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# The Canadian Entomologist.

VOL. XIV.

LONDON, ONT., MARCH, 1882.

No. 3

## ENTOMOLOGY FOR BEGINNERS.

### *THE POLYPHEMUS MOTH—Telea Polyphemus.*

BY THE EDITOR.

The caterpillar of this insect is also known as the American Silk Worm, in consequence of its having been extensively reared for the sake of its silk. When full grown the larva presents the appearance shown in

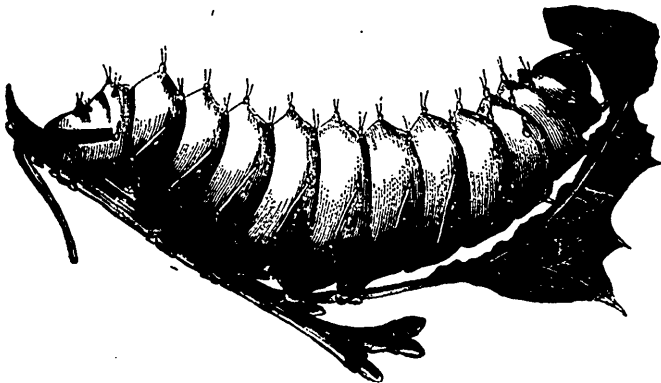


Fig. 4.

figure 4, is over three inches in length, with a very thick body. It is of a handsome light yellowish-green color, with seven oblique pale yellowish lines on each side of the body; the segments, which have the spaces between them deeply indented, are each adorned with six tubercles, which are sometimes tinted with orange and have a small silvery spot on the middle, and from each one of which arise a few hairs. The head and anterior feet are pale brown, the spiracles pale orange, and the terminal

segment bordered by an angular band resembling the letter V, of a purplish-brown color.

When mature the caterpillar proceeds to spin its cocoon within an enclosure usually made by drawing together some of the leaves of the tree it has fed upon, some of which are firmly fastened to the exterior of



Fig. 5.

the structure. The cocoon, fig. 5, is a tough pod-like structure, nearly oval in form and of a brownish-white color, and within it the larva changes to an oval chrysalis of a chestnut brown color, represented in fig. 6.

Usually the cocoons drop to the ground with the fall of the leaves, and in this state the insect passes the winter.

Late in May or early in June the prisoner bursts its prison house, when there is revealed a large and most beautiful moth, the male of which is well shown in fig. 8, p. 44, the female in fig. 9, p. 45. The antennæ are feathered in both sexes, but more widely so in the male than in the female. The wings, which measure when expanded from five to six inches across, are of a rich buff or ochre yellow color, sometimes inclining to pale grey or cream color, and sometimes assuming a deeper, almost brown color. Towards the base of the wings they are crossed by an irregular pale white band, margined with red; towards the outer margin is a stripe of pale purplish white, bordered within by one of deep, rich brown. Near the middle of each wing is a transparent eye-like spot, with a slender line across the centre; those on the front wings are largest, nearly round, margined with yellow, and edged outside with black. On the hinder wings the spots are more eye-like in shape, are margined with yellow, with a line of black edged with blue above, and the whole set in a large oval patch of rich brownish-black, the widest portion of the patch being above the eye-spot, where also it is sprinkled with bluish atoms. The front edge of the fore wings is grey.



Fig. 6.

This lovely creature flies only at night, and when on the wing is of such a size that it is often mistaken in the dusk for a bat. Within a few

days the female deposits her eggs, glueing them singly to the under side of the leaves, usually one only on a leaf, but occasionally two or even three may be found on the same leaf.

The egg is about one-tenth of an inch in diameter, slightly convex above and below, the convex portions whitish, and the nearly cylindrical sides brown. Each female will lay from two to three hundred eggs, which hatch in ten or twelve days.

This insect is subject to the attack of many foes, particularly while in the larval state. A large number fall a prey to insectivorous birds, and they also have insect enemies. A large ichneumon fly, *Ophion macrurum*, see fig. 7, is a special and dangerous foe. This active creature may often be seen in summer on the wing, searching among the leaves of shrubs and trees for her prey.

When found she watches her opportunity, and places quickly upon the skin of her victim a small, oval, white egg, securely fastened by a small quantity of a glutinous substance attached to it. This is repeated until eight or ten eggs are placed, which in a few days hatch, when the tiny worms pierce through the skin of the caterpillar and begin to feed on the fatty portions within. The *Polyphemus* caterpillar continues to feed and grow, and usually lives long enough to make its cocoon, when, consumed by the parasites; it

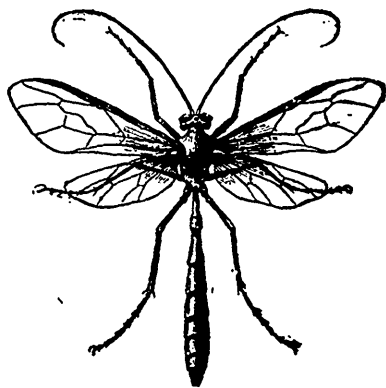


Fig. 7.

dies; in the meantime the ichneumons having completed their growth, change to chrysalids within the cocoon, and in the following summer in place of the handsome moth there issues a crop of ichneumon flies. It is also subject to the attacks of another parasite, a tachina fly. Should the insect ever appear in sufficient numbers to prove troublesome, it can be readily subdued by hand-picking. This larva feeds on a variety of trees and shrubs, such as plum, oak, hickory, elm, basswood, walnut, maple, butternut, hazel, rose, &c.

