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The Canadian Entomologist.

VOL. XIX. LONDON, DECEMBER, 1887. No. 12

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual Meeting of the Society was held pursuant to notice at Ottawa, on Wednesday and Thursday, 26th and 27th October, 1887. The meeting was held in Ottawa at the request of several members, in order that an opportunity might be afforded to visit the Central Experimental Farm of the Dominion Government, to examine the valuable collections of insects in the Museum of the Geological and Natural History Survey of Canada, and to inspect the collections of the members resident in Ottawa. Through the kindness of the civic rulers, the meetings were held in the City Hall.

A Council meeting was held on Wednesday, at 10 a. m., on the adjournment of which the Museum was visited and the insect collections examined, the magnificent exhibit of Lepidoptera eliciting universal admiration.

In the afternoon the Experimental Farm was visited, the Director, Prof. Saunders, kindly placing carriages at the disposal of the Council. A Council meeting was held in his office, after which he escorted the visitors around the farm, and explained the work already accomplished, and the plans for future operations. The house and barns in course of construction were justly admired, and it was evident to all that a great and useful work was being accomplished under the oversight of the Director and his skilful assistants.

In the evening a general meeting of the Society was held in the council chamber of the City Hall, and the Annual Address was delivered by the President, Mr. James Fletcher. Among the large audience present were, in addition to members of the Entomological Society, many officers and members of the Ottawa Field Naturalists' Club, of the Ottawa Literary and Scientific ociety, of the Geological Museum, of various educational institutions, agricultural associations, etc., as well as gardeners and farmers from the surrounding country.

The address was a very instructive and practical one, and was listened to with great attention and interest by all present. It gave a sketch of the growth of the Society, and an outline of the work being done and to be carried on at the Government Experimental Farms. The value of Natural Sciences as a training for the mental faculties and the co-relationship of the different branches was shown. The latter portion consisted of a report on the insect injuries for the year and the broad general principles regulating the application of remedies. On its conclusion a vote of thanks to the President was moved by Rev. C. J. S. Bethune, who described the work being accomplished in England by Miss Ormerod, and illustrated it by an account of her exertions to ward off the attack of the Hessian Fly. The vote of thanks was seconded by Prof. Saunders, who confirmed the statements made in the address, and gave accounts of some experiments with solutions of Paris green as a preventive of Curculio in plums, and Codling Moth in apples. The President's address will appear *in extenso* in the Annual Report.

A collection of Coleoptera captured in the vicinity of Ottawa was exhibited by Mr. W. Hague Harrington. It was arranged in 18 cases and contained about 1,250 species.

The annual meeting of the Society for the election of officers, etc., was held at 11 a. m on Thursday, in a committee room of the City Hall.

The President, Mr. James Fletcher, occupied the chair, and the following members of the Council were among those present: Rev. C. J. S. Bethune, Port Hope; Mr. J. Alston Moffat, Hamilton; Mr. J. M. Denton, London; and Mr. W. H. Harrington, Ottawa.

The minutes of the previous meeting having been printed and circulated amongst the members, their reading was dispensed with, and they were duly confirmed.

Mr. W. H. Harrington was requested to act as Secretary in the absence of that officer.

Letters were received from Rev. T. W. Eyles, Quebec; Mr. E. Baynes Reed, London; Mr. H. H. Lyman, Montreal; Mr. W. E. Saunders, London; Mr. J. D. Evans, Trenton; Capt. Gamble Geddes, Toronto, and others, announcing their regret at being unable to be present.

The Report of the Council was read by Rev. C. J. S. Bethune, and on motion of Mr. Denton, seconded by Mr. Moffat, it was duly adopted.

The statement of the Secretary-Treasurer (balance sheet) was received and adopted.

The Reports of the Montreal Branch, and of the Delegate to the Royal Society of Canada, were received and referred for publication.

The election of officers was then proceeded with, and the following gentlemen were duly and unanimously elected :

President—James Fletcher, Ottawa.

Vice-President—E. Baynes Reed, London.

Secretary-Treasurer—W. E. Saunders, London.

Librarian and Curator—E. Baynes Reed, London.

Council—W. Hague Harrington, Ottawa; Rev. T. W. Fyles, Quebec; J. Alston Moffat, Hamilton; J. M. Denton, London; Rev. Geo. W. Taylor, Victoria, B. C.

Editor "Canadian Entomologist"—Rev. C. J. S. Bethune, Port Hope.

Editing Committee—Prof. W. Saunders, Ottawa; J. M. Denton, London; Dr. Wm. Brodie, and Capt. Gamble Geddes, Toronto.

Auditors—J. M. Denton and E. Baynes Reed, London.

Delegate to Royal Society—H. H. Lyman, Montreal.

Rev. C. J. S. Bethune read a paper of much interest on the occurrence at Port Hope of immense numbers of *Aletia argillacea* on the 8th and 9th of October.

Prof. Macoun suggested the basswood tree as a possible food-plant of the larvæ, because there were not in the district sufficient malvaceous plants to furnish food for such numbers of insects.

