

NOTES ON THE CHANGES IN GEOMETRID NOMENCLATURE,
WITH RECORDS OF SPECIES NEW TO THE LIST OF
GEOMETRIDAE FOUND IN BRITISH COLUMBIA.

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As a kind of preface to my paper, I would like to say that I think the time is fast approaching when we, as a Society, shall have to prepare a new check-list of British Columbia Lepidoptera. There have been many revisions of genera and changes in nomenclature in the nine years which have elapsed since our last list was published, also there are quite a number of new records in nearly all the families to be added to the list.

Speaking of the Geometridæ, the family in which I am most interested, perhaps the time is hardly quite ripe, as there are still many knotty problems remaining to be solved and much research-work yet to be done. I am at present, in conjunction with Mr. L. W. Swett, of Boston, Mass., working on several groups, particularly the two genera **Petrophora** and **Mesoleuca** and the **Alcis latifasciaria-imitata** group, which we expect to get straightened out this year, and the results of which I hope to read at the next annual meeting of our Society. Fortunately, Mr. Swett is in close touch with the University Museum of Harvard College, which, in addition to housing his own large collection, contains most of Packard's types, many of which came from Victoria, B.C., being collected by a Mr. G. R. Crotch some forty years ago.

The purpose of my paper is to give some of the most important changes in nomenclature affecting our British Columbia Geometridæ, and by including the records new to British Columbia making it of some little help to those interested in this particular family. In the following additions to the list I would like to remark that those species taken in the Okanagan Falls District in 1913, and in the Atlin District in 1914, were all collected by Mr. E. M. Anderson, of the Provincial Museum, who has made extensive collecting trips in those localities during the past two seasons.

Taking the Geometers in order as they appear in Dyar's List, which in the main is the same as Hulst's classification, the name of **Cladora atroliturata** Walker is the first one to be added to the list, taken on April 20th, 1913, at Okanagan Falls. This is a decidedly interesting record, as it is a distinctly Eastern species, occurring in the Atlantic States. The specimen captured was in fine condition and does not differ in any way from the typical specimens.

Philopsia nivigerata Walker. One specimen taken by me at Victoria on May 4th, 1913. It bears a close resemblance to **Philopsia (Talledega) montana** Pack., but is quite distinct. According to Mr. R. F. Pearsall, in *Canadian Entomologist*, December, 1906, the distinguishing characters of

these two genera, *Philopsia* and *Tallegaga*, are inconstant; therefore one of them must fall, and as *Philopsia* has priority of page it must stand, *Tallegaga* becoming a synonym of it.

Nasusina (*Gymnocelis*) *melissa* Grosbeck. Taken at Okanagan Falls on May 9th, 1913. This genus differs from *Eupithecia*, which follows it, in having one pair of spurs on hind tibiæ, whereas all the species of *Eupithecia* have two pairs; also in having a projecting cone tuft on front of head.

In the British Columbia Check-list Taylor has a *Eupithecia* listed as *lachrymosa* Hulst, which is wrong; it should be *E. limnata* Pearsall. Taylor was not very well acquainted with Hulst's species, which was from Oregon, and, although somewhat similar in markings, can be at once differentiated by the antennæ, which is simple ciliate in *lachrymosa* and bi-ciliate in *limnata*. Another one listed wrongly is *E. togata* Hub., which is strictly European. Pearsall described it later as *E. mutata*, and that name will take the place of *togata* in our lists. There are three more records to be added to this genus—*E. cestata* Hulst and *E. implorata* Hulst at Okanagan Falls in April, 1913, and *E. adornata* Taylor at Atlin. This latter species was also taken by Mr. J. W. Cockle at Kaslo on May 16th, 1914. These records are very interesting, as the two districts are widely separated, each having different fauna and flora from the other. It is evidently a high-altitude species, as its type locality is Calgary, Alberta. It was described by Taylor in *Canadian Entomologist*, December, 1906.

One of the most interesting Geometers taken by Mr. Anderson on his Atlin trip was *Eustroma destinata* var. *lugubrata* Moschler. This is a most beautiful insect of a rich chestnut colour and exceedingly rare. I would like to remark here that Mr. Anderson's captures of Geometridæ in the Atlin District were very gratifying, and besides gathering in many uncommon species, he has taken at least five new to the Province. It is also remarkable to find that a number of species recorded from Atlin have been taken by Mr. F. Wolley-Dod at Calgary, Alberta.

Rheumaptera hastata var. *gothica* Gue. Four specimens of this well-marked variety were taken by me at Victoria in June, 1913, but I did not see any during the past season. It is also taken at Vancouver.

