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A MYSTERY AND ITS SOLUTION.

BY REV. W. J. HOLLAND, PITTSBURGH, PA.

Seated at my desk this evening, with a copy of Vol. I. of Edwards' Butterflies of North America before me, I am forcibly reminded, as I turn to the magnificent plate designated as "Argynnis I.," of an experience of my boyhood. My home, from 1858 to the fall of 1863, was in the village of Salem, N. C., famous as one of the most successful of the settlements made by the Moravian Brethren under the lead of the good Count Zinzendorf, and well known throughout the South as the seat of an excellent seminary for young ladies. The war broke out and the hopes cherished of sending me to the North to be educated were in consequence disappointed. I was left to pursue my studies under a tutor, and to roam the neighborhood of afternoons in quest of insects, of which I gathered a large collection. Unfortunately my stock of books upon entomology was limited, and aside from an original copy of Say's work, of no especial value. My determination of species was therefore very imperfect.

One day I spied upon a bed of verbenas a magnificent butterfly with broad expanse of wing, and large blue spots upon the secondaries. In breathless haste I rushed into the house and got my net. To the joy of my heart, when I returned to the spot, the beauty was still hovering over the crimson blossoms. But, as I drew near with fell intent, it rose and lazily sailed away. Across the garden—over the fence—across the churchyard—out into the street—with leisurely flight the coveted prize sped its way, while I quickly followed, net in hand. Once upon the dusty street, its flight was accelerated; my rapid walking was converted into a run. Down past the church, and,—*horribile dictu!*—past the boarding school that pesky butterfly flew. I would rather have faced a cannonade in those

days than a bevy of boarding-school misses, but there was no alternative. There were the dreaded females at the windows, (for it was Saturday, and vacation hour,) and there was my butterfly. Sweating, blushing, inwardly anathematizing my luck, I rushed past the school, only to be overwhelmed with mortification by the rascally porter of the institution, who was sweeping the pavements, and who bawled out after me: "Oh! it's no use—you can't catch it! It's frightened, you're so ugly!" And now it began to rise in its flight. It was plainly my last chance, for it would in a moment be lost over the house tops. I made an upward leap, and by a fortunate sweep of the net, succeeded finally in capturing my prize. I decided that it was an *Argynnis*, and noted the similarity of the silvery spots to those of *A. Diana*, of which I had several male specimens agreeing with the plate in Say. But I was sorely puzzled. In 1863 I went North. My collection followed me in 1865, after the war. I sought in vain, however, for some one to name my butterfly for me. I asked the Professor of Zoology in the College where I was pursuing my studies, to help me, but with characteristic frankness, he answered my request by saying: "I don't know anything about bugs and butterflies, and nobody else in the Faculty does." Some time later, being in London, at the British Museum, I asked to see the cases containing *Argynnis*, but my black beauty was not there represented. I described it as well as I could to the gentlemanly Curator, and made a rough drawing for him from memory, and received the reply: "You must be mistaken, sir, in your identification of the genus. We have no such *Argynnis* here, at all events."

Meanwhile my collecting ceased for the time, and my collection was deposited in the keeping of an Eastern institution of learning. There it went the way of such things when carelessly attended to. Eighteen months ago the collection was restored to me. Alas! for the most part in the form of dust and fragments. My black beauty was an unsightly wreck—a wingless, worm-eaten body on a pin.

The mystery remained unsolved for me until I opened this magnificent work of Mr. Edwards', and I now at last have the satisfaction of knowing the name of the beautiful insect I chased down the streets of Salem more than twenty years ago; and of having the assurance that in all probability the specimen I impaled that July morning was the first specimen of the female of *Argynnis Diana* ever put upon an insect pin.

NEWFOUNDLAND BUTTERFLIES, COLLECTED BY
P. H. GOSSE.

Editor CAN. ENT.:

DEAR SIR,—I send you herewith certain notes of observations made 50 years ago, by the eminent naturalist, Philip H. Gosse, F. R. S., &c., on Butterflies of Newfoundland.

I received a letter from Mr. Gosse, in the spring of 1882, from which I extract as follows:

"I began the study of Insects in 1832, when I was a clerk in a mercantile house at Carbonear, Newfoundland. For more than three years I pursued the study with great ardor and industry, making careful drawings of nearly every species I found, of all orders, often magnified. These drawings, in a small 4to book, I still possess, and for minute care I think they are in nowise inferior to any that I have executed in later years. They have never been used for publication, save a few slight allusions in my 'Canadian Naturalist,' and I have of late thought some of you American entomologists might be interested in looking over so early a record, since you are including Newfoundland in your Fauna. If it would give you the least pleasure, I will at once post it to you." At my reply to this, the book was sent, with the following note: "I do not know what is known to the U. S. entomologists about the economy and natural history of the insects of Newfoundland. I am pretty sure English entomologists know nothing at all about them, for my own drawings and observations have never been published. Therefore I have thought it just possible that these early notes of mine may embody facts sufficiently graphic and interesting to be published in one of your magazines. If you think so, you are perfectly at liberty to use them. I only stipulate that my *ipsissima verba* be not changed."