As this moth has been found to be easily propagated, extensive experi-

ments have been tried with the view of producing silk for commercial purposes from the cocoons. The silk is rather coarser than that of the

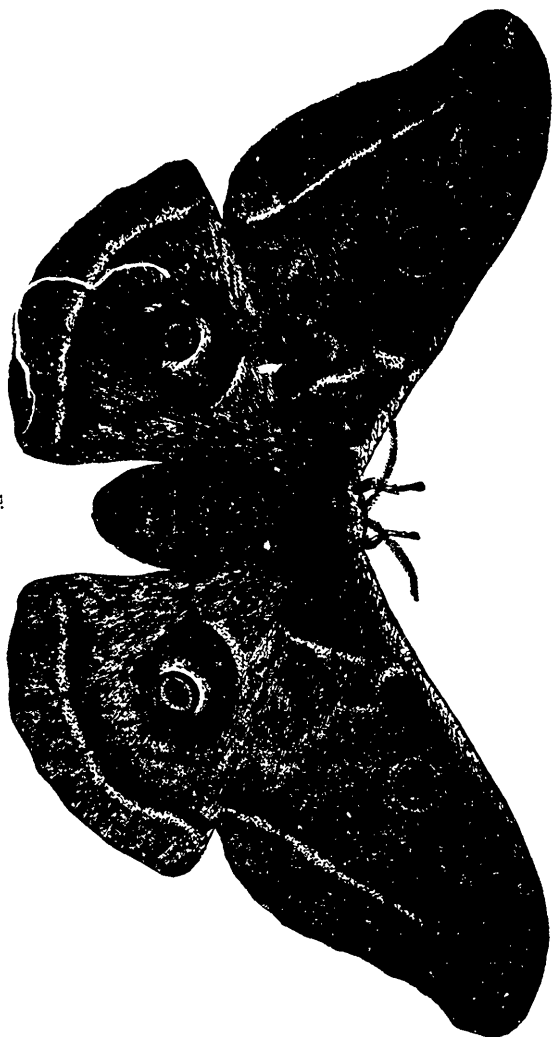


Fig. 8.

common silk worm, *Bombyx mori*, has a continuous thread, and can be readily unwound. A measure of success has attended these efforts, but

not sufficient, it appears, to secure their continuance, and we know of no one now raising these larvæ for the purpose of obtaining silk for com-

FIG. 9.



merce. The insect has also been introduced into France with a similar object, but with what success we have not learned.

## EUROPEAN WRITERS ON NORTH AMERICAN MOTHS.

BY A. R. GROTE.

For more than twenty years I have been endeavoring to complete the synonymy of our moths, and to find out what species were covered by Walker's and Gueneé's descriptions. During this time I have made three trips to Europe, with this object more or less directly in view. Comparatively few of M. Gueneé's species remain unknown to me; and as many of these were collected by Doubleday, the types will probably be found in the British Museum. Mr. Gueneé's descriptions of species are good, and among the best extant, but he does not give structural characters. The microscope was not used by him. His genera contained incongruous material. When he had a species that he did not know what to do with, instead of making a new genus for it, which would have assisted the identification of the species, he often made a group of it, under a genus to which it was opposed in every structural feature—and the species in this way was readily over-looked. As, for instance, *Leucania Littera*.

Mr. Walker's descriptions are entirely misleading, because his types prove that he made no serious study at all of the matter. No system whatever has been followed by him in locating his material; not even casual resemblance has been used as a guide. In my last work on the *Noctuidæ*, written in London, and with Mr. Walker's collection before me, I became satisfied that it would take over a year's steady work, glass in hand, to settle all the questions raised by his determinations. Not only have his types to be gone over with his descriptions, but his identifications of Gueneé's species have to be compared with that author's writings. Although in Gueneé's genera, such as *Hadena*, *Leucania*, *Aplecta*, *Mamestra*, species with naked or hairy eyes, spined or unspined legs, etc., are thrown indiscriminately together, yet some sort of system, i. e., casual resemblance, and often a knowledge of the larva, has been recognized in his work. All this is wanting in Mr. Walker's work; the specimens appear to have been described just as they came along. The genus *Bryophila* is not very hard to recognize; the species are slender bodied with flattened scales on the thorax; yet Mr. Walker describes three American species under this genus all different generically, and none belonging to *Bryophila*. Species belonging to *Agrotis* are described by him, up and down all over the family under all sorts of genera. Some of

his types are in very bad condition ; and sometimes the condition of the specimen is taken as a specific character. The same species is described in the same drawer several times over. It is absolutely impossible to find out what principle has guided Mr. Walker in his work. If the species had been sorted out just as they came along, and then described, I do not sincerely think the effect would have been much worse ; provided the material had previously been sorted into families. And yet, even here, there are a large number of mistakes. There are plenty of *Bombycidae* and *Noctuidae* among his *Geometridae*. For twenty-five years Mr. Walker's work has been a real obstacle in the way of American Entomologists. Through my different visits a certain number of his species have been made known ; but it is impossible for a private person, with my means, to finish this work. Every day that the British Museum allows Mr. Walker's work, which it published and paid for, to remain uncorrected, it continues to inflict as much injury upon the progress of this branch of science as it is possible to do.

I take this opportunity to thank Mr. Butler for his very kind and welcome assistance in the preparation of my Essay on the North American Noctuidæ, which is being printed in London.

