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# The Canadian Entomologist.

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## HENRY EDWARDS.

This well-known and highly-esteemed entomologist died at his home in New York City, at 1.30 a.m., on the ninth day of June, 1891. His death was caused by dropsy and other complicated troubles, which affected the heart.

In him the world has lost an earnest devotee to science and art, and those who knew him, a kind-hearted, generous, true and sympathizing friend. In his death, entomological science has lost one of its most active and energetic workers, and his loss is deeply felt and deplored by all who knew him, and he has passed out of this earthly domain with the affectionate regret of many grateful and loving friends.

Mr. Edwards was born in Ross, Herefordshire, England, August 27th, 1830, and was destined by his father to become a lawyer. After studying for some time without evincing any particular aptitude for the profession, he entered a London counting house, and frequently appeared in amateur theatricals, for which he had much talent. He finally decided, much against the wishes of his parents, to adopt the professional stage. In 1853 he embarked for Australia, where he made his first appearance as an actor, and where he passed many prosperous years. From Australia he drifted to Peru and Panama, and in 1867 he reached San Francisco, Calif. In about 1877 he made his first appearance in the east, at Boston, and finally in 1879 he came to New York. In 1889-90 he again visited his old home in Australia, from where he returned last year. During all these years he was constantly connected with the stage, until only a short time previous to his decease, when he was compelled to retire on account of his illness. At the time of his death he had just returned from a trip to the Catskill Mountains, where he was staying for his health, and three and a-half hours later he entered into rest and the everlasting silence.

As an entomologist, Mr. Edwards was world-known, and was considered one of the greatest authorities of the science, to which he was attached ever since his boyhood days. He was chiefly known by his excellent papers on the Pacific Coast Lepidoptera, which contain the descriptions of many new and interesting species from that region. He was also known by his articles on North American *Ægeriadæ*, of which family he described nearly all our American species. Besides these papers he has also written many other articles on descriptions of new species and transformations of Lepidoptera. He also edited three volumes of the journal "Papilio." The last large work he published was his "Bibliographical Catalogue of the Described Transformations of North American Lepidoptera," which is now in the hands of all our working entomologists. Mr. Edwards spent much money for the increase of his collection of insects, and devoted all his leisure time to his favourite study. His travels afforded him many rare opportunities for collecting material for his collection and writings. The collection consists of about 300,000 specimens of insects of all the orders from all parts of the globe. It contains the types of all the species he described, about four hundred and fifty, except a few which are in other collections. It also contains a number of Grote's types of Noctuidæ and Pyralidæ, and many of Fish's types of Pterophoridaæ, and types of other writers. It contains also the unique pair of *Oniticellus californicus*, and many other uniques, oddities and rareties of considerable value. The collection is one of the largest private collections in the world. His library consists of about five hundred volumes of entomological works, and about double the number of pamphlets, and about two thousand volumes on travels and other topics. (I am not sure about these figures.)

Mr. Edwards belonged to many scientific and other societies. He was for some time vice-president of the California Academy of Sciences, life-member Brooklyn Entomological Society, member of the Torrey Botanical Club, Players' Club (New York), Bohemian Club (San Francisco), corresponding member Boston Society Natural History, San Francisco Microscopical Society, San Diego Natural History Society, Belgium Natural History Society, etc.

He leaves a widow who deeply mourns his loss, and we would here add our condolence and sympathy and heart-felt regret to her irreparable bereavement.

New York, June 15th, 1891.

WM. BEUTENMULLER.

PARTIAL PREPARATORY STAGES OF SMERINTHUS  
OPHTHALMICUS, BD.

BY G. H. FRENCH, CARBONDALE, ILL.

*After First Moulting.*—Length .45 inch. Cylindrical, head with an elevated point upwards, in a subpyramidal point, the top in two points and about a third higher than the body; when at rest the jaws under back part of head with the point obliquely forward. Eight transverse wrinkles to each joint; green studded with pale green points; a subdorsal pale line, as usual converging to caudal horn; on sides, oblique pale lines that nearly coincide with a series on the dorsum; the pale parts yellowish-green; caudal horn reddish tinted; head with a pale stripe on each side of face, the two coming together above. Previous to the next moult, smooth, the oblique lines showing very pale; the oblique stripe and caudal horn creamy-white; the anterior base of horn reddish. Duration of this period 5 days.

*After Second Moulting.*—Length .90 inch. Colour green, a little dull and rather blue-tinted; each joint with 8 transverse folds that are studded with yellowish-green points that are but little lighter than the ground, a subdorsal line made of these points; a dorsal line and oblique stripe of the darker green without points, these lines defined by the points, on the sides below subdorsal line a similar stripe defined posteriorly by a row of these points more yellowish than the dorsal, the stripe that runs to the caudal horn creamy-white, as is also the caudal horn; the latter short hairy. Head pointed above as before and also the side of the face with a line of points more yellow than the last oblique stripe; thoracic feet red-tinted. Duration of this period 5 days.

