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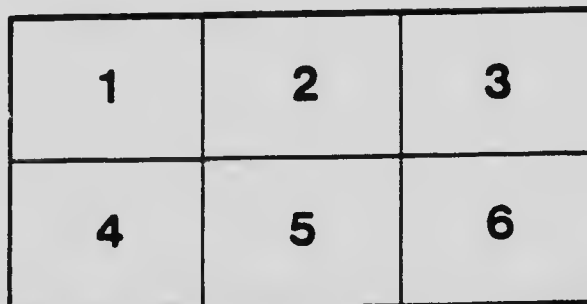
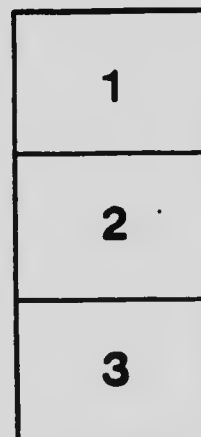
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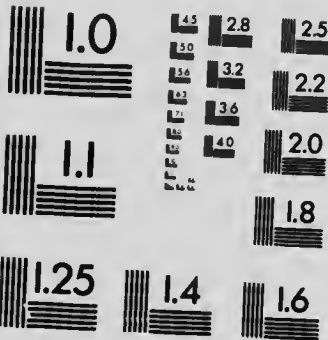
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REPORT  
OF THE  
CANADIAN ARCTIC EXPEDITION  
1913-18

VOLUME III: INSECTS

PART I: LEPIDOPTERA

By ARTHUR GIBSON



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OTTAWA  
J. de LABROQUERIE TACHÉ  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1920

Issued 10th Jan. 1920.

# Report of the Canadian Arctic Expedition, 1913-18.

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PART I: LEPIDOPTERA

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OTTAWA  
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PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1920

Issued 10th Jan. 1920.

# The Lepidoptera collected by the Canadian Arctic Expedition, 1913-18.

(With notes on other species collected in Arctic America.)

By ARTHUR GIBSON,

Entomological Branch, Department of Agriculture, Ottawa

The collection of lepidoptera made by members of the Southern Party of the Canadian Arctic Expedition during the years 1913 to 1916, is composed largely of butterflies. The material was collected chiefly by Mr. Frits Johansen, although a number of specimens were taken by Mr. D. Jenness and Mr. J. J. O'Neill, other members of the expedition. The localities where the lepidoptera were collected are in some instances the same as those visited by Mr. David T. Hanbury, whose collections were reported upon by Elwes and Hampson<sup>1</sup>. A small number of specimens of the families Pyralidae, Pterophoridae, and Tortricidae were brought back, but these are in such poor condition that it is impossible to determine them. In addition to the collection made by the Southern Party, I have also examined a small collection brought back by the Northern Party made on Victoria island and Melville island.

In the National Collection of Insects at Ottawa there are a number of species which were collected in Arctic regions by officials of the Geological Survey of Canada and which were not obtained by members of the Canadian Arctic Expedition. It has been therefore advisable to include the records of such captures in this report.

In the spring of 1917, I had an opportunity of studying portions of the Barnes' collection of lepidoptera, at Decatur, Ill., which is undoubtedly one of the most complete collections of North American lepidoptera in existence. On this occasion I compared some doubtful material with specimens in the collection. I received many favours while in Decatur, not only from Dr. Barnes himself but from Dr. J. McDunough. To both of these gentlemen I am much indebted. A few other specialists were consulted with regard to doubtful species and such assistance as was received is acknowledged in the text.

In the following pages nine species are described as new, in addition to which two new varieties are recognized. The majority of these new species and new varieties were collected by members of the Canadian Arctic Expedition.

The photographs from which Plates I to III, inclusive, were made were taken by Mr. A. E. Kellett, Artist Assistant, Entomological Branch, Department of Agriculture, Ottawa.

The arrangement of the species follows Barnes and McDunough's recently issued Check List of the Lepidoptera of Boreal America.

## FAMILY PAPILIONIDÆ

Genus *Papilio* L.

### *Papilio machaon allaska* Scudd.

*Papilio machaon* var. *aliaska* Scudd.: Proc. Bost. Soc. Nat. Hist., XII, 407, 1869.

No specimens of this butterfly were met with by members of the Canadian Arctic Expedition. In the National Collection of Insects at Ottawa there are specimens from: Valley of Mayo river, Yukon Territory, July, 1901 (J. Keele); Gravel river, near Twitya river, Northwest Territories, June 28, 1908 (J. Keele); three miles below summit of Chilkoot pass, July 15, 1886 (McDungall); between latitudes 67° 25' and 66° 30', long. 141°, June 12-27, 1912 (D. D. Cairnes).

Mr. Keele reported that this butterfly was quite common along the shores of Mayo lake and valley of Mayo river, Yukon, during July and August, 1904.

<sup>1</sup> Trans. Ent. Soc. Lond., 1903, part III (Oct.).



**Papilio glaucus canadensis** R. & J.

*Papilio glaucus canadensis* R. & J.: Novitates Zoologicae, XIII, 586, 1906.

Two Yukon specimens of the form *canadensis* are in the Canadian National Collection, namely from: Klotassin river area, lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ ; long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916 (D. D. Cairnes), and Frances river (lat.  $60^{\circ} 29'$ ), July 1, 1887 (Dawson and McEvoy).

Genus **Parnassius** Latr.**Parnassius smintheus** Dbldy. and Hew.

*Parnassius smintheus* Dbldy. & Hew.: Gen. Diur. Lep., pl. 4, 1847.

Two specimens in the Canadian National collection from the following northern localities: White river district, international boundary, Yukon Territory, lat.  $61^{\circ} 55'$ , long.  $141^{\circ}$ , July 13, 1913 (D. D. Cairnes); White river, Yukon Territory, long.  $141^{\circ}$ , July 23, 1913 (D. D. Cairnes).

FAMILY **PIERIDAE**.Genus **Pieris** Schrank.**Pieris occidentalis** Reak.

*Pieris occidentalis* Reak.: Proc. Ent. Soc. Phil., VI, 133, 1866.

One specimen from Bernard harbour, Northwest Territories, July 30, 1915, female (F. Johansen).

In addition to this specimen there is in the Canadian National collection at Ottawa, specimens from the following Arctic localities: Mackenzie river, opposite Gravel river, Northwest Territories, July 18, 1908 (J. Keele); Mt. Eduni, Gravel river, Northwest Territories, July 8, 1908 (J. Keele); Klutlian Glacier, elevation 7,500 feet, 141st meridian, international boundary, June 21, 1913 (E. W. Nesham).

**Pieris napi** L.

Verity<sup>1</sup> has treated, at length, the various races and forms of this species. More recently, however, Barnes and McDunnough<sup>2</sup> have discussed the forms of *napi* which occur in the extreme north.

No specimens of this species were collected by members of the Canadian Arctic Expedition but it is of interest to include here records of specimens in the Canadian National collection, which were collected by other explorers.

**Pieris napi arctica** Verity.

*Pieris napi arctica* Verity: Rhopalocera Palæarctica, 334, 1911.

In the Ottawa collection there are ten specimens which we have determined as this form, namely from the following localities: White river district, Yukon Territory, lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ , long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer 1916, 2 males (D. D. Cairnes); valley of the Mayo river, Yukon Territory, July, 1904, 1 male (J. Keele); Nansen creek, Placer Mining camp, Yukon Territory, July 4-7, 1914, 3 males (D. D. Cairnes); near Bear creek, 120 miles from Whitehorse, on Kluane road, June 17, 1914, 1 male (D. D. Cairnes); between latitudes  $67^{\circ} 25'$  and  $66^{\circ} 30'$ , long.  $141^{\circ}$ , June 15, 1912, 1 female (D. D. Cairnes); Pelly river, Yukon Territory, July 13, 1907, 1 female (J. Keele). In the Entomological Record for 1907<sup>3</sup> this latter specimen is recorded under the name *hulda*.

<sup>1</sup> Rhopalocera Palæarctica. Vol. 1.

<sup>2</sup> Cont. Nat. Hist. Lep. N.A., III, No. 2, and IV, No. 2.

<sup>3</sup> Rep. Ent. Soc. Ont., 1907.

One of the specimens taken between latitudes 67° 25' and 66° 30', long. 141° is shown on Plate III, fig. 3, together with the underside of a specimen from Nansen creek, Yukon Territory (fig. 4). Barnes and McDunnough in their "Contributions," vol. III, No. 2, Plate VI, figure a male and a female of *arctica* from Chatanika, Alaska.

***Pieris napi pseudobryoniae* Verity.**

*Pieris napi pseudobryoniae* Verity: *Rhopalocera Palæarctica*, 146, 1908.

Specimens of this form in the Ottawa collection are from the following localities: Bartlett bay, off Glæcier bay, Alaska, June 10, 1907, 2 males, 1 female (D. H. Nelles); Alaska, 1894, 2 females (Ogilvie). A male and a female from Bartlett bay are shown on Plate III, figs. 1 and 2.

In the Ottawa collection there is a specimen of *napi* taken at Dease lake, northern British Columbia, June 17, 1887 (G. M. Dawson). Fletcher<sup>1</sup> recorded this as *venosa* Seudd. This latter form was described from California. I have recently compared the specimen from Dease lake with Edwards' figure of *oleracea-hiemalis* on Plate 2, Vol. 1, Papilio, and while the veins are more heavily lined, it otherwise is similar to the figure referred to. It is certainly different from specimens of *venosa* from California in the Canadian National collection. Long series of such northern forms are required before one can arrive at any satisfactory decision regarding their status.

Genus ***Euchloe*** Hbn.

***Euchloe creusa*** Dbldy.

*Anthocharis creusa* Dbldy.: Gen. Diur. Lep., pl. 7, 1847.

Three specimens from northern localities are in the Canadian National collection, namely from Pelly river, Yukon Territory (W. Ogilvie), and between latitudes 67° 25' and 66° 30', June 12-15, 1912 (D. D. Cairnes).

The specimen from Pelly river was named *A. hyantis* some years ago by the late Dr. Fletcher. This latter name, however, according to Barnes and McDunnough<sup>2</sup>, should evidently be used for the Californian race of *creusa*.

In 1908, Mr. C. H. Young, of the Canadian Geological Survey, found the larvæ abundantly at Departure bay, British Columbia, feeding on tower mustard, *Arabis glabra* (L.) Bernh. Unfortunately he did not make any larval notes, but brought to me on his return to Ottawa a number of the ehyrsalids, from one of which a butterfly had emerged and from another a tachinid parasite of the genus *Exorista*<sup>3</sup>. The ehyrsalid is shown on Plate III, fig. 7.

***Euchloe ausonides*** Bdv.

*Anthocharis ausonides* Bdv.: Ann. Soc. Ent. Fr. (2), X, 286, 1852.

Four northern specimens of this species are in the Canadian National collection taken at the following localities: Telegraph creek, Stikine river, northern British Columbia, May 27, 29, 1887 (G. M. Dawson); Cassiar trail, 10 miles west of Dease lake, British Columbia, June 4, 1887 (G. M. Dawson); Pelly river, below Hoole river, Yukon Territory, July 5, 1907 (J. Keele).

<sup>1</sup> Ann. Rep. Geo. Surv. of Canada, 1887.

<sup>2</sup> Cont. Nat. Hist. Lep. N.A., III, 2, 60.

<sup>3</sup> The specimen which was much damaged was submitted to Mr. John D. Tothill, who reported that it belonged to the genus *Exorista* and that it may be *E. vulgaris* Fall.

Genus **Eurymus** Swains.**Eurymus meadi** Edw.

*Colias meadi* Edw.: Trans. Amer. Ent. Soc., III, 267, 1871.

One specimen from Bernard harbour, Dolphin and Union strait, Northwest Territories, July 14, 1916, male (F. Johansen).

This was the only specimen of this butterfly which was in the Arctic collection. It resembles very closely specimens from Colorado in the Canadian National collection. The glandular spot is well developed, and is distinctly tinged with red.

The occurrence of this species at Bernard harbour is a most interesting record. It was captured with specimens of *hecla glacialis*, from which, of course, it was at once separated by the spot referred to.

**Eurymus hecla glacialis** McLach.

*Colias hecla* var. *glacialis* McLach.: Jour. Linn. Soc., XIV, 108, 1878.

Twenty-four specimens from the following localities: Collinson point, northern coast of Alaska, July 10, 1914, 4 males, 2 females (F. Johansen); Barter island, northern Alaska, July 4, 1914, July 17, 1914; July 19, 1914; July 21, 1914; 8 males, 3 females (D. Jenness); Herschel island, Yukon Territory, end of July, 1916, 1 female (F. Johansen); Bernard harbour, Northwest Territories, July 14, 1916; August 1, 1915, August 4, 1915; August 17, 1915, August 25, 1915; 3 males, 3 females (F. Johansen).

One of the specimens from Collinson point represents the form *pallida* of Skinner and Mengel. The specimens collected on Barter island were captured while resting on the tundra. Mr. Jenness in a note which accompanied the specimens states: "This butterfly flies with considerable speed in a comparatively straight line for some distance." On Barter island the specimens were all with one exception taken during sunshine, the temperature records noted by Mr. Jenness varying from 44° to 56°F. The exception, a male specimen, was taken on a cloudy day, the temperature at the time being 38°F.

In the males the colour of the upper side of the wings is nearest to orange excepting along the costa and along the inner angle of the secondaries where the scales are greenish-yellow and black intermixed. The black marginal band is wide and in most examples is conspicuously crossed on all wings with yellowish-green veins. The discal spot on the primaries is black, conspicuous, and varies in shape from an almost straight short dash to an enlarged almost rounded spot. The centre of the latter spot is in some specimens filled in with white, in others with red. The underside of the males is fairly constant, the secondaries being greenish-yellow dusted with black. The black dusting is not so heavy along the margins and the marginal area therefore is paler in colour and shows up as a faint marginal band. The discal spot is white, heavily bordered, particularly outwardly with red and frequently prolonged to a point. In some specimens a very small additional spot is present. The primaries beneath are of a similar colour excepting the discal area which is flushed with pale orange. In some examples there is a submarginal row of black spots, in others a single black submarginal spot near the inner angle. The discal spot on the underside of the primaries is conspicuous, and is centred with white or pale orange. The males in expanse of wings vary from 38 to 45 mm.

The females are similar in appearance and resemble very much the figures labelled *hecla* on plate 27 g. vol. v of Seitz's *Macrolepidoptera of the World*, excepting that the marginal band on all wings is decidedly wider. One female from Bernard harbour has the wide band on the primaries with only traces in two instances of the yellowish-green submarginal spots. The secondaries in

this specimen are also darker than in the other examples and the yellowish-green submarginal spots are only faintly represented by a few scales of that colour. This specimen in the width of the band approaches *meadi* Edw. The females vary in size from 42 to 51 mm.

Specimens of both sexes have also been compared with Verity's figures of *hecla*. One or two, possibly more, of our females may be the same as his *chrysothemoides*.

Seven specimens, males, of the same species were brought back by the Northern Party of the Canadian Arctic Expedition. These were collected at Armstrong point, Victoria island, Northwest Territories, July 1-10, 1916 (J. Hadley).

In addition to the above specimens there are 21 other examples in the Canadian National collection taken as follows:

Klutlan glacier, international boundary, June 21, elevation 7,500 feet, 1 male (E. W. Nesham); Alaska, lat.  $59^{\circ} 30'$ , 141st meridian—lat.  $69^{\circ} 40'$ , 141st meridian, June-July, 1912, 2 males, 1 female (J. M. Jessup). This latter is a white female, and is apparently *pallida* S. and M.

Lansing river, Yukon Territory, June 24, 1905, 1 male (J. Keele). This specimen was recorded as *Eurymus boothi* in the Entomological Record for 1905<sup>1</sup>.

Ladue river, Yukon Territory, July 4, 1905, 1 male (J. Keele). Previously recorded with specimen from Lansing river as *E. boothi*.

Mayo valley, Yukon Territory, 1904 (J. Keele). In the Entomological Record for 1904<sup>2</sup> Fletcher recorded this specimen as *E. boothi*, stating that it corresponded exactly with Elwes' fig. 5<sup>3</sup>. Unfortunately this specimen is in very poor condition. I have compared it with Elwes' figure referred to, and would determine it as *hecla glacialis* not *boothi*.

Kluane road, 135 miles from Whitehorse, Yukon Territory, June 21, 1914, 1 male, 1 female (D. D. Cairnes).

Near mouth of Nansen creek, head of Nisling river, Yukon Territory, July 4, 1914, 2 males, 1 female (D. D. Cairnes); White river district, Yukon Territory, lat.  $61^{\circ} 55'$ , long.  $141^{\circ}$ , July 16, 1913, 1 male (D. D. Cairnes); Tatonduk river, international boundary, lat.  $65^{\circ} 02'$ , August 3, 1912, 1 male (D. D. Cairnes); Tinder creek, Yukon Territory, July 25, 1912, 1 female (D. D. Cairnes); west branch of the Thelon river, Northwest Territories, July 6, 1900, 1 male (J. Tyrrell); Sore-head river, east coast of Hudson bay, August 15, 1898, 3 males, 2 females (A. P. Low).

### *Eurymus boothi* Curtis.

*Colias boothii* Curtis: Ross' Nar. Second Voyage N.-W. Pass., App., 65, 1835.

Six specimens, all males, from the following localities: Bernard harbour, Northwest Territories, July 14, 1916, 5 specimens (F. Johansen); Port Epworth, Coronation gulf, July 15, 1915, one specimen (J. J. O'Neill).

I have compared these six specimens with the original figures and description of *boothi* and cannot associate them with any other species. The specimens have also been compared with Elwes' figures<sup>4</sup> of specimens collected at Port Epworth, Barren Grounds and Gray's bay. In the collection of the National Museum at Ottawa are three specimens taken in the Yukon in 1904 and 1905 which were recorded in the Entomological Record<sup>5</sup> for 1904 and 1905. I have studied these specimens and am satisfied that they are not *boothi* but similar to other specimens which we have determined as *hecla glacialis* McLach.

<sup>1</sup> Rept. Ent. Soc. Ont., 1905, 96.

<sup>2</sup> Rept. Ent. Soc. Ont., 1904, 61.

<sup>3</sup> Trans. Ent. Soc. Lond., 1903, pl. IX.

<sup>4</sup> Trans. Ent. Soc. Lond., 1903, pl. IX.

<sup>5</sup> Reports Ent. Soc. Ont. for years 1904 and 1905.

The pale orange-coloured scales on the primaries of the above specimens of *boothi* are in general similar in shade to Elwes' figures, 1, 4 and 5, already referred to and in Ridgway's Color Standards and Nomenclature (1912) come nearest to light orange-yellow or deep chrome, whereas in all of the specimens which we have determined as *hecla glacialis*, the colour of the wings is not yellow but in most examples is nearest to orange as figured by Ridgway in the work referred to. In these latter specimens too (41 examined) there is an absence of the greenish-yellow scales which in the specimens of *boothi* are present along the marginal band and also for the most part over the entire secondaries. In the three specimens referred to above, recorded erroneously as *boothi* the colour of the secondaries is similar to the colour of the primaries, as is the case in the series of specimens of *glacialis* examined. The discal spot on the secondaries in the latter butterfly is also much larger and redder in colour than in the specimens of *boothi*. The colour of the figures of *boothi* in Ross' Second Voyage referred to above is very close to bright chalcedony yellow (Ridgway, 1912). Verity<sup>1</sup> figures a coloured male (type) of *boothi*, plate XLIII, 37. Two of our specimens resemble this figure very closely.

Examining the six specimens more closely the following differences are apparent:—

Three of the specimens from Bernard harbour, have the marginal band well defined. The band on the primaries in these specimens varies in width at vein 3 from about 1 mm. to about 2 mm. On the secondaries there is the same variation in width. The marginal band on the latter wings in two of the examples ends abruptly at about midway between veins 2 and 3. In the other of these three specimens the band on the secondaries is only clearly defined to vein 4. The other three males have, also, narrow marginal bands but these are not so well defined and are preceded on the primaries by yellowish-green spot-like areas which give them a female-like appearance. In none of the specimens are the veins in the marginal band brightly coloured as in *hecla glacialis*, all are colourous with the band itself, but there are, however, in the marginal band on the primaries a series of transverse, short, greenish-yellow dashes midway between the veins. One specimen in fairly good condition has only a slight tinge of yellow in the discal area, all the wings in general being of a greenish-yellow colour. The discal spot on the primaries varies in size; in two examples it is rounded, in the others more like a short dash.

