

NOTES ON THE DIURNAL LEPIDOPTERA OF THE
CANADIAN ARCTIC COLLECTED BY OWEN
BRYANT IN THE SUMMERS OF
1929 TO 1932.

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WITH INTRODUCTION AND FIELD NOTES
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II.

As comparatively little collecting has been done in the regions visited by Owen Bryant, and described in the foregoing introduction, it was thought that a list of butterflies found on his trips would be of interest to Lepidopterists.

It is with that thought in mind that the following list is offered, together with such notes and comments as will be helpful to an understanding of the species found, and how they compare with published figures of some of the species, and with the original description in the case of others.

In studying this material, which Mr. Bryant sent me for mounting and determination, and in comparing it with material from other regions, and searching the literature dealing with Arctic butterflies, I have become impressed with the great diversity of forms produced in the various regions of the North American Arctic. Clearly much collecting and study is needed before a correct understanding of the relationship of the various forms and their specific value can be arrived at.

I wish to acknowledge the assistance of Dr. J. H. McDunnough in clearing up some of the more difficult determinations for me, and here express my sincere thanks for his valuable help.

The localities in which collections were made have been fully described in the introduction but for the sake of convenience they are briefly listed below:

Churchill, Man., on west shore of Hudson Bay, 58° N. lat.

Herschel Island, Yukon Terr., in Beaufort Sea, 70° N. lat., 139° W. long.

Shingle Point, Yukon Terr.

Ft. McPherson, N. W. Terr., on the Peel River, 12 miles above the Husky River.

Aklavik, N. W. Terr., 68° N. lat., 135° W. long.

Base Camp, 25 miles southwest of Aklavik.

Black Mountain, 30 miles southwest of Aklavik.

And a locality 50 miles northeast of Aklavik.

The classification used is in general that of Barnes & Benjamin's list of March 20, 1926.

1. *Papilio machaon* race *aliaska* Scudder.

A fair series of this handsome *Papilio* was taken at the base of Black Mountain between June 26 and July 15, 1931, and up to 2200 ft. on the mountain.

The specimens agree quite well with Barnes & McDunnough's fig. 2, Pl. IV, Contributions, Vol. III, No. 2. Some variation in the width of black borders of secondaries is observed in the series. Also variation in the size and shape of the submarginal yellow spots; in some specimens these spots are crescent shaped while in others they are larger and more quadrate. The orange spot at anal angle of hind wings is large and uniformly round, and on the under side of fore wings the submarginal yellow spots are fused together so as to form a continuous band. These two latter characters are constant in all of the specimens of the series.

It is an extremely active butterfly and while the earliest specimens collected were fresh most of them had already suffered some wing damage. Those collected July 15, were all badly battered. In the series there was but one female, taken July 15, in battered and mutilated condition.

According to Bryant this species has the habit of sitting among the rocks on the very highest rocky knobs or on gravelly knolls with its wings expanded but pressed down and generally with the right wing toward the wind. At the time of observation the wind was from the south and possibly the butterflies adopted the attitude described because it brought their heads towards the morning sun. They seemed always to sit with one wing toward the wind and both wings pressed downward so that the wind passed over their backs without having much effect. When active they dropped down to the lower levels to feed upon the flowers growing there and then returned to the very highest knobs.

Caterpillars, apparently of this species, were found at the base of the mountain on a composite with leaves like rhubarb (*Petasites frigidus*). They were pale green with black markings and yellow scent organs like those of *asterias*, which they extrude when annoyed. They pupated in August.

2. *Ascia napi* race *arctica* Verity.

A long series was taken at Aklavik and Base Camp, July 1 to 18, 1931. There is considerable variation in the series, especially

among the females; some specimens are quite typical while others approach *pseudobryoniae* (Verity). Most of them, however, are very close to *arctica* as illustrated by B. & McD., Contributions, Vol. III, No. 2, figs. 6 & 7, Pl. VI.