#### NOTE ON CATOCALA WALSHII.

BY A. R. GROTE.

After a comparison of my types with Mr. Walker's, Mr. A. G. Butler writes me that *Walshii Edw.*, as taken by Prof. Snow in Kansas, is the same as *Functura* of Walker. The form which has been taken about Albany and which is exactly like *Unijuga*, but differs by the band being a little narrower on hind wings and not quite so continuous, is an unnamed variety of *Unijuga*. It follows from this that my *Arizonae* is certainly not *Walshii*, as suggested by certain parties. Mr. Neumoegen has received it in quantity from Arizona. The form taken by Belfrage in Texas, and distributed as *Walshii*, may be the same as *Arizonae*, and should be carefully compared with Arizonian specimens. In any case it becomes now additionally probable that my suggestion that *Aspasia* is a re-description of *Arizonae* is correct, and if any one will take the trouble to compare the descriptions the reasonableness of my suggestion will become apparent. On account of the pinkish or red hind wings and the brown primaries, both species were naturally compared with *amatrix*. The amount of variation in color of hind wings in this genus is not yet ascertained.



## ON SOME CHALCIDIDÆ.

BY G. H. FRENCH, CARBONDALE, ILL.

In the January number of the CANADIAN ENTOMOLOGIST I described two new species of this interesting family under the names of *Isosoma Allynii* and *I. Elymi*. Professor C. V. Riley, to whom a pair of the first were sent, writes me that they belong to the genus *Eupelmus* instead of *Isosoma*. From a re-examination of my specimens I think he is correct, and the species will be known as *Eupelmus Allynii*, instead of as first described. They have 11 joints to the antennæ, and the prothorax short.

Since writing the descriptions above referred to I have had a number of wingless insects hatch from my wheat straws, and it is now evident that the description of chrysalids, and perhaps larvæ, as given under *Isosoma Allynii*, can not apply to that species, but to these wingless specimens. In a recent letter Professor Riley states that he has bred wingless specimens of an *Isosoma* from wheat received from Kentucky, and it is probable these are the same. I am inclined to think they belong to *Isosoma Elymi* that I obtained from the stalk of *Elymus Canadensis*, though it will be difficult to say positively without more specimens of *Elymi* or winged specimens of the other. The wingless ones are from .10 to .11 of an inch long, inclusive of ovipositor, while the winged *Elymi* I have is .07 of an inch. Premature development might account for the difference. They agree in the following points. Both have 9-jointed antennæ with whorls of hairs at the base of the joints, the antennæ black except the base, which is fulvous, the darkest in the winged specimen. The legs have the femurs and tibiæ fuscous, the joints fulvous, the feet, all but the terminal joint, brownish yellow. Abdomen jet black, the ovipositor and hairs brownish, the hairs arranged chiefly at the sutures of the joints. Head and thorax dull or brownish black, coarsely punctured, the eyes piceous, a fulvous spot on dorsum and sides of the prothorax and similar marks under the thorax. Where there are light markings those on the wingless specimens are a little paler than the corresponding ones on the winged specimen from which my description of *I. Elymi* was taken.

On the other hand, I have now (Feb. 9) larvæ inside stalks of *Elymus Canadensis*. Will they produce *I. Elymi* or something else? Rearing them to the imago will alone tell, and that may help to settle the other

question. I may say in conclusion that I have bred a specimen of *Eupelmus Allynii* from a gall that was probably made by *Isosoma Hordci*, hence there is a probability that the specimens I bred from the wheat stalks were parasitic on the larva of our wingless *Isosoma*.

## NOTES ON CERTAIN BUTTERFLIES, THEIR HABITS, ETC.

### No. 2.

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

#### 8. On Young Caterpillars Eating their Egg Shells.

Mr. Scudder, Butterflies, p. 101, says, after describing the way in which the caterpillar eats out of the egg: "The taste he has gained of egg-shell seems to allure him; for, strange as it may seem, although placed by the provident parent within immediate reach of choice and succulent food, *he will not taste it until he has devoured the last remnant of his prison-walls*. Strange food this for a new born babe! The act, however, is plainly a provision of nature by which the tender animal is rid of a sure token to his enemies of his immediate proximity." Surely here is an error in fact, and a wrong conclusion whatever the fact may be. I read the above statement on the 25th July last, and at once went to my garden to search for eggs of *Libythea Bachmanni*, on Hackberry leaves. The young caterpillars of this species are green, of a shade so near that of the leaves they feed on, that it is very difficult to discover them. Even where the tip of the leaf has been eaten, and their presence is suspected, it is easy to overlook them. I found at once three eggs and one young caterpillar. The egg from which this caterpillar had come was present at the base of the leaf on the extreme tip of which the little creature rested. A hole was in its side near the top, and no more had been eaten than just enough to permit egress. Repeatedly, in the next succeeding days, I found eggshells of *Bachmanni*, each with an opening like that described, and usually, on the leaf above was the caterpillar. So that here is one species which does not devour the last remnant of its prison-walls—perhaps no part thereof. And instead of ridding itself of a sure token of its presence to its enemies, quite the contrary happens, for the empty shell left at the

base of the leaf is a token by which an enemy, or a good friend in the form of an industrious naturalist, may find it.