Rheumaptera hastata var. *hastulata* Hub. This is much smaller and quite distinct from the preceding, somewhat resembling the variety *subhastata*, which, however, is darker. A series of this insect was taken at Atlin in the middle of June.

Mesoleuca cæsiata D. & Sch. should be changed to *M. aurata*, as *cæsiata* is strictly European.

The *Mesoleuca truncata-immanata* group I treated of in my paper read before you at the last annual meeting (Bulletin No. 4, page 44). It is unnecessary to add any more to that at present, only to remark that a few specimens of that group were taken at Atlin, and they all

show a change in colouring from warm brown to a greyish-brown, caused possibly either by a change of food-plant or to different climatic conditions.

I also remarked in the same paper that I had not seen the typical form of *Mesoleuca vasiliata* Gue., although the variety *niveifasciata* Hulst was taken regularly on Vancouver Island. On further investigation, however, I find that it does occur here, but very sparingly. Mr. G. O. Day, of Duncan, has taken a few, and so has Mr. A. W. Hanham. I found a couple of specimens when going over Mr. E. Skinner's collection which were taken by him at Duncan, B.C., some years ago; and also found one in the collection of Mr. A. H. Bush, of Vancouver, who has been collecting for many years.

There are also two more species of this genus to add to the list: *Mesoleuca formosa* Hulst, taken by the late Mr. Livingstone at Cowichan Bay, B.C., and now in the collection of Mr. L. W. Swett, of Boston, Mass. This is a very rare insect and I am glad to have the record. It was placed by Hulst in the genus *Philerme*, but it is a true *Mesoleuca*. The other one, *M. atrifasciata* Hulst, I found in the collection of Mr. E. Skinner, and was labelled "Possibly a var. of *E. nubilata*." It is listed by Dyar as a synonym of *M. immanata*, which it in no way resembles. It is a very striking insect, as may be seen from the type which is figured in Holland's Moth Book, Plate 44, Fig. 8, under the name of *Cleora atrifasciaria*.

The genus *Hydriomena* I have treated of in my previous paper, and I will now pass on to a variety of *Triphosa hæsitata* which occurs here, but which has evidently been overlooked. Mr. Swett first drew my attention to this variety, he having found it in the collection of Mr. C. Livingstone, which passed into his hands some time ago; since then I have taken two specimens in Victoria. It has a mottled appearance and is called var. *pustularia* Hy. Edwards.

Marmopteryx marmorata Pack. Two specimens of this handsome insect were taken at Okanagan Falls on May 7th, 1913. Its natural habitat is California. In an article by R. F. Pearsall, in the Bull. Brooklyn Ent. Society, Oct., 1914, on *Gypsochroa designata* Hufnagel, he says that on comparing the genitalia and markings with the European *designata* he finds them different, and proposes a new name for our species, viz., *emendata* Pearsall, *G. designata* being strictly European.

Petrophora circumvallaria Taylor. One specimen taken at Atlin on June 13th, 1914. This is a nice capture, and again illustrates the similarity of the fauna of northern British Columbia and southern Alberta. Both Messrs. Barnes and McDunnough and Mr. F. Wolley-Dod claim that this species is a synonym of the European *turbata* Hub., but until the genitalia of the two forms are compared I would hesitate to accept this, as I believe that we get very few of the European species in this country.

Petrophora incurсата Hub. is, according to Pearsall (Bull. Brooklyn Ent. Society, June, 1913), strictly European, he differentiating it from our species, which he has named **P. salvata**, by the structure of the antennæ.

In the *Canadian Entomologist*, 1900, page 104, Hulst described **Hydriomena amorata** (No. 3410 of Dyar's List). This Geometer is not a **Hydriomena**, however, but a **Petrophora**, and is a variety of **P. defensaria** Gue. I have found it to be double-brooded, as I have taken it at rest in September, and both at rest and at light in April, the spring forms being larger and a little brighter coloured.

Deilinia variolaria Gue. was included in the Provincial Museum catalogue compiled by E. M. Anderson in 1904, but was thrown out by Mr. Taylor in the 1906 check-list. This was wrong, as it is still taken in the Province, one specimen in good condition being taken at Okanagan Falls on July 3rd, 1913.

Macaria teucaria Strecker. There has been a certain amount of doubt connected with this insect. In the 1906 check-list Taylor put a question-mark before the specific name **teucaria**, and in Mr. Skinner's collection I found a specimen taken by him at Duncan some years ago and labelled "Undescribed" in Taylor's handwriting. When visiting Duncan in June, 1913, I was fortunate in taking a couple of specimens, and submitted them to Mr. Swett for his final opinion. Last July he took them to New York and compared them with specimens in the American Museum of Natural History. The result was that my specimens were found identical with those labelled "**Sciagraphia respersata** Hulst," one of which was also marked "Compared with type." As the late Mr. Grossbeck had the arrangement of the Geometridæ in the above Museum, and also was familiar with most of Hulst's types, there is no doubt that the above determination is correct.