Arctica is said to occur in the inland Arctic region (Barren Lands) while *pseudobryoniae* is said to occur along the Alaskan coast. As the locality from which the present specimens came lies between the Barren Plains and the Alaskan coast it is but natural that they should intergrade somewhat. They doubtless should all be referred to *arctica*.

3. *Colias hecla* race *glacialis* McLach.

A good series of both sexes from Churchill, June 25, Herschel Island, July 20, 1930, and from Base Camp and Black Mountain, 500 ft. and 2,000 ft., June 26 to July 24, 1931.

Strecker described *C. hecla* from Ft. Churchill where many of the present specimens came from and with which description they agree. Dr. Gibson in Rep. Can. Arct. Exp. lists Herschel Island as one of the localities where *hecla glacialis* has been taken and gives a very complete description of the specimens.

This description also fits the specimens from the above localities and suggests that *hecla* and *glacialis* are probably one and the same thing or at least without much difference. If so, the name *glacialis*, having priority, stands. Dr. McDunnough who has kindly compared one of the Churchill specimens with a series of *glacialis* from Baffin Land, states that he can detect no great difference. Neither is any real difference apparent between the Churchill specimens and those from the other localities named above.

There are two dimorphic females from Base Camp which are probably form *pallida* Skin. & M. One of these is dull whitish in ground color while the other is a very pale creamy-yellow.

They however have rosy fringes whereas the original description of *pallida* from Greenland states "fringes of all wings milky white."

There are also three males from Base Camp with extremely narrow fuscous borders and with the ground color a very pale orange. These are puzzling. They may be merely aberrant individuals or may be a distinct form. Seitz's ♂ fig. of *hecla*, Macro. Lep., Vol. 5, Pl. 27, shows borders nearly as narrow as in these three specimens.

4. *Colias eurytheme* form *eriphyle* (Edw.).

3 males from Black Mountain, 500 ft., July 24, 1931. The upper side is clear yellow with narrow black borders and a well

defined round black discal spot on primaries. On the secondaries there is a prominent orange spot and there is fairly heavy dusting of black along inner margin. On the under side the secondaries, as well as the costa and apices of primaries, are a deep ochre-yellow, and the secondaries are somewhat dusted with dark scales. The discal spot of secondaries on this surface is silver circled with rusty red.

5. *Colias gigantea* (Stkr.).

3 males from Churchill, June 25, 1930. *Gigantea* was described from the west coast of Hudson Bay north of Ft. Churchill and I think there can be no doubt that the Churchill specimens are that form. The upper surface agrees pretty well with *gigantea* from Bilby, Alberta, except that in two of the specimens the dark borders are narrower. On the under side the secondaries are more greenish than the Bilby specimens.

Gigantea is generally listed as a race of *christina* but Dr. McDunnough (Can. Ent., Vol. LIV, No. 6, page 135) regards it as a distinct species, basing his conclusion upon a difference in habits of the mature insect and a difference in food plants of the larvae.

6. *Colias pelidne* (Bdv. & Lec.).

One male and 1 female from Base Camp, July 15, and 1 female from Black Mtn., 500 ft., July 24, 1931, all worn; also 2 females from Base Camp, July 21, 1932. These are larger than Labrador specimens and also larger than the race *minisni* Bean, being as large as the larger *skinneri* Barnes. They have a pale orange discal spot on secondaries and the under side of secondaries is but lightly dusted with black. In other respects they show definite *pelidne* characters.

7. *Colias palaeno* race *chippewa* Kirby.

A series from Churchill, Man., June 25, 1930, and several specimens from Base Camp, July 11 to 24, 1931. Specimens agree with Holland's figures; also with Edwards's figure of *helena* from Mackenzie River, which has been determined to be synonymous with *chippewa*. In the series there are but 3 females, all from Base Camp. Of these, 2 are the normal pale females and one is the bright yellow form described and named *kohlsaati* by J. D. Gunder in Bulletin of the Southern California Academy of Sciences, Vol. XXX, Pt. 2, p. 45 (1931).