Mr. Fletcher said that careful search had been made for several years on this tree, as well as on all plants allied to the cotton plant, but no traces of larvæ had been found. He had hitherto been inclined to believe that the moth bred in Canada, and that the theory of migration from the cotton States was not tenable, but what he had learned concerning the appearance of these insects this autumn had somewhat changed his views.

Mr. W. Hague Harrington stated that the appearance of the moths had been very noticeable at Ottawa at almost the same date as they were observed at Port Hope. The first week of October had been comparatively wet, with calms and light winds varying from east through south to west. Sunday, 9th Oct., had been a remarkably mild day, and on that evening the moths had swarmed at some electric lights. On the following morning he had observed upon the front of the Ottawa Bank a great number of moths, at least 250 or 300. The building faced the north, being situated opposite the Parliament Square, and had in front of it an electric light. Moths were also seen at several points in the city, but not in any

great number. From the fresh, unrubbed condition of all those seen he then thought that they could not have flown far, and that possibly they might have been bred upon some of the plants on the Government grounds. Since hearing Mr. Bethune's paper, however, he was more inclined to favor the migration theory.

Mr. J. Alston Moffat reported that on Friday night, 7th Oct., immense swarms had appeared at Hamilton. He was informed by a friend that on that evening they had been around the electric lights literally in millions—the numbers being so great that he could not attempt to give an idea of them, other than by saying that all the insects previously observed by him were as nothing in comparison. Mr. Moffat visited the section of the city where they had been most numerous, on the following afternoon, and found the ground for a space of several yards around each electric light pole covered with these insects, every inch having at least one moth. Immense numbers had been crushed under foot, but the rest were lively, and darted off in their accustomed manner when disturbed. That night they were very abundant, but Sunday evening was wet and their numbers were lessened.

Mr. J. M. Denton said that in London the moths had not been observed, although there was an electric light quite near his house.

After the discussion the general opinion of the meeting was that a migration seemed indicated, and it was resolved that endeavors should be made to find out if the moths had been observed at points intermediate between Canada and the Southern States.

Mr. Fletcher exhibited some beautiful paintings, kindly loaned by Mr. Scudder, of four species of Thecla, viz., *strigosa*, *acadica*, *calanus* and *Edwardsii*, and he also showed specimens of several species of these butterflies, and pointed out the points of distinction or affinity.

It being one o'clock, the meeting adjourned until 2.30 p. m.

The afternoon session opened by the reading of a paper contributed by Prof. E. W. Claypole, "Suggestions to Teachers on Collecting and Preserving Insects," followed by two by Capt. Gamble Geddes on "Several Remarkable Captures during the Summer of 1887 in Ontario," and "Notes on the Genus Argynnis whilst Alive in the Imago State." In the discussion which followed the former paper, Mr. Moffat described his own capture of the ♂ of *Pelecinus polycerator*, and Mr. Fletcher described the unusual abundance at Ottawa of *Colias philodice*. At an excursion of the Field Naturalists' Club to Brittania, a few miles from the

city, the sandy shore of the Ottawa had been so thickly covered with them for a distance of several hundred yards, that at one stroke of the net he had captured 47, which, strange to say, were all males.

Prof. Saunders stated that he had made search near London for the larvæ of *Papilio cresphontes*, where it had formerly been captured, but without success.

Mr. Fletcher exhibited a fine collection of Canadian species of the genus Chionobas, and explained the great value of these insects on account of their rarity hitherto in collections. *C. Macounii* Edw. was a new species which had been collected by Prof. Macoun at Nipigon in 1885, and the Rocky Mountains in 1886 Closely allied to it was *C. Gigas* Butler, of which until the past summer only three specimens were known in collections. Other beautiful species exhibited and described were *C. Californica*, *C. Chryxus*, *C. Jutta*, *C. Varuna* and *C. Uhleri*, of which Prof. Macoun had taken specimens in the Rocky Mountains.

A pleasant and valuable paper by the Rev. George W. Taylor, of Victoria, B. C., was read, describing an ascent of Mount Finlayson, B. C., in search of *C. Gigas*, and the success which had attended the party.

Prof. Macoun, who had accompanied Mr. Taylor, described the manner of flight of this butterfly, which was swift and ceaseless, as was the case with the specimens of *C. Macounii* taken at Nipigon; all the specimens taken, it may be added, of both species, were males.

Mr. Fletcher exhibited three specimens of the rare *Papilio Nitra*, two taken by Prof. Macoun in the Rocky Mountains, the other by Mr. N. H. Cowdry at Regina, N. W. T.; also some interesting species and varieties of Colias, regarding which there was discussion by several of the members.

Attention was then called to the valuable paper by Mr. H. H. Lyman in the October number of the ENTOMOLOGIST, and the beautiful plate accompanying it. A series of the moths brought by different members of the Council was examined in connection with this paper.

Mr. J. Alston Moffat exhibited and distributed among the members specimens of two new species of moths which had been captured by him at Hamilton, and which had been described by Prof. Fernald and Prof. Grote respectively as *Proteoteras Moffatiana* and *Scopelosoma Moffatiana*.