*After Third Moulting.*—Length 1.25 inches. Green, slightly bluish; head still pointed but not quite so prominent as in preceding stages, the stripe rounding at the top; bluish-green, stripes yellow; stripes on back and sides as before; caudal horn pale bluish purple, more blue at base, the stripe from this down the sides very pale lemon yellow; prolegs concolorous; thoracic legs paler, red tipped, stigmata black ringed, centre creamy. Duration of this period 5 days.

*After Fourth Moulting.*—Length 1.40 inches. Bright green of a yellowish tint; head blue-green; granulations more white; side stripes yellowish-green, the one that extends to the caudal horn creamy, with a

slight greenish tint ; caudal horn purple-blue, except the sides which are a continuation of the lateral stripe ; jaws black, clypeus and anterior feet pale red ; head blunt, stripe yellow ; stripes on anal appendages yellow. Duration of this period 6 days.

*Chrysalis*.—Length 1.35 inches ; to the back of wing cases, .64 inch ; and this extends to posterior part of joint 5 ; depth through joint 5, .42 inch ; through 4, .40 inch ; through 3, .39 inch ; through 2, .37 inch ; end of tongue case, .55 inch from the anterior end. Cylindrical, tapering gradually back from joint 5, cremaster triangular tuberculate, especially on the dorsal part and on sides at base, round dorsally and flattened ventrally, no hooks but slightly forked terminally ; head rounded. Colour chestnut-brown, nearly uniform ; wing, tongue and leg cases a little darker than the rest ; the abdomen slightly punctured. Duration of this period 15 to 17 days.

A comparison of the pupæ of this species with *Geminatus* shows the following differences:—The cremaster on *Geminatus* is triangular, more slender, less roughly tuberculate dorsally and laterally ; this in *Ophthalmicus* having a distinct tubercle each side at the base that is lacking in *Geminatus*. The cremaster in *Geminatus* is nearly conical by reason of its being only slightly flattened ventrally, while in *Ophthalmicus* it is distinctly flattened ventrally, and dorsally is contracted at the base. A chrysalis of *Geminatus* measures as follows : Length 1.15 inches ; depth through joint 5, .40 inch ; joint 4, .38 inch ; joint 3, .37 inch ; length to end of wing cases, .60 inch ; to end of tongue case, .48 inch. A comparison of these figures with the measurements of *Ophthalmicus* shows a different proportion between the two pupæ. The pupa skin is about twice as stiff in *Geminatus* as it is in *Ophthalmicus*. Besides this, the larva of *Ophthalmicus* differs from that of *Geminatus* in being less cylindrical, the third and fourth joints being enlarged, thereby making it resemble the larvæ of *Everyx Myron*.

The food plant is the same as that of *Geminatus*.

The larvæ from which the above descriptions were made were received from the Hon. C. F. McGlashan, of Truckee, California. They were sent as eggs June 17th, 1889, but were received hatched June 22nd. The imagines were produced August 2nd and 3rd of the same year, making a total period from egg to imago, of the summer brood, of 47 days. The time of hatching shows that there are two broods in a season,

## ABOUT PSEUDOHAZIS AND ITS VARIATIONS.

BY E. NEUMOESEN, NEW YORK.

The genus *Pseudohazis*, Gr. & R., has only two typical representatives so far known, one being *Eglanderina*, Bd., with the purple colouring, and the other the white *Hera*, Harr., from Utah's salt regions. *Hera* has to be considered a distinct species, for, aside from its white colour, its primaries are falcated, while those of *Eglanderina* are broad and blunt. All the rest of named insects are variations of *Eglanderina*,—*Pica*, Walk., being especially recognizable by its heavy black markings and black basal areas. I have added to our list to-day the beautiful *Ab. Denudata* already figured in Strecker's book No. 15, but not described, and of which I possess a striking example, and a constant variation of *Hera* from Oregon, which I name *Marcata*. Both insects are herewith described.

Our list of this genus to the present day stands as follows:—

*Eglanderina*, Bd.

var. *Shastænsis*, Behr.

“ *Nuttalli*, Streck.

“ *pica*, Wlk.

“ *Arizonensis*, Streck.

ab. *denudata*, Neum.

*Hera*, Harr.

var. *Marcata*, Neum.

*Eglanderina* ab. *Denudata*.

Head, thorax, primaries and secondaries above and below of rich yellow; nearly denude of all markings. Abdomen yellow with black segmentary bands. Primaries, black costa, a beautiful rose tinge at base and along costa to apex, as well as along interior margin. Apical tip black, fading inwardly; a little black dusting, indicating location of discal spots and costal terminus of mesian bands respectively. Submedian cells tinted with light rose. Secondaries with black costa and black dusted discal spots. Very faint indication of mesian band and basal black field. Below, primaries and secondaries uniformly rich yellow, with rose tints at apical part of costa of primaries, and on upper half of secondaries. Abdomen tinted with rose; costa of primaries pronouncedly black, and black spots indicating costal terminus of mesian band and discal spot. Secondaries, costa black and light black indications of mesian band and

discal spot. In both wings the nervures are accentuated with black, especially at intersection with exterior margins; black marginal lines and yellow fringes.

Habitat—California.

Type, ♂. Coll., B. Neunoeugen.