The underside of the secondaries is of a dull yellowish-green, the submarginal area being paler and showing up as a band. In the better preserved specimens there is a distinct pale yellowish-green streak near the centre. The discal spot on the hind wings is rounded, white in colour, bordered with rosy-red which colour in two examples runs outwardly to a point. In the basal area near the body there is also a conspicuous rosy-red dash similar to that which occurs on *hecla glacialis*. The primaries underneath are in general similar, the yellowish flush in the discal area varying in intensity. In one specimen nearly the whole underside of the primaries is yellowish. In this latter specimen there is a conspicuous row of black submarginal spots. The discal spot is conspicuous, whitish in the centre and margined with black.

The specimens vary in expanse of wings from 36 mm. to 43 mm. Two examples, both from Bernard harbour are shown on Plate IV, figs. 1 and 2.

In the Entomological Record for 1910<sup>2</sup>, I recorded a specimen of *C. boothi* from Dawson, Yukon Territory, 1908 (A. Day). This record should undoubtedly refer to *hecla glacialis*.

<sup>1</sup> *Rhopalocera Palæarctica*.

<sup>2</sup> Rep. Ent. Soc. Ont., 1910.

**Eurymus eurytheme kootenai** Coekle

*Colias kootenai* Coekle: Can. Ent. XLII, 203, 1910.

Barnes and McDunnough<sup>1</sup> have recently separated the forms which they considered should be arranged under *eurythemis*. Regarding *kootenai* which they refer to as being evidently the spring form of British Columbia, it is of interest to include here the following records: Pelly river, at mouth of Campbell creek, Yukon Territory, male, July 8, 1907 (J. Keele); Pelly river, near Hoole river, Yukon Territory, male, July 5, 1907 (J. Keele); Klotassiu river area, Yukon Territory, 62° 31' to 63° 06'; long. 137° 30' to 139° 30', summer, 1916, male and female (D. D. Cairnes).

The above authors, in the publication referred to figure two males and one female, one of the former being of a specimen from Atlin, B.C., which is adjacent to the Alaskan border.

**Eurymus christina** Edw.

*Colias christina* Edw.: Proc. Ent. Soc. Phil., II, 79, 1863.

Mr. Jos. Keele, of the Department of Mines, Ottawa, has on several occasions collected interesting specimens of lepidoptera in northern regions. In 1908 he met with this species on the Mackenzie river opposite Gravel river, Northwest Territories, July 17, 18, 1908, 6 males, 5 females. A single female was also collected by Dr. D. D. Cairnes on the west side of Lake Kluane, near Jacquot's road house, Yukon Territory, Aug. 2, 1914. These specimens are similar to others taken in more southern regions in the provinces of Alberta and Saskatchewan. One of the specimens is apparently the form *gigantea* Stkr. The species was described from material collected "at the portage of Slave river."

In 1888, Mr. F. Bell collected a coliid at Fort Simpson, Northwest Territories, and this was determined by W. H. Edwards as *occidentalis*, and recorded as such by Fletcher<sup>2</sup>. Barnes and McDunnough<sup>3</sup> state that possibly the Fort Simpson specimens mentioned by Scudder in his description of *occidentalis* really belonged to a yellow form of *christina*, and for this reason they would restrict the name *occidentalis* to the Vancouver island form which, while close, they mention can at once be distinguished by the much greater suffusion of black at the base of both wings on the upper side, approaching in this respect *chrysomelas* Hy. Edw.

The specimen collected by Mr. Bell and named *occidentalis* for Fletcher by Edwards certainly lacks the suffusion of black at the base of both wings on the upper side and is thus similar to *christina* as we know the latter.

**Eurymus pelidne** Bdv.

*Colias pelidne* Bdv.: Icones, pl. VIII, 1832.

In the Canadian National collection there are twelve specimens which we have determined as this species. These specimens were taken as follows: Limestone harbour, opposite northern part of Big island, Hudson strait, July 24, 1897, male (R. Bell); head of Kaliktookduog inlet, north side of Hudson strait, July 26, 1897, male (R. Bell); Sore-head river, east coast of Hudson bay, August 15, 1898, male (A. P. Low); Hannah bay, Hudson bay, female; Koongneow inlet, Hudson strait, July 29, 1897, female (R. Bell); Labrador, July 9, 27, 5 males (A. P. Low); Little Charlton island, James bay, July 14, 1884, male (J. M. Macoun).

<sup>1</sup> Cont. Nat. Hist. Lep. N.A., III, 2, 64.

<sup>2</sup> An. Rep. Geo. Surv. Can., 1887.

<sup>3</sup> Cont. Nat. Hist. Lep. N.A., III, 2, 68.

The specimen from Hannah bay was identified by W. H. Edwards as *pelidne* and that from Koong-neow inlet bears the same name in Fletcher's handwriting. Two of the specimens from Labrador were examined by Dr. H. Skinner. Dr. McDunnough has very kindly sent me specimens of *pelidne* from Hopedale, Labrador. The specimens from Hudson bay and Labrador we presume are *labradorensis* Seud.

Comparing these specimens with the series determined as *chippewa* referred to below the following differences are apparent. In both sexes of *pelidne* the marginal bands are narrower, especially on the secondaries, and the discal spot on the underside of the secondaries is distinctly margined with red mostly of a purplish shade. Barnes and McDunnough<sup>1</sup> refer to the discal spot of the forewing of *labradorensis* as being entirely absent or only faintly outlined by a few scattering dark scales and figure a male specimen from Hopedale, Labrador.<sup>2</sup> In our specimens the discal spot is present but faint. Verity<sup>3</sup> figures a female from Labrador. The butterfly is also figured by Holland<sup>4</sup>.

### *Eurymus palaeno chippewa* Edw.

*Colias helena* Edw.: Butt. of N.A., Vol. I, Colias 1;

*Colias chippewa* Edw.: Proc. Ent. Soc. Phil. 2, 80, 1863 (*helena* preoccupied).

One specimen, a female, taken at Nome, Alaska, August 24-25, 1916 (F. Johansen).

In the Canadian National collection at Ottawa there are fifteen other specimens which we have determined as *chippewa*. They bear labels as follows: Pelly river, Yukon Territory, 15 miles above Woodside river, July 14, 1907, 3 specimens, males (J. Keele); Stewart river, above Nadaleen river, Yukon Territory, July 18, 1905, 2 males (J. Keele); Nansen creek, Placer Mining Camp, Yukon Territory, July 7, 1914, 1 male, 2 females (D. D. Cairnes); Harrington creek, Yukon Territory, lat. 65° 05', long. 141°, July 30, 1912, male (D. D. Cairnes); Ladue river, Yukon Territory, July 4, 1905, male (J. Keele); Champagne Landing, 50 miles from Whitehorse, by Klucane road, Yukon Territory, June 8, 1914, female (D. D. Cairnes); Siwash creek, international boundary, lat. 65° 57', June 30, 2 males (D. D. Cairnes). Mt. Eduni, Gravel river, Northwest Territories, 6,000 feet, July 8, 1908, male (J. Keele); west branch of the Thelon river, Northwest Territories, July 5, 1900, male (J. Tyrrell).

The males are fairly constant in markings, and in general are in good condition. The colour of the upper surface of all wings is chalcodony yellow<sup>5</sup>, the lower wings being not so bright resulting from the dark scales of the underside showing through. The marginal blackish bands are noticeably wide. Underneath the colour varies in the specimens from pale yellow to a decidedly greenish-yellow, the secondaries overlaid with blackish scales as is also the costal area. In all the specimens the discal spot on the secondaries, beneath, is white, faintly margined with yellow. The four females are also similar in appearance, being whitish with broad marginal band on primaries particularly at apex. Edwards' figures<sup>6</sup> resemble closely specimens in our series as do also those of Verity<sup>7</sup>.

<sup>1</sup> Cont. Nat. F. t. Lep. N.A., III, 2, pl. VII, 6.

<sup>2</sup> Dr. McDunnough has since informed me that the character is not always constant. In the Barnes collection specimens have recently been added which show the discal spot.

<sup>3</sup> *Rhopalocera Palæarctica*, pl. XL, 20.

<sup>4</sup> The Butterfly Book, pl. XXXV, 14; XXXVI, 15, 16.

<sup>5</sup> Ridgway's Color Standards and Nomenclature, 1912.

<sup>6</sup> Butt. of N.A., Vol. 1, Colias 1, figs. 5, 6, 7.

<sup>7</sup> *Rhopalocera Palæarctica*, pl. VIII, 43, 44, 45.



**Eurymus nastes** Bdv.

*Colias nastes* Bdv.: Icones, p. 245, pl. 8, 1832.

Thirty-eight specimens from the following localities: Barter island, northern Alaska, July 17, 1914, 1 female (D. Jenness); Collinson point, Alaska, July 10, 17, 1914, 2 females (F. Johansen); Cockburn point, Dolphin and Union strait, Northwest Territories, September 2, 1914, 1 male, 1 female (F. Johansen). Bernard harbour, Northwest Territories, 13 males, 20 females, July 30, 1915, August 1, 4, 6, 11, 14, 17, 25, 1915, July 14, 1916 (F. Johansen).

This excellent series has enabled us to form a good idea of the range of variation which may occur within the species. The wing expanse of the males varies from 35 mm. to 38 mm. and the females from 34 mm. to 43 mm. In the males the underside both in colour and markings is fairly constant but the upperside shows more variation. The secondaries are mostly of a pale flouirite green<sup>1</sup> more or less dusted with black. The primaries in most specimens are darker than the secondaries, the whole wings in some examples being heavily dusted with black. In the females there is more colour variation on the undersides, some specimens being greenish-yellow others darker green and others again dark green with a pinkish tinge. In most of the specimens the marginal band of yellow is conspicuous.

Verity<sup>2</sup> has figured a male and a female (types) of the variety *rossii* Guenée brought back by Captain Ross. None of our males can with certainty be definitely associated with the figure of the male type but one or two of the females match fairly well the figure of the female type. The figures on plate 27 d. of Seitz's *Macrolepidoptera of the World* are more like our specimens.

A single example (female) was brought back by the Northern Party of the Canadian Arctic Expedition. This was collected at Armstrong point, Victoria island, Northwest Territories, early July, 1916 (J. Hadley).

In addition to the above specimens there are in the Canadian National collection three females from Sore-head river, east coast of Hudson bay, August 15, 1898 (A. P. Low), and one male specimen from Labrador (collector and exact locality unknown).

## FAMILY SATYRIDAE.

Genus *Coenonympha* Hbn.***Coenonympha kodiak yukonensis*** Holland.

*Coenonympha kodiak* var. *yukonensis* Holland: Ent. News, XI, 386, 1900.

In 1905, Mr. Joseph Keele, of the Department of Mines Ottawa, collected five specimens of this butterfly as follows: Lansing river, Yukon Territory, June 24, 3 males, 1 female; Ladue river, Yukon Territory, July 4, female.

These specimens are in the National collection at Ottawa. This butterfly was not collected by any members of the Canadian Arctic Expedition.

Genus *Oeneis* Hbn.***Oeneis chryxus*** Dbldy. and Hew.

*Oeneis chryxus* Dbldy. and Hew.: Gen. Diurn. Lep., II, 383, 1851.

In the Canadian National collection are two specimens of this species taken by Mr. J. Keele, on the Pelly river, at Hoole canyon, Yukon Territory, July 3, 1907, both males. One of the specimens, although rubbed, resembles a specimen of the variety *calais* Seud. in the Ottawa National collection from Go Home bay, Ontario.

<sup>1</sup> Ridgway's Color Standards and Nomenclature, 1912.

<sup>2</sup> *Rhopalocera Palaearctica*.



**Oenels jutta** Hbn.

*Oenels jutta* Hbn.: Eur. Schmett. f. 614, 1800.

In the Canadian National collection are specimens from the following Yukon localities: North Fork Stewart river, Yukon Territory, June 22, 1905, 1 male (J. Keele); Klotassin river area, Yukon Territory lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ ; long.  $137^{\circ} 30'$  to  $139^{\circ} 60'$ , summer 1916, 1 male (D. D. Cairnes); Ladue river, Yukon Territory, July 4, 1905, 1 male, 2 females (J. Keele); Lansing river, Yukon Territory, June 24, 1915, 1 female (J. Keele).

In all of these specimens excepting the male, taken on the Ladue river, the median band on the underside of the secondaries is present. In the exception the band is not definitely marked and in general may be referred to the var. *alaskensis* Holl. The specimens on the whole are smaller than *jutta* which occurs commonly at the Mer Bleue, Carlsbad Springs, Ont., a favourite collecting ground near Ottawa.

**Oenels taygete** Hbn.

*Oenels taygete* Hbn.: Samml. Ex. Schmett, 1816-24.

One specimen, a male, as follows: Bay southwest of cape Krusenstern, Northwest Territories, July 3, 1916 (D. Jenness).

In the Canadian National collection at Ottawa there are nine other specimens bearing locality records as follows: Kluane road, 96 miles from Whitehorse, near Marshall creek, Yukon Territory, June 15, 1914, 1 male (D. D. Cairnes); Sit Down creek, lat.  $65^{\circ} 40'$ , long.  $141^{\circ}$ , July 9, 1912, 1 female (D. D. Cairnes); Nation river, lat.  $65^{\circ} 31'$  (1700-2500 ft.), July 17, 1912, 1 female (D. D. Cairnes); Siwash creek, Yukon Territory, lat.  $65^{\circ} 57'$ , long.  $141^{\circ}$ , June 30, 1912, 1 female (D. D. Cairnes); one other specimen evidently from the Yukon Territory, but without definite data; Labrador, male; King George sound, south side Hudson strait, July 16, 1897, 2 males, 1 female (R. Bell).

In the males the median band on the underside of the secondaries is very distinct, in the females less so. The whitish spots near the margin on the hind wings beneath, are conspicuous on most of the Yukon specimens and equally so on the Labrador specimen.

Holland has given a rather good figure of the species in his Butterfly Book pl. XXVII, 6, the specimen illustrated being from Nain, Labrador. In none of our specimens is the pale yellowish submarginal band on the upperside so marked as indicated in Seitz's figure 50g, vol. v—The Macrolepidoptera of the American Faunistic Region. The submarginal area of the specimens listed above is, in both sexes, similar in colour to the general colour of the primaries. In some of the examples the yellowish spots on the upperside of the secondaries near the margin are very conspicuous. The general colour of the upper surface of the Labrador example is of a golden-brown shade, while that of the Bernard harbour specimen and other males, is of a darker shade of brown. The median band on the underside of the secondaries while conspicuous in all the specimens indicate considerable variation not only in width but also in shape. The number of white scales on both sides of the median band also varies. In all the specimens the veins are white-lined.

The genitalia of the specimen taken on the Kluane road, 96 miles from Whitehorse, Yukon Territory, are shown on Plate 1, fig. 1.

**Oeneis semidea** Say.

*Hipparchia semidea* Say: Am. Ent., III, pl. 50, 1828.

In the Canadian National collection there are thirteen specimens of *Oeneis* from the Yukon Territory which I have compared with *semidea* from New Hampshire, and from which they do not differ in characters which seem to me to be important. The genitalia, also, are very close to those of specimens from Mount Washington, New Hampshire, as will be seen by comparing the figures on Plate I, figs. 2 and 3. The underside of these specimens is in general very similar to Edwards' figure 2<sup>1</sup>. The females are large, expanding 51-53 mm. The males, excepting one specimen, expand 44-47 mm, the exception having a wing expanse of 53 mm.

These specimens are from the following localities: Mountain 6,500 feet above Wolf canyon, Pelly river, Yukon Territory, July 17, 1907, 2 males (J. Keele); Pelly river at Hoole canyon, Yukon Territory, July 30, 1907, male (J. Keele); Stewart river, Yukon Territory, 4,000 feet above valley, July 18, 1905, male (J. Keele); Mountain top, above Nadaleen river, Yukon Territory, July 10, 1905, male (J. Keele); Mountain near Upper Pelly river, Yukon Territory, July 13, 1907, female (J. Keele); Orange creek, Yukon Territory, lat. 66° 10', international boundary, June 27, 1912, 2 females (D. D. Cairnes); Eduni mountain, 4,500-6,000 feet, Gravel river, Northwest Territories, July 5, 8, 1908, 1 male, 3 females (J. Keele); Gravel river, mountain below Natla river, Northwest Territories, July 2, 1908, female (J. Keele).

The underside of two males, one from Pelly river, Yukon Territory, the other from Gravel river, Northwest Territories, together with a female from Orange creek, Yukon Territory, are shown on Plate II, figs. 1, 2 and 3.

**Oeneis semidea** var. **arctica**, new variety

Differs from *semidea* from New Hampshire in the general colour of both the upperside and the underside of the wings. The upper side of the wings is pale brown, almost drab<sup>2</sup>, the dark scales of the underside showing through particularly on the secondaries. The underside is of a dull grey-brown, the maculation dark brown and not nearly so contrasting with the ground colour as in *semidea*, the mottlings being much more diffused and there being an absence of the conspicuous whitish areas present in the latter on the underside of the secondaries. The basal area to anal angle is noticeably darkest, inclining to blackish. Fringes whitish, weakly checkered with brown.

Alar expanse, 41 mm.

Type, a male, in the Canadian National collection from Bernard harbour, Northwest Territories, July, 1916 (F. Johansen). (Pl. IV, fig. 4.) Four male paratypes from the same locality and bearing the same data are in general similar, with wing expanse of 37-38 mm. In addition to the five males there are four females which we are placing tentatively with this new variety. Three of these are from Wollaston Land, Victoria island, 1915 (D. Jenness); the fourth is from Bernard harbour, Northwest Territories, July, 1915 (F. Johansen). In these females there is an absence of the black suffusion of the basal area. They have a wing expanse of 41-42 mm. The underside of one of the male paratypes is shown on Pl. II, fig. 4.

The claspers of *semidea arctica* are shown on Pl. I, fig. 4 beside those of *semidea* from New Hampshire. It will be seen that they are very close to those of the latter. The general colour of the arctic specimens as well as the nature of the maculation on the underside of the secondaries, and their smaller wing expanse seem to warrant the naming of this variety or race.

<sup>1</sup>Butt. of N.A., Chionobas, IX, f. 2.

<sup>2</sup>Ridgway's Color Standards and Nomenclature, 1912.

**Oeneis simulans**, n. sp.

Palpi black, upper fringe mostly white. Antennae brown, with conspicuous white scales on inner side, knob orange-brown. Body blackish. The upperside of the wings are immaculate, pale brown in colour, almost drab<sup>1</sup>, the maculation of the underside showing through particularly on the secondaries. Sex markings faintly indicated. Costa whitish, mottled with black. Underside: primaries dull grey-brown, costa and apex whitish with black mottlings; secondaries pale grey-brown inclining to whitish, particularly on outer half, and mottled and streaked with dark brown, blackish at base and along inner angle. Median band rather indistinct but noticeably defined by blackish shading both on its inner and outer margin. Maculation in general similar to *semidea* but not so contrasting as in this latter species and without the conspicuous whitish areas. Fringe whitish, checkered with pale brown.

Alar expanse, 43 mm.

Type, a male, from Bernard harbour, Northwest Territories, July, 1915 (F. Johansen). Two paratypes from the same locality and bearing the same date. In two of these latter the maculation on the underside of the secondaries is more diffused than in the type, the median band being defined on the outer margin only, the area between this and the base being almost wholly suffused with blackish-brown. A third specimen, which I also associate with the above, differs from the type on the underside of the secondaries in having the median band more heavily suffused with dark brown and more sharply defined with whitish scales on both its inner and outer margin. The outer margin is distinctly angled and in this respect differs from the type. These specimens have a wing expanse of 37-40 mm. The underside of the type specimen is shown on Plate II, fig. 5. All the types are in the Canadian National collection.

With the above males are two females from the same locality which are being placed tentatively with this species. The underside of both of these specimens is much darker than that of the males being more heavily mottled and streaked with dark brown. In one of the females there is hardly any indication of a median band but in the other female the band is noticeably present being rather heavily bordered on the outer margin with blackish-brown.

The above specimens of *O. simulans* were collected at the same locality as were the specimens of *O. semidea arctica*, from which on superficial characters they cannot be separated. The genitalia, however, are quite distinct from those of those figured by Elwes and Edwards<sup>2</sup> or Barnes and McDunnough<sup>3</sup>, as will be seen by comparing these with our figure on Pl. I, fig. 5.

**Oeneis peartiae** Edw.

*Chionobas peartiae* Edw.: Butterflies of North America, III. pl. 14, 1897.

Five specimens as follows: Bernard harbour, Northwest Territories, July, 1915, three males, 1 female (F. Johansen); Chantry island, near Bernard harbour, Northwest Territories, August 7, 1915, 1 male (F. Johansen).

These specimens resemble fairly closely, Edwards' figs. 5, 6, 7, and 8, part XIV, in his Butterflies of North America, Third Series, part XVII, 1897. In the female there is a yellowish spot between veins 5 and 6 on each primary towards the apex. This spot is also present on the underside. This specimen is shown on Plate IV, fig. 5. The underside of the same specimen is illustrated on Pl. II, fig. 6.

