spines and two others are upon each side, in vertical line ; the color of body varies much ; some examples are cream-white, some greenish-white, with almost no markings, or the markings are obsolescent ; others are velvet-black, the dorsum crossed by white stripes upon the posterior edges of the segments ; with two white divergent bars coming to an angle at the front of each dorsal spine, and running to the anterior edge of the segment ; and with a similar oblique bar from each spine of the first lateral row on the lower side ; along the base is a raised yellow stripe, and from this up to the second laterals the ground is crossed by abbreviated white stripes or patches, particularly on the last half of the segments ; above this the side is black ; but individuals vary in the extent of this black area ; sometimes the ground color is vinous-red ; under side greenish, or honey-yellow, according to the color of upper side ; the spiracles black in broad white rings ; at the base of the second laterals from 9 to 11, or from 7 to 11, is usually a fulvous or orange patch, varying in extent ; feet greenish or black ; legs greenish or brown ; head rather square, higher than broad, with high vertices ; in the light examples the color of head is dull pink, in the dark ones it is black, shining, sometimes with a forked whitish stripe down the front ; on each vertex a short, stout process, cylindrical, com-

pressed in the middle, broad at the top, crowned by five equal, blunt-tipped spines around a sixth in the middle; each with hair; these processes are black in the black larvæ, and in the light ones either red or red with black tops; face and whole head thickly covered with simple white spines of variable length, all white, except that sometimes there are one or two of the longer ones on side face below the vertex which are black, or black and white; along back of head and down the sides is a row of these spines close set. From 4th moult to pupation 5 days.

CHRYSALIS.—Length .8 to .9 inch; greatest breadth .24 to .26 inch; cylindrical; head case high, compressed transversely; at each vertex a long, conical process; the mesonotum elevated, the carina very prominent, thin, nose-like, followed by a deep excavation; wing cases raised, flaring at base, compressed in middle, with a point on the margin; on the abdomen three rows of tubercles, those corresponding to the dorsal row of the larva small, to the first laterals large and conical, the pair in middle of the series particularly prominent, and those in the excavation silvered, gilded or bronzed, varying; color variable, many examples being dark brown, with lighter or with yellow-brown, and much reticulated with dark lines; others are dead-leaf brown; others are light, up to dead-white shaded slightly with yellow-brown, with a bronze lustre over the wing cases and anterior dorsal parts. Duration of this stage about 7 days.

Grapta Comma is found abundantly in New England and thence through the Northern States to Nebraska; also through Canada and in Nova Scotia; and to the South, at least as far as the Kanawha district of West Virginia. In the Northern States the species is two-brooded, in Kanawha three-brooded. It is seasonally dimorphic, the winter form being *Harrisii* (i. e., the form described by Dr. Harris), the summer form *Dryas*, Edw. Both these are figured in *Butterflies of N. A.*, Vol. I. Where there are three broods, the middle one is made up of the two forms. Eggs laid by the hibernating females (form *Harrisii*) in April or May, give *Dryas* in May or June, and this is the first brood of the year. Eggs laid in July by *Dryas* give both forms in August—the second brood; and eggs laid in September by either form give *Harrisii* in October. The first eggs are laid in April or May, according to the forwardness of the season. In 1882, I obtained eggs from *Harrisii*, tied in bag over a hop spray, 14th April, and from 22nd to 25th May, had therefrom 35 *Dryas*, 17 ♂, 18 ♀. In 1874, the first eggs were obtained 10th May, and the result up to 27th

June, was 34 *Dryas*. In 1875, the first eggs were 14th May, and up to 18th June these gave 19 *Dryas*; no *Harrisii* in either case. In 1869, on 18th June, one ♂ *Harrisii* came from chrysalis, the only instance known to me in which that form has appeared in the first brood. So that in different years, at Coalburgh, there is a variation of at least a month in the laying of eggs by the hibernators, and consequently a month's difference in the appearance of the first brood. In Can. Ent., X., p. 69, I gave the results of rearing the several broods up to end of 1877.