This book contains excellent colored figures of many Coleoptera, Hemiptera, Orthoptera, Diptera, Hymenoptera, and Heterocerous Lepidoptera, with all which I myself have no concern, but by Mr. Gosse's permission I am free to submit it to any specialists who care to make use of it for these orders. But in the Diurnal Lepidoptera are many species of interest, and some which have only been described of recent years. In most cases there are drawings of the mature caterpillar and chrysalis also. The species given are

1. *Papilio Brevicauda* Saunders, ♀ both surfaces, 2 figs. of mature caterpillar, and 2 of chrysalis, the green and the brown vars.

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| 2. | <i>P. Turnus</i> ♂, both sides—the pale variety; caterpillar and chrysalis. | | |
| 3. | <i>Pieris Napi</i> , summer form <i>Acadica</i> Edw., 2 figs. | “ | “ |
| 4. | <i>Vanessa Antiopa</i> | “ | “ |
| 5. | “ <i>Milbertii</i> | “ | “ |
| 6. | <i>Pyrameis Atalanta</i> | “ | “ |
| 7. | “ <i>Cardui</i> | “ | “ |
| 8. | <i>Cœnonympa Inornata</i> , Edw. | “ | |
| 9. | <i>Chionobas Calais</i> , Scud., ♀. Under side only. | | |
| 10. | <i>Chrysophanus Epixanthe</i> , Bois. 2 figs. | | |
| 11. | <i>Lycaena Aquilo</i> , Bois. | “ | |
| 12. | “ <i>Couperi</i> , Grote. | “ | |
| 13. | “ <i>Aster</i> , Edw. | “ | |

The figures of *C. Inornata* agree with the type specimen of the butterfly from Lake Winnipeg. I have also four examples taken at St. John's, Newfoundland, in 1880, by Mr. T. L. Mead. I have seen this species from no locality between Winnipeg and the island.

Chion. Calais was described from a single female from Rupert House, Hudson's Bay, and to this day I have not seen another example. I formerly thought it was the same as *Ch. Chryxus*, Doubl., but am satisfied of its distinctness. This admirable figure by Mr. Gosse is unmistakably the likeness of *Calais*, which like *Inornata*, is thus found in localities thousands of miles apart.

Lyc. Aster was taken by Mr. Mead at St. John's, and I have not seen it from localities outside Newfoundland.

Lyc. Couperi was taken by Mr. Wm. Couper on Anticosti, and is also found in South Labrador.

W. H. EDWARDS.

Coalburgh, W. Va., 18th Dec., 1882.

NOTES ON BUTTERFLIES OBTAINED AT CARBONEAR ISLAND, NEWFOUNDLAND, 1832-1835.

BY P. H. GOSSE, F. R. S., ETC.

PAPILO BREVICAUDA, SAUND. ; AND ITS TRANSFORMATIONS.

[Extracts from journals, kept by P. H. Gosse, at Carbonear, Newfoundland, in 1834 and 1835.]

1834, July 25.—A friend, A. E., caught for me an example of the

Black Swallowtail,* in torn condition, on Carbonear Island, a high rocky islet, about a mile in length, lying off the mouth of the harbor, uninhabited, uncultivated, partly covered with bushes—visited occasionally for summer picnics. This is my first cabinet specimen; but I had possessed an old rubbed and patched specimen which had been captured in the same locality several years before I began to collect.

July 31.—I made a visit with A. E., to Carbonear Island. We saw immense numbers of the little Orange-brown Butterfly (the *Canyonympha* figured on page 22 of my Entom. of Newfoundland, 4to), and many of the *Polyommatus* (*Argus* of Ibid, p. 23).† After searching the Island, in vain, for a Swallowtail, we were just going down to our boat, when I caught sight of a great black fellow fluttering over a bed of tansy. I ran towards him, but I had to look about some time before I could find my beauty, for he had now alighted, and was so fearless that he did not attempt to fly, but continued sucking the aromatic flowers. I threw my net over him, and found I had secured a specimen much more perfect than my former acquisition.

Aug. 8.—My neighbor, Mr. Peters, gave me a beautiful caterpillar, which had been feeding on parsnip in his garden, and a few hours later he sent me another (No. 2), younger. They are of a clear apple-green hue, each segment marked by a black transverse band of velvet-black, carrying five spots of bright yellow. Each segment is also separated from its fellows by a narrower line of black. I feel confident they are the larvæ of one of the Swallowtails. The No. 2 protruded, and instantly retracted, a soft red organ from its neck.

Aug. 9.—I observed the orange-colored organ of the neck much farther projected; it was then forked, in form of a Y; it left a wetness on my finger, and diffused a strong odor of parsnip.

Aug. 11.—I am convinced that the Y-organ of the neck is used as a defence; for, on my touching the side of the caterpillar—the left side, for instance—it would jerk its head round to the place, and protrude the *left* branch of the forked horn; if I touched the right side, the *right* branch would be protruded; *the other branch*, on each occasion, *being kept undisplayed*, while a strong fetor was manifest. The caterpillar No. 1 has moulted to-day.

* *Papilio brevicauda*, Saund.

† *Lyc. Aster*, Edw.

Aug. 16.—The younger (No. 2.) moulted. There is a marked difference in the coloring of the two examples. This one has the yellow spots circular in outline, and quite insulated, centrally, on the black bands; but No. 1 has the spots of oblong shape, and placed *upon the front edge* of the black bands, interrupting it.