The specimen figured in Strecker's *Rhopal. and Heter.*, No. 15, plate XV., fig. 9, but not described, is an *Ab. Denudata*, with markings a little more pronounced than in my specimen.

*Hera*, var. *Marcata*.

Antennæ dark brown. Head, prothorax, patagiæ and legs light yellow. Thorax the same, with blackish ground. Abdomen white, with black segmentary bands; lower border of each segment as well as anal tuft of bright yellow. Primaries pure white. Costa, apices and fringes black. The intersection of each nervure at exterior margin accentuated by black dashes, pointing inwardly. A prominent black mesian line and a large black discal spot, faintly showing the white kernel. A basal dash encircled by a black outwardly-curved line from inner margin to costa, terminating in an irregular costal spot.

Secondaries pure white with black marginal line and fringes interspersed with black, a large black discal spot and mesian line; the latter curved outwardly near median nervure so acutely as to give the line nearly a triangular shape. In some specimens the ends of discal spot are confluent with mesian line. Below, primaries and secondaries pure white with markings as above. Abdomen with black lateral dots and black segmentary bands. Secondaries with black costa and termini of nervures slightly tipped with black; a black irregular line encircling basal space.

Types. Coll., B. Neunoeugen.

Habitat—Klamath County, Oregon.

This handsome variation is so decidedly marked as to be distinguishable at first glance from the typical *Hera* by the entire absence of black terminal dashes of nervures of secondaries and the lack of black basal tinges.

I have about fifty specimens before me all uniform in appearance.

THE MALE GENITALIA AND THE SUBDIVISIONS OF  
AGROTIS.

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

It is forty years ago since Lederer used the male genitalia to group the European species of *Agrotis*. According to the latest general work on the subject, the 127 European species of *Agrotis* fall into nine groups, characterized chiefly by changes in the form of the male genitalic appendages. The failure to correlate these European groups with the American subdivisions of *Agrotis*, prevents me from considering Prof. Smith's recent revision as complete, since I have demonstrated the near relation between the two faunae exhibited by *Noctuinae* of the Old and New World.

The characters drawn from the male genitalia must be ranked with those from the antennae. They are sexual or secondary characters. On this account to use them as the sole basis for generic separation is hardly necessary. The genitalia in the *Noctuidae* are found to differ markedly in otherwise very closely related species. In other species, easily distinguishable, they are practically of the same pattern. Undoubtedly we must know and study all the parts of an insect, but no single character will enable us to classify an order. It will be found as impracticable to classify the moths by their tails, as by their wings alone or chiefly, as attempted by Herrich-Schaeffer. Among the representative species this change in the structure of the genitalic appendages is instructive and indicative of their morphological value. The European *Agrotis augur* is a well marked and tolerably isolated species, presenting peculiarities in shape, size, colour and pattern. In all these respects the American *Agrotis haruspica* is nearly its exact counterpart. As the basis of separation of the two, the immature stages not having been used, we have a tendency to obsolescence of certain markings and perhaps a hardly perceptible change in the exact shade and average size in *haruspica*. Now the genitalia are shown to differ in pattern as well. From this fact we must logically conclude that the genitalia are more easily impressed and changed by environment than colour, size and pattern, or other structure. Consequently the genitalia are subject to variation, and the question rather comes up, are the characters drawn from the male genitalia of specific value? The true ground for considering the two species distinct is that they do not interbreed and produce each other, and that



so far the American examples may be picked out by experts. When these conditions can no longer be fulfilled there would be no ground for retaining a different name. The mere fact of their inhabiting different continents is not sufficient, they must breed true to type and not produce each other. Then we can be sure we have to do with separate cycles of existence and we can catalogue the fact. As the genitalia are concealed, their structure is not so apparent, and it is clear that repeated observations are necessary to verify the statements drawn from solitary dissections. But granting what has been published as substantially reliable, there yet remains the test of breeding to be applied to the genitalic species. We have an instance in the genitalic species of *Nisoniades*. These butterflies have not been bred to ascertain if they remain true in their genitalic peculiarities, if one genitalic type does not produce the other, if the caterpillars show no differences. Until all these matters are cleared up we can arrive at no final conclusion as to the value of genitalic characters, as to which single observations must be checked by repeated experiments. Writers on the subject have apparently proceeded on the basis that the male genitalia are formed, not by deposits of chitine but of cast iron, moulded so as to fit and give at last a stable and firm reality to our artificial system of classification. Vain expectations! The characters, on which we are obliged to found all our categories, are one in quality and only differ in quantity; what is generic is specific also, and what is specific is varietal.