8. *Colias nastes* race *rossii* (Gn.).

Four specimens from Herschel Island, July 20, 1930. They

have a somewhat faded appearance. The upper surface is a dirty yellow-green with a faint suggestion of a pale orange on the primaries. The under side is rusty blackish at base with the outer margin rusty yellowish. They agree quite well with Holland's figure in the Revised Butterfly Book.

9. *Colias nastes* race *subarctica* McDunnough.

A fair series of both sexes from Base Camp, July 11 and 15, and from Black Mtn., 500 ft., and 2,000 ft., July 24, 1931. The males without exception have the entire upper surface of primaries blackish with only narrow but clearly defined yellow-green dashes in margin. The secondaries also are very dusky but less so than primaries. The females show some variation in size, in the amount of dark suffusion and in the discal spot on upper side of secondaries. In two of the females this spot tends to orange but in most of them it is white or very pale yellow. A careful comparison of the specimens with Dr. McDunnough's original description of race *subarctica* from Bernard Harbour (Can. Ent., Nov., 1918) leaves no doubt that they are that race.

10. *Coenonympha kodiak* race *yukonensis* Holland.

Specimens of this prettily marked *Coenonympha* were taken at Base Camp, July 11 and 15, and on Black Mtn., at 500 ft. and 2,000 ft., July 24, 1931. The species was fairly common in open places and not very active. There is some variation in the series; most of them, however, agree with Holland's figures of the types and all of them are sufficiently close to leave no doubt as to their identity. Holland states that *yukonensis* may prove to be a distinct species. Judging from the specimens and also from Holland's figures I am inclined to believe that *yukonensis* is more nearly allied to *inornata* than to *kodiak*.

11. *Oeneis jutta* Hbn.

A single specimen (♀) from Base Camp, July 11, 1931. An extremely dark form both in ground color and in the fulvous area surrounding the ocelli. These fulvous areas are greatly restricted. On the under side the same darkening prevails, with the apex of primaries and the outer third of secondaries washed with a considerable amount of greyish. It is totally different from the race *alaskensis* Holland, and race *reducta* McDunnough, from Wyoming. It also differs from Labrador and Alberta specimens, most nearly approaching specimens from Mer Bleue, Ont., being however considerably darker than these.

12. *Oeneis cairnesi* Gibson.

One male and 3 females from Base Camp, at 500 ft. elevation, July 15 and 24, 1931. The male agrees with Gibson's fig. 6, Pl. IV, of the upper surface but is slightly more tawny.

One female is of about the same shade as the figure cited, while the remaining two females are lighter. The under side of the male agrees very closely with fig. 7, Pl. II, but in addition to the one ocellus of primaries between veins 5 and 6 shown there is a second smaller one between veins 4 and 5 and a minute dot between veins 2 and 3. The under side of the three females varies somewhat in the denseness of striations and the distinctness of the band, but one of them is almost identical with Gibson's fig. 8, excepting that in addition to the one ocellus shown on primaries there are three others, smaller and more or less indistinct, the one between veins 3 and 4 being a mere dot. This greater number of ocelli on primaries holds good in the remaining two females, each having 3 ocelli and a dot. As variation in the number of ocelli is common in the genus *Oeneis* I attach no great importance to this discrepancy. The secondaries in all four specimens have the 4 ocelli mentioned in the description and shown on the plates.

A careful reading of the original description leaves no doubt in my mind that the four specimens from Base Camp are the same species as the four specimens from the White River district, Yukon Terr., to which Dr. Gibson gave the name *cairnesi*.

At the end of the description is this significant statement: "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 color, in having no ocelli on hind wings above and the markings on these latter wings being more of an open character."

Before seeing the figures and descriptions of *cairnesi*, but having compared the specimens before me with the description of *nahanni*, I too conjectured that they were very close to that species if not actually lighter colored individuals of the same species.