Aug. 21.—In Peters' garden I found, on the parsnip leaves, two more Swallowtail caterpillars, larger than my largest (Nos. 3 and 4).

Aug. 22.—My No. 1 is hanging, back downward, from the roof of its cage, a silken band round its body, and its tail fastened to a knob of white silk. In the evening No. 3 suspends itself in like manner.

Aug. 23.—This morning I was so fortunate as to see the process of No. 4 putting the already spun silken girth over his head, and adjusting it around his shoulders.

Aug. 24.—No. 1 went into chrysalis during the forenoon. It is large and rough of surface, of a yellowish pink hue, green in some parts, marked with a broad streak of sooty brown down the back, and one down each side of the abdomen.

Aug. 25.—This morning I saw that No. 3 had already become a chrysalis. About 5 p. m., I witnessed, with great pleasure, the whole process of the evolution of another chrysalis, my No. 4—the one whom I had seen put on his necktie. This caterpillar appearing uneasy and restless, I watched it at intervals for about half an hour; when, by strong and apparently painful distension of the part, a slit was made in the skin, down the back of the third ring. Through this the soft chrysalis forced itself, gradually extending the slit *upwards*, till the head was divided and separated; and also *downwards*, for several rings' length. The skin was now gradually pushed down. I had been curious to see how the creature would get through this part of the business, for its weight pressed the silken girth very tight around the body. There seemed, however, no real difficulty; I thought it kept itself, by muscular effort, from pressing its whole weight on the girth until the skin had passed the part. As soon as it was pushed down to the extremity, the tail of the chrysalis was thrust out beneath, very cleverly, and pushed upward to take hold of the little knob of silk. When this was done, the old wrinkled skin was jerked off, and cast away, by the writhing of the pupa. The silken girth was now encircling the body, between the sixth and seventh rings; but the chrysalis twisted and turned, till it got the girth three rings nearer the head, namely,

across the middle of the wing-covers. The skin was as yet so soft, and the silk so slender, that it cut into the wing-covers, so far as to be invisible; but, as all my specimens are alike in this respect, I presume it is no other than natural. The shape of each was different, immediately on expulsion, from what it became after some hours; the fore parts being awkwardly shortened and shrivelled, and the hind wings stretched out.

Aug. 27.—Caterpillar No. 2 finished his girth, and put it over his head, about 8 a. m., and so is suspended.

Aug. 30.—This No. 2 went into pupa in the early morning. In this case when the skin was stripped down, the tail was not put out to take hold of the silken knob; and, by and by, the old skin loosed its hold of the silk, and the chrysalis was swinging about, suspended only by the girth. I proceeded carefully to assist nature by removing the old skin, and putting the tail to the silk, of which its projecting points now took firm hold. The girth, however, remains between the sixth and seventh rings, so as to cause the fore parts to hang down considerably. In shape it resembles the other three; but in color it is widely different, being wholly of a bright yellowish green, except a wide band of pale yellow down the back. This individual is the one which, as a larva, had the peculiarity of the yellow spots, which I noticed on the 16th inst., and from both circumstances, I fully expect the imago to be of a different species from the others.

1835. June 25.—To-day I sailed from Carbonear for Canada, carrying with me the four Swallowtail chrysalids of last summer, all alive and apparently healthy.

July 4. At sea, in the Gulf of St. Lawrence.—From the yellow and green chrysalis, No. 2 (see note on Aug. 30, 1834), was evolved before day, a specimen of the Black Swallowtail—*Papilo Asterias (brevicauda)* of Saunders.) It is identical with the examples taken on the Island last summer, but in great beauty of perfection; the wings are not in the least injured from the cutting of the pupa-skin by the girth (see Aug. 25, 1834), nor by the accident that the girth has been, for some weeks past, broken; one side first giving way, then the other, so that the chrysalis has been hanging perpendicularly.

July 14th.—One of the drab-hued, brown-striped chrysalids produced the butterfly this afternoon.

July 18 and 20. At Quebec.—The other two were evolved. Those of the 4th and 14th had been kept in glasses, exposed to the sunlight, all

the winter; these last two had been shut up in a dark box. Thus all my four examples have produced perfect imagines. I can discern no specific difference among these last three. *inter se.*: nor—what is much more remarkable—between them and the one from the yellow and green chrysalis, evolved on the 4th instant. The variation in color, which distinguished this individual, both in the larva and pupa (as I have described under dates Aug. 16 and 30, 1834), seems, therefore, a very noteworthy circumstance.

The liquid discharged by these butterflies, immediately after their evolution, is whitish, or cream-colored. The duration of the period of pupa-repose is not quite uniform. It does not fall much short of eleven months, from about the middle of August to about the middle of July. And the evolution of my individuals kept in unnatural confinement through the winter, does not sensibly vary, in seasonal period, from that of the examples caught on Carbonear Island, last July.

One of my evolved specimens, before it was killed for the cabinet, laid five globular yellow eggs. So that I have seen this beautiful insect in all its stages.

P. Turnus, Linn. Dwarfed in size, and paled in hue, from the normal American condition. It is very uncertain in its appearance; in some seasons I have seen 15 or 20 examples; in others not one; it must always be considered scarce. In my "Canadian Naturalist" I have given a few notes of these species.