The male genitalia are shown on Pl. I, fig. 7.

<sup>1</sup> Ridgway's Color Standards and Nomenclature, 1912.

<sup>2</sup> Trans. Ent. Soc. Lon., Dec. 1893.

<sup>3</sup> Cont. Nat. Hist. Lep. N.A., IV, 2, 1918.

**Oeneis cairnesi**, n. sp.

Upperside ochraceous-buff<sup>1</sup> lightly washed with brown, noticeably so along veins and outer margin, the markings of the underside showing through particularly on the secondaries; costa whitish, mottled with black.

Underside: primaries, centrally similarly coloured to upper side but rather more brownish; costa, apex and outer margin to near inner angle, whitish with dark brown mottlings. In the limbal area between veins 5 and 6 there is a distinct dark brown ocellus with white pupil. Secondaries whitish with brown mottlings, the median band mostly dark brown and well defined, paler in the centre. Area on either side of the median band almost wholly whitish. About midway between the median band and the outer margin there are four round, white spots, the two central ones being much smaller than the two outer ones, which latter are about half the size of the ocellus on the underside of each primary. The four spots are margined with brown, the outer ones distinctly so.

Fringes whitish, checkered with brown. Clothing of palpi black and grayish intermixed. Antennae brown with white scales, knob orange-brown. Body blackish. Genitalia shown on Plate 1, fig. 6.

Alar expanse 42 mm.

Type, a male, from the White river district, Yukon Territory, lat. 61° 55', long. 141°, July 16, 1913 (D. D. Cairnes); in the Canadian National collection. Named in honour of the late Dr. Cairnes who collected many interesting species when on northern explorations for the Canadian Geological Survey.

Paratypes, one male and two females (expanse 44 mm.) from the same locality. The females are slightly paler in colour than the males and the median band on the underside of the secondaries is not so well defined as in the type.

Before describing the above, I submitted a specimen to Dr. Dyar with a request that he compare it with his species *O. nahanni*. This he very kindly did reporting that it differed chiefly from his species in being too light in colour, in having no ocelli on hind wings above and the markings on these latter wings being more of an open character.

The upperside of the type of *O. cairnesi* is shown on Pl. IV, fig. 6, the underside of the same specimen on Pl. II, fig. 7. The underside of one of the female paratypes is shown on the latter Plate at fig. 8.

**Oeneis brucei** var. **yukonensis**, new variety.

Differs from *O. brucei* from Colorado in being smaller in wing expanse, in having a conspicuous submarginal row of yellowish spots on the upper side of both primaries and secondaries, in the costa being almost concolorous with wings not white or whitish as in the typical form, and in the median band on the underside of the secondaries being narrower. On either side of the median band the whitish areas are wider and thus more conspicuous, and there is in addition a distinct submarginal blackish line on the underside of the secondaries.

Alar expanse, 41 mm.

Type, a male, from Khatlan glacier, Yukon Territory, elevation 8,200 feet, June 14, 1913 (E. W. Nesham). Paratypes, three males and two females collected in the same locality by Mr. Nesham on June 13-15 at elevations of 8,200-8,500 feet; wing expanse, 38-41 mm. The paratypes are in general similar to the type. One of the female paratypes has on each primary two ocelli, one between veins 2 and 3 and the other between veins 5 and 6. All the types are in the Canadian National collection. The upperside of the type is shown on Pl. IV, fig. 3; the underside of the same specimen on Pl. II, fig. 9. On this latter plate is also shown at figure 10 the upperside of the female paratype with ocelli. The genitalia of one of the male paratypes are shown on Pl. 1.

<sup>1</sup> Ridgway's Color Standards and Nomenclature, 1912.

fig. 8. Barnes and McDunnough<sup>1</sup> have reproduced a drawing of the genitalia of *O. brucei* and a comparison of this with our figure of the genitalia of *O. brucei yukonensis* while indicating a close relationship, at the same time also being a near resemblance to the figure of *O. katahdin* shown by the same author on the same plate. With a good series of *O. brucei yukonensis*, the latter may ultimately prove to be of specific rank.

#### Genus *Erebia* Dal.

##### *Erebia discoidalis* Kirby.

*Hipparchia discoidalis* Kirby: Faun. Bor. Am., IV, 298, 1837.

Among a small collection of lepidoptera given to me by Mr. L. D. Burleigh of the Geological Survey of Canada and collected in Alaska by Mr. J. M. Jessup is a single male specimen of this species. The label covering all the specimens reads: "lat. 59° 30' and 141st meridian—lat. 69° 40' and 141st meridian, June 7, 1912." This specimen is now in the Canadian National collection.

##### *Erebia fasciata* Butler.

*Erebia fasciata* Butler: Cat. Satyr. Brit. Mus., 92, 1868.

Eleven specimens, eight males and three females, as follows: Bay southwest of Cape Krusenstern, Northwest Territories, July 3, 1916, 2 specimens (L. Jenness); Bernard harbour, Northwest Territories, August 4, 1915, 2 specimens (F. Johansen); Bernard harbour, Northwest Territories, July, 1916, 7 specimens (F. Johansen).

These specimens show noticeable variation. In two of the males taken at Bernard harbour there is an almost total absence of the reddish patch in the submarginal area of the upper surface of the primaries; in the other males the reddish patch in such area varies not only in size but in intensity of colour. The red in none of the species is as bright as that in Elwes' figure<sup>2</sup>, but mahogany red<sup>3</sup>. The number of white scales present in the basal area and in the band beyond the blackish-brown median band on the underside of the secondaries also varies in the specimens. The underside of one specimen matches almost perfectly that figured by Elwes, in the others the whitish and greyish areas are not nearly so distinct.

In the three females the greyish band beyond the dark median band on the underside is very conspicuous there being very little of the reddish colour on the primaries. The reddish area on the upper surface of the primaries is not nearly so bright as in Elwes' fig. 12 in the publication referred to above. The colour of the submarginal band on the underside of the secondaries in one specimen is decidedly greyish, more so than is shown in Elwes' fig. 11 of the male.

In addition to the above specimens there are in the Canadian National collection two specimens collected by the late Dr. D. D. Cairnes, of the Geological Survey; one, a male, collected at lat. 66° 58', international boundary June 15, 1912, the other, a female, collected at lat. 65° 10', long. 141°, (1,300 feet) on July 30, 1912, (Pl. IV, fig. 7).

Also, seven examples brought back by the Northern Party of the Canadian Arctic Expedition, two males from Armstrong point, Victoria island, Northwest Territories, collected during the period June 20 to July 11, 1913 (J. Hadley), and Walker bay, Victoria island, July 6, 1917 (J. Hadley), respectively, and seven females, six of which are from Armstrong point, Victoria island, June 20 to July 11, 1916 (J. Hadley) and one from Walker bay, Victoria island, July 6, 1917 (J. Hadley). A male from Armstrong point is shown on Pl. IV, fig. 8.

<sup>1</sup> Cont. Nat. Hist. Lep. N.A., IV, 2, pl. XXV.

<sup>2</sup> Trans. Ent. Soc. Lond., 1903, pl. IX, fig. 11.

<sup>3</sup> Ridgway's Color Standards and Nomenclature, 1912.

The specimens collected by Messrs. Cairnes and Hadley are in general similar to the series from Bernard harbour and Cape Krusenstern. The band on the underside of the female collected at lat.  $65^{\circ} 10'$  is faint, as is also the reddish area on both upper and lower sides of primaries.

#### *Erebia rossi* Curt.

*Hipparchia rossii* Curt.: Ross' Second Voyage N.-W. Pass, App., 67, 1835.

One specimen, a female, from Wollaston Land, Victoria island, Northwest Territories, July 22, 1915 (D. Jenness); Pl. IV, fig. 9.

On each forewing of the specimen, above, are three ocelli; the two in the sub-apical area are close together, but entirely separated, similar as in the specimen figured by Curtis; the lower spot is the larger. About midway between this latter spot and the hind angle is the third spot which is about the size of the upper of the two spots. The spots are ochraceous-orange in colour, the black pupil showing only in the largest of the three spots. The two upper spots are more distinct on the underside, being slightly paler in colour, of a more uniform size, and each having a distinct black pupil. The third spot is only faintly visible on the underside. The colour of the upperside of the wings is close to light seal brown; the underside is similar but the outer central portion of the primaries is reddish, the discal area being suffused with a paler brown than that of the hind wings. The underside of the secondaries are banded as in Elwes' figure<sup>1</sup>.

Two other specimens in the Canadian National collection, both males, one from Kluane P.O., Yukon Territory, June 23, 1914 (D. D. Cairnes), the other from West branch of the Thelon river, Northwest Territories, July 6, 1900 (J. Tyrrell) also appear to be the same species. The one from Kluane is very similar to the Wollaston Land specimen but that from the Thelon river is differently marked approaching Elwes' fig. 2 in the publication referred to.

#### *Erebia disa* Thun.

*Papilio disa* Thun.: Diss. Ent. Ins. Suec., II, 37, 1791.

Two specimens taken as follows: Port Epworth, Coronation gulf, Northwest Territories, July 15, 1915, 1 male, 1 female (J. J. O'Neill).

The former specimen is much like the figure of *disa* on plate 37h, vol. 1, of Seitz's Macrolepidoptera of the World but is much darker brown in colour. The median band on the underside of the secondaries is well defined, the area on either side being greyish-white. The female is in a poor state of preservation.

In the Canadian National collection there are specimens from the Yukon and Northwest Territories, bearing the following labels:—75 miles from Whitehorse, near Canyon river, Yukon Territory, June 11, 1914, 1 male (D. D. Cairnes); Whitehorse, Yukon Territory, (McLaughlin); Lansing river, Yukon Territory, June 24, 1905, 1 female (J. Keele); Siwash creek, Yukon Territory, lat.  $65^{\circ} 59'$ , long.  $141^{\circ}$ , July 29, 1912 (D. D. Cairnes); Gravel river, Northwest Territories, June 27, July 20, 1908, 3 specimens, 2 males, 1 female (J. Keele); Black river, Yukon Territory, lat.  $66^{\circ} 34'$ , June 18, 1912 (D. D. Cairnes).

There is a noticeable variation in these latter specimens, not only in the size of the spots on the primaries, but also in the colour of the lower side of the wings and the faintness or otherwise of the median band on the secondaries. In the specimen from near Canyon river, for instance, the colour of the underside of the secondaries is almost wholly dark brown, very similar to the colour of the reverse side, excepting the outer margin which is greyish.

Some of these examples should doubtless be referred to the var. *manicus* Dbl. and Hew. The specimen from Lansing river, was recorded by Fletcher as the var. *manicus* in the Entomological Record for 1905.<sup>2</sup>

<sup>1</sup> Trans. Ent. Soc. Lond. 1899, pl. XII, fig. 1.

<sup>2</sup> Rept. Ent. Soc. Ont., 1905, 96.

**Erebia epipsodea** Butl.

*Erebia epipsodea* Butl.: Cat. Satyr. Brit. Mus., 80, 1868.

This species which is evidently rare in northern regions was collected by Mr. J. Keele, in the Yukon Territory, on the Pelly river, below Hoole river, July 5, 1907, 1 male. This specimen is in the Canadian National collection. Two other specimens, 1 male and 1 female collected by the late Dr. D. D. Cairnes, in the Klotassin river area, Yukon Territory, lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ ; long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916, are in the same collection. These specimens are similar to examples from more southern localities.

**Erebia youngi** Holl.

*Erebia youngi* Holland: Ent. News, XI, 388, 1900.

This species was described from material collected between Fortymile and Mission creeks, northeastern Alaska. No specimens were brought back by the members of the Canadian Arctic Expedition, but in the years 1912 and 1914, Dr. D. D. Cairnes, of the Geological Survey of Canada, brought back from the Yukon, nine specimens, five taken in 1912 (all males), and four in 1914 (three males and one female). The 1912 specimens were taken at Siwash creek, international boundary, lat.  $65^{\circ} 57'$  on June 26-30, and the 1914 examples collected at Nansen creek, Placer Mining Camp, Yukon Territory, July 4-7.

In addition to the specimens collected by the late Dr. Cairnes, we also have in the Canadian National collection, a male specimen, collected with other material, the label covering all reading: "Alaska, lat.  $59^{\circ} 30'$  and 141st meridian—lat.  $69^{\circ} 40'$  and 141st meridian, June-July, 1912 (J. M. Jessup)."

In the female the broad dark median band on the underside of the secondaries is more conspicuous than in the males owing to the fact that the basal and submarginal areas are much paler in colour. In one of the males the submarginal reddish spots on the upperside of the secondaries are almost absent.

When describing *E. youngi*, Holland stated that the species is not far from *E. dabanensis* Ersehoff. It certainly is close to this latter species as figured by Elwes<sup>1</sup>. A male from Siwash creek, Yukon Territory, is illustrated on Pl. IV, fig. 10.

**Erebia magdalena** Strk.

*Erebia magdalena* Strk.: Bull. Brooklyn Ent. Soc., III, 35.

In the Canadian National collection there are two specimens of an *Erebia* from the Yukon which we have placed under *magdalena* Strk. One of these specimens, a male, has been recorded by Fletcher<sup>2</sup> as this species. It was collected by Mr. Jos. Keele of the Department of Mines, who captured it "on mountain 12 miles up Rackla river, August 2, 1905."

Mr. Keele informed me recently that the specimen was collected on a rocky situation above timber line, the elevation being about 6,000 feet. The other specimen, a female, was collected by the late Dr. D. D. Cairnes, of the Geological Survey, at Nation river, Yukon Territory, lat.  $65^{\circ} 30'$ , long.  $141^{\circ}$ , on July 24, 1912.

Comparing these two specimens with three examples of *magdalena* presented to Fletcher some years ago and collected by Bruce in Colorado and now in the Ottawa collection, they differ as follows: the male which is in poor condition, being rubbed, is smaller than the Colorado male, measuring 45 mm. with wings expanded, the former being 49 mm. Otherwise both specimens seem to be similar. The Yukon female is also smaller than the two Colorado females in

<sup>1</sup> Trans. Ent. Soc. Lon., 1899, p. XII.

<sup>2</sup> Rep. Ent. Soc. Ont., 1905, 96.



the collection, measuring 47 mm., the two latter being 50 mm. and 52 mm. respectively. The general colour in all three specimens is similar, but on the primaries of the Yukon female the whole central area is flushed with dark red, thus approaching *E. fasciata*. The specimens in colour are closest to *bister*<sup>1</sup>, none of them being the same shade as figured by Edwards<sup>2</sup>. A comparison of the genitalia of the male from the Yukon with that of a male from Colorado indicates that the clasper, in both specimens is similar and close to that of *E. fasciata* which has been figured by Chapman<sup>3</sup>.

### *Erebia sofia* Stkr.

*Erebia sofia* Stkr.: Bull. Brook. Ent. Soc., III, 35, 1880.

In the Canadian National collection are five specimens of this interesting butterfly which were taken as follows: White river district, international boundary, lat. 61° 55', long. 141°, July 16, 1913, 2 males, 1 female (D. D. Cairnes); Bonanza creek, Chisana district, Alaska, August 3, 1913, 1 male (D. D. Cairnes); Harrington creek, Yukon Territory, lat. 65° 05', long. 141°, July 30, 1912, 1 female (D. D. Cairnes).

In specimens of *sofia* examined from Colorado, which are in the Ottawa collection, the six reddish-brown spots comprising the submarginal band on the upper side of the primaries are of similar size and very conspicuous, whereas in the specimens collected by the late Dr. Cairnes, the spots are more or less indefinite and only the upper three approach in size similar spots in Colorado specimens. The lower three spots of the submarginal band are present on the primaries of the above-mentioned specimens, but are much smaller, being about half the size of the upper spots.

In the variety *alaskensis*<sup>4</sup> "the specimens are all characterized by the reduction of the number of light spots, both on the upper and lower sides of the wings." The author of this variety further states in his description: "In almost all of the specimens before me there are three spots on the primaries above and below and but two spots on the lower side of the secondaries. Only one specimen approximates the typical form in the number of spots on the lower side of the wings."

The specimens in the Canadian National collection do not agree with this description. There is nothing in the above description regarding the difference in the size of the spots on the upper surface of the primaries, and in all of the northern examples before me there are a greater number of white spots on the underside of the secondaries, two specimens (1 male and 1 female) having four spots and three specimens (1 male and two females) having five spots. The single exception from which *sofia* was described had four white spots on the underside of the secondaries. The underside of both wings of one of our specimens is very similar to fig. 51e of *sofia* in vol. V of Seitz's *Macrolepidoptera of the World*. Strecker in his description of *sofia* states that it is on the upper side an almost exact counterpart of *E. kefersteinii*, but as has already been pointed out by Elwes<sup>5</sup> he probably meant *haberhaueri* which was sent out by mistake under the former name. Our specimens of *sofia* certainly resemble somewhat *haberhaueri* as figured by Seitz. A male from the White river district, Yukon Territory, is shown on Pl. IV, fig. 11. The underside of the female from Harrington creek is shown on Pl. III, fig. 5.

<sup>1</sup> Ridgway's Color Standards and Nomenclature, 1912.

<sup>2</sup> Butt. of N.A., III, pl. 1, *Erebia*.

<sup>3</sup> Trans. Ent. Soc. Lond., 1893, pl. XVI.

<sup>4</sup> Ent. News, XI, 387, 1900.

<sup>5</sup> Trans. Ent. Soc. Lond. 1889, p. 333.



## FAMILY NYMPHALIDÆ.

*Argynnis bischoffi* Edw.

*Argynnis bischoffi* Edw.: Trans. Amer. Ent. Soc., III, 189, 1870.

A single specimen taken on August 7, 1904, at Mayo lake, Yukon Territory (J. Keele) was determined by Fletcher as *A. eurynome* Edw., and has been recorded under this latter name by Keele<sup>1</sup>. Several years ago I submitted this specimen to Dr. Skinner, who reported that it was a boreal form of *eurynome* Edw. Personally, however, I prefer to place the specimen under the name *bischoffi* Edw., which was described from Alaska, opposite Kodiak. In the description the spots on the underside are referred to as being pale, not silvered. The above specimen (a male) which is in the Canadian National collection, has silvered spots. Edwards, however, has remarked that the species occurs at Sitka, Alaska, in both silvered and unsilvered forms, and figured a specimen of the former<sup>2</sup>. Barnes and McDunnough<sup>3</sup> in discussing the species briefly point to the fact that the name *in sens. strict.* can only apply to the unsilvered form.

Genus *Brenthis* Hbn.

*Brenthis tricularis* Hbn.

*Brenthis tricularis* Hbn: Samml. Ex. Sehmett., II, 1824.

No specimens among the Canadian Arctic Expedition material. There are, however, in the Canadian National collection, specimens from the following northern localities: Nansen creek, Placer Mining camp, Yukon Territory, July 9, 11, 2 females, 1 male (D. D. Cairnes); west branch of Thelon river, Northwest Territories, July 5, 1900, 1 female (J. Tyrrell); Labrador, 1 female (collector unknown); Labrador, July 16, 1894, 1 female (A. P. Low); Charlton island, James bay, July 7, 1887, 1 female (J. M. Macoun).

*Brenthis chariclea* Schneid.

*Papilio chariclea* Schneid.: Neu. Mag. V, 588, 1794.

Fourteen specimens from the following localities: Collinson point, Alaska, July 10, 1914, 1 male (F. Johansen); Bernard harbour, Northwest Territories, August 4 and 6, 1915, July 14, 1916, 9 males, 1 female (F. Johansen); Wollastonia Land, Victoria island, Northwest Territories, summer 1915, 1 male, 1 female (D. Jenness); Port Epworth, Coronation gulf, Northwest Territories, July 1, 1915, 1 male (J. J. O'Neill).

Three specimens were collected by the Northern Party of the Canadian Arctic Expedition at Armstrong point, Victoria island, Northwest Territories, July 1-10, 1916 (J. Hadley).

In addition to the above examples there are in the National collection at Ottawa further specimens from northern localities, as follows: Slopes of mountain Ortell, Yukon Territory, July 16, 1906, 1 male (J. Keele); Ladue river, Yukon Territory, July 4, 1905, 1 male, 1 female (J. Keele); Nansen creek, Placer Mining camp, Yukon Territory, July 7, 1914, 1 female (D. D. Cairnes); Racquet creek, international boundary, lat. 65° 21', August 3, 1912, 2 males (D. D. Cairnes); Orange creek, international boundary, lat. 65° 05', June 12, 1912, 1 male (D. D. Cairnes); on Wagon road, 56 miles from Whitehorse, Yukon Territory, 1 female, August 15, 1908 (Geo. Stewart); Pelly river, Yukon Territory, August 3, 1887 (G. M. Dawson); White river district, Yukon Territory, lat. 61° 55', long. 141°

<sup>1</sup> Rep. upper Stewart river region, Yukon, Geo. Surv. Can. 1906.