Sympherta tripunctaria Pack. should be **Gladela lorquinaria** Gue. It appears that the genus **Sympherta** was preoccupied, so Grossbeck proposed the name of **Gladela** for it (*Entomological News*, October, 1909). The specific name of **lorquinaria** Gue. antedates by seventeen years that of **tripunctaria** Pack., so that name must stand, the latter becoming a synonym.

Alcis dissonaria Hulst. One specimen taken at Okanagan Falls on May 7th, 1913, and one at Penticton on June 30th. This is another rare insect and a very interesting record. Its type locality is Colorado, and it has been taken in Nevada.

Cleora indicataria Walker. I have taken an interesting series of this insect this past season. It is quite distinct from **umbrosaria** Hub., when fresh, but rubbed or worn specimens are hard to distinguish. Unfortunately they get worn very quickly, not lasting more than two or three days in a fresh condition.

Erannis coloradata Hulst. This is a record sent me by Mr. Swett, taken by Mr. Livingstone at Vancouver, but without date.

Euchlaena johnsonaria Fitch. One specimen taken on June 28th, 1913, at Okanagan Falls. This species was listed in the 1904 catalogue as taken at Victoria; that was an error, as the species taken at Victoria, Duncan, and other localities on the Island is the variety **mollisaria** Hulst, which occurs regularly, but not commonly.

Pero giganteus Grossbeck. This was given to me by Mr. A. W. Hanham amongst some pinned material last April. When setting it I noticed that it was different from the species that I had in my collection labelled "**honestarius (ancetaria)** Walker." I sent it to Mr. Swett, who pronounced it to be **giganteus**. It was described by Mr. Grossbeck in a paper given by him in the Proceedings of the United States National Museum, Vol. 38, pages 359-377. In this paper he shows that the genus **Azelina** Gue. must fall, as **Pero** H. & Sch. is the older one; also that our species **ancetaria** should be called **honestaria** for the same reason, so that the old name of **Azelina ancetaria** Hubner should read **Pero honestaria** Walker.

In addition to the foregoing, I have taken one species and three varieties new to science, the descriptions of which are now in the hands of the editor of the *Canadian Entomologist*, but as they have not yet been published I cannot make any remarks on them at this time.

I will now bring my paper to a close with the remark that in the near future all our closely allied species will be separated by comparisons of the genitalia of the various forms. There has just been issued in England a work of Mr. F. N. Pierce entitled "The Genitalia of the Geometridæ," dealing with all the recognized species in the British Isles and illustrated with over 1,500 figures. This work will be indispensable to any one working up the North American Geometridæ, as, having this for a basis, it will be comparatively easy to determine with certainty many of our doubtful species, and to settle the vexed question whether certain species are European or not.

Below is a tabulated list of the new records which I have been enabled to get together. As it is necessarily incomplete, I should be glad if the collectors of Geometridæ in this Province would send me the records of any new species, with the date, locality, and the name of the authority who made the determination.

GEOMETERS NEW TO BRITISH COLUMBIA.

Name.	Locality.	Date.	Captor.
<i>Cladora atroliturata</i> Walker.....	Okanagan Falls	April 20, 1913....	E. M. Anderson.
<i>Philopsia nivigerata</i> Walker.....	Victoria	May 4, 1913.....	E. H. Blackmore.
<i>Nasusina melissa</i> Grossbeck.....	Okanagan Falls	May 9, 1913.....	E. M. Anderson.
<i>Eupithecia implorata</i> Hulst.....	"	April 15, 1913....	"
<i>Eupithecia cestata</i> Hulst.....	"	April 15, 1913....	"
<i>Eupithecia adornata</i> Taylor.....	{Atlin	} May 16, 1914.....	J. W. Cockle.
	} Kaslo		
<i>Eustroma destinata</i> var. <i>lugubrata</i> Mosch	Atlin	August 16, 1914	E. M. Anderson.
<i>Rheumaptera hastata</i> var. <i>gothica</i> Gue.	Victoria	June 20, 1913.....	E. H. Blackmore.
<i>Rheumaptera hastata</i> var. <i>hastulata</i> Hub.	Atlin	January 16, 1914	E. M. Anderson.
<i>Mesoleuca formosa</i> Hulst.....	Cowichan Bay...	No date	C. Livingstone.
<i>Mesoleuca trifasciata</i> Hulst.....	E. M. Skinner.
<i>Hydriomena furcata</i> var. <i>viridata</i> Pack.	Victoria	May 22, 1914.....	E. H. Blackmore.
<i>Triphosa hæsitata</i> var. <i>pustularia</i> Hy. Edw.	{Victoria	March 20, 1914*	"
	} Vancouver	August 23	C. Livingstone.
<i>Marmopteryx marmorata</i> Pack.	Okanagan Falls	May 7, 1913.....	E. M. Anderson.
<i>Petrophora convallaria</i> Tay.....	Atlin	June 13, 1914.....	"
<i>Petrophora defensaria</i> var. <i>amorata</i> Hulst	Victoria	April 20, 1914....	E. H. Blackmore.
<i>Alcis dissonaria</i> Hulst	Okanagan Falls	May 7, 1913.....	E. M. Anderson.
<i>Cleora indicataria</i> Walker.....	Victoria	June 26, 1913.....	E. H. Blackmore.
<i>Erannis coloradata</i> Hulst.....	Vancouver	No date	C. Livingstone.
<i>Euchlæna johnsonaria</i> Fitch....	Okanagan Falls	June 23, 1913.....	E. M. Anderson.
<i>Pero giganteus</i> Grossbeck.....	Duncan	July 20, 1913.....	A. W. Hanham.