Pieris Oleracea, Harr. Always abundant; a nuisance in the cabbage-gardens. The 1st brood appears early in June; the 2nd late in August and early in September, at which times we find oleraceous plants studded with the oblong, whitish eggs. I once saw a ♀ lay an egg; she alighted on the under side of a leaf of horse-radish, and immediately, bending her abdomen down, touched the leaf for an instant, and flew away. Looking at the spot I found the white egg adhering by its end. I have had females lay several eggs, when pinned on the setting board. I once found a pupa which was all over of a light pellucid green hue; this is always the color when newly evolved, but in this instance the green hue remained without any change till the imago appeared, some ten days after I had found it. Another unusual circumstance was that this chrysalis, instead of being horizontal, was bound in a perpendicular position, head downward to an upright post. The June brood have remained in pupa through the winter,

the August brood only about a fortnight. What becomes of butterflies at night? I had often asked. One evening after dark, I saw a *P. Oleracea* resting with closed wings on a stalk of grass. I threw it into the air repeatedly, but it would not fly; it merely fluttered to the ground, and made no resistance to my taking it up again.

Vanessa Milberti, Godart. The first butterfly that gladdens our eyes in spring, appearing on sunny days in the middle of April, but in no considerable number in May. Then it becomes by far the most abundant of all our butterflies, more common than even the Garden White, and that in every season. It seems to survive the long and severe winter. I once found one, half-torpid, on the 15th October, resting, with closed wings, on a stone *in the midst* of a loose heap; and a gentleman presented me with another, living, but torpid, which had fallen from a loft on the 5th of April. This last was certainly a survivor of the winter.

About the middle of June we see the tops of the growing nettles covered with unsightly webs, which are inhabited by families of the little black caterpillars of *Milberti*. They live in society some time after they are hatched; but as they grow up they separate into groups of four or five on each plant. As they are not long eating the choice leaves of one nettle, they colonize to others, leaving their deserted habitations mere leafless stalks, covered with the dense and cloth-like web, and with the excrement and sloughed skins of the caterpillars.

When full grown they have a rather repulsive appearance, being black above, dingy green below, with toothed spines. But the beauty of the chrysalis atones for the ugliness of the caterpillar; for the numerous sharp points on the brown segments are of a most brilliant gold, like polished metal. Occasionally we see examples of more than usual splendour; the abdominal rings of a dull red, and the whole fore parts of polished gold, tinged with green. Alas! it is a fatal beauty! for all such specimens are punctured by parasitic flies, the terrible "Long Stings;" and from every one there are sure to emerge one or more of these rascally ichneumons.

V. Antiopa, Linn. Rather rare, flying round the tops of willows. Fine specimens measure $3\frac{1}{2}$ inches in expanse; the border of the wings, which in European examples is buff, is in Newfoundland examples pure white, speckled with blackish: at least in the female.

Pyrameis Atalanta, Linn. The Red Admiral is sufficiently abundant with us. As soon as summer is fully set in our gardens are gay with this

very fine insect, itself looking like a brilliant flower. Like other members of the group, it often alternately expands and closes its beautiful black and scarlet wings in the sun when resting from flight. There seem to be two broods in the season; one appearing in June, one in Sept. and Oct. The transformations of this wide-spread species are sufficiently known. A day or two before the evolution of the butterfly the brilliant marking of the fore wings becomes distinctly visible through the transparent skin of the pupa; but all in miniature. I have taken a chrysalis in this condition between my fingers, and gently pressing it till the skin of the back cracked, the butterfly crawled out. Though it was quite lively, the wings did not begin to expand for more than an hour; then they rapidly attained their full size and perfect form, without any injury from the premature birth. Though the Red Admiral is so abundant in Newfoundland, I cannot recollect that I ever met with it in Lower Canada, and very rarely in Alabama.

Pyr. Cardui, Linn. The last remark is true of this universally distributed species also. In Newfoundland, however, it is more abundant as larva than as imago: the caterpillars, in great societies, crowding the web-clothed thistles by the wayside, which I have found very easy to rear. While if we search the same plants a few weeks later no trace of one and not even an empty pupa-skin appears, and the butterflies are far from numerous. The chrysalis is even more beautiful than that of *Milberti*, the gilded spots being often orange-colored.

Chionobas Calais, Scudd. Of this species I am sorry to say I can give no account, except the colored figure in my book of drawings, which was certainly made from a specimen taken near Carbonear.

Cænonympha inornata, Edw. If my little Orange-brown is indeed this species, it must be wide-spread, since this reaches to the Pacific. In Newfoundland it is not uncommon, though local. In Aug. 1833, I found a few specimens on Carbonear Island, and in July of the following year, immense numbers were swarming there, though only one or two straggling individuals were to be seen elsewhere. I know nothing of the immature stages.

Chrysophanus Epixanthe, Lec. This tiny butterfly, which I called the Purple-disk, was the smallest species that I had ever seen, expanding less than an inch. It appears to be rare. I met with it only in 1834, at the end of July and the beginning of August, chiefly on some low shrubs, unknown to me, whose leaves have an aromatic odor somewhat like that

of the orange tree growing in some abundance on the banks of a brook behind the town of Carbonear. A few examples only occurred, but from its minuteness and dull hue it may be easily overlooked. Yet the area of the upper surface, though dull, has a rich purple flush in some lights.