<sup>2</sup> Butt. of N.A. II, pl. 25.

<sup>3</sup> Cont. Nat. Hist., Lep. N.A., II, 95.

1 female, July 16, 1913 (D. D. Cairnes); Alaska, collected with other species, the label covering all reading "lat. 59° 30' and 141st meridian-lat. 69° 40' and 141st meridian, June-July, 1912, 1 male (J. M. Jessup)"; Labrador, July 16, 1894, 1 male (A. P. Low); Sore-head river, east coast Hudson bay, lat. 60° 35', 2 males, 3 females (A. P. Low); Kalik-took-duag inlet, north side of Hudson strait, July 26, 1897, 1 female (R. Bell); "Nottingham island, John McKenzie, 1886, 2 females (R. Bell)"; Finlayson river, Yukon Territory, lat. 61° 40', long. 130° 16', July 22, 1887 (McConnell)<sup>1</sup>; Finlayson lake, Yukon Territory, July 27, 1887 (McConnell)<sup>1</sup>; Pelly or Yukon river, Yukon Territory, August 7, 1887, 3 specimens (McConnell)<sup>1</sup>.

Looking over the above series there is of course considerable variation among the specimens not only in the general colour of the upper surface of the wings, but also in the arrangement and colour of the markings on the underside. The median band particularly on the underside of the secondaries shows marked variation. The specimens brought back by members of the Canadian Arctic Expedition and also those from the Yukon Territory approach the variety *arctica* Zett., in fact one of the examples, namely the male from Ladue river, Yukon Territory, was some years ago determined as *arctica* by Dr. Henry Skinner. The specimens from Sore-head river, east coast of Hudson bay, are in general smaller and in the series there is a greater tendency to melanism. The marginal spots on the underside of the secondaries are white, very distinct and tend to coalesce. These examples differ noticeably from the variety *boisduwali* Dup. which is represented in the Labrador specimens above referred to, collected by Dr. A. P. Low.

Two of the males from Bernard harbour, Northwest Territories, were kindly compared by Mr. H. J. Elwes, with specimens in the British Museum from Arctic America. Mr. Elwes reported that they agreed precisely with specimens collected by Hanbury on the same coast.<sup>2</sup>

The specimen collected by Jessup in Alaska in 1912, in the district between the Porcupine river and the Arctic coast resembles very much Elwes' figure of *chariclea*.<sup>3</sup>

It is of interest to state that the example from Finlayson river was submitted by Fletcher to W. H. Edwards, and on the envelope in which the specimen was sent, the following appears in Edwards' handwriting: "This is very near *helena*: if not think (it) is *chariclea*. Dyar<sup>4</sup> refers to *helena* as a variety of *chariclea*."

### *Brenthis pales alaskensis* Holl.

*Brenthis pales* var. *alaskensis* Holland: Ent. News, XI, 383, 1900.

One specimen, a female, as follows: Bernard harbour, Northwest Territories, August 25, 1915 (F. Johansen).

In the National collection at Ottawa there are also three specimens, both males, two taken on July 25, 1912, at Racquet creek, international boundary, lat. 65° 20' (D. D. Cairnes), and the other collected on July 5, 1900, on the west branch of the Thelon river, Northwest Territories (J. Tyrrell).

The variety *alaskensis* was described from the "mountains between Forty-mile and Mission creeks." One of the males taken at Racquet creek is shown on Pl. V, fig. 5.

### *Brenthis natazhati*, n. sp.

Upper side: ochraceous-orange<sup>5</sup> the black markings much heavier than in *chariclea* or *freijsa*, to which species it is closely related, the median and basal areas of the secondaries being without any orange. The median spots on the primaries coalesce forming a wide distinct band.

<sup>1</sup> Recorded by Fletcher as *chariclea* in Ann. Rep. Geo. Surv. Can. 1887.

<sup>2</sup> Trans. Ent. Soc. Lond., 1903, 239.

<sup>3</sup> Ibid., pl. IX, fig. 8.

<sup>4</sup> Dyar, H. G., Proc. Ent. Soc. Wash. V, 130.

<sup>5</sup> Ridgway's Color Standards and Nomenclature, 1912.

On the underside the ground colour of the primaries is of a uniform shade similar to ochraceous-buff<sup>1</sup>, the black markings being dull and much reduced. There is an almost total absence of the pale apical patch which is present in the above closely related species. The median band on the secondaries is very faint but the band just beyond the median band is conspicuous and silvery. The two central median triangle-shaped spots of the median band as well as the rhomboid spot are dull silvery as are also the basal spot, which is indistinct, and the marginal row of spots, some of which are reduced in size. Between the marginal row of spots and the white silvery band and between the central silvery spots and the rhomboid spot the colour is similar to the under surface of the primaries. The basal area and the median area below the central silvery spots are dark almost blackish and heavily pubescent. The antennae are almost wholly blackish there being only a few silvery scales laterad. The setae on the palpi are dark brown.

Alar expanse, 39 mm.

Type, a male, in the Canadian National collection bearing the label "141 meridian, north of mount Natazhat, international boundary survey, elevation 8,600 feet, June 15, 1913 (E. W. Nesham).

Paratypes, three males and two females from the same locality and bearing the same label.

The underside of the secondaries of one of the male paratypes is most yellowish-orange in the submarginal area, otherwise all the males are similar in colour and markings. These latter, particularly on the upper surface of the wings are more diffused in two of the specimens than in the type. The upper surface of one of the females is in general darker than in the type and on the underside of this example there are present a greater number of silvery scales in the submarginal area.

Two specimens taken during the Canadian Arctic Expedition, namely at Bernard harbour, Northwest Territories, July 1, 1916, male and female (Dr. Johansen), although somewhat rubbed are apparently this new species.

The males differ in expanse of wings from 35 to 39 mm. and the females from 37 to 39.5 mm.

The upper side of the male type is figured on Pl. V, fig. 6 and the underside of the same specimen shown on Pl. III, fig. 6. On this latter plate the upper side of a female from Bernard harbour, is shown at fig. 12.

I rather hesitate to add a new name to the *chariclea-freja* group but seems advisable under the circumstances as I cannot associate the mount Natazhat specimens with any of the known forms. The dull silvered spots on the underside of the secondaries and the general colour of the upper and lower sides of primaries and secondaries should readily separate it from any of the forms in the group referred to.

### *Brenthis freija* Thunb.

*Papilio freija* Thunb.: Diss. Ent. Succ., II, 34, 1791.

No specimens brought back by members of the Canadian Arctic Expedition but in the National collection at Ottawa there are examples from the following northern localities: Nansen creek, Placer Mining camp, Yukon Territory July 7, 1914, 2 males (D. D. Cairnes); on Whitehorse-Dawson wagon road Yukon Territory, June 2, 1914, 1 male (D. D. Cairnes); near Jo-Jo's Road House on Kluane road, Yukon Territory, June 9, 1914, 2 females (D. D. Cairnes); Champagne Landing, 50 miles from Whitehorse by Kluane road Yukon Territory, June 8, 1914, 1 female (D. D. Cairnes); Dease lake northern British Columbia, June 5, 1887 (G. M. Dawson and J. McEvoy); Cassiar trail 10 miles west of Dease lake, British Columbia, June 4, 1887 (G. M. Dawson).

<sup>1</sup> Ridgway's Color Standards and Nomenclature, 1912.

and J. McEvoy); Gravel river, Northwest Territories, June 18, 1908, 1 male (J. Keele).

These specimens are in general similar to examples collected in Alberta and British Columbia. The two examples one from Dease lake, and the other from near Dease lake, were submitted by Fletcher to W. H. Edwards, and the name "*freya*" given.

Three other specimens, males, all below average size, taken in northeastern Alaska, collected with other species, the label covering all reading "lat. 59° 30' and 141st meridian; lat. 69° 40' and 141st meridian; June-July, 1912, (J. M. Jessup)" in the Canadian National collection, I also associate with *freija*.

### *Brenthis polaris* Bdv.

*Argynnis polaris* Bdv.: Ind. Meth., 15, 1829.

Thirty-two specimens as follows: Barter island, north coast of Alaska, July 5, 1914, 1 male, July 2, 4, 5, 11, 17, 1914, 6 females (D. Jenness); Bernard harbour, Northwest Territories, July, 1916, 7 males, 2 females (F. Johansen); Bernard harbour, Northwest Territories, 3 males, 5 females, July 10-20, 1915 (F. Johansen); Bay southwest of cape Krusenstern, Northwest Territories, July 3, 4, 1916, 2 males (D. Jenness); Lake Angmaloktak, Colville mountains, Wollaston Land, Victoria island, Northwest Territories, July 29, 1915, 1 male (D. Jenness); July 22, 1915, 2 females (D. Jenness); Wollaston Land, Victoria island, summer, 1915, 1 female (D. Jenness); Port Epworth, Coronation gulf, Northwest Territories, July 23, July 30, 1915, 2 females (J. J. O'Neill).

In the National collection at Ottawa are two other specimens, one a female collected at Kalik-took-duag inlet, north side of Hudson strait, July 27, 1897 (R. Bell), the other, a male, from cape Chidley, Hudson strait, 1885 (R. Bell).

The males do not show any material variation. In size they have a wing expanse of from 36 to 43 mm. The upperside of all specimens is similar. The general colour of the underside of the secondaries of two of the specimens inclines to a uniform reddish shade similar to the underside of the primaries. In the females there is a difference in wing expanse, the variation being from 37 mm. to 45 mm. The colour of the upper side of the primaries of this latter sex varies in the specimens from a pale reddish-yellow to a dull bluish-white or dull purplish-white. In a few of the specimens many of the scales particularly towards the hind angle are, under a lens, seen to be decidedly bluish. The reddish bands on the underside of the secondaries vary in colour from pale red similar to the general colour of the primaries beneath, to dull brownish-red.

Mr. Jenness who collected the specimens on Barter island states that they were captured on the tundra early in the afternoons, in most instances between 1 and 2 p.m. in bright sunshine, the temperature varying from 34° F. to 56° F., the majority being taken when the temperature was about 50° F.

In addition to the above specimens, thirty-four examples were brought back by the Northern Party of the Canadian Arctic Expedition, from the following localities: Armstrong point, Victoria island, Northwest Territories, June 20 to July 11, 1916, 15 males, 11 females (J. Hadley); Walker bay, Victoria island, Northwest Territories, July 6, 1917, 4 males, 2 females (J. Hadley); Melville island, main base, August 4 (?), 1916, one male (V. Stefansson); near cape Ross, Melville island, Northwest Territories, about June 20, 1916, 1 male (Castel and Emiu). These specimens in general are similar to the examples collected by members of the Southern Party.

The underside of a female from Barter island, Alaska, is shown on Pl. V, fig. 2. On the same plate is also shown the upper side of a male and a female from the same locality (3 and 4).

**Brenthis frigga alaskensis** Lehm.

*Argynnis frigga* form *alaskensis* Lehm.: Macrolepidoptera of the World (Seitz), V, 424, 1913.

Seven specimens as follows: Barter island, north coast of Alaska, July and 11, 1914, 2 males, 3 females (D. Jenness); Collinson point, Alaska, July 1914, 1 female (F. Johansen); west of Konganevik (Camden Bay), Alaska, July, 1914, 1 male (F. Johansen). Accompanying the specimen from Barter island is a note by Mr. Jenness, which reads as follows: "Flying on tundra; sunshine; light N.W. breeze; temperature 50° F."

I have compared the females with the original figure of *alaskensis* in the work referred to above. They agree fairly well with this illustration. A female from Collinson point, Alaska, is shown on Plate V, fig. 1.

Six examples were brought back by the Northern Party of the Canadian Arctic Expedition, three males and three females. These were collected at Armstrong Point, Victoria island, Northwest Territories, June 20 to July 1916 (J. Hadley).

**Brenthis frigga saga** Stgr.

*Argynnis frigga saga* Stgr.: Stett. Ent. Zeit., XXII, 350, 1861.

In the Canadian National collection there are two specimens from the following localities in the Yukon Territory: 96 miles from Whitehorse on Klondike road, near Marshall creek, June 15, 1914, 1 male (D. D. Cairnes); Pelly river below Hoole river, July 5, 1907, 1 female (J. Keele).

**Brenthis frigga improba** Butl.

*Argynnis improba* Butl.: Ent. Mo. Mag., XIII, 206, 1877.

Thirty-four specimens from the following localities: West of Konganevik (Camden bay), Alaska, July, 1914, 5 males, 1 female (F. Johansen); Barter island, Alaska, July 1, 2, 4, 5, 11, 1914, 9 males, 5 females (D. Jenness); Bernard harbour, Northwest Territories, July, 1916, 5 males, 7 females (F. Johansen); Port Epworth, Coronation gulf, July 15, 23, 1915, 1 female, 1 male (J. J. O'Neill).

Three of the above specimens, namely, one male from Barter island, one male from west of Konganevik and one female from Barter island, were forwarded to Mr. H. J. Elwes, of Colesborne, Cheltenham, Eng., who very kindly compared them with the series in the British Museum. He reported that the specimens agreed precisely with examples collected by Hanbury on the same coast further east.

The series above listed is an excellent one. Most of the specimens are in fairly good condition. The males vary in wing expanse from 31 mm. to 36 mm. and the females from 33 mm. to 37 mm. The ground colour of the former shows marked variation. In some of the specimens the colour is very close to that of *B. frigga* in one much brighter, more of a vinaceous-rufous<sup>2</sup> and in the others dull tawny. In the brighter coloured examples the median band on the upper side of both the primaries and secondaries is very conspicuous. The spots about midlength between the median band and the outer margin vary much in size and in some specimens are joined forming a distinct band.

The underside of the males is fairly constant, the chief differences being on the secondaries, namely in the number of pale, slightly bluish-coloured scales present beyond the reddish-brown median area, in some examples these scales being noticeably abundant and forming almost a wide marginal band.

<sup>1</sup>Ridgway's Color Standards and Nomenclature, 1912.

<sup>2</sup>Ibid.

contrasting noticeably with the reddish-brown median area and in others being much reduced in number. The colour of the median area also varies in the specimens from a rather pale reddish-brown to a decidedly dark reddish-brown. The median band is faint in some of the examples.

The underside of the secondaries of the females vary similarly as in the males.

A female from Bernard harbour, Northwest Territories, is shown on Pl. V, fig. 7, together with a male from near Konganevik, Alaska, fig. 8.

In the Entomological Record for 1917<sup>1</sup> I recorded *Brenthis youngi* Holl. from Klutlan glacier, 9,000 feet, June, 1913 (H. F. J. Lambert). On further study, however, this specimen is undoubtedly *improba* Butler. I rather suspected that *youngi* might prove to be the same as *improba* and for this reason I forwarded the Klutlan glacier specimen to Dr. W. J. Holland who reported as follows:—

"I found time this morning, (December 20, 1918), to compare your specimen with my type of *Brenthis youngi*. It is not the same. It is smaller in size, darker both on the upper and lower side of the wings—a far more melanic insect—and consequently different in not having the dark, sharply defined mesial band, characteristic of the secondaries of *B. youngi*. I would call it *B. improba* Butler. It has a fascies quite different from that of *B. youngi*, which is a much lighter insect. Of course, there is a general similarity in the markings of this genus and the species vary principally in the intensity and accentuation of the markings on the different spots. In *B. youngi* the spots are not silvered, or only slightly. I should say very decidedly that this specimen is not a representative of my species."

#### *Brenthis distincta*, n. sp.

Close to *B. alberta* from which it differs in being larger, in the ground colour of the upperside of the wings being of a clear yellowish-red colour, much as in *B. astarte* Dbldy. and Hew., in the black marginal band being wider, and on the underside in lacking the dull pubescent-like appearance of *B. alberta*, the median band being decidedly more conspicuous, as are also the other markings on the underside of the secondaries. Discal row of round spots reddish.

Alar expanse, 48 mm.

Type, a female, from Harrington creek, Yukon Territory, lat. 65° 05' July 30, 1912 (D. D. Cairnes). Two paratypes, one male and one female, the former from Eduni mountain, 6,000 feet, Gravel river, Northwest Territories, July 8, 1908, (J. Keele) and the latter from Tindir creek, Yukon Territory, lat. 65° 20' international boundary, July 25, 1912 (D. D. Cairnes). The male paratype (44 mm.) is in general similar to the holotype, but the underside of the female paratype (49 mm.) is redder in colour, the reddish discal row of spots larger and brighter, and the pale areas whiter. This new species is apparently, also, close to *amphiletes* from the Anur. All the types are in the Canadian National collection.

The underside of the type is figured on Pl. IV, fig. 12.

#### Genus *Phyciodes* Dbldy.

##### *Phyciodes campestris* Behr.

*Melitara campestris* Behr.: Proc. Cal. Acad. Nat. Sci., III, 86, 1863.

Five specimens from northern localities are in the Canadian National collection. They were collected as follows: Ladue river, Yukon Territory, July 4, 1905, 1 male, 1 female (J. Keele); Harrington creek, Yukon Territory, lat. 65° 05', long. 141°, August 3, 1912, 1 female (D. D. Cairnes); Upper Liard river, June 26, 1887, lat. 60°, 1 male (G. M. Dawson); Dawson, Yukon Territory, 1908, 1 male (collector unknown).

<sup>1</sup> Rep. Ent. Soc. Ont., 1917.

Genus **Polygonia** Hbn.**Polygonia faunus** Edw.

*Grapta faunus* Edw.: Proc. Acad. Nat. Sci. Phil., 222, 1862.

Eleven specimens in the Canadian National collection from the northern localities: Klotassin river area, Yukon Territory, lat.  $62^{\circ} 31'$  to long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916 (D. D. Cairnes); Alaska, collect other species the label covering all reading "lat.  $59^{\circ} 30'$ , 141st merid  $69^{\circ} 40'$ , 141st meridian, June-July, 1912 (J. M. Jessup)"; Yukon river national boundary, lat.  $64^{\circ} 40'$ , August 15, 1912 (D. D. Cairnes); Po river, 80 miles below Rampart House, Yukon Territory, May 25, 1912 (D. D. Cairnes); between lat.  $67^{\circ} 25'$  and  $66^{\circ} 30'$  long.  $141^{\circ}$ , June 10 (D. D. Cairnes); Black river, Yukon Territory, lat.  $66^{\circ} 31'$ , long. 141 18, 1912 (D. D. Cairnes); six miles south of New Rampart House, Territory, June 6, 1912 (D. D. Cairnes).

**Polygonia zephyrus** Edw.

*Grapta zephyrus* Edw.: Trans. Am. Ent. Soc., III, 16, 1870.

Three specimens in the Canadian National collection from the northern localities: Klotassin river area, Yukon Territory, lat.  $62^{\circ} 31'$  to long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916 (D. D. Cairnes); Alaska, collect other species, the label covering all reading "lat.  $59^{\circ} 30'$ , 141st merid  $69^{\circ} 40'$ , 141st meridian, June-July, 1912 (J. M. Jessup)"; between lat. and  $66^{\circ} 30'$ , long.  $141^{\circ}$ , June 16, 1912 (D. D. Cairnes).

**Polygonia silenus** Edw.

*Grapta silenus* Edw.: Trans. Am. Ent. Soc., III, 15, 1870.

One specimen in the Canadian National collection from Klotassin area, Yukon Territory, lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ , long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916 (D. D. Cairnes).

**Polygonia progne** Cram.

*Papilio progne* Cram.: Pap. Exot. I, pl. 5, 1775.

In 1888, Mr. F. Bell, collected two specimens of this species at Fort Simpson, Northwest Territories.<sup>1</sup> One of these, taken on July 20, is in the Canadian National collection.

Genus **Aglais** Dal.**Aglais j-album** Bdv. and LeConte.

*Vanessa j-album* Bdv. and LeConte: Lep. Am. Sept., 185, 1833.

One specimen in the Canadian National collection from Klotassin area, Yukon Territory, lat.  $62^{\circ} 31'$  to  $63^{\circ} 06'$ , long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer, 1916 (D. D. Cairnes).

**Aglais milberti** Godt.

*Vanessa milberti* Godt.: Enc. Meth., IX, 307, 1819.

A single specimen of this widely distributed species from Dawson, Yukon Territory (D. D. Cairnes) is in the Canadian National collection.

<sup>1</sup> Ann. Rep. Geo. Surv. Can., 1887.



**Aglais antlopa** L.

*Papilio antiopa* L.: Syst. Nat., 476, 1758.

This common and widely distributed species has occasionally been recorded from northern localities. Fletcher<sup>1</sup> recorded it from ninety miles above Fort Good Hope (lat. 65° 20'), July 19 and from Fort Smith (lat. 60°), August 24 (Dawson and McEvoy). These specimens are not in the Canadian National collection, but we have three specimens, one each from the following places: Fifty miles below Fortymile creek, August 7, 1887 (R. G. McConnell); Artillery lake, Northwest Territories, May 26, 1900 (J. Tyrrell); Yukon river, at international boundary, August 13, 1912 (D. D. Cairnes).