Mr. Fletcher showed specimens of an Halesidota and of its larvæ, which had been very abundant and destructive upon the Douglas Fir in British Columbia during the past year. He also distributed a collection of Coleoptera sent from Vancouver Island for this purpose by Rev. G. W. Taylor.

Mr. W. Hague Harrington read a paper on the "Nuptials of Thalessa," describing the emergence and copulation of these the largest of our Hymenoptera (CAN. ENT., p. 206).

Mr. Moffat read a suggestive paper on "Species and Varieties," deprecating strongly the doing away with all names distinctive of well marked varieties.

Prof. Macoun agreed with Mr. Moffat that every variety should have a name distinguishing it, and that much was lost if such was not the case.

Rev. C. J. S. Bethune submitted a circular letter from Prof. Alfred Wailly, of England, asking for specimens of any silk moths or their cocoons.

Mr. Fletcher drew attention to an article which had appeared in the August number of the *Canadian Horticulturist*, condemning the use of Paris green as an insecticide. He considered that article inaccurate and very injurious, as it might prevent the farmers from making use of this most valuable remedy, and in confirmation of his opinion read a letter from Prof. A. J. Cook describing experiments with Paris green, and proving that no ill effects could result from eating potatoes or fruit upon which it was used in the ordinary manner for the prevention of insect attacks.

Mr. Harrington submitted a note on "Further Observations on *Oryssus Sayi*," in which attention was also drawn to a clerical error in paper on that insect in the May number of the ENTOMOLOGIST.

A vote of thanks was unanimously ordered to be conveyed to the Mayor and City Council for the use of the council chamber and committee room in the City Hall for the meetings of the Society.

The meeting adjourned at 6 p. m., *sine die*.

W. HAGUE HARRINGTON, Secretary *pro tem.*

HISTORY OF THE PREPARATORY STAGES OF COLIAS ALEXANDRA, EDW.

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

EGG.—Fusiform, thick in middle, tapering both ways, the base a little broader than the summit; some examples have the side convex from middle to either end, but others have the upper half a little incurved; ribbed longitudinally, the number of ribs sixteen, three or four of which

end at about four fifths the distance from base; ribs low, narrow, the spaces between flat, and crossed by many fine ridges; top rounded; the micropyle is in centre of a rosette of fine cells, outside of which is a ring of larger ones; color yellow-green. Duration of this stage four days.

YOUNG LARVA.—Length .07 inch; cylindrical, a little thickest on 2 and 3; on the ridges of the segments are many black points, each of which gives a short white hair; among these are rounded black tubercles, some of which give long black hairs, but most bear short white clubbed appendages, longest on 2 and 13; on 3 and 4 these are in straight cross row, four on either side, the lowest being in line with the spiracles, bent after 4, and to 12, there are three on either side, disposed so as to make three longitudinal rows, of which the sub-dorsal has the appendage on the front ridge, the upper lateral on fourth ridge, and mid-lateral on second ridge; on 2 are three appendages on either side the mid-dorsal line, two of them at the front, the third behind and between the others; lower down on same segment are two more in vertical line; on all segments from 2 are two black hairs over feet and legs, and in same line; color greenish-brown; head rounded, scarcely depressed at top; color black; the hairs white. Duration of this stage 4 to 5 days.

After first moult.—Length .14 inch; nearly same shape; the appendages present, those on dorsum paddle-shaped, quite broad at top, the thin side running with the long axis of body, those on sides clubbed; all from black tubercles; color brown-green; head more green than body, rounded, depressed; with many white tubercles and white hairs. Duration of this stage about 6 days.

After second moult.—Length .2 inch; color yellow-green, thickly covered with a white down; head color of body. During this stage the larvæ became lethargic, and so passed the winter.

After third moult, in spring.—Length .36 inch; color dark green; the basal ridge yellowish, but there is no distinct band; head as before, yellow-green. The next moult took place about seven days after the larvæ began to feed.

After fourth moult.—Length .6 inch; color dark yellow-green; there is now a band along base, pure white, stained in middle of some segments, usually 3, 4 and 12, with pink; as the stage progresses, the pink appears on other segments and in a few hours runs through the length of the band.

MATURE LARVA.—Length 1.1 inch; shape of *Eurydice* and *Philodice;* color one shade of yellow-green, the under side a little lighter;

much covered with small black tubercles, the hairs from which are short, straight, and over dorsum, black, but on the sides, gray; along base a white band, with broken dashes of red-orange running through it; head rounded, depressed at top; color yellow-green, studded with black tubercles, which give short black hairs. From fourth moult to pupation 13 days, in April.

CHRYSALIS.—Length .8 inch, greatest breadth .2 inch, depth .26 inch; shape of *Eurydice* and *Philodice;* compressed laterally, the thorax prominent; the head case pointed, beak-like; the mesonotum rounded (almost angular); color yellow-green, the dorsal side darker than ventral; on ventral side of abdomen next wings three small reddish spots in line. Duration of this stage 9 and 10 days.