Lycæna Aster, W. H. Edw. This species, which I had supposed to be our English *Argus*, is far more common than the preceding. In the summer of 1834 it was nearly as abundant as the little Orange-brown on Carbonear Island, where every step aroused numbers of these bright little creatures from the grass to sport in the sunshine. It was surprising to see how much the beams of the sun, reflected in every direction from their lustrous wings, added to the life and gaiety of the scene. I have found the species not rare also on Bake-apple Marsh, during July and August, the hottest and brightest part of our short summer.

Lyc. Couperi, Grote. On the other hand I am acquainted with but a single specimen of this species, which I distinguished as the Silver Blue. This was caught on Carbonear Island, on the 10th of July.

Lyc. Aquilo, Boisd. The Lead-grey Blue. This too is found on Carbonear Island in July, but by no means commonly.

The above-named are all the butterflies that I have actually taken in Newfoundland. But there are doubtless some that escaped me. In May, 1835, as I was on Flagstaff Hill, about a mile from the town of Carbonear, I saw a small butterfly, strange to me, red, with black spots. It may have been *Melitæa* or *Chrysophanus*. I observed it five or six times during an hour that I remained there, but, though it flew near me, I could not catch it.

ON THE GENUS AGROTIS.

BY A. R. GROTE, A. M.

In the Reports of Dr. Harris and Prof. Riley and some other State Entomologists, the structural characters of the genus *Agrotis* are not given, and the term is evidently loosely applied to cover certain Noctuidæ known as "cut-worms." In Dr. Harris's Report, as I have shown, the moth *Hadena devastatrix* (the *Agrotis devastator* of Brace) is considered to be an *Agrotis*, while *Agrotis Claudestina*, which has the structural characters of *Agrotis*, is referred to the old Linnean genus *Noctua*, now without

standing in our lists. The three genera to which the "cut-worms" are referable, *Agrotis*, *Hadena* and *Mamestra*, are separated in the Preface to my list of the Noctuidæ, p. 3, April, 1874, by their characters.

The genus *Agrotis* is recognized, in a more or less extended sense, by all modern writers upon the *Noctuidæ*. It is very numerous in species, over two hundred and twenty-five being described from our territory. The perfect insects may be known by their rather narrow and pointed fore wings, which are even along the short external margin, and the rather full and rounded hind wings. They are usually of a brown or gray color, and the primaries above show the stigmal marks plainly; the two ordinary spots on the cell are often relieved by a black or dark shade spreading between them and on either side of them, setting them off. The median lines are usually not very distinct; they are often double, darker than the wing, and form little scallops, as curves between the veins. The structure of the genus must be made out with the help of a lens, under which the compound eyes will be found to have the surface naked; the ocelli are present; the middle and hind tibiæ are always, and usually the front tibiæ as well, spinose, or covered with prickles, similar to those usually present on the tarsi of all Noctuids. Besides these characters, the body is deprived of tufts along the dorsal line which signalize the allied genera of "cut-worms," *Hadena* and *Mamestra*. The labial palpi are not very prominent; the tongue is well sized in almost all the species; the front is smooth: the vestiture or clothing of the body is of a hairy character, rather smooth than rough. The antennæ of the males are of varied structure: sometimes they are simple, merely provided with little hairs or ciliæ; again they are brush-like, serrated, or again quite lengthily pectinated or feathered. The type of *Agrotis* is *Segetum*, and we owe the generic name to Hubner.

Subdivisions of the genus can be undertaken when the form of the genitalia is studied. This character, taken in connection with the antennal structure, will give us sub-genera and assist in the identification of our numerous species. I cite 206 species in my late Check List, one (*rufipectus*) has been forgotten: I have described nearly twenty since, not all at this writing published (in a paper in the Annals and Magazine for Natural History, Jan., 1883, will be found several new forms found by Prof. Snow in New Mexico). I have separated from *Agrotis* the genus *Agrotiphila*, founded on the constricted eyes, a good character which, indeed, allies the moth (*Montana*) to *Anarta* and the Helioid genera.