Genus **Basilarchia** Seudd.

**Basilarchia arthemis rubrofasciata** B. and McD.

*Basilarchia arthemis rubrofasciata* B. and McD.: Can. Ent., XLVIII, 221, 1916.

Three specimens in the Canadian National collection from the following localities: Gravel river, Northwest Territories, July 16, 1908 (J. Keele); Mackenzie river, opposite Gravel river, Northwest Territories, July 18, 1908 (J. Keele). These records extend considerably the northern range of this form, which was described from examples from the provinces of Alberta, Saskatchewan, and Manitoba.

## FAMILY LYCAENIDAE.

Genus **Incisalia** Seudd.

**Incisalia irus** Godt.

*Polygonumatus irus* Godt.: Enc. Meth., IX, 674, 1823.

Two specimens in the Canadian National collection from the following localities in northern British Columbia: Telegraph creek, Stikine river, British Columbia, May 29, 1887 (Dawson and McEvoy); Cassiar trail, 22 miles east of Telegraph creek, British Columbia, June 1, 1887 (Dawson and McEvoy).

These examples are similar to specimens found in Canada in more southern localities.

Genus **Heodes** Dalm.

**Heodes helloides** Bdv.

*Polygonumatus helloides* Bdv.: Ann. Soc. Ent. Fr. (2) X, 291, 1852.

In the Canadian National collection there are three specimens of this species from northern localities, namely: Tepe lake, near head of Wolverine creek, Yukon Territory, August 16, 1914, female (D. D. Cairnes); Upper Pelly river, Yukon Territory, August 7, 1887 (Dawson and McEvoy); Siwash creek, Yukon Territory, lat. 65° 59', long. 141°, June 30, 1912, female (D. D. Cairnes).

**Heodes hypophlaeas feildeni** McLach.

*Chrysophanus feildeni* McLach.: Jour. Linn. Soc., XIV, 111, 1879.

Two specimens, both males, of what is probably this form. The spots are smaller than in typical *hypophlaeas* and the colour of the primaries is paler.

<sup>1</sup> Ann. Rep. Geo. Surv. Can., 1887.



more of a yellowish shade. The specimens were taken as follows: Bern-  
bour, Northwest Territories, August 6, 1915 (F. Johansen); Cockbur-  
(near Bernard harbour), Northwest Territories, September 2, 1914 (F. Jo-

In the Canadian National collection at Ottawa is another specimen  
in the Yukon Territory, namely, in the Klotassin river area, lat.  $62^{\circ} 3'$   
 $06'$ , long.  $137^{\circ} 30'$  to  $139^{\circ} 30'$ , summer of 1916 (D. D. Cairnes).

On July 25, 1912, Dr. Cairnes, while at Tindir creek, Yukon Ter-  
took a female of *hypophleas* which approaches *arctusa* of Dod. This s-  
is also in the Ottawa collection.

Genus **Everes** Hbn.

**Everes amyntula** Bdv.

*Lycæna amyntula* Bdv.: Ann. Soc. Ent. Fr. (2), X, 294, 1852.

Fletcher<sup>1</sup> recorded this species from Devil's Portage, Liard river  
 $126^{\circ} 10'$ , July 17, 1887 (McConnell.) No specimens were brought b-  
members of the Canadian Arctic Expedition. In the Government col-  
at Ottawa are three specimens from the Yukon Territory, taken on the  
road, between Dawson and Whitehorse, 1908, by Mr. George Stewart.

Genus **Plebeius** Linn.

**Plebeius scudderi** Edw.

*Lycæna scudderi* Edw.: Proc. Acad. Nat. Sci. Phil., XIII, 164, 1861.

In the Canadian National collection there are several specimens fr-  
Yukon and other northern localities which we have associated with this s-  
Records of these specimens will be of interest to readers of this report.  
are from the following localities: Lansing river, Yukon Territory, June 2  
(J. Keele); Pelly river, below Hoole river, Yukon Territory, July 5, 1887  
(J. Keele); Upper Pelly river, Yukon Territory, August 3, 1887 (G. M. Daws-  
Little Charlton island, Hudson bay, July 14, 1887 (J. M. Macoun); C-  
island, Hudson bay, July 7, 1887 (J. M. Macoun)<sup>2</sup>; Wagon road, 9 miles  
Whitehorse, Yukon Territory, July 7, 1908 (G. Stewart); west side o-  
Kluane, near Jaquot's roadhouse, Yukon Territory, August 2, 1914  
Cairnes); Stewart river, Yukon Territory, July 17, 1905 (J. Keele); D-  
Yukon Territory, 1908 (collector unknown).<sup>3</sup>

It must be admitted, however, that there is a misunderstanding reg-  
the species to which the name *scudderi* should be definitely given. The  
locality is "Lake Winnipeg," but I am informed by Dr. J. McDunnoug-  
the actual types cannot be found. Much further study of material from  
localities is required of the *scudderi-melissa-anna* group before the stan-  
these species will be stable.

The specimen from Upper Pelly river, August 3, 1887 (G. M. Daws-  
undoubtedly the specimen referred to by Fletcher in the Annual Report  
Geological Survey of Canada, 1887, p. 230B, under the name of *Lycæna*

The example from Pelly river below Hoole river, July 5, 1905 (H-  
was recorded in the Entomological Record, 1907,<sup>4</sup> as *Rusticus anna*.

The underside of the male from west side of lake Kluane, Yukon Ter-  
is shown on Pl. III, fig. 15.

<sup>1</sup> Ann. Rep. Geo. Survey Can., 1887, 230B.

<sup>2</sup> Determined as *scudderi* years ago by H. Strecker.

<sup>3</sup> Determined as *scudderi* some years ago by H. Skinner.

<sup>4</sup> Rep. Ent. Soc. Ont., 1907.

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### *Plebelus aquilo* Bdv.

*Argus aquilo* Bdv.: Icon. 62, 1833.

Six specimens as follows: Bernard harbour, Northwest Territories, August 1-25, 1915, 1 female, 3 males (F. Johansen); Bernard harbour, Northwest Territories, July 14, 1916, female (F. Johansen); Wollaston land, Victoria island, Northwest Territories, July 1, 1915, male (D. Jenness).

Four other specimens in the National collection at Ottawa from the Yukon Territory, two labelled "Burwash creek, Kluane district, Yukon Territory, August 8, 1914 (D. D. Cairnes)"; one "Kluane P.O., Yukon Territory, June 23, 1914 (D. D. Cairnes)," and the fourth "Harrington creek, Yukon Territory, lat. 65° 05', long. 141°, July 30, 1912 (D. D. Cairnes)," may possibly be a form of the same species. They are larger than the three specimens collected by members of the Canadian Arctic Expedition and the underside is more heavily spotted. Two of these latter specimens are shown on Plate III at figures 16 and 17, together with a male of *aquilo* from Bernard harbour, Northwest Territories (fig. 18).

### *Plebelus saepiolus* Bdv.

*Polyommatus saepiolus* Bdv.: Ann. Soc. Ent. Fr. (2), X, 297, 1852.

In the Canadian National collection there is a specimen of this widely distributed species from the Yukon: namely from Kluane P.O., Yukon Territory, June 21, 1914 (D. D. Cairnes). Fletcher<sup>1</sup> recorded this species from Devil's Portage, lower Liard (long. 126° 10'), July 17, 1887 (McConnell), and from Finlayson lake, Yukon Territory, July 25, 1887 (Dawson and McEvoy).

### *Plebelus shasta* Edw.

*Lycæna shasta* Edw.: Proc. Acad. Nat. Sci. Phil. 224, 1862.

It is of interest to note that in the Annual Report of the Geological Survey of Canada, 1887, p. 230B, Fletcher recorded this species from the Upper Pelly river (lat. 61° 50', long. 132°), August 3; Lewes river (lat. 62° 20'), August 21. Recently I located the specimen collected on August 3, 1887, by G. M. Dawson, and it is evident that it should not be referred to as *shasta* Edw. I have included the record under *Plebelus scudderi* Edw. *Shasta* was described from specimens from California.

A specimen of this latter species taken at Crane lake, Saskatchewan, June 2, 1894, by Prof. John Macoun, determined by Dr. J. McDunnough as *shasta minnehaha* Seudd. is in the Canadian National collection. I have not seen any examples from more northern localities.

### Genus *Glaucopsyche* Seudd.

#### *Glaucopsyche couperi* Grt.

*Glaucopsyche couperi* Grt.: Bull. Buff. Soc., I, 185, 1874.

In the Canadian National collection are specimens from the following Yukon and northern British Columbia localities: 96 miles from Whitehorse on Kluane road, near Marshall creek, Yukon Territory, June 15, 1914 (D. D. Cairnes); on Wagon road, between Whitehorse and Dawson, Yukon Territory, 1908 (G. M. Stewart); Mayo lake, Yukon Territory, July 28, 1904 (J. Keele); between lat. 67° 25' and 66° 30', long. 141°, June 12, 1912 (D. D. Cairnes); Dawson, Yukon Territory, 1908 (collector unknown); Frances river, lat. 60° 29', July 1, 1887 (G. M. Dawson); Upper Liard river, Yukon Territory, June 27, 1887 (Dawson and McEvoy). Gravel river, Northwest Territories, below Natla river, June 13, 1908 (J. Keele); Telegraph creek, Stikine river, British Columbia, May 31, 1887 (Dawson and McEvoy); Dease lake, British Columbia, June 5, 1887 (Dawson and McEvoy);

<sup>1</sup> Ann. Rep. Geo. Surv. Can. 1887, 230B.

Genus *Lycopops* Feld.***Lycyaenops pseudargiolus*** Bdv. and Lee.*Argus pseudargiolus* Bdv. and Lee.: Lep. Am. Sept., 118, 1833.

Nine specimens of this variable species are in the National collection at Ottawa from the following northern localities: Dease lake, British Columbia, June 8, 1887 (G. M. Dawson); on Whitehorse-Dawson wagon road, Yukon Territory, June 2, 1914 (D. D. Cairnes); Alaska, collected with other specimens the label covering all reading "lat. 59° 30', 141st meridian and lat. 60° 30', 141st meridian, June-July, 1912 (J. M. Jessup); ten miles south of Pelly, Yukon Territory, June 8, 1912 (D. D. Cairnes); six miles south of Rampart House, Yukon Territory, June 6, 1912 (D. D. Cairnes); lat. 67° 25' and 66° 30', long 141°, June 15, 1912 (D. D. Cairnes).

In the Annual Report of the Geological Survey of Canada, 1887, p. 230n, Fletcher refers to specimens collected in the neighbourhood of Dease Lake, British Columbia, referring to the same as representing the forms *lucida* Edw. and *violacea* Edw.

## FAMILY HESPERIIDAE.

Genus *Hesperia* Fabr.***Hesperia centaureæ*** Ramb.*Hesperia centaureæ* Ramb.: Faun. Ent. And., pl. 8, f. 10, 1839.

No specimens in the Canadian Arctic Expedition collection. In the district of northern British Columbia the species has been met with.<sup>1</sup> In the Canadian National collection there are three specimens which were taken in Labrador on June 18 and July 16, 1894 (A. P. Low).

Genus *Thanaos* Bdv.***Thanaos persius*** Scudd.*Nisoniades persius* Scudd.: Proc. Essex Inst., III, 170, 1862.

Two specimens of this *Thanaos* from Dawson, Yukon Territory, 1908 (one unknown) are in the Canadian National collection.

Both specimens, one a male, the other a female, were determined as *Thanaos persius* several years ago by Dr. H. Skinner. According to Skinner<sup>2</sup> the species has a wide distribution, being found from Alaska to the Gulf of Mexico and from the Atlantic to the Pacific oceans.

Genus *Carterocephalus* Led.***Carterocephalus palæmon*** Pall.*Pamphila palæmon* Pall.: Reise, I, 471, 1771.

In 1912, the late Dr. D. D. Cairnes collected a single specimen of this species near Siwash creek, Yukon Territory, lat. 65° 59', long. 141°, on June 28. The specimen is in the Canadian National collection.

<sup>1</sup> Rep. Prov. Museum of Nat. Hist., B.C., 1914, (1915), F. 24.<sup>2</sup> Trans. Amer. Ent. Soc. XL, p. 204.

## FAMILY ARCTHIDAE.

Genus *Lexis* Wallgr.*Lexis bicolor* Grt.*Lithosia bicolor* Grt.: Proc. Ent. Soc. Phil., III, 74, 1864.

In the Canadian National collection there is one specimen of this widely distributed species from Sixtymile river, along 141st meridian river, Yukon Territory, 1907 (Thos. P. Reilly).

Genus *Hyphoralia* Hbn.*Hyphoralia parthenos* Harr.*Arctia parthenos* Harr.: Agassiz's Lake Sup., 309, 1850.

One specimen in the Canadian National collection from the following Yukon locality: Stewart river, above Frazer falls, June 15, 1905 (J. Keele).

*Hyphoralia alpina* Quens.*Bombyx alpina* Quens.: Acerbi's Travels N. Cape, II, p. 253, pl. 1, f. 4 (1802).

Four specimens reared from larvæ or cocoons collected at Collinson point, Alaska, emerged July 27, August 3, 14, September 2, 1914, 3 males and 1 female (F. Johansen). One of the males is shown on Pl. V, fig. 18.

All of the specimens are in general similar in appearance and resemble fairly closely Seitz's figure of *alpina* Quens. (= *thulea* Dahn.)<sup>1</sup> In these specimens however, the pale coloured spots on the wings in both sexes are decidedly yellowish almost a cream-buff<sup>2</sup>, not whitish as in the figure referred to above. Hampson<sup>3</sup> also refers to the spots as being white in the female. The male antennæ in this species are serrate differing from the antennæ of the foregoing species which are pectinate.

The larvæ and cocoons were collected on the tundra, by Mr. Johansen, in the months of May, June, and July. They emerged on the dates mentioned above. (Breeding record 33.)

The following brief description of the larva has been made from a cast skin removed from a cocoon:

Head 3 mm. wide, rounded, somewhat quadrate, black, polished, setæ black; mouth parts reddish. Body blackish, tubercles large and conspicuous, each bearing a bunch of rather long stout hairs, slightly spinulose. The hairs on the dorsum and upper lateral area are yellow and brown intermixed, those along the lower lateral area being of a darker brown shade. Thoracic feet black, reddish at ends; prolegs concolorous with venter.

The cocoon, figured on Pl. III, fig. 8, varies in size from 16 to 20 mm. in width to about 36 mm. in length. It is rather thin, the pupa inside being readily observable. In colour it is yellowish-white.

PEPA.—Length 19 mm., width at widest part 7 mm.; black, polished, anterior half of abdominal segments slightly pitted and with short setæ, posterior half smooth. Wing-cases and thorax slightly wrinkled. Cremaster roughened, reddish, shaped as shown on Pl. III, fig. 10, and bearing a conspicuous bunch of long, rather slender, dark reddish or blackish bristles slightly curved at ends.

In addition to the above specimen, Mr. Johansen collected a cocoon of what I take to be of this species, on Herschel island, Yukon Territory, end of July, 1916. It was parasitized by *Amblytele* species<sup>4</sup> which emerged on August 8, 1916.

<sup>1</sup> Macrolep. World, Div. 1, Palæarctica, Vol. 2, pl. 17c.<sup>2</sup> Ridgway's Color Standards and Nomenclature, 1912.<sup>3</sup> Cat. Lep. Phalæna in B.M., III, 223.<sup>4</sup> Det. by C. T. Brues.

**Hyphoraia festiva** Bork.

*Bombyx festiva* Bork.: *Verh. Zool. Bot. Ges. Wien*, III, p. 191 (1790), nec. Hufn.

*Bombyx lapponica* Guenée: *Ann. Ent.*, pt. II, p. 40, f. 7 (1791).

Four specimens of this species from the following localities: Bernard harbour, Northwest Territories, July 9, 24, 1915, July 3, 1916, 2 males (F. Johansen); Port Epworth, Coronation gulf, Northwest Territories, July 15, 1915, 1 male (J. J. O'Neill). The specimen obtained on July 24, 1915, was reared. (Breeding record 68.)

These specimens resemble rather closely the figure of the species which is given in Seitz's *Macrolepidoptera of the World*.<sup>1</sup> As is to be expected among aretiid moths the markings are variable. Such variation is indicated in two male specimens figured on Pl. V, figs. 19 and 20. The abdomen of the female is much redder than that of the male as is also the underside of the wings. The antennæ of the males are distinctly pectinate similar to the male of *H. parthenos* Harr.

On July 7, 1915, Mr. Johansen found the cocoon of the moth which emerged on July 24, attached to a stone near a river bed at Bernard harbour, Northwest Territories. His notes indicate that the pupa was 20 mm. long, smooth and black. The resultant moth a female, was kept alive. Mr. Johansen's notes read:

"August 8—Imago still living. During the last few days she laid about one dozen pale-green eggs (1 mm. in diameter) on different places in the jar."

"August 16—Imago dying. She has now laid seventy eggs all told."

The cocoon is thin, pale yellowish-white, oval, 25 mm. long, 14 mm. wide. The pupa and cast larval skin are plainly observable through the cocoon.

The following notes on the larva have been made from the cast skin removed from the cocoon:

Head 3 mm. wide, rounded, black, polished, mouth parts reddish. Body black, tubercles large, each bearing a bunch of spreading, rather long hairs, slightly spinulose, those from the dorsum being mostly of a sordid whitish colour with black and dark brown hairs intermixed, while those from the lower lateral and ventral areas are darker, being black or dark brown. Thoracic feet black, red tipped, shiny; prolegs also black, shiny, crochets mostly reddish.

PUPA.—Length 18 mm., width at widest part 6.5 mm., polished, anterior half of abdominal segments slightly pitted and with short setæ; posterior half smooth, as in *Hyphoraia alpina* Quens. Wing-cases and thorax slightly wrinkled. Cremaster different from this latter species being shaped as shown on Pl. I at fig. 11, and bearing about forty stout capitate dull reddish bristles.

Seitz<sup>2</sup> refers to the larva as being dark grey with small black head and long black or foxy red hair. The food plant is given as *Vaccinium uliginosum* and other bog plants.

In addition to the above specimens there is in the Ottawa collection a female bearing the label "Hudson bay, Dr. Bell," which we associate with this species.

Genus **Apantesis** Wlk.**Apantesis quenseli** Payk.

*Bombyx quenselii* Payk.: *Skriv. of Nat. Selsk.*, II, 99, 1793.

In the Entomological Record for 1915<sup>3</sup> I recorded this species from 141st meridian, north of mount Natasht, 6,500 feet, July 1, 1913 (E. W. Nesham).

This specimen, a female, is in the Canadian National collection.

<sup>1</sup> *Macrolepidoptera of the World*, Div. I, Palearctica, Vol. 2, plate 17e

<sup>2</sup> *Ibid.* p. 95.

<sup>3</sup> *Rep. Ent. Soc. Ont.*, 1915.

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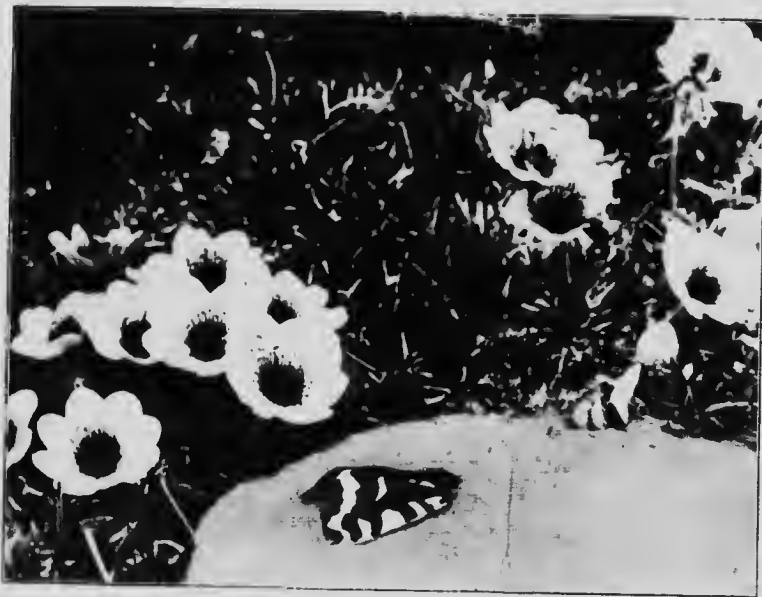
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oracic feet  
reddish.  
l, anterior  
terior half  
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on Pl. III

head and  
*uliginosum*

n a female  
is species.