In my Buffalo lists, 1874-1876, I was at some trouble to give the generic types of the Noctuidæ, and my action, unless it can be shown that I was in any one case in error, is binding from those dates. Prof. Smith was, therefore, no longer free to retain *Peridroma* for *occulta*, as I accepted *Eurois* for that species, without showing my action to have been at the time unwarranted. To place my *A. pellucidalis* in the same "genus" with *occulta*, and on account of the genitalia, is not to be defended. The variability of the genitalia cannot be made a basis for generic separation nor their agreement for generic grouping without other characters. The two insects are strongly different in form and vestiture, the hind-wings being in the *Anicla* group translucent, where I would refer my species. The work of Prof. Smith bears proof, from internal evidence, that the intention was at first to consider but one genus, *Agrotis*. Not only are the "genera" called "groups" in the body of the text on

occasion, but in the case of *Agrotis pellucidalis* the change of title has been forgotten. According to Hofmann the type of *aplecta* is *prasina*. I have made the following types of named subgeneric divisions: *occulta* of *Eurois*, *alabamæ* of *Anicla*, *lewisii-tessellata* of *Pleonectopoda*, *moerens-citricolor* of *Carneades*, *catherina* of *Matuta*. These must first be used before new titles are coined. There remains a literary research as to the oldest generic titles used in Europe for species of *Agrotis in sensu* Lederer, which is not in any sense a superficial assemblage, but a scientifically and properly assorted genus of *Noctuide*. The question as to the rank of the species with tuberculate clypeus may be separately considered. On my discovery of the character I made it, as elsewhere, the basis for a distinct genus. Had I had then the material and the time I would certainly have continued my observations and extended the limits of the genus, which has grown to unexpected dimensions in Prof. Smith's work.

In my Revised Check List I accepted several forms as varieties which Prof. Smith shows to be distinct species, thus reverting to my original opinion respecting them which I had incorrectly modified from information received subsequently. With regard to these and to the representative species, now definitely separated as distinct upon distinctions found in the male genitalia, Prof. Smith's observations may be accepted as corrections of my list. It is not my intention here to review the whole of Prof. Smith's brochure, merely to point out certain misapprehensions and, as I think, wrong identifications, which in the future, if uncorrected, may render the synonymy uncertain. Similarly I avoid any reply which might take the shape of controversy, confining myself to matters of fact, as I understand them, and referring the student to my published papers for all special cases of difference.

A prominent feature in Prof. Smith's treatment of the species is his referring names designating recognizable varieties as simple synonyms. Even when intermediary forms exist, as they do in very many cases of variation, the names for the extremes for the pronounced varieties, should be retained to designate them exactly. Colour varieties, as for instance the bright red *specialis*, in contradistinction to the olive-grey *Wilsoni*, *gularis* as distinguishable in a similar way from *ochrogaster (turris)*, might, with advantage, be designated. In a few instances where the differences remain, in my opinion, of specific value, the names are made equally synonyms. The most prominent instances of this are

*Clodiana*, Essay fig. 10, and *semiclarata*, Essay, fig. 9. This latter is smaller and slighter, bright reddish-brown, with a thick black basal dash absorbing the long claviform, the hindwings dark above, beneath half-pale. The former is stouter, obscure purplish-brown with a yellow tinge, the male with yellow streaks; the claviform is reduced, no black basal dash, hindwings soiled white with diffuse terminal shadings, beneath wanting the character of *semiclarata*; the female is still more obscure, the markings of primaries lost. The differences between these two forms seem certainly specific. In the Check List I have besides accorded specific rank to the following names, which in the revision are put down as varieties or synonyms: *Brunneipennis*, *orbis*, *lætula*, *cloanthoides*, *balanitis* and *verticalis*. As regards *brunneipennis*, I incline to believe that we may have a second eastern species smaller than *cupida*, and variable in colour. The larger specimens from Texas are published with the use of my description by Prof. Smith, under the name *Belfragei*, and probably this is the correct view. From Prof. Lintner's remarks it seems that *cupida* is more constant in size than I thought it, although more variable in colour.

As to *orbis* and *lætula*, they are referred by Prof. Smith as synonyms of *cupidissima*. But what Prof. Smith describes as *cupidissima* is most certainly not that species but *orbis*. *Cupidissima* is really and originally founded on three specimens with open orbicular and faint, shaded markings. A fourth, which had no discernible markings, need not concern us here. I thought it a variety. I cannot account for the statement that I have confounded two distinct species, one with the orbicular open, the other with the orbicular closed. Most assuredly, so far as I can see and remember, and both originally in the CANADIAN ENTOMOLOGIST and subsequently in the bulletin of the U. S. Geol. Survey, I have described *cupidissima* with the orbicular open. On the other hand I had only the type of *orbis*. This is a smooth olive-gray species, with slightly paler terminal field, and which may be held the Californian representative of *alternata*. The orbicular is small, spherical, pale-ringed; the closed round orbicular suggested the name *orbis*. I am quite confident that *orbis* and *cupidissima* are distinct species, while it is almost certain that Prof. Smith has failed to recognize *cupidissima* under my name for it, while both this and *lætula* may figure as new species in the section of *Rhyncagrotis* with open orbicular. As to *cloanthoides*, Prof. Smith says *albialis* of Dr. Bailey's collection looks like a washed-out specimen of

*cloanthoides*. I have no special knowledge now of the specimen referred to, but I believe the Nevada specimens of *albalis* are distinct. The types in my own collection were fresh, with a white bloom, very different from the smooth strigose *cloanthoides* from Colorado, which is darker. There was nothing "washed out" about my material. As to *balanitis* it differs from *messoria* by the abdominal line, the different maculation and course of t. p. line, all specific characters. As to *verticalis*, the fact as to whether it be distinct, or only a constant form of *designata*, must be determined by breeding; I thought it distinct. In other cases, I believe Prof. Smith's large material has enabled him to properly correct the synonymy of the list.