it is said by Mr. Morrison to have a European analogue not known to me. Lately I have described the genus *Carneades*. This is based on a species I should otherwise have referred to *Agrotis (moerens)*, but the clypeus is roughened with a navel-shaped protuberance, around which the frontal hairs converge, while the infra-clypeal plate is prominent. To this genus, *Carneades*, I also refer *Agrotis citricolor*, Grote, which shares the embossed clypeus. On examination the pattern of ornamentation is the same; *Citricolor* is light yellow. *Moerens* is ochrey fuscous, varying in the depth of shade; both have the terminal space darker, the reniform with an inferior dark spot; the two are western. *Citricolor* from Colorado and California, *Moerens* from Arizona; the size is moderate (30 to 26 mil.) *Anytus* differs in the shape of the thorax, which is more square in front and approaches that of *Lithophane (capax)*, which led me to place the moth (*Sculptus*) in that group at one time; the moth hibernates, but so do some other *Agrotis*, as now appears. In addition the eyes are lashed. As to this last character I am not certain but that it is shared by other species. My notes on this character were made in 1875, and the species must be again examined. *Adita* has a claw on the front tibiae, and the species (*chionanthi*), rediscovered by myself in New York since its illustration in the last century from Georgia by Abbot & Smith, is otherwise a striking and peculiar form. While these four genera rest upon decided characters, three others: *Anida*, and *Matuta*, and *Pleonectopoda* are of doubtful value and are not considered valid in my late Check List. The type of *Anida* is *incivis*, and the other forms agree with this (*beata. lubricans*) in the close short vestiture, the simple antennae, the black velvety band in front, the pale, sub-diaphanous secondaries, the long abdomen. Comparative as these characters are and shared by other species singly, I yet believe when the genitalia are studied that we shall be able to use this term in a sub-generic sense. The type of *Matuta* is *Catherina (manifestolabes)*. This is a red species with pectinate antennae and looking like the European *Tacniocampa rubricosa*. Probably this also may be used in a sub-generic sense and include such forms as *Manifesta*, *Orthogonia*, etc. I have not been able to examine any of these carefully; the species seem to be rare, and with the exception of the type, a female *Catherina* (mistaken by me for a male), have never been in my possession. The type of *Catherina* I photographed for the CANADIAN ENTOMOLOGIST and returned it to Mr. Norman too quickly; I saw it lately in Coll. British Museum. Finally with regard to *Pleonectopoda*,

the type (*Lewisii*) is an ordinary *Agrotis* with the fore tibiae very lengthily spinose and, apparently, a slight tuft on thorax, which latter character may be accidental. In perfectly fresh specimens of *saucia*, there is, however, a species of creasing which is very curious. With regard to other genera proposed by European authorities at the expense of *Agrotis*, we have in our fauna representatives of *Ammoconia*, which has a distinct longitudinal thoracic ridge of scales, and is apparently valid. The same character separates *Epiglaea* from *Glaea*. It is less strong, however, than any of the four genera above discussed and established by me. Our forms are much slighter than the European type of *Ammoconia*. The sub-generic term *Eurois* (*oculta*) may be retained for large, wide-winged forms. I should think that *Clandestina* and *Cupida* would afford sub-generic types.

The genus *Agrotis* should first be divided by the separation of the forms with non-spinose fore tibiae, then the other characters here discussed should be used. In this way the monographist will do a good work, now much needed.

With regard to the species, there may be too many separated from *Cupida*, although Prof. Lintner seems hardly to be agreed with this. The western forms are very confusing, and the range which I admit under "*Cupida*" is very great, though in all probability it will have to be extended to admit both *Alternata* and *Brunneipennis*. *Variata* I regard as decidedly distinct. *Recula* may be an extreme form of *Cicatricosa*. The forms allied to *Campestris* (*i. e.*, *Decolor*, *Albipennis*, *Nigripennis*) may have to be all united under the name *Declarata* of Walker, which, applied to western specimens under an erroneous generic appellation, is probably the oldest term for any of them. The western specimens (coll. Neumoegen) which I have labelled *Declarata* can hardly be distinguished from eastern *Campestris*. As to the species erected at the expense of *Subgothica*, we certainly ought to be able to decide the matter by breeding them. While there is no difficulty in separating *herilis*, from the ornamentation of the primaries, *tricosis* is considered hard to recognize always with certainty, by some correspondents who have probably had a larger material to look over than myself. As for the great bulk of the species cited in the New Check List, they are undoubtedly valid. As compared with the European fauna, our species of *Agrotis* are far more numerous. Staudinger gives 170 species, but he includes Labrador forms. In my opinion he is not justified in this procedure; the resemblance is owing to the presence of Arctic forms (*Anarta*, etc.) The Labrador

fauna is a true extension of that of New England, and is copied in miniature on the slopes of the White Mountains.

ON THE GENUS LEUCOBREPHOS.

BY A. R. GROTE.

In my Check List (1876) I proposed three new generic names, *Conservula*, *Oxylos* and *Leucobrephos*. I have since discarded *Oxylos* and given the character which separates *Conservula* from *Trigonophora* Led. There remains *Leucobrephos*, which, owing to the kindness of Mr. Butler, who has examined Walker's types for me, I now describe as follows :

LEUCOBREPHOS Grote ; Type : *Anarta Brephoides* Walk.

Male antennæ with longer pectinations than *Brephos*, and broader. Palpi concealed by the beard-like hair, more thickly hirsute than in *Brephos*. Eyes narrower, smooth, naked. The neuration differs by veins 3 and 4 of primaries arising from a common foot-stalk. On secondaries veins 3 and 4 arise from a long stem, diverging near the margin.

Leucobrephos Brephoides has been twice redescribed, by Prof. Zeller as *Archicaris Resoluta* and from a mutilated specimen by myself as *Melicleptria Hoyi*. Its occurrence in the United States, Wisconsin, is remarkable. Although I originally, nearly twenty years ago, determined the species from the Yukon River, in the Proceedings of the Entomological Society of Philadelphia, I failed to recognize the species from the specimen (wanting antennæ and legs) sent by Dr. Hoy. The genus seems to be sub-arctic and probably embraces *Amphidasyus Middendorffi*, from Siberia, besides the North American type.