The fact is, so far as my observation goes, and besides what I had noticed in a general way for years, I paid particular attention to this matter of eating the egg shells for the rest of last season, caterpillars very rarely eat up the shell so completely that one cannot discover some remains of it. *Papilio Ajax* usually leaves that part which is cemented to the leaf. The *Graptas* nibble about the tops a little, but leave the greater part of the shell. *Lycaena Pseudargiolus* eats its way out at the depressed summit, and sometimes eats a little of the upper part of the shell. I had two score eggs of two species of *Lemonias*, viz., *Palmeri* and *Nais*, which came last summer from Arizona, giving caterpillars after they reached me. In every case the egress was by a round hole bitten out of the top, as in *Lycaena* (the eggs much resembling *Lycaena* in shape), and the caterpillar could scarcely squeeze through, so small was it. Not a bite from the shell was taken afterward.

As to why caterpillars eat their egg-shells at all, an eminent authority writes: "It is to save the labor of building up new chitine, that substance being here at hand in the shell."

#### 9. On the Appearance of Albinic Females of *COLIAS PHILODICE*.

Mr. Scudder, in same work, page 183, says: "It is a curious fact that *these pale females never appear in the early spring brood*, and increase in proportion as the season advances. This is in harmonious contrast with the occurrence of a melanic male in the spring brood of *Lycaena Pseudargiolus*; when we consider that albinism is a northern, melanism a southern peculiarity, we should anticipate albinism in the cool, melanism in the hot season."

In *Butterflies N. A.*, vol. 2, text of *Colias Eurytheme*, I speak of albinic females of that species: "Albinic females appear in every brood, as in *Philodice*. In that species (*Philodice*) these females are as common in the early spring brood as in any of the later ones; and judging by the number of albinos received by me from many quarters, the same is true of *Eurytheme*." In case of *Eurytheme*, the distinction between the spring form (*Ariadne*) and the later forms (*Keewaydin* and *Eurytheme*) is so marked, that an albino specimen received can be allotted to one or the other with certainty. There is not such distinctness between the early and late broods of *Philodice*, and my statement on the occurrence of

albinic females in spring was based, not on dried specimens, but on personal observation. Such females are seen by me here, at Coalburgh, every spring. I took one in my net early in 1881, thinking before I struck it that it was a large *P. Rapae*, and same day I saw another. In my note book I recorded, 1874, 8th May, that I took an albino female *Philodice*. But as it might be said that albinos were to be expected at the south, but still were not to be found at the north, I wrote Mr. Lintner for such information as he could give on the matter. He replied, 27th July, 1881: "I was at Albany yesterday and a friend showed me a beautiful white female *Philodice* taken near Centre, on May 15th. On 20th June, he took six more." So that albinic females do appear in the early spring brood, in New York as well as in West Virginia, and the foregoing generalization is erroneous.

10. Upon Certain Alleged Peculiarities in the History of SATYRUS ALOPE.

Mr. Scudder says, l. c., page 132, it "first appears on the wing in the early half of July. . . . The females live a long while before depositing a single egg; the earliest record I have of this event is the 22nd of August, or *from five to six weeks after the first appearance of females*; they continue to lay eggs until the end of the first week in September; and in *keeping with the indolence of the females* is the duration of the egg state—from 3 to 4 weeks, a period longer than in any butterfly known to me where the eggs hatch at all the same season. The earliest caterpillars therefore appear by the middle of September," etc. I spent some time at Martha's Vineyard, Mass., in July, 1877, at Oak Bluffs, and on the grassy plains back of the town I searched daily for butterflies. The first *Alope* seen were 2 males, and they were just from chrysalis, 23rd July. On 26th, the first female was seen, and I took 12 ♂, 1 ♀. I then left the Vineyard and Mr. Mead came there just at that time, and set to work to obtain eggs of *Alope* for me. On 10th Aug., or 15 days after the first female had been seen by me, he began to shut up females in a bag over a plant of grass in a tin can, and 22nd Aug., at Coalburgh, I received from him 125 eggs, laid prior to Aug. 18th. These began to hatch 27th Aug., or 17 days after the first female was enclosed. This certainly is not a long period for the egg as compared with some other butterflies, especially the large species of *Argynnis*. The period of *A. Cybele* I have found to run from 12 to 24 days; of *A. Diana* 15 to 26; *A. Idalia*, 25; *A. Alcestis*, 27

and 29 days. On the other hand, I have had eggs of *Alope* and *Nephele* from several localities, and the periods of this stage have run from 14 to 28 days. It depends much on the weather how long the egg period shall be, whether it be a *Satyrus* or *Argynnis* egg, and it is hardly right to charge the females of *Alope* with special indolence of habit. Their eggs are laid, so far as my observation goes, as soon after emergence of the female from chrysalis, as are the eggs of the larger *Argynnis*ids, and hatch as speedily.

#### 11. On Eggs of *THECLA CALANUS*.

It is stated, l. c., page 128, that the eggs of *Calanus* "are laid towards end of July and early in August; these eggs remain unhatched until the following spring, when the caterpillar emerges, feeds on oak leaves, changes to chrysalis in June and July, and after a fortnight the butterflies of the new year appear." I should much like to see evidence to support this statement. Mr. Saunders, at London, Canada, *Can. Ent.*, vol. 1, p. 57, says of this species, which he calls by its synonym *T. inorata* G. & R. (= *T. Falacer* B. & L.): "About the middle of July, 1868, two eggs were deposited on the sides of a pill box. This box was overlooked for several days, and when examined again, the larvæ were found to have escaped and dried up for want of food."