*Dryas octopetala*, Bernard harbour, Northwest Territories, July 9, 1915; *Hyphocia jastua*, male, at rest on rock in foreground

(Photo by G. H. WILKINS.)

om 141st  
ham).



Genus **Parasemia** Hbn.**Parasemia plantaginis** L.*Bombyx plantaginis* L.: Syst. Nat., I, 501, 1758.

One specimen in the Canadian National collection from the following Yukon locality: Lansing river, Yukon Territory, June 24, 1905 (J. Keele).

## FAMILY AGARISTIDAE.

Genus **Androloma** Grt.**Androloma mac-cullochi** Kirby.*Alypia mac-cullochii* Kirby: Faun. Bor. Am., IV, 301, 1837.

One specimen in the Canadian National collection from slopes of mount Ortell, Yukon Territory, July 16, 1905 (J. Keele).

## FAMILY NOCTUIDAE.

Genus **Barrovia** B. and McD.**Barrovia fasciata** Skin.*Psychophora fasciata* Skin.: Ent. News, XIII, 143, 1902.

Two males as follows: Barter island, north coast of Alaska, July 11, 1914, captured in bright sunshine on the tundra, temperature 56° F. (D. Jenness); Herschel island, Yukon Territory, July 29, 1916 (F. Johansen).

Both of these specimens are in fair condition. The species, concerning the generic status of which much has been written, is an interesting one. The type locality is Point Barrow, Alaska. The specimen collected on Barter island is shown on Pl. V, fig. 17.

Genus **Par . . . ia**, n. gen.(Type *Parabarrovia keelei*, n. sp.)

Agrees with Hampson's characterization of the genus *Agrotiphila*, Section I (*Schöyenia*), excepting that the fore-tibiae are not spined and veins 3 and 4 of secondaries are stalked.

In the Canadian Entomologist, vol. XLVIII, 290, Barnes and McDunnough erected the genus *Barrovia* with type *fasciata* Skin., placing the genus near *Agrotiphila* Grt., differing therefrom by its unspined fore-tibiae and hairy vestiture. Dr. McDunnough has recently informed me, however, that this characterization is not correct, as the spined fore-tibiae of *fasciata* were overlooked at the time. *Barrovia* B. and McD. will, therefore come very close to *Schöyenia*, from which it differs in antennal structure.

**Parabarrovia keelei**, n. sp.

Antennae serrate and fasciculate. Head, thorax, abdomen and feet clothed with black and gray or silvery hairs intermixed. All the wings brownish, semi-translucent, the primaries darker than the secondaries. The median area of the primaries particularly towards the costa is irrorated with white, as is also the costal margin to near apex. Hairs on costa yellowish. The brown neuration of all the wings is conspicuous. Scales on discal vein black, showing as a black streak. Cilia brownish-yellow. Underside of all wings paler than upper side, the scales being of a creamy white colour.



Unfortunately the specimen is rubbed, rendering a more complete description impossible.

Alar expanse, 26 mm.

Type, male, bearing the label "Mountain below Twitya river, near U river, Northwest Territories, July 2, 1908 (J. Keele)."

Paratype, female from the same locality and bearing the same label. This specimen expands 30 mm., and in general is in rather fair condition. The wings are brownish and semi-transparent as in the type and there is a faint indication of a wide darker brown median band on the primaries, the outer third of the wing being faintly irrorated with white. In the median and basal areas whitish markings are also present. The wings of this specimen are more rounded at apex than those of the type. The latter is figured on Pl. V, fig. 10, the paratype on the same plate at figure 9. Both types are in the Canadian National collection.

#### Genus *Epipsilia* Hbn.

#### *Epipsilia wockei* Moeschler.

*Agralis wockei* Moeschler: Wien. Ent. Mon., VI, 130, 1862.

In the Entomological Record for 1908<sup>1</sup> I recorded this species from Labrador, July 19 (A. P. Low). This specimen is in the Canadian National collection.

Hampson gives the following distribution: Labrador; White Mountain, New Hampshire; Ala Tau, W. Turkestan.

I have compared our specimen with his figure<sup>2</sup> with which it agrees well.

#### Genus *Anarta* Ochs.

#### *Anarta subfumosa*, n.sp.

Head, thorax and abdomen brown, thorax with black and gray hairs mixed. Antennae moderately serrate and fasciculate. Primaries dull smoky brown suffused with gray; costal area black along the edge and thinly irrorated with white. Markings on the primaries indistinct, the most apparent being the t. p. line. The basal line and the t. a. line are specially noticeable on the primaries. All these lines are whitish. The s. t. line is represented by a series of faint whitish spots. Orbicular and reniform small, whitish. Cilia inner third dark brown, two-thirds pale brown. Secondaries white with rather broad dark brown terminal band and dark brown discoidal lunule; basal area darkened, whitish, inner third pale brown.

Underside of all wings whitish, veins black-lined; discoidal spot on the wing conspicuous; secondaries with dark terminal band.

Alar expanse, 26 mm.

Type, a male, (Pl. V, fig. 16) from Armstrong point, Victoria island, Northwest Territories, July, 1916 (J. Hadley). Paratypes, 4 males and 1 female from the same locality, July 1-10, 1916 (J. Hadley). In one of these (male) the median area on the primaries is darkened. In another (male) there are faint golden yellow scales in the subterminal area and traces of a postmedial line on the secondaries. All are of a similar size to the type. Types in the Canadian National collection.

This species evidently comes nearest to *A. staudingeri* Auriv.

<sup>1</sup> Rep. Ent. Soc. Ont., 1908.

<sup>2</sup> Pl. LXXIII, Lep. B.M., Vol. IV.

**Anarta richardsoni** Curt.

*Hadena richardsoni* Curt.: Ross' Narr. Second Voy., App. p. 72, pl. A, f. 11, 1834.

Two specimens as follows: Bernard harbour, Northwest Territories, July, 1915, male (F. Johansen); Port Epworth, Coronation gulf, Northwest Territories, August 18, 1915, male (J. J. O'Neill).

Four specimens (3 males, 1 female), collected at Armstrong point, Victoria island, Northwest Territories, July 1-19, 1916 (J. Hadley), were brought back by the Northern Party of the Canadian Arctic Expedition.

In the Canadian National collection are two other specimens labelled as follows: Kharlan glacier, Yukon Territory, 9,000 feet, June, 1913 (H. F. J. Lambert); Gravel river, Northwest Territories, July 2, 1908 (J. Keele).

This species has a wide distribution. Hampson records it from Greenland, Hudson bay, Labrador, Alaska, Scandinavia, and Novaya Zembla.

**Anarta leucocycla** Staud.

*Anarta leucocycla* Staud.: Stett. Ent. Zeit., 1875, p. 296.

Four specimens, three males and one female, as follows: Bernard harbour, Northwest Territories, August 14-18, 1915, 3 males (F. Johansen); cape Pullen, Wollaston land, Victoria island, Northwest Territories, August 18, 1915, 1 female (D. Jenness).

The only locality given by Hampson, in vol. V of the Catalogue of the Lepidoptera Phalaena in the British Museum, is Greenland.

The female from cape Pullen is figured on Pl. V, fig. 14.

**Anarta cordigera** Thunb.

*Noctua cordigera* Thunb.: Mus. Nat. Acad. Ups. Diss., VI, 72, 1788.

In the Canadian National collection there is one specimen, a female, from the Yukon, collected "60 miles from Whitehorse, Yukon Territory, near Champagne landing, June 10, 1914 (D. D. Cairnes)." Also a specimen, a female, bearing the label "Lake No. 4, Pike's portage, Great Slave lake, May 20, 1900 (J. Tyrrell)."

These specimens, in general, resemble examples in the collection from eastern Ontario.

Genus **Leucania** Ochs.**Leucania yuconensis** Hamp.

*Leucania yuconensis* Hamp.: Ann. Mag. Nat. Hist., VIII, 425, 1911.

One specimen of this species from the type locality, namely, Dawson, Yukon Territory, 1909, is in the Canadian National collection.

Genus **Sympistis** Hbn.**Sympistis melaleuca** Thunb.

*Noctua melaleuca* Thunb.: Diss. Ent., II, 42, 1791.

In the Canadian National collection are two specimens of this arctic species, one from Charlton island, James bay, July 8, 1887 (J. M. Macoun), and the other from Burwash creek, Klwane district, Yukon Territory, August 8, 1914 (D. D. Cairnes).

The specimen from Charlton island, is in good condition and was determined some years ago by Dr. Dyar. I have recently compared it with the figure of *melaleuca* on plate 50e, of Seitz's Macrolepidoptera of the World. The Yukon specimen is in rather poor condition, but seems to be this species.

**Sympistis zetterstedti** Staud.

*Anarta zetterstedti* Staud.: Stett. Ent. Zeit., 294, 1857.

Two specimens of what is apparently this species taken as follows: Bernard harbour, Northwest Territories, females, August 14, 1915 (F. Johansen).

The specimens unfortunately are in poor condition. This species taken on the Barren Grounds by Hanbury.

Genus **Parastichtis** Hbn.**Parastichtis verberata** Sm.

*Orthosia verberata* Sm.: Can. Ent., XXXVI, 153, 1904.

One specimen in the National collection at Ottawa from Bartlett bay off Glacier bay, Alaska, June 10, 1907 (D. H. Nelce).

This specimen is similar to specimens in the collection from Kaslo, B. C. The type locality is Calgary, Alta. The above specimen agrees fairly well with Hampson's figure.<sup>1</sup>

Genus **Homoglæa** Morr.**Homoglæa murrayi**, n. sp.

Head, thorax and abdomen pale drab, immaculate; abdominal hairs dark. Primaries pale drab irrorated with darker brown especially in the median and outer areas; costa pale grayish. T.a. line sepia, darkest on costa, angled inward below costa, excurved from cell to inner margin. Orbicular a rather indistinct small greyish annulus. Reniform of moderate size constricted centrally, defined by grey. T.p. line sepia, darkest on costa, greyish on outer edge, dentate bent outwardly below costa. S.t. line indistinct, greyish on outer edge; terminal dark line; fringes pale drab. Secondaries pale brownish with dark brown border.

Beneath, both wings whitish, thinly irrorated with brown; discoidal spots dark; on primaries a rather wide smoky longitudinal shading from base to discoidal spot; postmedial line dark; terminal line blackish.

Alar expanse, 36 mm.

Type, a female, from Bernard harbour, Northwest Territories, July 10, 1916 (F. Johansen). Paratype, a female, from the same locality and bearing the same label; both types in the Canadian National collection. A third specimen also a female, taken at Bernard harbour, Northwest Territories, August 4, 1916 (F. Johansen), is broken and rubbed, but is apparently the same species. The specimen which I have made the type was submitted to Dr. Dyar who reported that it belonged to the genus *Homoglæa*.

The paratype is smaller than the type, expanding 33 mm.; the smoky longitudinal shading of the underside of the primaries is indistinct.

The type is figured on Pl. V, fig. 12.

I have pleasure in naming this new species after the late James Murray a well known biologist of Scotland, who was attached to the Northern Party of the Canadian Arctic Expedition. Mr. Murray, unfortunately, was lost with several associates, in 1914, in attempting to reach Wrangell island.

<sup>1</sup> Pl. CVII, 1, Lep. B.M., Vol. VI.

Genus *Agroperina* Hamp.*Agroperina lateritia* Hufn.

*Phalaena lateritia* Hufn.: Berl. Mag., III, 206, 1767.

I have recently received a single worn specimen of this common and widespread species from Rev. C. E. Whittaker. The specimen was collected at Whitehorse, Yukon Territory.

Genus *Autographa* Hbn.*Autographa sackeni* Grt.?

*Plusia sackeni* Grt.: Can. Ent., IX, 135.

In the Entomological Record for 1904 we recorded this species from Mayo lake, Yukon Territory, August 7, 1904 (J. Keele).

I submitted this specimen to Dr. R. Ottolengui, and he has kindly studied it and reported that he is practically certain it is *sackeni*. The species was described from Idaho Springs, Colorado, so its occurrence in the Yukon is noteworthy. Dr. Ottolengui states<sup>2</sup>: "I have never before seen *sackeni* from any section except Colorado. However (unlike *vaccinii* which is found nowhere except on Mount Washington) *sackeni* has been taken on several of the mountains in Colorado."

I cannot, however, agree with Dr. Ottolengui in the above determination. *A. sackeni*, according to the description, should have a distinct golden-yellow patch on the costa, near the base of the wing, described by the author of the species as an "interior golden patch." This character is entirely absent in the specimen under discussion from Mayo lake, and I am inclined to think that it will ultimately prove to be of a species which is at present undescribed. The specimen is figured on Pl. III, fig. 14.

*Autographa altera* Ottol.?

*Autographa altera* Ottol.: Jour. N.Y. Ent. Soc., X, 69, 1902.

One male specimen taken at Bernard harbour, Northwest Territories, August 25, 1915 (F. Johansen).

Unfortunately the specimen is in rather poor condition and it is difficult to definitely determine it. I referred it to Dr. Ottolengui who would not name it otherwise than *altera*? The specimen is shown on Pl. III, fig. 13.

## FAMILY LYMANTRIIDAE.

Genus *Gynaephora* Hbn.*Gynaephora rossi* Curtis.

*Larva rossi* Curtis: Ross' Second Voyage N.-W. Pass, App., 70, 1835.

Ten adult specimens, six males and four females from Demarcation point and Collinson point, Alaska, July, 1914, six males and three females (F. Johansen); Barter island, Alaska, June 24, 1914, female (D. Jenness).

These specimens undoubtedly represent the species described by Curtis. The secondaries are yellowish with black border.

Under the generic name *Dasychira*, this species is referred to in several arctic reports. Its life-history is only partially known, so the following observations are worthy of record.

<sup>1</sup> Rep. Ent. Soc. Ont., 1904.

<sup>2</sup> In litt., March 16, 1919.

Mr. Johansen in his notes states that the larvae and cocoons were found rather abundantly in 1914 at Collinson point and Demarcation point on the Alaskan coast. The following are his notes: (Breeding record 15)

- 1914, May 31—Collinson Point—Two large larvae and two cocoons found on tundra.  
 June 1—One of the larvae collected yesterday began making its cocoon.  
 " 3—Four mature larvae and six cocoons found.  
 " 4—One mature larva and three cocoons found.  
 " 7—Four cocoons found.  
 " 11—Five cocoons found.  
 " 13—One mature larva and eight cocoons found.  
 " 15—Two larvae found east of Collinson point.  
 " 18—One cocoon found.  
 " 20—Four cocoons found.  
 July 13—First moth emerged.  
 Other moths emerged on July 15, 16, 18, 20, 22, 27; August 3, 21, September 2, 15, 1914.

Some of the males and females were kept alive by Mr. Johansen and his notes state that copulation took place freely, and that eggs were secured, the same having been deposited upon the cocoon. Pairs were noted to remain in coitu for a whole day. Under natural conditions, Mr. Johansen also found many eggs on empty cocoons. The females which were reared failed to properly develop their wings, these latter in every case being crumpled.

The eggs brought back by Mr. Johansen are 1.2 mm. wide, white, smooth, spherical, depressed above and are stuck firmly together and partially covered with hair. One patch contained over 55 eggs.

The specimen from Barter island emerged from a cocoon found on the ground on June 23. The temperature at the time varied from 36° to 46°F.

On September 7, 1913, Mr. Johansen collected at Collinson point, among old driftwood on tundra elevation, a single specimen of the larva of what is undoubtedly this species. It was placed in alcohol.

The following is a description of the specimen:

Length, 30 mm. (I should think this specimen when alive and walking would easily measure 45 mm.). Head, 3.5 mm. wide, rounded, dull brownish grey, excepting clypeus and area around antennae and mouth parts which are shining black, and sides which are reddish-yellow; thickly hairy, the hairs black. Body black, the tubercles with thick bunches of hairs; the lateral hairs mostly longer than the dorsal hairs and many, brown in colour, are conspicuously feathered and more spreading; the lateral hairs which are not feathered spinulose and either long brown or dark-reddish brown hairs or are short hairs orange-yellow in colour. The dorsal hairs are shorter than the lateral hairs and the feathered ones are bunched together particularly so on the anterior segments, the yellow hairs which also occur on the dorsum being more or less hidden, excepting in the subdorsal area where they are of a brighter yellow and more conspicuous. This specimen is figured on Pl. III, fig. 9.

Other larvae differ from the above in that all the hairs are lighter in colour and in having the yellowish hairs more noticeably intermixed with the dark feathered hairs which in these specimens are greyish.

The larva has been described by Curtis<sup>1</sup> as follows: "Large and hairy caterpillar, beautiful shining velvety black, the hairs being somewhat ochereous; there are two tufts of black on the back, followed by two of orange."

This brief description is, of course, of little value. Dyar who has studied the larva of *rossi* as well as that of *groenlandica* states<sup>2</sup> that "Curtis must have mixed the species, describing the moth of *rossi* and the larva of *groenlandica*. Packard described the larva of *rossi* from Polaris bay<sup>3</sup> but his description does not agree with the description of the larva described above from Collinson

<sup>1</sup> Ross' Second Voyage.

<sup>2</sup> Psyche, VIII, 153.

<sup>3</sup> Amer. Nat. XI, 52.

point. This latter description is in general similar to Dyar's description of *rossi*<sup>1</sup>.

The larvæ reared by Mr. Johansen were fed in captivity on mountain saxifraga (*S. oppositifolia* L.) and willow, chiefly the latter as soon as available.

In the Entomological Record for 1903<sup>2</sup> the species is recorded from Blackfalds, Alta., where in 1902 and 1903 Mr. P. B. Gregson found the larvæ on willow and poplar. Mr. Gregson at the time forwarded to us some larvæ and from one of these a male moth was reared. Larvæ were also received in 1903 from Mr. D. Tipping, of the same place.

Regarding the occurrence of the species at Blackfalds, Alta., Mr. Gregson reported that he first met with the larvæ on August 27, 1901, on which date he found three specimens feeding on aspen poplar. In some notes which he sent to us at the time it is stated that larvæ seemed to be full grown on September 22, and that since August 27 they had moulted once. They fed very little and hibernated among dead leaves and twigs in a breeding cage which was kept in an outhouse. In the spring of 1902 the larvæ were brought indoors and early strawberry leaves offered as food, until the leaves of aspen poplar appeared. This latter food was continually present in the breeding cage, but unlike the larvæ reared by Mr. Johansen, referred to above, these three Blackfalds larvæ refused all food and eventually spun their cocoons among the dead leaves and twigs at the bottom of the cage. The moths emerged about June 10.

The Blackfalds larvæ are much grayer than the Collinson point larvæ and the upper lateral yellow hairs are decidedly brighter being citron-yellow in colour. The number of yellow hairs, however, varies in the specimens.

Another larva, immature, in the National collection at Ottawa, from Fullerton, Hudson bay, collected on July 7, 1901, by Mr. Andrew Halkett, bears still lighter greyish feathered hairs, but otherwise is similar to the Blackfalds larvæ.

In addition to the larvæ collected at Collinson point and Demarcation point, Mr. Johansen also collected larvæ at Nome, Alaska, and at Chantry island, Northwest Territories, but unfortunately no adults were reared. These may be *rossi* but owing to the condition of the larvæ brought back it is difficult to determine them definitely.

In addition to the material collected by the Southern Party of the Canadian Arctic Expedition, I have also examined five cocoons collected by members of the Northern Party, namely, four by Messrs. Castel and Emlin, from near Cape Ross, Melville island, about June 20, 1916. Three of these I would determine as being those of *G. rossi*, but the pupa of the fourth differs from that of the others in having black dorsal hair which according to Dyar<sup>3</sup> is a characteristic of *G. groenlandica*. The fifth cocoon is from Armstrong point, Victoria island, Northwest Territories, summer, 1916 (J. Hadley).

From cocoons collected by Mr. Johansen, the tachinid parasite *Euphorocera gelida* Coq. was reared. As many as six puparia were found in one cocoon. The species was determined by Mr. J. R. Malloch, and is referred to in his report on diptera collected by members of the Canadian Arctic Expedition<sup>4</sup>. From Mr. Johansen's notes I gather that he reared also a hymenopterous parasite.

In the Canadian National collection there is a male specimen of the moth from Ashe inlet, North Bluff, Hudson's strait, August 13, 1884 (R. Bell).

<sup>1</sup> Psyche, VII, 328.

<sup>2</sup> Rept. Ent. Soc. Ont., 1903.

<sup>3</sup> Psyche, VIII, 153.

<sup>4</sup> Rep. Canad. Arct. Exped., 1913-15, III, C, p. 57c. 1919.

## FAMILY GEOMETRIDAE.

Genus *Leucobrephos* Grt.*Leucobrephos brephoides* Walk.*Anarta brephoides* Walk.: Cat. Brit. Mus., XI, 702, 1857.