I would certainly retain the name *tricosa* of Lintner. In my New Check List of 1882 I say, in a note to this species, p. 24: "This form should perhaps bear Guenée's name, being later separated from Guenée's *jaculifera* than *herilis*. The typical form of *jaculifera* exactly corresponds to *subgothica* of Stephens." And Prof. Smith, without giving me credit, prefers the name. Mr. Butler says positively, according to Prof. Smith, that *tricosa*, Lint., is typical *jaculifera*. Now Guenée happens to figure typical *jaculifera* and he figures typical *subgothica*! Prof. Smith does not quote Guenée's illustration, which contradicts both Butler's statement and his own course. Guenée's types of "*jaculifera*" or so-called "types," were several in number at least, as he included two other species as varieties. One of these so-called types Mr. Butler may have and this may be a *tricosa*, Guenée's var. A. Guenée made three mistakes as to his material: first he described and figured *subgothica* as *jaculifera*; then he described specimens belonging to two different species, *tricosa* and *herilis*, as varieties of *jaculifera*. Under no circumstances can Butler's statement be correct, while I submit that it is unfair both to Prof. Lintner's acumen in contradicting the conclusions of Guenée and the figures of "The Practical Entomologist," and to an exact interpretation of the names, to resuscitate *jaculifera* at the expense of *tricosa*.

*Agrotis morrisonistigma*, Grt.—According to Prof. Smith, Mr. Morrison's so-called "type" of this species does not agree with the specimens returned me by Mr. Morrison. The species figured by me as *exsertistigma*, will therefore have to be known by the name *Morrisonistigma* proposed by me in Buffalo Bulletin for this eventuality. The "types" of *exsertistigma*, Morr., came originally from me, and it appears that Mr.

Morrison has distributed different species under this name. As I figure one of these, the name might have been allowed to remain as fixed by me. Since Prof. Smith has overturned my determination of course the above name must be used and not a new one as attempted in the "revision."

In conclusion, *Agrotis costata* is a near and close ally of *idahoensis* and does not belong with the *cupida* group. I have always associated the two, describing in fact the latter comparatively with the former, of which I had but a single poor specimen, though in my lists I have placed the two together wrongly. The description was misplaced, and the words "resembles the preceding" become thus misleading. But the description is clear enough; it is a species with pallid costa, hence the name. I hope that figures may be obtained of my types in the collection of the British Museum not known to Prof. Smith, so that every point may be cleared up. As these unknown species are, proportionately speaking, few, there should not be any great difficulty in the matter.

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#### DESCRIPTION OF A MUSCID BRED FROM SWINE DUNG, WITH NOTES ON TWO MUSCID GENERA.

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

(Read before the Entomological Society of Washington, Feb. 5, 1891.)

On Dec. 14, 1890, I secured from the upper Piney Branch region (District of Columbia) a small quantity of swine dung that had been dropped in the edge of open woods, and seemed to be old enough to contain with probability larvæ or puparia of Diptera. This was placed in a large glass jar, with a few inches of sand in the bottom, occasionally moistened and kept in a moderately cool room in the house. The dung was soon noticed to be full of larvæ, which in a short time crawled out of it entirely, clustered on the inside of the glass, or worked themselves down into the sand, manifesting a considerable migratory instinct, no doubt induced by the moisture and mild temperature. Up to Feb. 1st about a dozen specimens of the perfect fly had issued, there being only one species. It belongs to the genus *Cleigastra* in the *Cordyluridæ*.

This genus, in the sense of Schiner, differs from *Cordylura*, for which it might easily be mistaken, by having the arista naked or only short pubescent, and the wings very distinctly longer than the abdomen.

*Cordylura* has the arista feathered, and the wings as long as, or shorter than the abdomen, though some of our American species may have them somewhat longer. *Cleigastra* might also be mistaken for an Anthomyiid, particularly of the genus *Cænusia*, to which it bears much resemblance. It may, however, be distinguished from that genus by having six abdominal segments. The *Anthomyiidae* have only four or five abdominal segments, usually four. The eyes of *Cleigastra* also are nearly round, while in *cænusia* they are elongate. A large number of descriptions of North American species of *Cordylura* and *Cleigastra* have been lumped together in the O. S. catalogue under the genus *Cordylura*. Loew described nearly all of these. Reference to these descriptions in most cases shows to which genus they belong. Though the separating characters of the two genera may seem insufficient, the division is warranted by the considerable number of species. There are also in the catalogue one or two errors which should be corrected. I give at the end of this paper a revised list of the N. Am. species of the two genera as they should appear, based on the character of the arista as learned by consulting each description, omitting the repetition of references contained in the catalogue, except two corrections.

Reference to the descriptions of all the N. Am. species failed to identify the present form, which is described below. The breeding of this species as above detailed indicates that the last brood of larvæ may reach full growth at the time winter sets in and hibernate in the larval state in the dung. With the milder weather and rains of spring such larvæ entirely abandon the dung to pupate in the earth. I have specimens of the same genus captured in this vicinity (District Columbia) from the 3rd to the 8th of May. It is extremely probable that many of our coprophagous Diptera winter equally in the larval and pupal state. *Hæmatobia*, *Lucilia* and *Musca* are familiar examples, which I believe may winter either as larvæ or pupæ. In a state of nature the flies themselves rarely winter.