Mr. C. E. Worthington, at Chicago, writes me: "I took examples of *Calanus* the last days of June, and confined on a branch of oak. The eggs were laid, and hatched during the first week in July, and the larvæ died a few days after. *Calanus* is our commonest species. My memoranda of captures are June, July, September."

It is certain then that *Calanus* eggs laid in June and July hatch in a few days, in Canada and Illinois, and that in the latter the species is double-brooded. If eggs are laid in September, they may possibly hibernate, or the caterpillars may, or the chrysalis, and to this date apparently no one knows which of these stages hibernates. My opinion is that it is the chrysalis, as with other American species of this genus.

#### 12. On the Number of Larval Segments.

Authors have recognized 13 segments, counting the head as one (*vide* Burmeister, Westwood, &c.) Mr. Scudder, page 17, says: "The body, or the portion of the caterpillar lying back of the head, is composed of thirteen segments." I find no explanation of this thirteenth segment, nor

directions where to look for it. It does not appear to be visible. Twelve after the head are distinctly seen in all the large lepidopterous larvæ, and any one can satisfy himself of that if he will examine a caterpillar of one of the large Bombycidæ or Sphinges. The segments are distinct in many butterfly larvæ, as for example, *D. archippus*. Now on page 82, Mr. Scudder gives a magnified figure of the larva of *Archippus* from Burgess, in which the thoracic segments are numbered 1 to 3, and the abdominal 1 to 9, making 12 without the head. On page 19 we read: "Among the butterflies these appendages (pro-legs) are always borne by the 3rd to the 6th abdominal segments, and by the last segment, leaving thus a *similar space without support between the true and false legs, and between the terminal and preceding false legs.*" Plainly this accounts for but 12 segments, as these "similar spaces" are two segments in each case. Three thoracic, bearing legs, 2 segments "without support," 4 with false legs, 2 more "without support," and the "terminal" segment. That is 12. I should have regarded the statement that there were 13 segments without the head as an error of the printer; but on page 239, the author undertakes to conceive a picture of the primeval butterfly, and says: "The caterpillar had a rounded head, a body composed of 13 segments," &c. Therefore I should like an explanation, and a hint as to where one is to look to find this 13th segment. It is hardly necessary to count segments which are invisible to the naked eye.

### 13. On *Apaturas* "*Herse*" and "*Lycaon*."

In 1833, Boisduval and Leconte, in *Lep. de l'Amer. Sept.*, described and figured two species of *Apatura* as *Celtis* and *Clyton*, and for more than a generation these names were unchallenged. In 1869, Mr. A. G. Butler, in his *Catalogue of Di. Lep.*, described by Fabricius in the *Collection of the Brit. Museum*, introduced *Lycaon* ♂ and *Herse* ♀, *Fab. Ent. Syst.*, as of one and same species, and remarked: "This species is well figured in Jones's unpublished 'Icones'; it comes very near a new species figured by Mr. Edwards" (*A. Alicia*). All that Fabricius himself knew of these species was from the drawings, so far as appears, and his description is taken directly from the drawings. What part of the globe the butterflies came from he did not know, as in both cases he says "Habitat —."

In 1871, Kirby's *Catalogue* followed Butler, giving *Lycaon* as ♂, *Herse* as ♀, of one and the same species, but not one identical with either *Celtis* or *Clyton*. In this *Catalogue*, *Lycaon* stands No. 34 and *Celtis* No. 38 in

the series, two tropical species intervening with others. No locality is given for *Lycyon* and *Herse*, as it was not known by Kirby what part of the world they came from. Since the time of Fabricius, 1793, these drawings had never been fixed on any living species.

In 1872, 39 years after Boisduval and LeConte had figured *Celtis* and *Clyton*, during all which period their names had stood unchallenged, Mr. Scudder, in his Systematic Revision, first connects Jones's figures with our N. Am. species, making *Clyton* to be identical with *Herse* and *Celtis* with *Lycyon*, differing completely, as is seen from both Butler and Kirby. They regarded these drawings as meant to illustrate two sexes of one species, but that one neither *Clyton* nor *Celtis*. Mr. Scudder asserts them to illustrate two distinct species, with no explanation allotting one to *Clyton*, the other to *Celtis*. Now *Clyton* and *Celtis* belong to two well marked sub-groups, and it shows the utterly worthless character of the Jones drawings for identification of species, that such an authority as Mr. Butler should regard them as representing the two sexes of one species, and that Mr. Scudder should, on the contrary, think they represented two species of distinct sub-groups.

In 1874, Mr. Riley, 6th Mo. Report, gave admirable wood-cuts—as his manner is—of both our species, but unfortunately, followed Mr. Scudder in perpetuating the errors I have spoken of, and that evidently out of deference to Mr. Scudder's supposed means of information. He says that “for forty years the species have been known as *Celtis* and *Clyton*, and he regrets that some time should not by agreement be fixed, say a quarter of a century, after which an insect which has been universally designated by a particular name, should not be called on to change its name evermore, no matter what prior name might turn up. But as no such rule exists, he thinks the quickest way to get rid of the confusion now attaching to the specific nomenclature is to follow Mr. Scudder, who has given the matter so much attention.” If I am not much mistaken, Mr. Riley would not give that advice to-day. I do not suppose Mr. Scudder ever saw *Celtis* and *Clyton* alive—as they are not New Englanders—and all that he knew of Jones' figures was learned by a cursory inspection of them at Oxford at some time during his travels. That unlucky inspection has been the cause of a great deal of trouble.