The larvæ, as described, are quite variable, when mature, the color of body being white, green or black; and the black examples vary much in the extent of the white or yellow markings. But neither color belongs especially to one form of the butterfly. Thus, of 50 larvæ, from eggs laid by *Harrisii*, in 1882, but one was white, the rest being black. Of 34 larvæ from eggs of *Harrisii*, in 1874, but 6 had black ground, and the rest were all light, several being cream-white. Of 23 larvæ from eggs of *Harrisii*, in 1875, 10 were white or greenish, 13 more or less black. Of 60 larvæ from eggs of *Dryas*, 1873, only one was white, the rest black. So that there is no apparent connection between the color of the caterpillar and the form of the butterfly.

The caterpillars feed on Hop, Nettle, false Nettle, (*Boehmeria cylindrica*), and Elm. I have found them at Coalburgh almost always on Hop and *Boehmeria*. The eggs are laid either singly or in small clusters upon the under side of the tenderer leaves, and the young larva eats a hole for itself in the substance of the leaf, and during the first stage feeds about this. For the first two stages it is exposed on the leaf just as the larva of *G. Interrogationis* is, but at the second moult behaves differently from that species, which makes no shelter for itself at any time. I watched three larvæ of *Comma* in Aug., 1882, to learn exactly at what stage they began to protect themselves, placing them as soon as hatched upon a plant of *Boehmeria* set in flower-pot in my room. Very shortly after the second moult they had gotten to the bases of the third pair of leaves from top, two on one leaf, one on the other, and were engaged in drawing the edges of the leaves next base down with silk spun. To effect this they had bitten off the principal rib on either side the mid-rib, very near the edge of the leaf, and had cut quite to the edge. This leaf naturally curves the other way, so that the caterpillars were working at a disadvantage on the convex side. But notwithstanding this, they had, in course of an hour,

bent down the edges and bound them together for one half inch. Next morning they all rested under their awnings, two under one, as at the first, and had fed off the tip end of the leaf. Twenty-four hours later the two larvæ had left what remained of their leaf, now scarcely longer than themselves, and each had betaken itself to another leaf. I had to transfer them to a larger plant, and next day found two under one leaf, again brought together as before. The other was upon the *upper side* of its leaf, and had closed that at the top. Still later this larva had drawn down the top of the plant and was concealed very nearly as much as the larva of *Vanessa Atalanta* is, which uses this same plant. Here it passed 4th moult. So that these larvæ can adapt themselves to circumstances, and cover themselves on the upper as well as the lower side of the leaf, if expedient. I noticed that at the older stages the ribs were not bitten, nor were the edges of the leaf slit, the larvæ being able to draw down the edges without that aid. When lying under the shelter the larvae are at the inmost part, and are coiled up much like figure 6. In nature I do not remember to have found more than one caterpillar under one leaf.

The nearest ally of *G. Comma* is *G. Satyrus* Edw., a species common in the Pacific States to Rocky Mts., and taken even in Ontario. Mr. T. L. Mead captured two examples some years ago, north of London, Ont. *Satyrus* is dimorphic, its other form being *Marsyas* Edw., and the larvae remarkably resemble those of *Comma* in color and markings. So they protect themselves in precisely same manner as do *Comma* larvae, and these are the only two American species of *Grapta* which have that habit, so far as known.

DESCRIPTION OF A NEW SPECIES OF LYCAENA, FROM NEWFOUNDLAND.

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

LYCAENA ASTER.

MALE.—Expands 1 inch.

Upper side purplish-blue, the costal margin of primaries silvery; both hind margins narrowly edged black; secondaries have a marginal series of black points or minute spots; fringes white.

Under side white; primaries have the hind margin edged by a fuscous line thickened at each nervule; a submarginal row of rounded black

spots entirely across the wing, and parallel to the margin; a discal row of smaller spots in a curve from costa to lower median interspace, the next spot below out of and behind the line; on the arc a thick bar. Secondaries have an oblong, rounded, fuscous spot at the end of each nervule, but otherwise the edge is white; a submarginal series of metallic points, each of which is overlaid by orange, and above this a black crescent; a discal series of black points, following the costal margin from base, and running parallel with hind margin to lower median interspace, after which there are two spots back of the line; on arc a streak, a dot nearer base, and another below cell.