In the Canadian National collection there are seven specimens of uncommon moth from northern localities, as follows: Mayo river, Yukon Territory April 16, 1907, 3 males (J. A. Davidson); Janerk, Khatlan glacier elev. 5,500 feet, 141st meridian, north of mount Natashat, May 2, 1913, 2 males (E. W. Nesham); Portage at Grand falls, Hamilton river, Labrador, May 1894, 2 males (A. P. Low).

The life-history, habits, and distribution of the insect in Canada recently published in *The Canadian Entomologist*.<sup>1</sup>

Genus *Acidalla* Tr.*Acidalla frigidaria* Moesch.*Acidalla frigidaria* Moesch.: Wien. Ent. Monat., IV, 373, 1860.

One specimen in the Canadian National collection from Baldoff Yukon Territory, White river district, July 7, 1913 (D. D. Cairnes). The species was determined by Mr. L. W. Swett.

*Acidalla* species.

Three specimens belong to this genus all collected in the Yukon Territory by the late Dr. D. D. Cairnes, namely, two in White river district, lat. 61° 55', long. 141°, July 16, 1913, and the other near Nation river, lat. 65° 15', long. 141°, are in the Canadian National collection. They probably represent an undescribed species, but unfortunately the specimens are in poor condition.

Genus *Holarctias* Prout.*Holarctias sentinaria* Geyer.*Hamatopsis sentinaria* Geyer in Hubner, Zutr. Exot. Schmett., f. 823, 1857.

One specimen in the Canadian National collection from White river district, Yukon Territory, lat. 61° 45', long. 141°, July 20, 1913, female (D. D. Cairnes). The specimen was determined by Dr. McDunnough.

Genus *Cosymbia* Hbn.*Cosymbia pendulinaria* Guen.*Ephyra pendulinaria* Guen.: Spec. Gen., IX, 414, 1857.

A specimen of what is apparently this species was collected by the late Dr. D. D. Cairnes, near Black river, Yukon Territory, lat. 66° 31', long. 141° 15', June 18, 1912; it is in the Canadian National collection. The lines on this specimen are blacker than those of examples in the collection from British Columbia and other localities and the discal spot on all wings is entirely black.

<sup>1</sup> Can. Ent., XLVIII, 133.

Genus *Lygris* Hbn.*Lygris destinata* Moesch.

*Lygris destinata* Moeschler: Wien. Ent. Monat., 375, IV, 1860.

Among a small collection of lepidoptera made in the Yukon in 1908 by Mr. Geo. Stewart, the specimens being now in the National collection at Ottawa, are three specimens of *Lygris destinata* Hbn. taken at Nordenskiöld, 63 miles from Whitehorse, Yukon Territory, August 23, 1908. With these specimens are two other examples taken on the same day and at the same place, which resemble *destinata* but the antemedian band and the subterminal area are distinctly yellowish, thus approaching, according to Dr. McDunnough, who examined the specimens, *similis* of Walker.

Ten other specimens of what is probably this latter form were brought back by members of the Canadian Arctic Expedition. These were taken as follows: Nome, Alaska, August 24, 25, 1916, 4 specimens (F. Johansen); cape Pullen, Wollaston Land, Victoria island, Northwest Territories, August 18, 1915, 4 specimens (D. Jenness); Bernard harbour, Northwest Territories, August 25, 1915, 2 specimens (F. Johansen).

Unfortunately most of these specimens are in poor condition.

Genus *Dysstroma* Hbn.*Dysstroma truncata* Hufn.

*Geometra truncata* Hufn.: Berl. Mag., IV, 602, 1769.

One specimen in the Canadian National collection from Bartlett bay off Glacier bay, Alaska, June 10, 1907 (D. H. Nelles).

This specimen is in poor condition but Dr. J. McDunnough who examined it, considered it to be this species. In the Barnes' collection there are specimens of *truncata* from southern Alaska.

*Dysstroma citrata* Linn.

*Phalæna citrata* Linn.: Faun. Suec., p. 332, 1761.

One specimen from Latouche, southern Alaska, September 3, 1916 (F. Johansen).

The specimen is in poor condition but is apparently a form of this species.

In addition there is in the Canadian National collection a specimen from the Yukon, namely, from Burwash creek, Kluane district, August 4, 1914 (D. D. Cairnes), the determination of which was confirmed by Mr. Swett.

Genus *Xanthorhoe* Hbn.*Xanthorhoe abrasaria congregata* Wlk.

*Thera congregata* Wlk.: Ent. Brit. Mus., XXIV, 1,264, 1862.

In the Canadian National collection are four specimens from the Yukon, namely from wagon road between Whitehorse and Dawson, Yukon Territory, July 7 to August 2, 1908 (Geo. Stewart). The species was not met with by Mr. Johansen or other members of the Arctic Expedition.

In Dyar's Catalogue,<sup>1</sup> *congregata* of Walker is given as a synonym of *unangulata* of Haworth. This has been corrected by Barnes and McDunnough in their Contributions<sup>2</sup> and given in their recently issued check list<sup>3</sup> as the American race of *abrasaria*.

<sup>1</sup> List of N. A. Lepidoptera, 1902.

<sup>2</sup> Cont. Nat. Hist. Lep. N. A., II, 5, 204.

<sup>3</sup> Check List of the Lep. of Boreal Amer., 1917.



Genus **Psychophora** Kirby.**Psychophora sabini** Kirby.

*Psychophora sabini* Kirby.: Supp. App. Parry's Voy. Disc. N.W. Passa  
1824.

Two specimens from Bernard harbour, Northwest Territories, July, 1913 (F. Johansen). These specimens agree fairly well with Curtis' figure in Appendix to Ross' Second Voyage.

Two other specimens, one from Wollaston Land, Victoria island, Northwest Territories, summer, 1915 (D. Jenness); the other from Cape Pullen, Wollaston Land, Victoria island, August 18, 1915 (D. Jenness), may also be this species but the specimens are not in very good condition.

Genus **Cidaria** Treit.**Cidaria** species.

Two Yukon specimens are in the Canadian National collection, both collected by the late D. D. Cairnes, one on July 21, 1912, on the Nation river, lat. 65° 30', long. 141°, the other on July 23, 1913, in the White river district, long. 141°. Both specimens were submitted to Mr. L. W. Swett, who determined them as *Cidaria frigidaria* Gn.? He reported that the specimens seemed to be very close to specimens from Lapland determined by Standring. Unfortunately, both specimens are in poor condition.

Genus **Dasyuris** Gn.**Dasyuris polata** Dup.

*Dasyuris polata* Dup.: Hist. Nat. Lep. Fr., VIII. (V), 102, 1830.

Two specimens, on the authority of Mr. L. W. Swett, are at present placed in the Canadian National collection under the above name. Both were studied by Mr. Swett and compared with specimens in the Packard collection. One, a male, was reported to match some of the rubbed specimens in this latter collection. The second specimen, a female, is much larger but was thought by Mr. Swett to be a female of *polata*. Referring to this latter specimen he stated: "I think the character of the basal band being accentuated outward rather indicates this species or a race of it". Both specimens were collected at Tindir creek, Yukon Territory, international boundary, July 25, 1912 (D. Cairnes).

Genus **Oporinia** Hbn.**Oporinia** species.

In the Canadian National collection there is one specimen belonging to this genus which was collected in the Yukon by Mr. Jos. Keele, the label on the specimen reading "Ladue river, August 21, 1905." This specimen was submitted by Mr. L. W. Swett, who named it *Oporinia autumnata*? In report upon it Mr. Swett remarked: "The markings are so effaced I cannot tell what race or species it may be. The double lines on the hind wings are nearer together than in typical *autumnata*, and it is not my race *henshawi*."

<sup>1</sup> In litt. March 22, 1919.

Genus **Eulype** Hbn.**Eulype hastata** L.

*Phalana-Geometra hastata* L.: Syst. Nat., 527, 1758.

In the Canadian National collection there are nine specimens of this widely distributed and very variable species from the following Yukon localities: Klunne P.O., Yukon Territory, June 23, 1914 (D. D. Cairnes); Klotassin river area, Yukon Territory, lat. 62° 31' to 63° 06', long. 137° 36' to 139° 30', summer of 1916 (D. D. Cairnes); between latitudes 67° 25' and 66° 30', long. 141°, June 18-27, 1912 (D. D. Cairnes); Finlayson river, Yukon Territory, July 25, 1887 (Dawson and McEvoy).

Genus **Isturgia** Hbn.**Isturgia truncataria** Wlk.

*Fidonia truncataria* Wlk.: Cat. Brit. Mus., XXIV, 1934, 1862.

In the Canadian National collection there are five specimens taken in the Yukon, as follows: 50 to 80 miles from Whitehorse, on Klunne road, Yukon Territory, June 8-12, 1914, 4 examples (D. D. Cairnes); between lat. 67° 25' and 66° 30', long. 141°, June 12, 1912, 1 example (D. D. Cairnes).

Genus **Macarla** Curt.**Macarla granitata** Gn.

*Macaria granitata* Gn.: Spec. Gen., X, 85, 1857.

This common and widely distributed species was not present in the Arctic collection. There is one specimen in the Ottawa National collection from the Yukon, labelled: Burwash creek, Klunne district, Yukon Territory, August 8, 1914 (D. D. Cairnes).

Genus **Phasiane** Dup.**Phasiane hebetata** Hbst.

*Phasiane hebetata* Hbst.: Bull. Brook. Ent. Soc., IV, 31, 1881.

No specimens in the Arctic collection. In the National collection at Ottawa, there is one specimen which was collected at Canyon river, 75 miles from Whitehorse, Yukon Territory, June 11, 1914 (D. D. Cairnes).

The species was described from Colorado. It is also known to occur in Arizona and Washington Territory. In addition to the specimen referred to there are in the Ottawa collection specimens from the provinces of Alberta and Saskatchewan. Barnes and McDunnough<sup>1</sup> figure the species in their "Contributions."

Genus **Itame** Hbn.**Itame andersoni** Swett.

*Diastictis andersoni* Swett.: Can. Ent., XLVIII, 251, 1916.

Three specimens of this species are in the Canadian National collection, all bearing the label "Yukon Territory, collected on the wagon road between Whitehorse and Dawson, August 22, 1908 (Geo. Stewart)." One of the specimens was submitted to Mr. L. W. Swett, who confirmed the determination. The species was described from Atlin, B.C. Recently Blackmore<sup>2</sup> has figured

<sup>1</sup> Cont. Nat. Hist. Lep. N. A., IV, 2, pl. 21, f. 13, 1918.

<sup>2</sup> Proc. Ent. Soc. B.C. 10, 1917, (1918) pl. III.

the species but this illustration is much too pale and cannot be considered satisfactory. The species is figured in colours on Pl. V, fig. 15.

#### **Itame brunneata** Thunb.

*Phalana brunneata* Thunb.: Diss. Ent., I, 9, 1784.

One specimen from Burwash creek, Kluane district, Yukon Territory, August 8, 1914 (D. D. Cairnes), is in the Canadian National collection. L. W. Swett compared this example with material in his collection from Europe and reported that it did not match exactly the specimens in his series. states<sup>1</sup> "Packard's name *ferruginaria* would hold in case this form was exactly like the European. It could only be a race of the European *brunneata* at best and a series of microscopic slides with life-histories, would be necessary to separate them; in *Itame* the genitalia are not so highly specialized as in some other groups."

The Yukon example is rather darker in colour than the other specimens under the name *brunneata* in the Ottawa government collection from the provinces of Ontario and Nova Scotia.

#### Genus **Dysmigia** Warr.

#### **Dysmigia loricaria** Evers.

*Fidonia loricaria* Evers.: Bull. Soc. Imp. Nat. Mose., 59, 1837.

In the Canadian National collection there are eleven Yukon specimens, all males, of this species which were collected by Mr. Geo. Stewart, in 1908, at the following localities: Wagon road between Whitehorse and Dawson, Yukon Territory, August 2, 18, 1908, and Takhuna, Yukon Territory, July 19, 1908.

The species is a common one. We have examples from the provinces of Ontario, Manitoba, and Saskatchewan.

#### Genus **Aspilates** Tr.

#### **Aspilates orciferaria** Wlk.

*Napuca orciferata* Wlk.: Cat. Brit. Mus., XXVI, 1,693, 1862.

Three male specimens as follows: Bernard harbour, Northwest Territory, July 10, 1916, 2 specimens (F. Johansen); Kugaluk river, Wollaston Lake, Victoria island, Northwest Territories, August 18, 1915 (D. Jenness).

In addition to the above the Northern Party of the Canadian Arctic Expedition brought back seven specimens, all collected at Armstrong point, Victoria island, Northwest Territories, June 20 to July 11, 1916 (J. Hadley).

These specimens are much darker than others which we have in the National collection at Ottawa, from Manitoba, Alberta, and Saskatchewan.

We have also specimens of this moth from Nansen creek, Placer Mine camp, Yukon Territory, July 7-10, 1914 (D. D. Cairnes).

#### Genus **Selenia** Hbn.

#### **Selenia alciphearia** Wlk.

*Selenia alciphearia* Wlk.: Cat. Brit. Mus. XX, 184, 1860.

A specimen of this geometer from Siwash creek, Yukon Territory, lat. 59° long. 141°, June 28, 1912 (D. D. Cairnes), is in the Canadian National collection. It is a female and closely resembles the form *ornata* B. and M. which occurs on Vancouver island, British Columbia.

<sup>1</sup> In litt. March 22, 1919

## FAMILY PYRALIDAE.

Genus *Loxostege* Hbn.*Loxostege commixtalis* Wlk.*Scopula commixtalis* Wlk.: Cat. Brit. Mus., XXXIV, 1,459, 1865

One Yukon specimen of this species is in the Canadian National collection. It bears the following label: Bear creek, 90 miles from Whitehorse, on Klucane road, Yukon Territory, June 13, 1914 (D. D. Cairnes).

Genus *Diasemia* Hbn.*Diasemia alaskalis*, n. sp.

Palpi dark brown, grayish-yellow above; head whitish, brown in centre; thorax reddish-brown; abdomen brown, whitish towards end; legs whitish. Primaries pale brownish with whitish scales along costa from base to reniform and with whitish area from t.p. line to outer margin; veins more or less marked with brown; costal margin yellowish-brown. T.a. line brown, sinuous, indistinct on costa. Orbicular oval, defined by brown, filled with yellowish-brown. Reniform rather large of an elongate-quadrate shape, slightly constricted centrally and filled with yellowish-brown. T.p. line dark brown, slightly dentate, almost straight from costa to vein 4 then incurved to below reniform on vein 2 and then excurved to inner margin. Terminal line brown, widened into conspicuous spots at ends of veins. Fringes pale brown, darker brown centrally. Secondaries whitish, thinly spotted with brown scales; discal spot brown; an inner second brown spot is present midway between the discal spot and the costal margin, as also a brown subterminal line; fringes as on primaries. Underside of all wings white, thinly spotted with brown, with all the markings of the upperside distinctly brown; primaries thinly dusted with brown.

Alar expanse, 22 mm.

Type, a male, in the Canadian National collection from Collinson point, Alaska, July 10, 1914 (F. Johansen). One paratype, bearing label "W. of Konganevik (Camden bay), Alaska, beginning of July, 1914 (F. Johansen)." The primaries of this specimen are more heavily dusted with brown than are those of the type.

Dr. Dyar kindly compared the specimen which I have made the type with material in the United States National Museum and reported that it represented an undescribed species of *Diasemia*.

The type is figured on Pl. V, fig. 11.

Genus *Titano* Hbn.*Titano* species—1.

Two specimens collected at Bernard harbour, Northwest Territories, one August 4, 1915, the other in July, 1916 (F. Johansen), were submitted to Dr. Dyar, who reported that they represented an undescribed species of the genus *Titano* close to *alticolalis* B. and McD. The specimens, however, are considerably rubbed and for this reason I do not at present care to give the species a definite name.

*Titano* species—2.

A third specimen from cape Pullen, Wollaston Land, Victoria island, Northwest Territories, July 15, 1915 (D. Jenness), probably also belongs to the genus *Titano* and represents another undescribed species. It too, unfortunately, is in poor condition.

Genus *Pyla* Grt.*Pyla arctiella*, n. sp.

Palpi black with white scaling; head, thorax and body blackish with bronzy green iridescence and dusted with white scales, body particularly so on ventral sides and posterior half of dorsum. Primaries dark brown with bronzy-green iridescence and rather heavily dusted throughout with white scales. T. line white, wide, almost straight, slightly bent outwardly at centre. T.p. line white, wide, from costa near apex inwardly oblique to near centre of wing then continuing in an outcurve to above vein 1b and then outwardly oblique to inner margin. Secondaries pale brownish. Fringes on all wings pale brownish. Legs dark brown, white-scaled.

Wings beneath smoky-brown, paler along costa and near apex.

Alar expanse, 20 mm.

Type, a female. (Pl. V, fig. 13), from Collinson point, Alaska, July 17, 1914 (F. Johansen), in the Canadian National collection.

The generic determination was made by Dr. Dyar. This new species, which is represented by one specimen, is, according to Dr. Dyar's table, closely related to *bistriatella* Hulst.

## FAMILY EUCOSMIDÆ.

Genus *Eucosma* Hbn.

Eighteen specimens from the following localities: Nome, Alaska, August 24, 1916, 4 specimens (F. Johansen); west of Konganevik, Camden bay, Alaska, July, 1914, 5 specimens (F. Johansen); north side of big lake west of Konganevik, Camden bay, Alaska, end of June, 1914, 4 specimens (F. Johansen); Barter island, northern Alaska, June 27, July 11, 1914, 4 specimens (D. Jenness); Bernard harbour, Northwest Territories, July, 1915, 1 specimen (F. Johansen).

Unfortunately the above specimens are in a poor state of preservation. Eleven of them were submitted to Mr. August Busek, of the United States National Museum and were referred to the genus *Eucosma*.

## OTHER MICROLEPIDOPTERA.

In addition to the specimens of the genus *Eucosma* a small number of other examples of microlepidoptera were collected by Mr. Johansen at Bernard harbour, Northwest Territories, July and August, 1915; cape Bathurst, Northwest Territories, July, 1916, and Ketehikan, southeastern Alaska, September, 1916. All of the specimens, however, are in very poor condition.

## FAMILY HEPIALIDÆ.

Genus *Hepialus* Fabr.*Hepialus* species.

Two specimens were taken at Latouche, southern Alaska, September, 1916 (F. Johansen).

These specimens are in very poor condition; the primaries of one are missing and the other specimen is much rubbed and otherwise broken.

## LARVÆ COLLECTED DURING THE EXPEDITION.

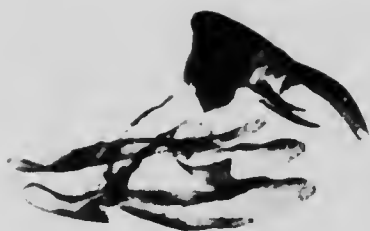
Various members of the Southern Party of the Canadian Arctic Expedition collected lepidopterous larvæ under stones, etc., and these were placed in alcohol. In most instances the specimens were immature, and without a knowledge of the adults it is not possible to make a report of any value on them. Such larvæ are of the families Nymphalidæ, Noctuidæ, as well as others of the Microfrenatæ.

In 1915 and also in 1916, Mr. Johansen found at Bernard harbour, Northwest Territories, specimens of a small lepidopterous larva feeding commonly in the roots of *Pedicularis lanata*. The first larva was found on July 4, 1915. Under this date Mr. Johansen's note reads: "Larva 10 mm. long, flesh-coloured, with head, neck plate and thoracic feet brown, found in the root of the common red-flowered *Pedicularis*. The larva had made a tunnel 15 mm. long, down the middle of the root." Other larvæ of similar size were collected on July 16. On July 18, a further examination of plants showed that the larva did not confine its burrows to the roots but that it also tunnelled the stem feeding upon the pith. As a rule only one occurred in a plant. The larva was further met with on the roots and the stems of *Pedicularis* on the island forming the north side of the harbour, at Bernard harbour, on June 10, 1916. Unfortunately the pupæ were reared from larvæ kept under observation. (Breeding record 71.)

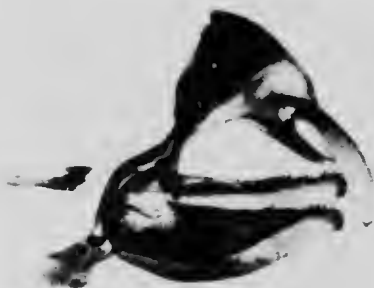
## PLATE I.