On 29th July, 1884, I received 16 young larvae, hatched *en route*, from Rosita, Col., sent by Mr. H. W. Nash, the eggs laid 23rd and 24th July, on Astragalus. On 2nd Aug., they began to pass first moult, on 8th the second moult. Shortly after, they became lethargic, and I sent them to Clifton Springs, New York, to be placed in the "Cooler" for the winter. On 7th March, 1885, I received them from Clifton, all dead but one, and this died a few days later.

On 18th Aug., 1886, I received six larvae hatched *en route*, sent from Central City, Col., by Prof. G. H. French, the eggs having been laid on Thermopsis Tabacea var. Montana. These larvae began to pass first moult, 25th Aug.; the second moult was overlooked; on 4th Sept., two out of five larvae became lethargic, and by 11th Sept., the other three had gone same way. In October, all six were sent to Clifton Springs. These came back alive, 21st March, 1887, and were placed on white clover in pot, and covered by muslin bag. On 1st April, they were first noticed as feeding; on 7th, one larva passed 3rd moult; this one passed 4th moult, 13th April, and pupated 26th April. The imago came on 6th May, a female of type *Edwardsii* in some important points, the marginal borders to fore wings being unusually broad and heavy.

The second larva passed third moult on 15th April, the fourth on 25th, pupated 5th May, and the imago came out 14th May, a female, typical *Alexandra*, with no borders whatever. This one was like the parent female, and consequently the spring butterfly in this case was like the fall butterfly that produced it.

On 28th June, 1887, I received four young larvæ from Central City, the eggs having been obtained by Master William Lake, at the request of

Prof. French. These were of the earliest butterflies, and I expected to raise them to imago the same summer.

On 2nd and 3rd July, all these larvæ passed 1st moult; on 5th July, two passed 2nd moult; on 10th or 11th, one passed 3rd moult. On 27th July, the three survivors had been lethargic for about a week, as I recorded. Later, I sent these to Clifton Springs. So that larvae from the earliest flight of the butterflies, as far as observed, hibernate, as do the larvae of the later flight, and all would produce butterflies in spring. How comes it then that there is the appearance of a second brood of the butterfly in late summer, or August? Apparently one brood flies in June, another in August, though fresh butterflies are also found in July, and one would expect eggs of the June brood to produce the August butterflies. The explanation I conceive may be this: in June, the butterflies from the lower elevations first come from pupae, in July from higher elevations, and in August from the highest of all, and a constant stream of fresh butterflies is kept up from higher to lower elevations. Mr. David Bruce has collected several seasons in Colorado at every altitude, and in 1887, particularly, his attention was directed to the habits of *Alexandra*, and this is what he writes 22nd Sept., 1887: "I think my notes and the specimens sent will satisfy you that there can be but one brood annually of *Alexandra*. This species is a powerful flier and takes very long flights, and in the narrow canons will fly along the side of the trail or stream down hill for miles. Even Colias *Meadii*, when it once gets in the canons, will follow the track, and I have found several at Webster, 9000 feet, and below it, though their proper habitat is 2000 or 3000 feet higher." *Alexandra* is found at various elevations from 6000 to 10,000 feet.

As to *C. Edwardsii* and its relationship to *Alexandra*; I have of late years thought it probable that the former might be a dimorphic form of the other. But if there is but one annual brood of *Alexandra*, that view is not tenable. *Edwardsii* was named by Dr. Behr, from examples taken in Nevada, and was first described in vol. 1, But. N. A., in 1869. At that time very few examples were known, and the same is true as to *Alexandra*, originally described in 1863. It was not till Mr. Mead collected in the summer of 1871, in Colorado, that *Alexandra* became better known. Since then a vast deal of collecting has been done in Colorado, and *Alexandra* is found in every collection. *Edwardsii* yet differed from *Alexandra*, as known up to 1869, in the shape of the wings, these being narrow, the fore-wings pointed apically, the hind margins incurved;

in contrast to the shorter and broader wings of *Alexandra*, with rounded apices and hind margins. The fore wing of the female had more or less of a marginal border, and there was an orange discal spot to hind wing. In *Alexandra*, the female had no border, but was immaculate, and there was but a pale discal spot, if any at all, on hind wing, and never orange. There were other differences of less importance perhaps, but the ones mentioned were enough to make the separation of the two forms not merely proper but imperative. In 1877, Pr. Cal. Acad. Nat. Sci., Mr. Henry Edwards expressed the opinion that *Edwardsii* was but a variety of *Alexandra*, and with my present experience, I can only join in the same conclusion. The two females which came from one laying of eggs, as before related, were of the two types in many respects. One was immaculate, and altogether, in color and markings, the typical *Alexandra* as figured in B. N. A. (and like the mother insect), the other had the marginal border of *Edwardsii*, while both had the pointed wing given as characteristic of the latter. The species is *Alexandra*, and *Edwardsii* a variety of the same.

Among the many examples recently sent me by Mr. Bruce are two albino females, one with, the other without, any traces of marginal borders. Usually the discal spot on under side of hind wing is without a circlet, but I have two males with a narrow brown ring, and one of these has a second small spot, such as appears in many species of the genus. One of Mr. Bruce's males has a broad, not very distinct, border outside the ring. Generally the fringes throughout are yellow, but occasionally they are pale pink. Some examples have no pink at base of hind wings, others a minute patch of it. In none have I ever seen a trace of submarginal spots on either wing below, or of a patch at outer angle of hind wing.