*Cleigastra suisterci*, n sp.

*Imago*. ♀. Brownish cinereous. Head brownish or yellowish, nearly round, elongate behind; eyes blackish, round; frontal vitta very dark reddish brown, W-shaped, cleft behind, almost reaching the eyes in front on each side; front very broad, not quite one-half the width of the head, with bristles on each side, and longer erect bristles on the vertex; antennæ not quite

so long as the face, first joint very short, black ; second joint much longer, yellowish ; third joint not twice as long as the second, blackish ; arista black, almost naked, only very short pubescent ; vibrissæ black, strong ; proboscis black, stout ; palpi elongate, club-shaped, light yellowish or reddish, bristly, terminal bristles usually black ; occiput convex, cinereous brown, black bristly on the sides above, gray hairy below ; cheeks and face lighter, sometimes light silvery yellow. Thorax cinereous brown on the sides and below, pubescent on the sides ; darker above, not pubescent, but with black bristles that are longer behind, and four longitudinal, brown, dorsal lines, the outer two sometimes obsolete ; scutellum concolorous, with four black marginal bristles. Abdomen brownish cinereous, black bristly on the borders of the segments, and black hairy on the whole surface. Legs reddish or yellowish ; femora not much enlarged, short bristly, usually largely cinereous ; tibiæ with strong black bristles, especially the hind pair ; tarsal claws black, moderately long. Wings subhyaline, the costal portion slightly tinged with yellowish, especially near the base, the anterior and posterior transverse veins clouded with black ; all the veins blackish, at least toward the apex of the wing, delicate, except the thickened first longitudinal and transverse humeral veins ; tegulæ not large, nearly circular, glassy, with a light brownish border and a long fringe of light hair ; halteres yellowish.

♂. Differs from the female in the front being narrower, but considerably more than one-third the width of the head ; and the abdomen thinly woolly or pilose, without bristles.

Length of body 6 mm. ; of wing 6 to 6½ mm.

Described from one female and three male specimens. District of Columbia.

*Larva* (full-grown). Dirty yellowish white, long, cylindrical, of equal thickness, tapering slightly at the posterior extremity, more markedly so at the head, composed of 12 segments including the cervical and anal, each segment transversely wrinkled. Head small, corneous, one-half the width of middle segments, irregularly very short ovate in outline from above, light brownish above and below, with a dark brown margin posteriorly both above and below ; above with two light dividing lines, diverging from the centre of the posterior margin outward to the antennæ, which appear as short, minute, raised points of a darker color, apparently 3-jointed ; mouth parts dark brown, nearly black. Second segment

(counting the cephalic the first) longer than the head, a little narrower than the third segment, with a deep scallop on the anterior margin above, into which fits the head, forming an anterior lateral dark brown spinous process on each side of the segment; third segment of nearly full width, shorter than the second; fourth and fifth segments of equal length, shorter than the third; segments six to ten nearly equal in length, one and one-half times so long as four and five; segment eleven slightly longer, a little narrower than the tenth; anal segment about one-half so long as the eleventh, in some specimens very light, in others dark brown or nearly black, sculptured, narrowed posteriorly, anterior upper margin raised, posterior portion 4-cleft behind exhibiting a pair of processes above and below.

Length about 8 mm.; width nearly 1 mm.

Described from several alcoholic specimens.

CORDYLURA, Fall., Spec. Ent. etc. CLEIGASTRA, Mcq., Hist. Nat. Dipt.  
(1810). II. 384 (1835).

*angustifrons*, Lw.

*bimaculata*, Lw.

*confusa*, Lw.

*flavipes*, Lw.

*gagatina*, Lw.

*glabra*, Lw.

*gracilipes*, Lw.

*latifrons*, Lw.

*lutea*, Lw.

*munda*, Lw.

*picticornis* (not *pictipennis*), Lw.

*pleuritica*, Lw.

*præusta*, Lw.

*scapularis*, Lw.

*setosa*, Lw.

*terminalis*, Lw.

*vittipes*, Lw.

*unilineata*, Zett.

*acuticornis*, Lw.

*adusta*, Lw.

*albibarba*, Lw.

*capillata*, Lw.

*cincta*, Lw.

*cornuta*, Lw.

*fulvibarba*, Lw.

*gilvipes*, Lw.

*hæmorrhoidalis*, Meig.

*impudica*, Reiche. Bull. Soc.

Ent. Fr., 1857, p. ix. (not p. 77).

*inermis*, Lw.

*megacephala*, Lw.

*nana*, Lw.

*tricineta*, Lw. Centur. IX., 85.

? *variabilis*, Lw.

NOTE.—*Cordylura qualis*, Say, does not belong anywhere in this family.



## DESCRIPTIONS OF THREE NOCTUID LARVÆ.

BY HARRISON G. DYAR, NEW YORK.

The moths bred from the larvæ here described were kindly determined for me by Prof. J. B. Smith.