Body above blue, beneath white; legs white; palpi white with many black hairs in front; antennæ annulated black and white.

FEMALE.—Expands 1.1 inch.

Upper side fuscous, bluish over basal areas of each wing, and on secondaries, over the inner half the wing; secondaries have a marginal series of large rounded blackish spots, faint towards outer angle, each with a little fulvous on upper side. Under side pale fawn-color; marked as in the male, but all spots more conspicuous; and in addition, on primaries, the spots which in the male form the submarginal row, and stand alone, here are the crescents which overlies orange spots, and between these last and the margin is a series of black points. From 1 ♂, 1 ♀ (part of a considerable number) taken by Mr. T. L. Mead, in Southern Newfoundland. The species is near to the Californian species, *L. Anna*, Edw.

LIST OF THE SPECIES OF TRIPUDIA AND GYROS.

BY A. R. GROTE, A. M.

I have described the genus *Tripudia* in the Can. Ent., but the characters are not obvious until we know the neuration, which I am satisfied will give us distinguishing features from *Eustrotia* and *Thalpochares*. Compared with these the front is narrow and a little bulging; the vestiture is scaly, and there is a ridge of scales on the occiput. The lashless naked eyes, the slender unarmed tibiae agree with its allies. The wings are entire and there is a velvety band on the primaries, not legible, however, in two minute, pyralidiform species which may not be different, my

flavofasciata and Mr. Edward's *versuta*. The species are only known to me as yet from single examples, and are from the South. *Limbata* has the hind wings orange; the rest fuscous or blackish, silky.

Tripudia Grote.

Type: *Erastria Quadrifera* Zell.

Quadrifera Zeller

Basicinerea Grote.

Limbata Hy. Edw.

Flavofasciata Grote.

Opipara Hy. Edw.

Versuta Hy. Edw.

Lixiva Grote.

Gyros Hy. Edw.

Type: *Oribates Muirii* Hy. Edw.

Muirii Hy. Edw.

TABLE OF SPECIES OF EUCHAETES.

BY A. R. GROTE.

The number of described species of this Arctian genus is increasing, and from my own collections in New York, I do not believe that our Eastern forms are at all well known. Among the most interesting recent discoveries in Arizona is *E. zonalis*, Grote, a form in which the abdomen is banded with crimson and black and unlike the other species in this respect. The following table may assist the identification of the species:

- a. Wings with costa and internal margin of primaries striped.
 1. Stripes crimson; wings dark. *Spraguei* Gr.
 2. Stripes dark yellow; wings dark. *Abdominalis* Gr.
 3. Stripes faint, yellow; wings pale. *Vivida* Gr.
- b. Wings with costa only striped.
 4. Stripe dark yellow; wings dark; abdomen banded. *Zonalis* Gr.
 5. Stripe "pale luteous"; wings dark; abdomen spotted. *Eglenensis* Clem.
 6. Costa yellow to apex; wings pale. *Collaris* Fitch.
 7. Costa yellow one-third its length; wings pale. *Pudens* Hy. Ed
- c. Wings unstriped.
 8. Wings dark; abdomen yellow. *Egle* Drury.
 9. Wings white; abdomen crimson. *Elegans* Stretch.
 10. Wings dark; hind wings with crimson patch on hind margin. *Perlevis* Gr.

Two species, *Inopinatus* Hy. Edw., and *Oregonensis* Stretch, I have not examined; the latter species I have been shown, without making any notes upon it, in different collections made in New York State.