I suspect that both *cairnesi* and *nahanni* are closely related to *uhleri* and *varuna*.

13. *Oeneis taygete* Gey.

A small series, both sexes, from Churchill, June 20 and 22, 1930, and 3 males from Base Camp, June 22 and 24, 1931. The upper side of these specimens agrees with Holland's figure, and they also have the white veins on the under side of secondaries and black median line on under side of primaries mentioned by Dr. McDun-

nough (Can. Ent., VI, 1922, page 136) as distinguishing characters. The specimens from Base Camp are a trifle larger than those from Churchill, and the white veining on under side of secondaries is more striking.

14. *Oeneis polixenes* Fabr.

A series of specimens from Churchill, June 20 to 25, 1930, has given me considerable trouble to place. After much study and checking of the characters of the specimens with the original description of various species and comparison with published figures I was still uncertain as to their identity.

Dr. McDunnough to whom examples were submitted kindly helped me out of my dilemma. He stated "by genitalia they belong in the *polixenes* complex and are half-way between *brucei* and the var. *yukonensis* Gibson, the under side agreeing quite well but the upper side lacking distinct yellow submarginal dots; the upper side being more like Labrador *polixenes* but the under side of secondaries in this race generally shows much less white shading beyond median band."

The series shows considerable variation in the color of the upper surface, some of the specimens being fairly brown with a reddish tinge, while most of them resemble Holland's figure of *katahdin* (Newc.). On the under side there is considerable variation also. In some of the specimens the median band is fairly dark and well defined, while in others it is less so. Also the light areas on either side of the median band are more pronounced in some specimens than in others.

It would seem best to regard the series as intergrades rather than create a new name.

15. *Oeneis melissa* race *semidea* Say.

Three males and 1 female from Churchill, June 20, 1930. These specimens are slightly darker and somewhat smaller than New Hampshire specimens but do not otherwise differ from them.

16. *Erebia discoidalis* Kirby.

Two males and 2 females from Base Camp, June 24, 1931, and several males and females from Aklavik, July 1, 1931.

These specimens are apparently quite typical. They do not differ materially from Alberta specimens. The only difference that can be observed is that on the under side the apex of primaries and outer half of secondaries is more hoary. In this respect they agree with one specimen from Chatanika, Alaska, with which they have been compared. The difference however is slight.

17. *Erebia fasciata* Butler.

One male from Herschel Island, July 20, 1930, and 2 males from Base Camp, June 24, 1931. *E. fasciata* is such a well marked species that there is no mistaking it, but as the 3 specimens depart somewhat from the typical some comment would seem to be in order. In the Herschel Island specimen the ground color is far from being black; it is not even dark brown; dull brown of a medium shade better describes it. On the primaries it has an oblong dull red spot between veins 1 and 2, another between veins 2 and 3, and a faintly indicated partial spot between veins 3 and 4. On the under side both the dark mesial band and the light submarginal band are as shown in Holland's fig. 6, Pl. LXI, but the basal area and the light submarginal band are greyish brown instead of stone grey. On the primaries this band is tinged with rufous. The entire under side is less contrasty than the figure cited.

The two specimens from Base Camp are much darker on the upper surface, in fact they appear black until compared with *E. magdalena* Stkr. when it is seen that the ground color is a very deep blackish-brown. The oblong spots are as in the Herschel Island specimen but these spots are a brighter, more decided red. On the under side these two specimens differ from the Herschel Island one and also from each other. The median and marginal bands are extremely dark in both. On one of them the bands are shaped much as in Holland's fig. 6 and are of the same width as shown in that figure, but on the primaries the submarginal band is decidedly dark rufous and on the secondaries it is a silvery grey, much sprinkled with brownish scales.

In the other Base Camp specimen the submarginal band is quite narrow, scarcely wider than in Holland's fig. 7 of *avinoffi*, and the dark median band is correspondingly wider, but in shape these bands are those of *fasciata* and not of *avinoffi*. The submarginal band is dark rufous on the primaries, and silvery grey on the secondaries, less heavily sprinkled with brownish scales than the preceding specimen.