NOTES ON THE GENUS ARGYNNIS WHILST ALIVE IN THE IMAGO STATE.

BY GAMBLE GEDDES, TORONTO, ONT.

1. ARG. LAIS, Edw.

A new species discovered by me in 1883, whilst collecting for Mr. Henley Grose Smith, of England. It was described by Mr. W. H. Edwards shortly after my return. In the end of June and beginning of

July, I found this insect easy to capture. It was comparatively rare in some districts of the North-west Territory, but at the principal crossing of the Red Deer River and the neighborhood of Fort Edmonton, it was quite common. When the orange lilies of the prairies, *Lilium Philadelphicum*, were in bloom, I took many specimens of both sexes upon these flowers, and could approach them quite easily with the killing bottle, and so avoid the necessity of using a net and running the chances of rubbing their wings. Mr. Edwards has figured this species in Part I., Vol. III., of the "Butterflies of North America."

2. ARG. CYBELE, F.

Taken at Edmonton and surrounding country, flying in company with *Lais* and attracted by the blossoms of the numerous vetches which occur in that district.

3. A. CORONIS, Behr.

This beautiful insect I found most common at Fort Macleod, but I also took specimens in the Kicking Horse Pass, and at Calgary, 100 miles north. Here they were not by any means plentiful. It occurs principally late in the season when the harvesting is going on, and when the Golden Rod is in bloom. At the entrance to the Kootenay Pass many perfect specimens were taken. The specimens captured were very variable, and one was thought by Mr. Edwards to be new; it turned out however to be *Coronis*. The specimen was called by him *Arg. Baucis*, and is now in the collection of Mr. Henley Grose Smith, Isle of Wight.

4. A. CHARICLEA, Schneid.

5. A. BOISDUVALLII, Somm.

I took both these species in the Crow Nest Pass, and both at great altitudes. Strange to say, I saw none of them in the foot-hills, or the rolling prairie, but last summer *Arg. Charidea* appeared in large numbers in the hills at Port Arthur, Lake Superior. It would be useful to know from any members of the Society what their observations have been regarding the localities of these species. They seem to be in perfect order all through the summer, and quite like *A. Myrina* in this respect.

6. A. ATLANTIS, Edw.

This species occurred in all parts of the Mountains, and was at its best in the early part of July.

7. A. EURYNOME, Edw.

First taken about Calgary, N. W. T., and afterwards in all the valleys here and there through the Rocky Mountains. It has many varietal forms. The silver spots on under side of secondaries are nearly covered over with yellow and green scales in some specimens, whilst in others they are silver to the very edges of the spots. This species was abundant in the vicinity of the Crow Nest Pass in all its forms, including *Erinna* and *Arge*. Some of the specimens also varied much in size, the smallest being about the same measurement across the primaries as *Arg. Myrina*. This was particularly noticeable in the males, the females being for the most part of an uniform size.

8. *Var.* ERINNA.

9. *Var.* ARGE, Strk.

No notes were particularly taken in connection with either of these forms.

10. ARG. CLIO, Edw.

In capturing this insect in 1883, I thought that I was the happy possessor of *A. Bischoffii* or *A. Opis*, and wrote to Mr. W. H. Edwards to that effect. It turned out otherwise, however. *A. Clio* was first seen by me and taken in small numbers in 1883, but in 1884 occurred more commonly in several distinct localities.

11. ARG. ARTONIS, Edw.

This is uncommonly like *Clio*, in my opinion, and I have not been able to distinguish one from the other up to the present time.

12. A. MONTICOLA, Behr.

I took but very few of this species in the Crow Nest Pass, and they varied much from other specimens I have seen, notably from California. In the Kicking Horse Pass and other localities in the Rocky Mountains, however, larger varieties were captured resembling very closely specimens from the southern slope of the Pacific coast. The silver spots usually found in the Argynnidæ on the under side of the posterior wings were entirely of a yellow color, and no appearance of silver was visible in the smaller specimens, whilst in the larger varieties more than two-thirds of the spots was covered with silvery scales.

13. A. EDWARDSII, Reak.

14. A. NEVADENSIS, Edw.

A. Edwardsii is a lively insect to follow with a net, and a man must

be in excellent training to do much with it in that way. I have been led away a long distance from my camp (and often from a well-earned meal) upon seeing one of these insects flit by. It is, like its confrère *Arg. Nevadensis*, a bewitching and tantalizing creature—bewitching because of the beautiful combination of the pale green and silver of the under side in the sunlight, and the red and orange of the upper side which contrasts so wonderfully and at which one gets a glimpse occasionally during its flight. It flies more like the Satyridæ, by which I mean it folds its wings completely over its back whilst flying, and seems to traverse a long space until it becomes necessary to open the wings again to prolong its flight, or to settle on the ground. Tantalizing, I call it, because it indulges in short and rapid flights, making one suppose it is an easy matter to follow it a few yards and then capture it. I have had to creep along on all fours sometimes, and occasionally drag myself along on my stomach, to secure these specimens, and then have missed about 50 per cent. of the number followed. *Nevadensis* and *Edwardsii* do not fly high, and when alighting after a short and rapid flight, they expand the wings to the full extent, until the edges touch the ground. This of course is when they alight on the bare soil, which they frequently do. Like most Argynnidæ, they are both fond of the thistle, and are much more easily approached when sipping honey from the flowers than when they come down to the ground.