- Fig. 1. Genitalia of *Oenais laygate* Hbn. (Near Whitehorse, Yukon Territory).  
2. Genitalia of *Oenais semidea* Say. (Gravel river, Northwest Territories).  
3. Genitalia of *Oenais semidea* Say. (New Hampshire, U.S.).  
4. Genitalia of *Oenais semidea arctica* Gibson. (Bernard harbour, Northwest Territories).  
5. Genitalia of *Oenais simulans* Gibson. (Bernard harbour, Northwest Territories).  
6. Genitalia of *Oenais cairnesi* Gibson. (Yukon Territory).  
7. Genitalia of *Oenais pearlia* Edw. (Bernard harbour, Northwest Territories).  
8. Genitalia of *Oenais brucei yukonensis* Gibson. (Yukon Territory).

(All magnified 14 times.)



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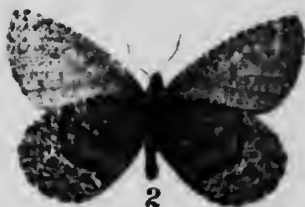
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## PLATE II.

- Fig. 1. Underside of *Oeneis semidea* Say, female. (Orange creek, Yukon Territory).  
2. Underside of *Oeneis semidea* Say, male. (Pelly river, Yukon Territory).  
3. Underside of *Oeneis semidea* Say, male. (Gravel river, Northwest Territories; genitalia of this specimen shown on Plate I, fig. 2).  
4. Underside of *Oeneis semidea arctica* Gibson, paratype, male. (Bernard harbour, Northwest Territories).  
5. Underside of *Oeneis simulans* Gibson, type, male. (Bernard harbour, Northwest Territories).  
6. Underside of *Oeneis partia* Edw., female. (Bernard harbour, Northwest Territory).  
7. Underside of *Oeneis cairnesi* Gibson, type, male. (White river district, Yukon Territory).  
8. Underside of *Oeneis cairnesi* Gibson, paratype, female. (White river district, Yukon Territory).  
9. Underside of *Oeneis brucei yukonensis* Gibson, type, male. (Klutlan glacier, Yukon Territory).  
10. Upperside of *Oeneis brucei yukonensis* Gibson, paratype, female, showing ocellar primaries. (Klutlan glacier, Yukon Territory).

(All natural size).



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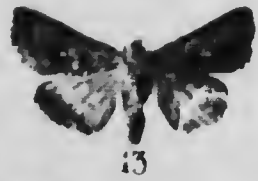
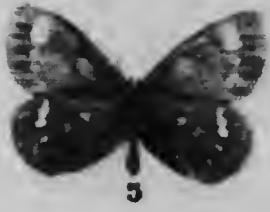
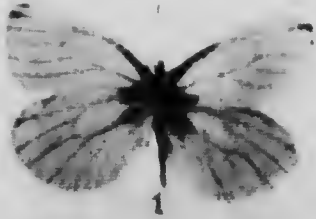




## PLATE I

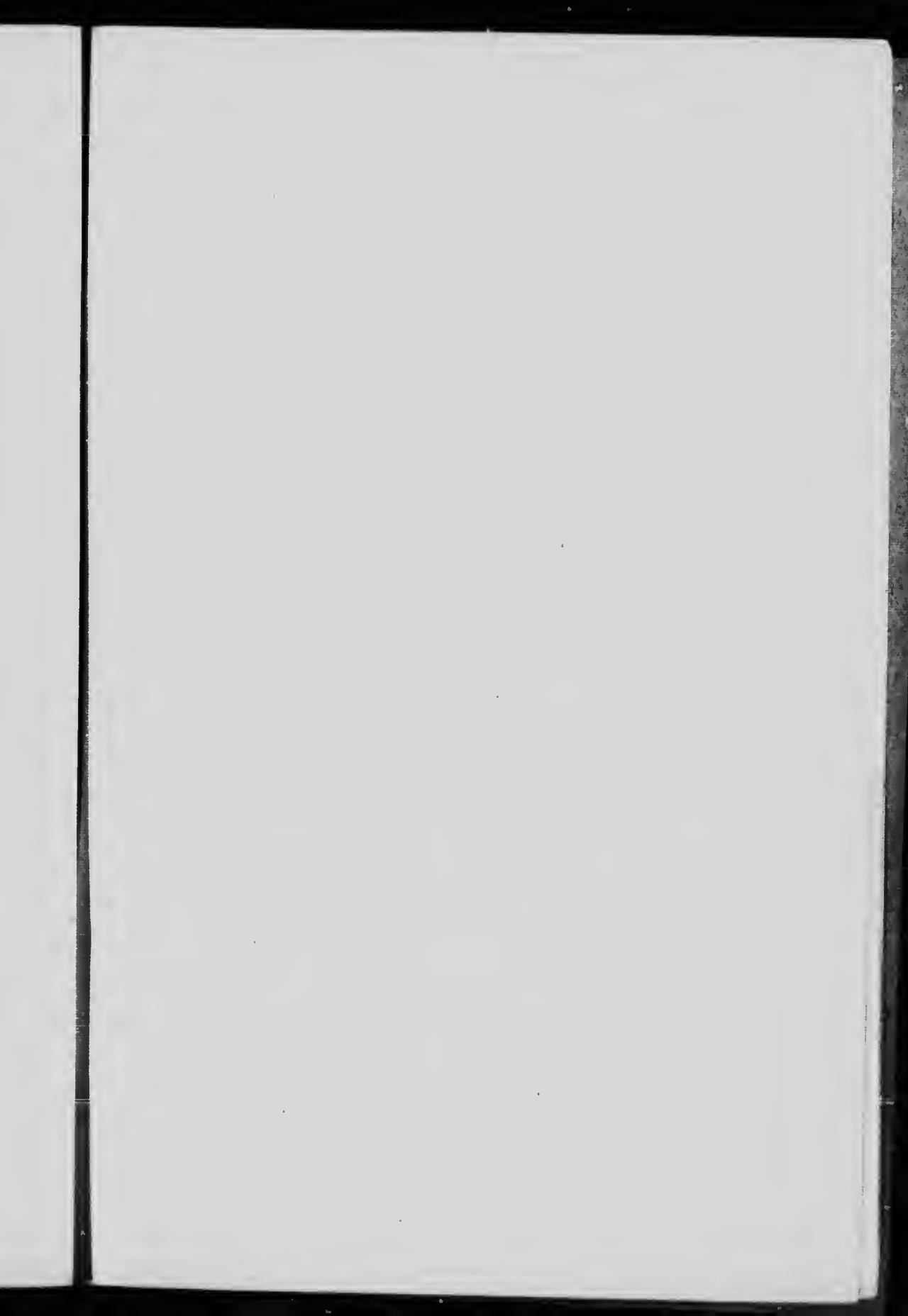
- Fig. 1. *Puris napi pseudobryonia* Verity, male. (Collinson bay, Alaska)  
 2. *Puris napi pseudobryonia* Verity, female. (Collinson bay, Alaska)  
 3. *Puris napi arctica* Verity, female. (Bernard harbour and 66° 30' long 111° 30' W., Yukon Territory)  
 4. *Puris napi arctica* Verity, male, underside. (N. side of Kluane lake, Yukon Territory)  
 5. *Erebna sofia* Stål, female, underside. (Bernard harbour, Yukon Territory)  
 6. *Brenthia nataszhati* Gibson, type, male, underside. (long 111°, north of mount Nataszlat).  
 7. *Euchla creusa* Dbl'dy, chrysalis. (Deception bay, coast Columbia)  
 8. *Hyphoraea alpina* Quens., cocoon. (Collinson point, Alaska)  
 9. *Gynophrora rosea* Curtis, larva. (Collinson point, Alaska)  
 10. *Hyphoraea alpina* Quens., cremaster, X 9. (Collinson point, Alaska)  
 11. *Hyphoraea festiva* Bork., cremaster, X 9. (Bernard harbour, Northwest Territories)  
 12. *Brenthia nataszhati* Gibson, female. (Bernard harbour, Northwest Territories).  
 13. *Autographa uctera* Ottol.? male. (Bernard harbour, Northwest Territories)  
 14. *Autographa sackeni* Ottol.? male. (Mayo lake, Yukon Territory)  
 15. *Plebeius scudleri* Edw., male. (West side of Kluane lake, Yukon Territory)  
 16. *Plebeius aquilo* Bdv.?, male. (Burwash creek, Yukon Territory).  
 17. *Plebeius aquilo* Bdv.?, male. (Kluane, Yukon Territory).  
 18. *Plebeius aquilo* Bdv., male. (Bernard harbour, Northwest Territories).

(All natural size)









## PLATE IV.

- Fig. 1. *Eurygus boothi* Curtis, male. (Bernard harbour, Northwest Territories).  
2. *Eurygus boothi* Curtis, male. (Bernard harbour, Northwest Territories).  
3. *Oeniscus brucei yukouensis* Gibson, type, male. (Kluthan glacier, Yukon Territory).  
4. *Oeniscus scutidea arctica* Gibson, type, male. (Bernard harbour, Northwest Territories).  
Genitalia of this specimen shown on Plate I, fig. 4.  
5. *Oeniscus peartii* Edw., female. (Bernard harbour, Northwest Territories).  
6. *Oeniscus cairnesi* Gibson, type, male. (White river district, Yukon Territory).  
7. *Erebina fasciata* Butler, female. (Lat. 65° 10' long. 141°).  
8. *Erebina fasciata* Butler, male. (Armstrong point, Victoria island, Northwest Territories).  
9. *Erebina rossi* Curtis, female. (Wollaston land, Victoria island, Northwest Territories).  
10. *Erebina youngi* Holl., male. (Siwash creek, Yukon Territory).  
11. *Erebina sofia* Stkr., male. (White river district, Yukon Territory).  
12. *Breuthis distincta* Gibson, type, female. (Harrington creek, Yukon Territory).

(All natural size).

PLATE IV



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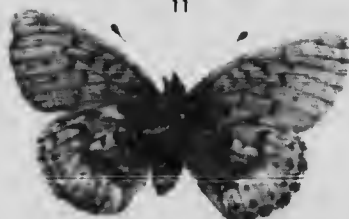
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## PLATE V.

- Fig 1. *Beechus frigga alaskensis* Lohm., female. (Collinson point, Alaska).
2. *Beechus polaris* Bdv., female, underside. (Barter island, Alaska).
3. *Beechus polaris* Bdv., male. (Barter island, Alaska).
4. *Beechus polaris* Bdv., female. (Barter island, Alaska).
5. *Beechus pulis alaskensis* Holl, male. (Raquet creek, International Boundary).
6. *Beechus natashati* Gibson, type, male. (International Boundary, north of mount Natashat).
7. *Beechus frigga improba* Butl, female. (Bernard harbour, Northwest Territories).
8. *Beechus frigga improba* Butl, male. (W. of Kongnevik, Camden Bay, Alaska).
9. *Parabarrocia kecki* Gibson, paratype, female. (Mountain below Twitya river, Northwest Territories).
10. *Parabarrocia kecki* Gibson, type, male. (Mountain below Twitya river, Northwest Territories).
11. *Diasamia alaskalis* Gibson, type, male. (Collinson point, Alaska).
12. *Homoglaea naurayi* Gibson, type, female. (Bernard harbour, Northwest Territories).
13. *Pyla arctiella* Gibson, type, female. (Collinson point, Alaska).
14. *Anarta leucoeycla* Stand., female. (Cape Pullen, Victoria island, Northwest Territories).
15. *Hame andersoni* Swett., male. (60 miles from Whitehorse, Yukon Territory).
16. *Anarta subfamosa* Gibson, type, male. (Armstrong point, Victoria island, Northwest Territories).
17. *Barrocia fasciata* Skell., male. (Barter island, Alaska).
18. *Hyphocia alpina* Quens., male. (Collinson point, Alaska).
19. *Hyphocia festiva* Bork., male. (Bernard harbour, Northwest Territories).
20. *Hyphocia festiva* Bork., male. (Port Epworth, Coronation gulf, Northwest Territories).

(All natural size).



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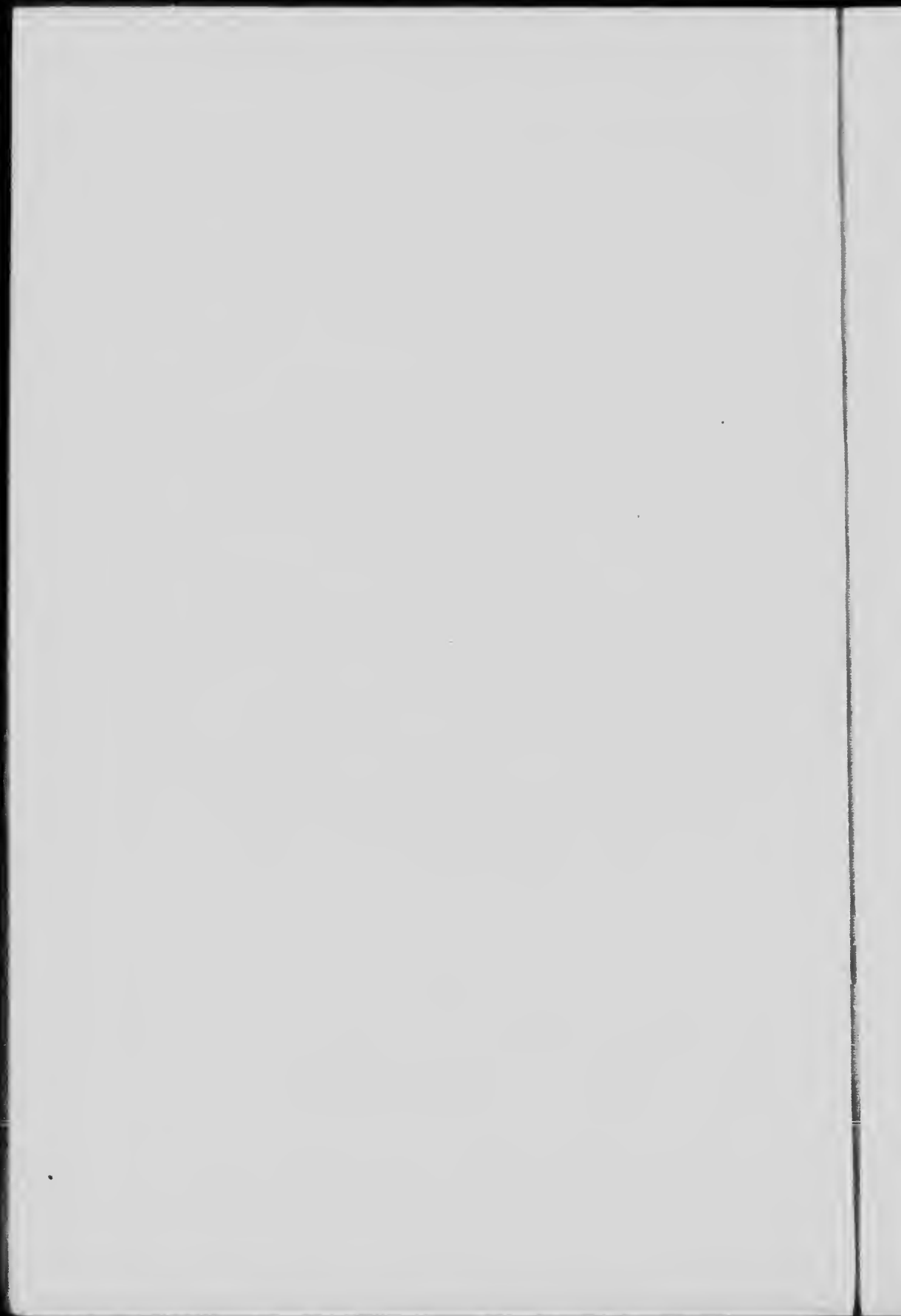


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- Part A: Northern Party, 1913-14.
- Part B: Southern Party, 1913-16. By Rudolph Martin Anderson. (*In preparation*).

**Volume II: Mammals and Birds.**

- Part A: Mammals. By Rudolph Martin Anderson. (*In preparation*).
- Part B: Birds. By R. M. Anderson and P. A. Tavernor. (*In preparation*).

**Volume III: Insects.**

- Part A: Collembola. By Justus W. Folsom. (*Issued*).
- Part B: Neuropteroid Insects. By Nathan Banks. (*Issued*).
- Part C: Diptera. By Chas. W. Alexander, Harrison G. Dyar, and I. R. Malloch. (*Issued*).
- Part D: Mallophaga and Anoplura. By A. W. Baker, G. F. Ferris, and G. H. F. Nuttall. (*Issued*).
- Part E: Coleoptera. By J. M. Swaine, H. C. Fall, C. W. Long, and J. D. Sherman, Jr. (*Issued*).
- Part F: Hemiptera. By E. P. Van Duzee. (*Issued*).
- Part G: Hymenoptera and Plant Galls. By Alex. D. MacGillivray, Charles T. Hrues, F. W. L. Slafen, and E. Porter Felt. (*Issued*).
- Part H: Spiders, Mites, and Myriapods. By J. H. Emerton, Nathan Banks, and Ralph V. Chamberlin. (*Issued*).
- Part I: Lepidoptera. By Arthur Gibson. (*Issued*).
- Part J: Orthoptera. By E. M. Walker.
- General Observations on Insect Life in the Arctic. By Frits Johansen. (*In preparation*).

**Volume IV: Botany.**

- Part A: Freshwater Algae and Freshwater Diatoms. By Charles W. Lowe. (*In preparation*).
- Part B: Marine Algae. By F. Collins. (*In preparation*).
- Part C: Fungi. By John Dearness. (*In preparation*).
- Part D: Lichens. By K. L. Merrill. (*In preparation*).
- Part E: Mosses. By R. S. Williams. (*In preparation*).

**Volume V: Botany.**

- Part A: Flowering Plants and Ferns. By James M. Mason, and others. (*In preparation*).
- Part B: General Notes on Arctic Vegetation. By Frits Johansen. (*In preparation*).

**Volume VI: Fishes, Tunicates, Etc.**

- Part A: Fishes. By F. Johansen. (*In preparation*).
- Part B: Ascidians, etc. By A. G. Huntsman. (*In preparation*).

**Volume VII: Crustacea.**

- Part A: Deep-sea Crustaceans. By Mary J. Rathbun. (*Issued*).
- Part B: Selizopod Crustaceans. By Waldo L. Schmidt. (*Issued*).
- Part D: Isopoda. By Miss P. L. Boone. (*In preparation*).
- Part E: Amphipoda. By Clarence L. Shoemaker. (*In press*).
- Part F: Pantopoda. Leon J. Cole. (*In preparation*).
- Part G: Euphyllipoda. By F. Johansen. (*In preparation*).
- Part H: Cladocera. By Chancey Juday. (*In preparation*).
- Part I: Ostracoda. By R. W. Sharpe. (*In preparation*).
- Part J: Freshwater Copepoda. By C. Dwight Marsh. (*In press*).
- Part K: Marine Copepoda. By A. Willey. (*In press*).
- Part L: Parasitic Copepoda. By Chas. B. Wilson. (*In preparation*).
- Part M: Cirripedia. By H. Pillsbury. (*In preparation*).

**Volume VIII: Mollusks, Echinoderms, Coelenterates, Etc.**

- Part A: Mollusks, Recent and Pleistocene. By Wm. H. Dall. (*Issued*).
- Part B: Cephalopoda and Pteropoda. By S. S. Berry and A. G. Huntsman. (*In preparation*).
- Part C: Echinoderms. By Austin C. Clark. (*In press*).
- Part D: Bryozoa. By R. C. Osborn. (*In preparation*).
- Part E: Rotatoria. By H. K. Harring. (*In preparation*).
- Part F: Chaetognatha. By A. G. Huntsman. (*In preparation*).
- Part H: Medusae and Ctenophora. By H. B. Bigelow. (*In press*).
- Part I: Hydroids. By McLean Fraser. (*In preparation*).
- (Porifera, Actinozoa, and Alcyonaria: material small in amount, and no specialists selected).

**Volume IX: Annelids, Parasitic Worms, Protozoans, Etc.**

- Part A: Oligochaeta. By Frank Smith and Paul S. Welch. (*Issued*).
- Part B: Polychaeta. By Ralph V. Chamberlin. (*In press*).
- Part C: Hirudinea. By J. P. Moore. (*In preparation*).
- Part D: Gephyrea. By Ralph V. Chamberlin. (*In press*).
- Part E: Acanthocephala. By H. J. Van Cleave. (*In press*).
- Part F: Nematoda. By N. A. Cobb. (*In preparation*).
- Part G: Trematoda. By A. R. Cooper. (*In preparation*).
- Part H: Cestoda. By A. R. Cooper. (*In preparation*).
- Part I: Turbellaria. By A. Hassell. (*In preparation*).
- Part J: Gordiacea.
- Part K: Sporozoa. By J. W. Mavor. (*In preparation*).
- Part M: Foraminifera. By J. A. Cushman. (*In press*).

**Volume X: Plankton, Hydrography, Tides, Etc.**

- Plankton. Marine Diatoms.
- Hydrography.
- Tidal Observations. By W. Bell Dawson. (*In preparation*).