Family BREPHIDÆ.

Leucobrephos Grote (1876).

Brephoides Walk. *Middendorffi* Men.

Resoluta Zeller.

Hoyi Grote.

Brephos Hübn. (Tentamen).

Infans Moschl. *Nothum* Hübn.

Hamadryas Harr. *Puella* Esp.

Parthenias Linn. *Spuria* Hübn.

The species described by Boisduval from California are probably Arctians and do not belong here.

The two genera are regarded as comprising a distinct family by Dr. Herrich-Schäffer, and probably correctly. The earliest name for it seems to be *Noctuo-Phalanidi* of Boisduval. Following a corrected terminology, I should call it *Brephidae* in future.

ENTOMOLOGY FOR BEGINNERS.

THE MELON MOTH—*Eudiotis hyalinata*. Linn.

BY THE EDITOR.

A specimen of this beautiful little moth, known also under the name of *Phakellura hyalinatalis*, has been taken by Mr. J. Alston Moffat, in the neighborhood of Hamilton, the first capture, as far as we know, of this insect in Canada. It is shown in figure 3. The wings are of a pearly white color with a peculiar iridescence, bordered with black, and they measure when expanded nearly an inch across. The body and legs are of the same glistening white, and the abdomen terminates in a movable brush-like tuft of a pretty buff color, tipped with white and black. It is very widely disseminated, being found throughout the greater part of North and South America; and is very common in some sections in the Southern States.

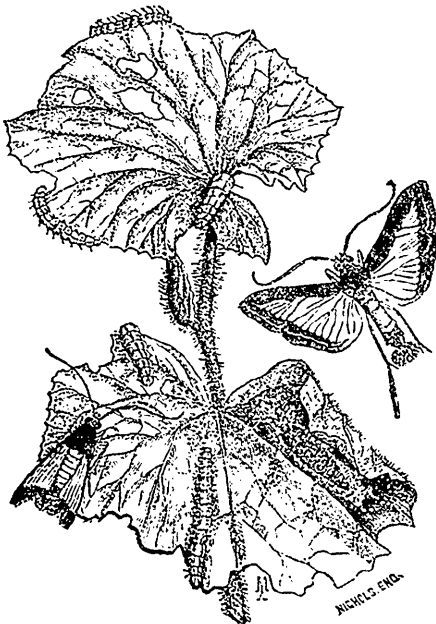


Fig. 3.

The larva, shown also in the figure, is, when mature, about an inch and a quarter long, translucent and of a yellowish green color, with a few hairs scattered over its

body. They are frequently found feeding on melon and cucumber vines, and do not confine their attacks to the leaves, but eat also into the fruit, either excavating shallow cavities on the surface, or penetrating directly into its substance. They spin their cocoons on a fold of the leaf, as seen in the figure, within which they change to slender brown chrysalids about three quarters of an inch long, from which in a short time the perfect insect emerges.

The beautiful figure illustrating this subject was drawn from nature by Mr. Marx, of Washington, and published in Prof. Comstock's Report, as Entomologist of the Department of Agriculture, for 1879. Through the kindness of Dr. Loring, U. S. Commissioner of Agriculture, we have been supplied with an electrotype of it.

OBSERVATIONS ON LIMENITIS ARTHEMIS.

BY MRS. C. E. HEUSTIS, PARRSBORO, N. S.

I was much interested in an article in Vol. xiii. of the CANADIAN ENTOMOLOGIST, by Mr. W. H. Edwards, entitled. "Is *Limenitis arthemis* double-brooded?" My own observations previous to the time of reading the article were confirmatory of Mr. Edwards' theory; but I wished to learn more of this interesting species before hazarding any remarks concerning its habits.

I have never reared or attempted to rear *arthemis* from the egg, but have one specimen obtained from a full-fed larva found on the 2nd July, 1877. It went into chrysalis on the 3rd, and the imago appeared on the 16th. I have seen fresh looking specimens on 1st July, when enjoying, with other citizens, "Dominion Day" in the country. Later than this I have not seen a fresh specimen, excepting the example before recorded.

I find in an old note book the following entry: "Parrsboro, N. S., July 25, 1877, captured to-day a worn and battered specimen of *Limenitis arthemis*, the only example seen, although the species is usually abundant in this wood." A few days later I saw another specimen less worn, but did not succeed in capturing it.

The bustle consequent upon a change of residence prevented me in the early part of last summer (1882) from going much collecting, so that I had no opportunity to observe at how early a date *arthemis* appears here: but later in the season I spent a few days with some friends in a

collecting tour along the south shore of Cumberland Co., N. S., a distance of 45 miles. We were in search of plants and minerals, as well as insects. We started on the 15th of August; on that day I observed two examples of *arthemis*, one of which I took. It was sitting on a low shrub, and seemed to be perfectly stupid, making no attempt to escape when I put my hand on it. It was a good deal worn and damaged. On the three following days I observed quite a number, all in the same condition. At several points they were quite abundant, especially where our road lay through damp woods. Thus, so far as my observation extends, both in New Brunswick and Nova Scotia, *arthemis* may be taken occasionally, in good condition, as late as the middle of July, after which date I think few, if any, fresh specimens will be met with.