The most unusual species is *Perlevis*, with its partly red secondaries, and which is smaller than the rest and somewhat narrow-winged. *Pudens* is a thinly scaled, whitish form, looking like, but slenderer than *Collaris*. A female specimen of *Spraguei* which I saw in Mr. Von Meske's collection, from Texas, had the stripes tinged with yellowish, not so purely crimson as in my male type from Kansas. *Zonalis*, *Spraguei*, *Elegans* and *Vivida* are, perhaps, the handsomest species in the genus and are not inferior in beauty, from the contrast offered by their colors, to the species of *Arctia*. The brilliantly tinted stripes and bodies are set off by the neutral tints of the wings. I have elsewhere drawn a parallel between this genus and *Ctenucha* in form and color, which is interesting; the metallic sheen of *Ctenucha* is wanting in these soft colored species of true *Arctiidae*.

ARSILONCHE AND LEUCANIA.

BY JOHN B. SMITH, BROOKLYN, N. Y.

During the past two years I have found on the exchange lists of most northern, and all Canadian collectors with whom I have done any exchanging, *Arsilonche albovenosa* Goetze under its synonym *Ablepharon Henrici* Grt., and on their list of "wants" as uniformly appeared *Leucania phragmitidicola* Guen. I always sent for *Arsilonche*, and always received *Leucania phragmitidicola*. The latter is a common insect, but the former is more rare, and it may be interesting to know how the two can be distinguished. Superficially they are very much alike; generically they differ as follows: *Arsilonche* has *lashed* eyes, *Leucania* has them *hairy*; the tongue in *Arsilonche* is weak and short, in *Leucania* long and corneous; the legs in the former are shorter and more compact than in the latter, and the spurs of middle and posterior tibiae are much shorter. The vesicle of *Arsilonche* on thorax and body is entirely hairy, fine and long; in *Leucania* the hair is somewhat flattened, more scale-like and shorter. *Arsilonche* has also the head more retracted, the abdomen longer and the primaries rather more lanceolate. The secondaries in *albovenosa* are pure white, in *phragmitidicola* they are more smoky and have a darker border.

The primaries in *albovenosa* are whitish with smoky lines; in *phragmitidicola* the ground color is a straw yellow, darker on costa, through the centre of the wing and just below the apex; the median vein is white, and in fact all the veins can be distinctly traced as fine white lines. At the end of the discal cell, almost on the median vein, there is a distinct black spot, and there is an oblique row of dark spots—often not very distinct—from the apex to the hinder margin. I have in one instance received a specimen of *L. Harveyi* Grt. as *albovenosa*, and several times *Harveyi* have reached me ticketed *phragmitidicola*. *L. Harveyi* is smaller, has the ground color of primaries paler, and while the pattern of markings is almost identical with *phragmitidicola*, it is readily distinguished from it by the much heavier, clearly defined dark markings, by having several distinct black dots in the discal cell, and by the want of white scales on the veins; the median vein is the only white one, and this is much more distinct than in *phragmitidicola*; the secondaries seem also much darker in *Harveyi*.

As to relative position in the family, *Arsilonche* stands near the head, before *Acronycta*, while *Leucania* (or *Heliophila* according to Mr. Grote) comes after the typical *Noctua* and nearer to *Orthosia* and its allies.

Mr. Grote, in his Catalogue, places *Arsilonche* just before *Leucania*, but it seems much nearer to *Acronycta*, and I consider the place Lederer gave the genus when he described it as more appropriate.

NOTES ON A GALL MITE OF THE NETTLE TREE (*Celtis occidentalis*.)

BY REV. T. W. FYLES, COWANSVILLE, P. Q.

GALL, formed on the under side of the leaf, pear-shaped, half an inch long, forms a cup-like indentation on the upper surface. I have counted eighteen galls on one leaf. One mite in a gall.

MITE, one-tenth of an inch long. Eyes large and protuberant, light red. Antennæ moniliform, ten-jointed—the basal joint and that next it being much larger than the rest. Proboscis for suction. Four undeveloped wings—mere protuberances in the case of some (probably younger) specimens—generally translucent, but in some instances smoky brown. Legs, six in number, hairy, semi-transparent. Abdomen much enlarged, top-

shaped, the three last segments reddish brown. Tuft of terminal spines of the same color. The creature has a gelatinous appearance; and this, together with its agitation when disturbed, reminds one of Young Blight's description of Old Dolls: "All a-shaking like glue monge." It attains its growth in August and becomes quiescent.