I had occasion to figure *Celtis* and *Clyton* in Vol. 2, But. N. A., Parts 3 and 5, and I obtained, by the kindness of Prof. Westwood, colored copies made by himself of both surfaces of *Herse*. Mr. Riley, after his

paper was written, had also obtained from the same source uncolored tracings of both *Herse* and *Lycæon*, which he permitted me to see. Mr. Butler had himself examined the drawings and wrote me, he still regarding them as representing two sexes of one species: "It is certainly not *Celtis*, which I know well." Now Mr. Butler's testimony was of itself sufficient to settle this matter.

I first saw the tracings spoken of through Mr. Riley, and in my Part 3, I say: "I entertain not a doubt that they were meant to represent *Idyja*, or a species allied to that." There are certain well marked peculiarities in the arrangement of the spots in *Idyja* to be found roughly done in the drawings, and herein *Idyja* differs from either of our two species. I copied Fabricius' description of *Lycæon* (drawn up from Jones), and compared it line for line with the appearance of *Celtis*, and made it plain that the description of one could not apply to, and could not have been meant for, the other, whether as to coloring or markings.

When I wrote the text of *Clyton*, Part 5, a year later, I had Prof. Westwood's colored copies of *Herse* before me, and I showed that Fabricius' description of *Herse* could not possibly relate to *Clyton*. I gave wood cuts of the under sides of *Herse* and *Idyja* (a West India species whose nearest allies are to be found in tropical America), and the resemblance in the arrangement of the spots between these two was as unmistakable as was the difference between either and *Clyton* or *Celtis*. If Jones did not have *Idyja* before him he certainly had a species of same sub-group. But what that species was it is impossible to say. Surely it is quite time that Fabricius' names for Jones' figures should drop into their original obscurity. Nevertheless here they stand in Mr. Scudder's "Butterflies," 1881, as if their claims were established, or had never been denied, and the names properly belonging to the species are put down as synonyms!

#### 14. On *COLIAS CHRISTINA* Edw.

In Mr. Strecker's Catalogue, p. 81, *Colias Christina*, a well marked orange species, figured in Vol. 1, But. N. A., is set down as a var. of *C. Pelidne* Bd., a yellow species which I should say was at a considerable distance in a series; and in various other publications Mr. Strecker has expatiated on this supposed discovery. *Pelidne*, with its var. *Christina*, stands as No. 54 in his series. *Colias Occidentalis* Sc. is quite as strangely put down as a var. of *C. Philodice*, a species for which it has but a slight



affinity, and *Philodice* stands No. 58 in his series, *Alexandra*, *Emilia* and *Barbara* intervening between it and *Pelidne*. And *C. Scudderi* is given as a synonym of *Pelidne*, not even worthy to be called a variety.

Being recently in New York, I saw in the collection of Mr. Henry Edwards several examples of what Mr. Strecker had sent him as *Christina* from Hudson's Bay, where this complication of species is said to be the normal condition. These examples embraced ♀ *Scudderi*, ♂ ♀ *Occidentalis*, and no *Christina* at all!

While on this subject, I may as well add that *C. Barbara*, H. Edw., spoken of above, stands as a good species in Strecker's Cat., No. 57, and *C. Harfordii*, H. Edw., is put as a var. of *C. Chrysothème*, No. 60, although the latter is not an American species. It is however an orange species, whereas *Harfordii* is a yellow one, and *Harfordii* and *Barbara* are really one and the same thing. Mr. H. Edwards suggested this in a paper in Proc. Cal. Acad. Sci., 17th June, 1878, and he informs me that he is at present fully satisfied of the identity. After inspection of the specimens in his collection I agree with him.

#### MIGRATION OF DRAGON-FLIES—*Aeschna heros*\* (Fabr.)

BY A. H. MUNDT, FAIRBURY, ILL., LIVINGSTON CO

On the evening of August 13th, 1881, I observed them between the hours of 5 and 7 o'clock. The air for miles around seemed literally alive with these dragon-flies, from a foot above ground to as far as the eye could reach, all flying in the same direction, a south-westerly course, and the few that would occasionally cross the track of the majority could all the more easily be noticed from the very regular and swift course they generally pursued; but even these few stray ones would soon fall in with the rest again. Very few were seen alighting, and all carefully avoided any movable obstacles.

The next day very few were seen on the prairies, and these mostly of another species very abundant in this country, *Anax junius* (Drury), which were probably at home previously, and in a few days I could see none others but the latter. A few newspapers, and also a few correspond-

\* { *Aeschna heros*, Fabr.  
 { *Aeschna*.

ents from twelve to fifteen miles east and west of here, had observed and mentioned their flight. Although their course was precisely in that direction, Prof. Forbes, of the State Normal Museum, writes that "no observations had been made there regarding the migrating of this insect," and he kindly identified the last named species for me; however both have been carefully looked up and identified as being separate, by other well informed Entomologists, all agreeing with me that the above names are correct.

Whether their migrating was instinctive, or forced by the Manitoba wave, then reported in Chicago papers as having arrived in that direction, after a spell of very warm weather; or caused by the dry season, the ponds having become so exhausted as to afford no pasturage for their larvæ, seems a matter of conjecture; most likely the latter, however, as the cold wave reached here but very slightly.

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#### NOTES ON LAST YEAR'S COLLECTING.

BY J. ALSTON MOFFAT, HAMILTON, ONT.