15. A. Bellona, F.

This small species has been taken in large numbers in the vicinity of Brandon, Manitoba, and the further west I proceeded the rarer it became. At Calgary it was quite rare, and resembled *Epithore* very much, with the exception of the darker colors on both upper and under surfaces of the wings.

16. A. Myrina, Cram.

Only at one point in the North-west was this species common, and that was about 50 miles west of Calgary. As in this part of the country, marshes and the edges of streams were the principal haunts.

17. A. Triclaris, Hüb.

Taken only at extreme altitudes, where snow was plentiful on the neighboring hills and peaks.

18. A. Leto, Behr.

This is a remarkable looking insect on the wing, and until the eye becomes accustomed to it, may be taken for a Papilio. I allude to the

♀, for I cannot remember seeing a ♂ flying, or if I did, was not prepared to make notes about it. As most of our collectors are aware, the ♀ and the ♂ differ in appearance considerably, the female being a very dark brown (almost black) and yellow, whilst the male is red and brown like any other Argynnis.

I append a list of Argynnidæ which I have myself taken at different times, with notes on their flight and habits.

1. *Arg. Lais*, Edw. Very lively on the wing, but easily captured with cyanide bottle from flowers.

2. *Arg. Cybele*, F. Precisely the same as *Cybele* in this Province in its movements. I never saw *Cybele* from the time I left St. Paul, Minn., until I arrived at Edmonton, N. W. T.

3. *Arg. Coronis*, Behr. Extremely lazy and easy of capture. I have walked through patches of golden rod and knocked the stalks and flowers about considerably without disturbing *Coronis*. I have also taken them between my thumb and forefinger without any attempt at escape.

4. *Arg. Chariclea*, Schneid.; 5. *Arg. Boisduvallii*, Somm. Not a particularly lively fly. Often difficult of capture, as it flies high in the air at certain parts of the day, particularly the evening. I was not aware that these were separate species until my return, and so my notes apply to both.

6. *Arg. Atlantis*, Edw. A curious fact in connection with the dark variety of *Atlantis* taken in the Mountains is that it constantly alighted on the trunk of a tree head downwards, like the Graptas often do. Very lively and about only during the brightest part of the day.

7. *Arg. Eurynome*, Edw. A slow insect for the most part and easily approached.

8. V. *Erinna;* 9. V. *Arge*, Streck. Not observed.

10. *Arg. Clio*, Edw. Principally males taken; very quick and hard to catch without rubbing the wings.

11. *Arg. Artonis*, Edw. Same as above.

12. *A. Monticola*, Behr. Very rapid flight; hard to take.

13. *A. Edwardsii*, Reak.; 14. *A. Nevadensis*, Edw. Short zig-zag flight; alights quite frequently on the ground; extremely difficult to take either in flight or whilst at rest.

15. *Arg. Bellona*, F. Specimens taken altogether whilst flying, with only one or two exceptions. Comparatively easy to catch on the wing.

16. *Arg. Myrina*, Cram. Same as any locality in Ontario.

17. *Arg. Triclaris*, Hüb. Slow in flight, but difficult to take, as it flies over boggy and marshy places in the valleys amongst the snow-caps.

18. *Arg. Leto*, Beh. ♀ only observed; lively in flight and easily distinguished from its dark brown and yellow colors.

NOTES ON CALLIMORPHA.

BY JOHN B. SMITH, WASHINGTON, D. C.

In the early spring of 1887, while arranging the National Museum collection of *Arctiidæ*, I tried to make out the varieties of *Callimorpha lecontei* listed in our catalogues, and soon came to the conclusion that we had to do with more species than were generally accepted. I investigated the literature of the subject and prepared a paper, the results of which were first communicated to the Entomological Society of Washington at their March meeting (see Entom. Americ., iii., p. 20). At this time I had concluded to describe three new species, viz., *lactata*, *suffusa* and *confusa*, and prepared the descriptions for Ent. Am, sending the MSS. of the monograph to the Proceedings of the National Museum. For reasons hereinafter stated, I finally identified my *confusa* with *lecontei* Bd., and withdrew my description of that species, changing also the name in the proof of the monograph.

The descriptions of *lactata* and *suffusa* appeared in Ent. Am., iii., 25, and I refer on p. 26 to the monograph of the genus for the Proc. U. S. N. Museum.

In August, at the meeting of the Ent. Club, A. A. A. S., I read from advance sheets of my paper the substance of my conclusions, and tried to convince the gentlemen present of their correctness—I grieve to say, with very little success, as a reference to the report of the meeting in Ent. Am., iii., 103, will show. Mr. Lyman, to whose paper I will presently refer, had evidently not seen this when his MSS. went to the printer.