THE PERFECT INSECT makes its appearance in September. To allow its egress the pupa-skin is ruptured from the head to a point beyond the base of the wing-covers. Its appearance is that of a very minute Cicada. Colors light at first, but darkening with exposure. Eyes large, madder-brown in a lighter setting. The facets very distinct, giving the eye a granulated appearance. Three ocelli, like small rubies, one above each compound eye, and one between the plates of the face just above the palpi. Antennæ moniliform, two large and eight smaller joints, as in the mite. Thorax, dark brown above with longitudinal bands of lighter color, amber-colored beneath, mottled with dark brown. Six powerful legs covered with short bristly hairs; femur much stouter than tibia, and more darkly colored; tarsus two-jointed. Upper wings large and full, pearl-grey, thickly peppered with black—the peppering leaving a band, towards the lower end, clear. The nervures are brownish amber. Under wings of finer texture, and with no black spots, but in some lights beautifully iridescent; have three nervures, the inmost indented. The insect is quick in its motions, making a sudden spring like the Frog-hopper.

EARLY STAGES OF FIDONIA NOTATARIA, WALK.

BY L. W. GOODELL, AMHERST, MASS.

EGGS.—Oblong, covered with hexagonal depressions and bright green in color. Length 0.6 mil.; width 0.3 mil. Duration of egg stage 12 days.

YOUNG LARVA.—Length 2 mil.; head twice as wide as the body, round and deep ochre yellow; body dull yellowish green with a faint paler stigmatal stripe.

MATURE LARVA.—Body of uniform thickness, deep green with a narrow sub-dorsal and stigmatal white stripe, and a dorsal greenish-white hair line; dorsal space pale green; ventral space yellowish green. Head brownish green with a lateral white stripe which is a continuation of the sub-dorsal stripe of the body. Length at rest 25 to 26 mil.; when crawl-

ing, 26 to 27 mil. Food plant, *Pinus strobus*. Duration of larva stage, 35 to 40 days. Described from 57 specimens.

PUPA.—Length 9 to 11 mil.; color brown, the spaces between the segments and a dorsal line darker; wings dark green; subterranean.

CORRESPONDENCE.

DEAR SIR: In a recent number of the CAN. ENT., Mr. Reed speaks of *Tityrus* Skipper as scarce about London. Here it is one of our most abundant species, and its larva can be found on the locust trees at almost any time throughout the summer. But this fall I found great numbers of them feeding on a wild trailing vine, in all stages of their growth; this vine may have been their native food plant before they had the locust to feed upon.* Mr. Reed also mentions having found *Clytus pictus*. It is no doubt *Clytus* or *Cyllene robinia* that he refers to, *pictus* being the Hickory *Clytus*, and only found in the spring of the year. There is a good deal of confusion existing about these species, some even questioning if there are two. It is undoubtedly *robinia* that Harris describes under the name of *pictus*. Whether both species were discovered at that time I know not, but Walsh is reported by Packard to have said that the male of *robinia* differs from *pictus* in having much larger and stouter antennæ, and in having its body tapered behind to a blunt point, while the female is not distinguishable at all. With 18 specimens of *pictus* before me, captured between the 17th and 21st of May, 1879, on hickory cord-wood cut the previous winter, and a large number of *robinia*, I note the following differences: In *pictus* the body is uniformly more slender and tapers more behind than *robinia*. In *pictus* the antennæ is decidedly longer, that of the females reaching to the end of the body, and that of the males beyond. The third or W-band on the wing covers is noticeably more delicate than in *robinia*, and quite white in contrast to the yellow of the other's markings, a characteristic I have never seen in any *robinia* I ever met with (and I see them here in hundreds every fall feeding on the Golden-rod), and one which would of itself make it quite easy to pick out my *pictus*, male or female, from amongst any quantity of *robinia* they might be mixed with.

J. ALSTON MOFFAT, Hamilton, Ont.

*This vine, a sample of which was sent by Mr. Moffat, is *Lathyrus paluster* L., known under the common name of "The Marsh Vetchling."—[Ed. C. E.]