* Hybernated.

Mr. Day: Since the death of Mr. Taylor we have had no authority on British Columbia insects, and Mr. Blackmore has very kindly jumped into the breach and is doing great work in this order, and we shall derive great benefit from the work Mr. Blackmore has done.

Mr. Treherne: It is true that the Calgary species and northern British Columbia are similar, and that they differ from the Vancouver Island species. Are they similar to the Asiatic species?

Mr. Blackmore: They are similar, but I do not know as to the Asiatic species.

Mr. Sherman: On the trail of the Cassiar Mountain we took many species that are found, not on the Coast, but on Vancouver Island.

Mr. Blackmore: I would like to thank the President for his kind remarks. I am trying in a small way to put things on a better basis. As far as possible, I try to be accurate and get things down fine, and can only do a little at a time, as our Province is so large and varied.

Mr. Treherne: Are these up-to-date endings of the species you name?

Mr. Blackmore: The endings, I think, are absolutely authentic. At one time, as you know, the various species of genera ended in a certain way. You could tell by the end of the word what class they belonged to.

Mr. Day: I shall now call on Mr. Anderson, of the Museum, Victoria, to give his paper on "Insect Records from Atlin and Northern British Columbia."

INSECTS RECORDED IN THE ATLIN DISTRICT (NORTHERN BRITISH COLUMBIA) DURING THE SUMMER OF 1914.

BY E. M. ANDERSON.

(Reprinted from *Provincial Museum Report, 1914*, by permission of the Director.)

Since my report is of no economic value, I sincerely trust that it will be of interest to some members present; therefore, on a systematic order, I shall endeavour to furnish you with extracts from my field-notes, including a brief synopsis and annotated list of the insects collected in northern British Columbia.

In connection with the Provincial Museum of Victoria, I had the honour of making an extended zoological expedition into the Atlin District during the summer of 1914. Accompanied by an assistant, Mr. C. B. Garrett, we sailed from Victoria on May 29th, via Skagway, Alaska; thence by train and boat, arriving at Atlin on June 6th after a most enjoyable and pleasant trip. On our arrival we found the town of Atlin ("Atlin," a "Tahltan" Indian word meaning "Big Water") nothing but a mass of ruins, save the Government buildings and a few dwellings at the southern end of the town, these only being saved from devastation after a fierce fire. The following day, after provisioning the best we could under the circumstances, we departed from Atlin by wagon to Wilson Creek, and after a slow and rough ride we camped at the foot of a steep mountain, close to a small lake, at an altitude of 3,000 feet. On our arrival the weather was still cool, fresh snow lying on the foothills close to camp; the snow did not melt until about June 20th. This spot favoured the collecting of insects, Diurnals, Geometers in particular. Most of the material gathered at this camp is most desirable, and nearly all proved good species. Six out of seven species of *Brenthis* taken on this trip were found at Wilson Creek, including *Brenthis improba* Butler, which is still very rare in collections. This beautiful form was found on a grassy mountain-top, none being captured below 5,000 feet.

The three listed forms of *Cœnis* and both *Erebias* appeared on the western slope of the mountains, while on the opposite side, only a short distance of about two miles, we found a marked difference in the fauna. *Lycæna sæpiolus*, *aquilo*, and *scudderi*, commonly called "blues"; *Colias scudderi* and *eryphile*, the sulphur butterflies; *Pontia occidentalis* var.