No one I think can have been long engaged in collecting insects without having noticed the remarkable diversity in the products of different years, not only in quantity, but in kinds. Each summer seems to bring its own particular species to the front, so that if a person wishes to get a moderately correct idea of the insects of any locality, it is necessary for him not only to hunt diligently all the season, but every season for a considerable length of time; and if he has from any cause missed one, he may be sure he has missed something which it may be years before he will again have an opportunity of securing, or securing in the same abundance. The causes of these variations seem as yet to a great extent a mystery.

Insect hunting could not be said to be good in this locality last summer. It might be considered very poor, yet it produced its new things for the collection, and some things in plenty which had hitherto been scarce. On the 12th of May I came across some specimens of a *Pieris* which I thought were poor specimens of *oleracea*, but which Mr. Edwards determined to be *Virginiensis*. On the 23rd I took a very attractive *Chrysomela*, which is in the Society's Coll. in London as *C. labyrinthica*, but which the authorities say is *multiguttis* of Crotch's Check List, of which

*scalaris* is a synonym. Rather remarkable, surely, that so handsome and distinctly marked an insect should not have a name of its own. Its season lasted about four weeks, during which I secured over a dozen. I took one specimen of *Stenosphenus notatus* Oliv. Of this species I captured in May, 1879, three specimens, the first I ever took, and that year, a week or two previous to my captures, I received from Mr. Reinecke, of Buffalo, a pair labelled Dallas, Texas. They are exactly similar. The Cerambycidæ were ten days later than usual this year. *Goes debilis* was numerous, and I took my first and only specimen of *S. pulcher*. *Saperda discoidea*, although never plentiful, is interesting from the great difference in size and markings of the sexes. I had always found two or three females to one male until last season, when the males were most numerous. There were several species of *Leptura* quite common, especially *vibex*, which I had not seen before. *Gaurotes cyanipennis* was in great abundance, but although you could bring a dozen down with one stroke, you might not secure more than two or three, they were so quickly on the wing again. The months of July and August were barren of anything worthy of note. In the second week of September the fall moths began to appear, and up to the end of October were quite plentiful. Those attractive genera, *Scopelosoma* and *Lithophane*, were more fully represented than I had seen them since the fall of 1877, when I took eight or ten species for the first time. A few *S. Graefiana* and *L. Bethunei* can be found every year, but *Scopelosoma Pettiti* and *ceromatica*, and *Lithophane semiusta*, *pexata*, *signosa*, *petulca*, *querquera*, are rare. Some of these choicer species were easily secured again last fall. I also took one new to me, *L. ferrealis*, whilst a friend here, Mr. J. Johnston, took *S. tristigmata* and *L. cinerosa*, which we were enabled to identify through the kindness of Mr. R. Thaxter, of Cambridge, Mass. Mr. Kyle, of Dundas, secured *L. Georgii*, which I have not yet met with. It may be worthy of note that Mr. Johnston took a specimen each of *Plusia striatella* and *Cherocampa tersa*, the first taken here of either species.

Mr. Thaxter kindly determined the following for me :

Dryopteris rosea,	Hadena Miselioides,
Limacodes inornata,	Dianthoecia meditata,
Gortyna cerina,	Orthodes cynica,
Calledapteryx dryopterata,	Paristichtis perbellis,
Mamestra eloniplina.	

The last four were taken the previous year at Long Point.

CATOCALÆ TAKEN IN THE VICINITY OF FRANKFORD,  
PENNSYLVANIA.

BY JAMES S. JOHNSON.