Prof. Riley, and Messrs. Hulst and Graef vigorously opposed my views, and one emphatic gentleman (not in open meeting, however,) pronounced them profane adjectived nonsense. Mr. Edwards wrote me I was all wrong, and Mr. Butler, whose reputation as a lumper is none of the best, considered six species an abundance, and they not very good ones either.

My paper appeared Sept. 16th, and was distributed to correspondents

of the Museum; my extras came in a few days later. No one has responded as yet, so I do not know whether I have made converts or not.

Under these circumstances, Mr. H. H. Lyman's paper on the species of *Callimorpha*, CAN. ENT., Oct., 1887, agreeing as it does in the main with my own conclusions, was most gratifying, and restores to some extent my faith in the inteliigence of Lepidopterists. Mr. Lyman, while agreeing in the main with my results (he could not have seen my paper), presents some differences to which I beg to call attention. I will do it under the call of species, following his order, which differs from my own.

C. LECONTEI Bd.

Mr. Lyman accuses me of mistaking the type of this species, and he is right. My excuse is that I have never seen *lecontei* as Mr. Lyman here fixes it. I had seen Boisduval's figure, and Herrich-Schaeffer's figure, which evidently referred to the same species. I have never seen specimens like Mr. Lyman's figures 1, 2 and 3. His figure 4 and all the others are familiar to me. The most obvious and striking point in Boisduval's figure was the transverse black band near the base of the primaries, and as I knew only one species that had this peculiarity, I referred the name to that species, crediting the figures with sufficient inaccuracy to cover the differences between them and my specimens. I did not deem it possible that there was a form that I had not seen, so close as to be confusing. As it proves, I was mistaken, and I confess Mr. Lyman's figures 1, 2 and 3 were a surprise to me. He is undoubtedly correct, however, in his references and identification of the species.

Var. *confinis* Wlk. This is without doubt a mere synonym of *militaris* Harr. Mr. Butler kindly sent me a drawing of that form. The Museum series readily fills all gaps between figures 6 and 8 on Mr. Lyman's plate.

Query.—Is the typical *lecontei* local? It seems passing strange that none of the numerous collections I have seen should have a single specimen referable to it, so as to save me from blundering!

C. CONTIGUA Wlk.

This needs no further reference. I thoroughly agree with Mr. Lyman in all he says. It may be well to say here that in my paper I have described and figured the genitalia of nearly all the species, and the differences there noted bear out the conclusions otherwise reached.

C. CONFUSA Lyman.

Undoubtedly a good species, which in my paper I have referred to as

lecontei. The specific character of markings is found in the form of the broad half band of the primaries that arises from the internal margin, and sends off from its summit a band to the outer margin below the apex, and a spur inwardly. In my paper I figure some varieties with the markings much more nearly obsolete. Mr. Lintner's description of the larva of *C. lecontei* (Ent. Contr., iii., 143) refers to this form. I have seen the imagos. Mr. Lintner found it on Spear-mint, *Mentha viridis.*

I have found the species common in the Catskills, where all the specimens taken were of this species. At first, as above suggested, I was inclined to consider this a distinct species, and oddly enough selected the same name for it that Mr. Lyman did. My reasons for changing my opinion have been already given.

C. SUFFUSA Smith.

This is the species figured by Mr. Stretch in his Zygaenidæ and Bombycidæ as typical of *lecontei*, and he credits Mr. Saunders with the specimens. This is my authority for the locality, Canada, for this species, and also my authority for referring Mr. Saunders's description of the larva in CAN. ENT., i., 20, to this species, though somewhat doubtfully.

Unaware of the existence of forms like the true *lecontei*, I also assumed from these facts that Mr. Caulfield referred to this form as *lecontei;* he assumed the distinctness of *lecontei* and *militaris*, which proves unfounded, and which also misled me. I am sorry my name does not please Mr. Lyman. The matter is not so bad as it might be, however, since, as I shall show hereafter, the name *clymene* is misapplied and must be credited to a different species. The species varies quite extensively, and I have figured a number of the forms. One specimen is nearly immaculate, having only the margins dusky.

C. FULVICOSTA Clem.

Mr. Lyman should have cited as a synonym *Tanada conscita* Wlk., in part. He cites it for the ♀ only.

C. VESTALIS Pack.

Mr. Lyman cites this as a synonym of *fulvicosta*, in my opinion quite erroneously. Query—Whether Mr. Lyman really knows *vestalis?* It is smaller, whiter, without any creamy tinge, and appears more frail and *Euchaetes* like. I feel as confident of its distinctness as of any others of the species. To this I cite *Tanada conscita* Wlk., as I believe Mr.

Walker had this before him, with a yellowish ♂ *fulvicosta*. Mr. Butler writes of this species: "*H. conscita* = *vestalis* var. = *fulvicosta* var."

C. INTERRUPTO-MARGINATA De Beauv.

According to Mr. Butler, this form has been previously described by Peter Brown as *clymene*. The citation and description I have given in my paper. This will please Mr. Lyman, since it does away with an objectionable name, though it has the disadvantage of compelling a new association between name and insect.