*Taniocampa alia*, Guen.

*Stage I.*—Head shiny, pale yellow; mouth orange; ocelli black; width, .3 mm. The abdominal feet are well developed only on joints 9, 10 and 13, so the larva walks like a Geometrid. Body whitish, appearing green from the food within, with many black, piliferous dots. Joint 12 is a little enlarged; cervical shield coloured like the head, but paler. Length, 4 mm. This larva was found May 3.

*Stage II.*—Head shiny, whitish; ocelli black; mouth brown; width, .6 mm. Body dark green above, paler below, enlarged at joint 12; the feet on joints 7 and 8 small and unused. A dorsal, subdorsal and stigmatal white line, the latter broad and blending below with the colour of the venter. A number of minute black piliferous dots and a few fine hairs on the head. Length, 6 mm.

*Stage III.*—Head dull, pale yellowish-white; ocelli black; mouth brown; width, .9 mm. Body as before, the dorsal and subdorsal lines clear cut. In the subdorsal space are two white spots per segment, each with a minute black centre. The feet on joints 7 and 8 are better developed than in the previous stage.

*Stage IV.*—Head dull pale whitish; mouth faintly brownish; ocelli black, ringed with white; a few pale hairs; it is partly withdrawn under the skin of joint 2; width, 1.6 mm. Body pale, semi-transparent yellow, appearing green. Dorsal, subdorsal and stigmatal white lines, the lowest large and bordered above with dark green. White piliferous dots with minute black centres, about two per segment in each of the spaces. Feet normal, nearly equally developed; joint 12 enlarged. Length, 15 mm.

I think a stage occurs between stage IV. and the last stage, but I have not observed it.

*Stage VI. (?)*, *Last Stage.*—Head green, with a few hairs; marked as before. Body yellowish-green, sprinkled with pale yellow; a yellowish-white dorsal line, a faint and broken subdorsal line and a narrow stigmatal line above the spiracles, except on joints 2 and 12, where it runs below

them, passing into the anal foot. Spiracles white in a narrow black oval. Feet all present. Length, 30 mm.

*Pupa*.—Cylindrical; the abdominal segments slightly tapering. Cremaster, two thin, sharp divergent spines. Body punctured. Colour red-brown, darker in the sutures on the back. On the dorsum posteriorly to each of the three movable abdominal sutures, and also posteriorly to the one before them, is a transverse row of large deep punctures, becoming smaller towards the sides and not reaching beyond the dorsal half of the body. The wing cases are wrinkled. Pupation occurred in June, and the moth emerged Jan. 10 (in a warm room). It was the form *confluens*, Morr.

*Gortyna cataphracta*, Grote.

*Mature Larva*.—Head pale brown, mottled with dark brown, and with a black stripe at the side covering the eyes; mouth parts largely black; labrum pale, narrowly brown above; jaws sharply dentate on the ends; a few hairs; width, about 3 mm. A large, testaceous, cervical shield, edged with black below, and narrowly bisected by a whitish dorsal line. Body whitish, with a dull purple stripe in the subdorsal spaces, obsolete anteriorly; another more extensive lateral one, and traces of one in the subventral space. A number of brown-black blotches in two irregular transverse rows per segment, varying in size. Anal plate testaceous, shaded with blackish at the sides. Thoracic feet and spiracles black. Length, 35 mm.

*Pupa*.—Cylindrical; of unusual length in comparison with its diameter; obtusely rounded anteriorly; wing cases moderately prominent. Cremaster short, thick and rounded, with two sharp, divergent spines; cases creased; body segments punctured on their anterior edges. Colour reddish-brown, the body lighter. Length, 20 mm.; width, 5 mm.

*Food Plant*.—Rhubarb, in the leaf stems of which it bores, pupating in its burrow after biting a hole, across which it spins a few threads.

*Hypena (Bomolocha) abalienalis*, Walk.

*Mature Larva*.—Head bilobed, green; the mouth brownish; labrum and antennæ white; ocelli black; width, 2 mm. Body slender, contracted at the sutures, the skin forming distinct folds. Two rows of small warts on the cervical shield, and others on the body arranged much

as in the Arctiidae, except that there are none on the last segment. They are small, purplish, each with a single black hair. Body green, with a white subdorsal band. The feet are normal, divergent, but the larva walks with a looping motion. Spiracles orange.

*Pupa*.—Formed in a slight web just under the surface of the ground. Cylindrical; the abdominal segments tapering; wing cases very prominent. Cremaster, two curled, knobbed, slender spines, surrounded at base by several smaller knobbed spines. Wing cases coarsely creased; body punctured. Colour dark red-brown, the cases almost black.

*Food Plant*.—Slippery elm (*Ulmus fulva*). The larvæ rest on the leaves, but throw themselves violently off with contortions if disturbed.

This, as well as the two preceding species, from Dutchess Co., New York.