NAME.	OCCUR- RENCE.	CAPTURES.	EARLIEST CAPTURE.	LATEST CAPTURE.	DURATION, DAYS.	FOUND ON
<i>Epione</i> .	Not common.	Every season.	July 10, 1880.	July 23, 1881.	19	Oak and chestnut.
<i>Lachrymosa</i> .	Rare.	3 specimens.	Sept. 4, 1877.	Sept. 7, 1881.	4	Oak.
<i>Obscura</i> .	Not common.	Every season.	July 10, 1880.	Sept. 27, 1881.	18	Hickory and oak.
<i>Angusii</i> .	Rare.	5 specimens.	Sept. 3, 1880.	Sept. 7, 1881.	5	White and black oak.
Var. <i>Lucetta</i>	Rare.	3 specimens.	Sept. 3, 1880.	Sept. 8, 1877.	6	" "
<i>Ulalume</i> .	Rare.	1 specimen.		Sept. 27, 1881.		Black oak.
<i>Insolabilis</i> .	Not common.	Every season.	July 8, 1880.	Sept. 3, 1881.	63	Hickory and oak.
<i>Robinsonii</i> .	Not common.	Every season.	Aug. 10, 1880.	Sept. 27, 1881.	49	" "
<i>Viduata</i> .	Very rare.	2 specimens.	Sept. 5, 1877.	Sept. 7, 1881.	3	Black oak and elm.
<i>Retecta</i> .	Not common.	Every season.	July 19, 1880.	Sept. 10, 1881.	54	Oak, hickory & chestnut
<i>Flebilis</i> .	Not common.	Every season.	July 26, 1877.	Sept. 27, 1881.	64	" " "
<i>Desperata</i> .	Common.	Every season.	Aug. 9, 1877.	Sept. 19, 1881.	42	" " "
<i>Tristis</i> .	Rare.	5 specimens.	July 14, 1877.	July 21, 1877.	8	Tulip, poplar and oak.
<i>Judith</i> .	} Rare.	Every season.	July 9, 1880.	Aug. 23, 1881.	46	Shell-bark hickory.
<i>Levetii</i> .						
<i>Cara</i> .	Not common.	Every season.	Aug. 6, 1880.	Sept. 13, 1880.	39	Oak and old stumps.
<i>Anatrix</i> .	Common.	Every season.	Aug. 9, 1880.	Oct. 10, 1877.	63	Beech, maple & willow
Var. <i>Nurus</i> .	Common.	Every season.	Aug. 17, 1880.	Oct. 10, 1877.	55	" " "
<i>Cocinnati</i> .	Very rare.	3 specimens.	July 14, 1880.	July 23, 1877.	10	Beech.
<i>Unijuga</i> .	Not common.	Every season.	Aug. 28, 1881.	Sept. 2, 1877.	25	Beech and willow.
<i>Marmorata</i> .	Very rare.	1 specimen.		Sept. 6, 1881.		White oak.
<i>Parta</i> .	Not common.	Every season.	July 21, 1877.	Oct. 10, 1877.	32	Beech, oak and willow.
<i>Ultronia</i> .	Not common.	Every season.	July 8, 1880.	Aug. 23, 1881.	47	" " chestnut.
<i>Concumbens</i> .	Very rare.	1 specimen.		Aug. 16, 1877.		Beech.
<i>Ilia</i> .	Common.	Every season.	July 1, 1880.	Sept. 10, 1881.	72	" "
<i>Inubens</i> .	Rare.	7 specimens.	Aug. 10, 1877.	Aug. 31, 1877.	22	" and chestnut.
Var. <i>Scintillans</i> .	Very rare.	2 specimens.	Aug. 18, 1877.	Aug. 29, 1877.	12	" "
<i>Piatrix</i> .	Not common.	Every season.	Aug. 10, 1877.	Sept. 6, 1881.	28	Walnut and oak.
<i>Subnata</i> .	Rare.	Every season.	July 14, 1880.	Aug. 22, 1881.	40	Beech.
<i>Neogama</i> .	Common.	Every season.	July 10, 1880.	Sept. 27, 1881.	80	" and oak.
<i>Paleogama</i> .	Common.	Every season.	July 11, 1880.	Sept. 19, 1881.	71	" "
Var. <i>Phalanga</i>	Rare.	Every season.	July 16, 1880.	Sept. 8, 1881.	55	" "
<i>Nebulosa</i> .	Very rare.	4 specimens.	July 26, 1877.	Sept. 27, 1881.	64	" "
<i>Serena</i> .	Not common.	Every season.	July 11, 1880.	Sept. 8, 1881.	60	Shell-bark hickory.
<i>Habilis</i> .	Common.	Every season.	July 25, 1880.	Sept. 27, 1881.	65	Oak, hickory & chestnut
<i>Cerogama</i> .	Not common.	Every season.	Aug. 8, 1880.	Aug. 27, 1881.	20	Oak and beech.
<i>Antinympa</i> .	Rare.	Every season.	Aug. 15, 1877.	Aug. 23, 1880.	9	Under brush and logs.
<i>Grynea</i> .	Not common.	Every season.	July 1, 1880.	July 24, 1881.	24	Oak and hickory.
<i>Gracilis</i> .	Not common.	Every season.	July 9, 1880.	July 29, 1877.	21	Oak.
Var. <i>Similis</i> .	Not common.	Every season.	July 10, 1880.	July 27, 1881.	18	" "
<i>Minuta</i> .	Rare.	4 specimens.	July 21, 1877.	July 28, 1881.	8	" "
<i>Linella</i> .	Common.	Every season.	July 4, 1880.	Sept. 1, 1881.	60	Black oak.
<i>Androphila</i> .	Common.	Every season.	July 14, 1880.	Sept. 8, 1881.	57	White oak.
<i>Amasia</i> .	Very rare.	3 specimens.	July 24, 1877.	Aug. 6, 1877.	14	" "

The above table was compiled from my diary for the past five years. I notice that the season of 1880 was 8 or 10 days in advance of the others, while 1877, during which there was a harvest, held out the longest. All of the specimens were taken at rest, and the trees named are those on which they were discovered and seemed to select for hiding. It is a singular fact that among the hundreds I have captured, I have never yet found a ♀ *Catocala* containing eggs.

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### CORRESPONDENCE.

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#### A CORRECTION.

DEAR SIR,—

In my article which appeared on pages 21-23 of the CANADIAN ENTOMOLOGIST, Vol. xiii, No. 2, the species was erroneously accredited to *Plusia precatonis* Gueneé, instead of to *Plusia simplex* of the same author. This mistake on my part was owing to the fact that the moths from which I obtained the eggs had the metallic spots in the centre of the fore wings nearly as they are in a *precatonis* which Mr. Grote determined for me. I have been enabled the present season to correct my former mistake by the use of the excellent descriptions of the *Plusia* moths given by Prof. Cyrus Thomas in his Fourth Report.

On the 21st of November, 1881, I received from the Editor of the Germantown *Telegraph* a box of insects for determination, and in the letter which accompanied the box the Editor stated that the worms which he sent me were very destructive to the celery in many gardens in his locality.

These celery worms agreed precisely with the description of the *simplex* larvæ referred to above. They differ from the larvæ of *brassica*, as given by Prof. Riley, only in having the spiracles ringed with black; and both of these larvæ differ from that of *precatonis* by not having a black stripe on each side of the head. In all other respects these three larvæ appear to be utterly indistinguishable.

D. W. COQUILLET, Woodstock, Ill.