Dr. Holland in New Species of *Erebia*, Trans. Am. Ent. Soc., LVI, 149-153, calls attention to the considerable varietal difference found in *fasciata* and suggests that some of the forms may ultimately prove to be valid subspecies if not species.

More material is needed from the above localities before it can be safely determined whether the differences described represent mere individual variation or whether they constitute valid subspecies.

18. *Erebia rossii* Curtis race *ornata* new race.

A good series of this *Erebia* was obtained at Churchill, June 15 to 20, 1930. The series shows a certain amount of variation in the number, size and shape of ocelli but all of them show increased spotting, and in other respects also differ sufficiently from typical *rossii* as well as from the Alaskan race *kuskoquima* Holland to warrant a name.

Male. Upper side of wings uniform seal brown of medium shade, fringes paler, indistinctly checkered, antennae ochreous; on the primaries the two subapical spots, which in the typical form are separate, are fused into one large rufous spot with a more or less irregularly shaped black center; between this and the inner margin are two smaller rufous spots with black pupils.

On the secondaries there are three rufous spots in a curved row, the one nearest anal angle being largest and containing a black pupil.

On the under side the ground color of primaries is rusty red, from the base outward; the subapical spot of this wing is reproduced but the black center is divided into two twinned spots, each with a tiny white pupil. Of the other two spots on primaries only the one situated between veins 1 and 2 is reproduced on the under surface. None of the spots of secondaries is reproduced on this surface. The extra discal pale band of secondaries is rather obscure, and on the outer edge of this band there are three tiny yellow dots.

Female. This sex differs from the male only in having both the ground color and the rufous spots paler. The spots are somewhat larger and more conspicuously pupiled. The extra discal band on under side of secondaries is only a trifle lighter in this sex than in the males.

Expanse: Male 48 mm., Female 46 mm.

The above description is that of the male holotype and female allotype.

In the series, consisting of 16 males and 9 females, there is variation in the number and size of spots. In some of the males the subapical spot of primaries is divided into two twinned spots, and some of them have but one additional spot on this wing. On the secondaries the rufous spots vary from one to four, three being the usual number. None of the females have less than two spots on primaries in addition to the large fused spot in the subapical area. Not one of the entire series, either male or female, has secondaries without spots.

For this race from the Churchill region of the Hudson Bay country, which differs from typical *rossii* and the Alaskan race *kuskoquima* in the rather constant tendency of the subapical spots of primaries to coalesce and the quite constant character of spotted secondaries in the males as well as the females, I propose the name *ornata*.

All the specimens of the series, other than the holotype and allotype are designated paratypes.

19. *Erebia youngi* Holland.

A few specimens of both sexes from Base Camp, July 11, and Black Mountain, 500 ft., July 24, 1931, all somewhat the worse for wear. These agree quite well with the figures of the types in Holland's Revised Butterfly Book, Pl. LXI, but are somewhat larger, the ground color is darker, and the submarginal spots are of a deeper orange color. They match fig. 10, Pl. IV, Can. Arct. Exp., excellently.

Unlike the series of *rossii*, the specimens of *youngi* show practically no variation in spotting.

20. *Erebia herscheli*, n. sp.

Three males from Herschel Island, July 20, 1930. One specimen which will be designated the holotype, is in good condition, with the exception of a slightly torn right fore wing. The other two, designated as paratypes, are considerably frayed.

Holotype. Male. Upper surface of wings a peculiar drab brown with a slight satiny gloss. On primaries there are four pale indistinct rufous spots arranged as in *E. youngi*, but considerably smaller, and pupiled with a pale fuscous dot.

On the secondaries there are two very small pale rufous submarginal spots with pale fuscous dots in the centre. These spots are quite indistinct.