I have no doubt that worn and faded specimens might have been found in this county throughout August, or even in September last year. The extreme backwardness of the spring probably retarded the development of the larvæ, and thus caused the imagoes to be seen later than usual.

CORRESPONDENCE.

I have used the Pyrethrum powder, "Buhach" mixed with ten parts of flour, as the easiest and most effectual remedy for the cabbage worm. It was mixed in 1881 and remained in the "insufflator" till the past summer without apparently losing any of its virtue. Its effect was in no wise diminished. I gave some of the mixture to a friend here whose sheep were infested with ticks, requesting him to try it and report to me. He did so, saying that the ticks seemed to enjoy it and he rolled them about in it without inconvenience or injury so far as he could see.

I have both kinds, *Pyrethrum roseum* and *P. cinerariifolium** growing from seed sent me by Prof. Riley.

There are marked distinctions between the plants from the very first. The seed leaves of *P. roseum* are spatulate, those of *P. cinerariifolium* are oval. The former throws out a single leaf from between them; the latter throws out two together. The foliage of the former has a tendency

* The usual spelling of this word cannot be defended, and is against the analogy of almost every other similar term of classic origin.

to lie flat on the ground, and looks comparatively feeble; that of the latter is ranker and stands much more upright. The plants now (January 1st) look healthy and strong. *P. roseum* lived out of doors in Ohio through last winter without the slightest care or protection in a box above ground. Some of the plants began to grow in February, but a heavy rain, followed immediately by a hard frost, unfortunately killed their roots late in the spring. Had they been in the ground this accident would hardly have happened. So far as I can now see *P. cinerariifolium* is the more hardy of the two. I will report later on my success, if I have any, during the coming season of 1883.

E. W. CLAYPOLE, New Bloomfield, Pa.

Dear Sir: An office mate made a capture last summer in a novel manner, but such as would not meet with the favor of entomologists as a method of collecting. He had occasion one hot midsummer day (29th June) to go out for a short time, and on returning complained that a fly had flown into his ear, and, having crawled in as far as possible, was causing great annoyance by a disagreeable buzzing and scratching. I advised him to pour a few drops of oil into the infested organ, or, better still, perhaps, to seek a doctor and have the occupant extracted by skilled labor. On reaching his doctor's office he found that he was absent at a medical convention, but after telephoning all over the city he found a stay-at-home doctor to whom he went and stated the case. An examination of the ear was made, but the doctor could discover nothing in it, and as the buzzing and scraping had then ceased, it was decided that the insect had taken his departure. However, he said it would do no harm to pour a little oil into the ear to allay the irritation which the fly had caused. My friend had not gone far from the office when the insect, which had only been taking a rest or "playing possum," commenced a more violent commotion than ever, causing his unwilling host to hurry home and try the anointing process. Hastily pouring in a few drops of oil, he lay down with his ear on a pillow, and almost immediately felt the intruder withdrawing from his hiding-place and beating a retreat. Lifting his head he was astonished to see, not a fly, as he expected, but a long-legged, active beetle, scampering away. This he imprisoned and bore back triumphantly to me to identify. It proved to be a full-sized and lively specimen of *Acmæops pratensis*. The doctor, on being afterward confronted with the prisoner, was greatly surprised that it had so well secreted itself

from him, and assured my friend that it might easily have caused serious trouble. Small insects cause frequent annoyance and occasional slight pain by flying into eyes and ears, but it is fortunate that such formidable hard-shelled beetles as the species just mentioned do not make a habit of exploring our ears. Had the case been that of some "blockhead," one might have supposed that the beetle had visited him under the guidance of instinct, but in the present instance the intrusion must have been merely the result of accident.

Much as beetles injure man's property, they seldom attack his body, but there is one Canadian species which most decidedly indulges in that unpleasant habit, and to an extent that is perhaps unknown to many entomologists. I refer to *Melanophila longipes*, which occurs here from 12th May to 12th Oct., and is usually abundant during the hot season, basking upon stone walls, etc. It has a fashion of lighting on one's collar and inflicting a sharp nip on the nape of the neck, and then disappearing with great swiftness. I have often been thus bitten, and have sometimes, by making a sudden grab, taken the beetle in the act and proved his identity. Last summer several instances of persons being bitten fell under my observation. While at dinner one day in a hotel, three or four sitting at the same table complained that some "confounded fly" had nipped them viciously. The gentleman sitting next to me was one of the victims and caught the offender, but it escaped almost immediately, only allowing him to see that it was black and harder than a fly. I was just going to say that it was probably a specimen of *M. longipes*, when I got a nip that settled the question and the insect.

A few weeks ago I was trying to convince two ladies that beetles might be handled fearlessly, as they had no biting propensities, when one of them at once exclaimed, "don't tell us that, for there is a nasty, little, flat, black beetle that bites me on the neck in the summer."

Ottawa, 25th January, 1883.

W. HAGUE HARRINGTON.

LISTS OF NAMES OF CANADIAN INSECTS.—The Council of the Entomological Society of Ontario having recently decided to issue additional sheets of the names of insects of all orders found within the Dominion of Canada; we should be glad to receive from any of our Canadian members lists of such insects as they may have which are not included in the sheets already published by the Society, so as to make the sets as complete as possible.