C. CLYMENE Esp.

As this name was pre-occupied by Brown as above stated, the next name in order of time must be used, and this is *C. colona* Hb.—not cited by Mr. Lyman.

C. CONSCITA Wlk.

Mr. Lyman cites my name *lactata* as a synonym—erroneously, I think. Mr. Walker confused two, if not three, species under the one name, and in addition referred them to the wrong genus. Such a species as that intended by Walker never existed, and I do not think any point should be stretched in his favor. Besides, Mr. Lyman is not consistent. The same reasoning that makes *lactata* a synonym of *conscita*, will make *suffusa* a synonym of *reversa*—or worse—Mr. Stretch's description includes also *confusa* Lyman, and on this theory one part of Mr. Stretch's species is a synonym of *contigua*. I separated *suffusa*, and the name stands for the remaining part, viz., *confusa* Lyman, which would remain only as a synonym of *reversa*. I scarcely expect Mr. Lyman's adhesion to this theory, but unless he so holds, my *lactata* will stand.

I propose in view of the preceding, the following synonymy, adopting here my own order of species:

1. CLYMENE Brown.
   interrupto-marginata DeB.
   comma Wlk.
2. COLONA Hb.
   clymene || Esp.
   carolina Harr.
3. LACTATA Smith.
   ♂ *conscita* Wlk., in part.

4. LECONTEI Bd.
   var. MILITARIS Harr.
   confinis Wlk.
5. CONTIGUA Wlk.
   reversa Stretch, in part.
6. SUFFUSA Smith.
   lecontei ‡ Stretch et Auct.
   reversa Stretch, in part.
7. CONFUSA Lyman.
   lecontei ‡ Auct.
   reversa Stretch, in part.
8. FULVICOSTA Clem.
   ♂ *conscita* Wlk., var. *b*.
9. VESTALIS Pack.
   ♀ *conscita* Wlk.

For a full discussion of the generic characters and a history of the genus, I refer to my paper in Proc. U. S. National Mus., 1887, pp. 338–353, and plates xiii. and xiv.

[Mr. Lyman's paper was in type before the end of September, and was in our hands in MS. some time before. He could not, therefore, have seen Mr. Smith's paper. Our October number was delayed for three weeks, waiting for the Plate.—ED. C. E.]

FURTHER OBSERVATIONS ON ORYSSUS SAYI.

BY W. HAGUE HARRINGTON, OTTAWA.

During the past season I endeavored, as opportunity offered, to confirm and supplement the observations upon this insect recorded in the May issue of the CANADIAN ENTOMOLOGIST, pages 81–86. The insects appeared at least ten days earlier than in 1886, and on 29th May I captured, upon the old sugar-maple near Hull therein mentioned, four males, which were entirely black—var. *affinis*. Of these, one was dead in a spider's web, and had evidently furnished a meal to the spinner, and another had just been seized by a jumping spider of moderate size. On the following day I took a ♀, var. *occidentalis*, which had sought shelter,

or concealment, in the burrow of a *Dicerca divaricata*. I also saw a specimen just about to emerge from its own burrow, down which it rapidly retreated backward, when I commenced to dig with my pocket knife in the tough wood. On 3rd June, Mr. Fletcher and the writer saw a ♀ var. *terminalis* ovipositing in a minute crack in the perfectly dead dry wood of the same old sugar-maple. The ovipositor of this insect was found to be one and one-quarter inches in length. At the same time I obtained two males, var. *affinis*, and my companion captured two specimens. We also saw two in their burrows, and tried to cut them out, but the wood defied our knives, and the insects retired to the interior, their burrows being evidently of considerable depth. The following day we saw two specimens, one on a telegraph pole, the other on an old maple, and on the 7th I captured on the same maple a ♀ var. *terminalis* and two ♂'s var. *affinis*. I saw also two gnawing their way out, but could not get them. The last date of capture was on 9th June, when I found two just about to emerge, which I succeeded in digging out after some patient and difficult cutting. These were both males, one var. *affinis*, the other var. *occidentalis*, with two white marks on face, and a large triangular spot on terminal segment above. Of twelve specimens captured by me during the season (29th May to 9th June) there were var. *terminalis*, three ♀; var. *occidentalis*, one ♂, one ♀; var. *affinis*, seven ♂. This confirms my previous observations that nearly all those with a portion of the abdomen red are female, while those with the abdomen entirely black are male, although an occasional male will be found partly red, or a female entirely black. In conclusion, I wish to correct a clerical error in the paper above mentioned. On page 83, the seventh and sixth lines from foot should read:

1. *Oryssus Sayi* Westwood, 1835 = *maurus* Harris.
2. *terminalis* Newman, 1838 = *hæmorrhoidalis* Harris.

EXCHANGE.

Mr. W. Harcourt Bath, of Ladywood, Birmingham, England, is anxious to correspond with North American Entomologists with a view to procuring specimens of Canadian Dragon-flies, and is willing to give in exchange British Dragon-flies and Lepidoptera.

ERRATUM.—Page 218, line 10, for "guages," read "gangues."

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