The under surface is slightly darker on the inner two-thirds of both wings; on the primaries there is a pale rufous submarginal band which does not quite reach either the costa or the inner margin. In this margin the four fuscous dots of the upper side are reproduced. On the secondaries there is a submarginal band paler than the inner two-thirds of the wing.

The antennae are pale ochreous. Alar expanse 40 mm.

Altogether this is a very obscure little insect. It may prove to be a local race of *youngi*, although it is a decidedly smaller and different looking insect.

One of the paratypes is practically a duplicate of the type, while the other is still more weakly marked.

In this connection it may be of interest to recall that the single specimen of *E. fasciata* taken on Herschel Island is also of a shade of ground color quite similar to that of these specimens.

21. *Brenthis aphaerete* race *alticola* B. & McD.

A male from Aklavik, July 1, and a female from Base Camp, July 15, 1931, fit the description of *alticola* in having the upper side pale with the basal shading reduced and the black markings narrow and cleanly cut. On the under side the spots are unsilvered, pale cream colored except the marginal row which are whitish with a faint suggestion of silver. This butterfly was not common and seemed to prefer the vicinity of woods.

The first of these specimens was captured by Corporal Fielding's daughter Doris.

22. *Brenthis aphaerete* race *dawsoni* B. & McD.

One male from Churchill, June 25, 1930, also 1 male from Herschel Island, July 20, 1930. These two specimens although coming from widely separated localities are nevertheless identical. They approach most nearly race *dawsoni* described from Ontario but they do not have as broad black borders as shown in Holland's figure of the male.

23. *Brenthis chariclea* race *arctica* (Zett.).

A long series of this little *Brenthis* from Herschel Island, July 20, 1930, and from Base Camp and Black Mtn., 500 ft. and 2,000 ft., throughout July, 1931. Many of the specimens show the effect of having been buffeted by winds.

This is apparently a common butterfly north of the Arctic Circle and I can do no better than to repeat what Dr. Gibson has said of this species in Rept. Can. Arct. Exp., 1913-1918: "Looking over the above series there is of course considerable variation among the specimens, not only in the general color of the upper surface of the wings, but also in the arrangement and color of the markings on the under side. The median band particularly on the underside of secondaries shows marked variation." All of this applies perfectly to the series before me. I would add that as a general thing the spots on under side are well silvered, that a tendency to melanism is present particularly among the females some of which are very considerably suffused with blackish, and finally that in a few of the males the entire surface of the hind wings

beneath, except the silvered spots, is reddish-brown—*butleri* Holland. I infer therefore that *butleri* is an aberrant form rather than a geographical race.

24. *Brenthis pales* race *alaskensis* Holland.

A single specimen (male) from Black Mtn., at 2,000 ft. alt., July 24, 1931. The upper side agrees in all respects with fig. 5, Pl. V, Rept. Can. Arct. Exp., 1913-18, and the under surface is quite unlike any other North American *Brenthis*, agreeing pretty well with Seitz' fig. 67 i., Palearctic Fauna, in having the peculiar arrangement of the silver spots, the yellow median band of secondaries, and primaries with the black band and spots of upper side showing only faintly through on the lower surface. The brownish basal area and submarginal band of secondaries are less reddish than in the figure cited, and the yellow median band is continued almost to the inner margin. In these latter two characters the under surface of secondaries resembles Seitz' fig. 68 b of *graeca*.

An interesting character in *pales alaskensis* is the long thick hair which clothes the upper surface of the wings at the base, and on the hind wings along the inner margin.

25. *Brenthis freija* race *tarquinius* Curtis.

A few worn specimens from Aklavik, Base Camp and Black Mtn., 1,000 ft. alt., July 1 and 11, 1931. Not noticeably differing from those from the Banff region excepting that the brown color on under side of secondaries is somewhat deeper in tone and the black markings on upper side somewhat heavier. This, however, does not hold good in all of the specimens, some of them being intermediate.

26. *Brenthis polaris* (Bdv.).