## NOTES.

### HALISIDOTA TRIGONA, GRT.

Mr. Dyar's note and Mr. Grote's reply, concerning the identity of the above species with *specularis*, H.-S., may make further notes interesting. Mr. Hy. Edwards informed me two or three years ago that Mr. Grote had redescribed Herrich-Schaeffer's species, and that he had a specimen. I suggested that he should print this note, and he promised to do so in connection with a number of other remarks on Bombycid species. The notes were not printed, and I made no reference to the matter in my catalogue. After Mr. Dyar's note appeared, Mr. Butler wrote me at some length giving the differences between the tropical species and North and South American forms, and mentioning others which he thought formed a distinct section at least of the genus. I saw Mr. Edwards afterwards, and stated Mr. Butler's indisposition to accept *trigona* as = *specularis*. Mr. Edwards adhered to his original conclusion, and fortified it by stating that he had examined and compared the specimens in the British Museum, and felt sure he was right. The existence of several closely allied species is indicated by specimens in Mr. Neumoegen's collection, and it would seem to be hazardous to unite species from a comparison of a picture and description merely. Mr. Edwards's comparisons, made in the British Museum, stand on quite a different base, but we must wait until he gives us his notes before putting *trigona* into the synonymy.

J. B. SMITH.

## DASYCHIRA LINTNERI, GRT.

Recently on a visit to Plattsburgh, N. Y., I noticed in the collection of my friend, Mr. G. H. Hudson, four specimens of a *Gluphisia* new to me, similar to *G. trilineata* but larger and stouter, and with a yellow shade preceding the subterminal line. These were taken by Mr. Hudson as follows:—April 13th, 1890, 1 ♂; April 23rd, 1890, 3 ♂♂. I compared the descriptions of all our species of *Gluphisia* without finding anything to fit, but later found the species in the collection of Prof. Lintner under the label "*Dasychira Lintneri*, Grt.," and Mr. Grote's description fits the specimen exactly. From the above it will be seen that the species must be referred to *Gluphisia*, and will stand thus: *Gluphisia Lintneri*, Grt.

1877—Grote, CAN. ENT., IX., 85, *Dasychira*.

The venation is that of *G. trilineata*; three median venules; the subcostal series crowded well toward the apex of the wing; the independent vein of secondaries absent, but represented by a strong fold which runs to the base of the wing. It is very different from that of *Dasychira*, and it is somewhat curious that Mr. Grote should have been led to refer it to that genus, differing as it does in subfamily characters.

HARRISON G. DYAR, New York.

## AGROTIS SUBGOTHICA, HAW.

Mr. Grote in his "Check List of N. American Noctuidæ," 1890, treats this as a distinct species. I do not know the American *subgothica*, which is, I dare say, a distinct species; but why is it *subgothica*, Haw.? I think there can be no doubt that Haworth's description applies to a well-known variety of *Agrotis tritici*, and, therefore, unless the American species is also a var. of *A. tritici* I fail to see how it can be called *subgothica*, Haw., at all. It should, in my opinion, be *subgothica*, Grote. Mr. A. G. Butler has followed this nomenclature, "Trans. Ent. Soc.," 1889, p. 377, and looks like landing us into a muddle. I drew his attention to this and other errors in the "Entomologist's Record," etc., 1890, p. 10, and on p. 31 Mr. Butler simply falls back on Grote's "Check List" as his authority without attempting to combat my view that *subgothica*, Haw., is not *subgothica*, Grote. Perhaps Mr. Grote will tell us what he knows of *subgothica*, Haw., other than as a well-recognized var. of *tritici*.

J. W. TUTT, Westcombe Hill, London, England.

## BOOK NOTICE.

THE BRITISH NOCTUÆ AND THEIR VARIETIES, by J. W. Tutt, F. E. S.:  
Sevan, Sonneuschein & Co., Paternoster Square, London, E. C.:  
Volume I., 164 pages, May, 1891.

This book is characterized by the extreme care which the author has taken in describing and fixing the original form which was taken as the basis for the first specific description, and the enumeration and designation of all the varieties of the species hitherto known. It is simply invaluable to the English collector, and has in so far an interest for the American, as the species common to Europe and America are fully treated, and it is a matter of scientific importance to ascertain whether all the varieties of such species occur equally in both the Old and New World, or what varieties are peculiar to either. For clearness of treatment and precision of language the work cannot be too highly spoken of. Whether all the named varieties are constantly recurring, and sufficiently recognizable in every case is a matter for future elucidation; but it is undeniable that it is a matter of convenience that the varieties should receive special designations. In this way what are commonly called synonyms have a use in designating the particular form which they were originally intended to cover and the geographical distribution, and the occurrence of these varieties can be properly brought to light. Where a work has been prepared with so much evident care, and contains so many valuable scientifically-stated suggestions as to the phenomena of variation itself, it disarms any unfavourable criticism. It seems, however, a matter of regret that the generic terms employed are not the most correct in a number of cases, that the system of M. Guenée has been retained, and, lastly, that no account is made of possible variation in structure, neuration, armature and secondary characters. The work is well printed and will be of interest, and is hereby cordially commended to the notice of all lepidopterists.

A. R. GROTE.

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\* \* \* By some oversight the name of MR HARRY CARTER was omitted from the list of members of the Geological Section of the Entomological Society of Ontario (p. 108). As he is a very useful and active member, we regret the omission very much.

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Mailed July 4th.