Specimens from Aklavik, July 1, 1931, Base Camp, June 22, and Black Mtn., 2,000 ft., July 24, 1931, and Herschel Island, July 20, 1930. Specimens were also observed up to 3,000 ft. on Black Mtn.

Apparently this species is not common, for only a few specimens were obtained from the above localities. That it also is an early butterfly is indicated by the fact that those taken June 22 and July 1 were quite fresh while those taken after that date were badly worn.

Dr. Holland states that Alaskan specimens of this species are generally lighter in color on the under side of secondaries than specimens taken in Labrador and that these lighter individuals have been named *americana* by Strand. Dr. Th. Lehman in Seitz'

Macro Lep. states that Strand described the Greenland form as *americana*, and Dr. McDunnough in Can. Ent., Vol. LX, No. 11 (Nov., 1928) also states the name *americana* was based on Greenland material and states further that *groenlandica* Skin. has priority over *americana* Strand. He adds "There is considerable variation in the amount of black suffusion on the upper side (notably in the ♀) and the maculation on the under side of secondaries and I am doubtful whether the distinguishing characters given by Strand for this race will always hold good." In the light of this uncertainty it seems best to refer the specimens under consideration simply to *polaris*. In order, however, to give a clue to their correct identity I should state that on the under side they are not as dark as Labrador individuals, and not nearly as dark as Seitz' fig. 71e, Palearctic Fauna.

27. *Brenthis frigga* race *saga* (Staud.).

Half a dozen specimens were taken at Churchill, June 20, 1930. These are considerably worn and not much can be said regarding them except that they average slightly larger than Labrador specimens but do not otherwise differ from them.

They definitely are not race *alaskensis* Lehmann = *gibsoni* Barnes & Benj.

28. *Brenthis frigga* race *gibsoni* Barnes & Benj.

A single specimen (male) taken at Aklavik, July 1, 1931, is tentatively placed here, although it does not altogether fit the description of *gibsoni*. It is *not* larger than Labrador specimens of *saga*, nor is the basal area on upper side darker.

The black median band, however, is heavy and the marginal border lightly marked. The blackish suffusion of the basal area of secondaries does not reach the median band but is restricted to basal half of the cell and the markings of both wings are clean cut. In these latter respects it fits the description of the Colorado race *sagata* described by Barnes & Benjamin in Can. Ent., June, 1923. The locality from which the specimen comes, however, would make it seem more likely that it is *gibsoni*.

29. *Brenthis frigga* race *improba* (Butler).

A small series from Herschel Island, July 20, 1930, and from Black Mtn., 500 ft. and 2,000 ft., July 24, 1931.

This small form is generally listed as a race of *frigga* but may quite possibly prove to be a distinct species.

While the markings on both surfaces are quite similar to those

of *frigga*, its uniformly very small size, dull, dark greasy looking upper surface and pale washed out under side with scarcely a trace of purplish tint would seem to support the theory of a distinct species. Another fact which points that way is that the specimen of *frigga gibsoni* was taken in the same general locality as *improba* and Bryant found that *frigga* actually occurred within 25 miles of *improba* without the slightest tendency for the two to intergrade in size or coloring.

Among the Black Mtn. series there are several which approach the description of *B. youngi* Holland, in that the outer portion of the wings is fulvous, but it is a dirty fulvous rather than a bright fulvous, and they also lack the bright fulvous under side shown in Holland's fig. 28, Pl. LV, they being a rather dull fulvous.

A strange circumstance is that these somewhat fulvous specimens came from the higher altitude.

30. *Brenthis distincta* Gibson.

Two specimens (1 ♂ and 1 ♀) from Black Mtn., 500 ft., July 11 and 15, 1931.

A comparison of the specimens with Gibson's fig. 12, Pl. IV (Rept. Can. Arct. Exp., 1913-18), of the under side and his description of the insect leaves no doubt about the identity of the above specimens. On the under side the pale areas are whiter than in the figure of the type, but I note that Dr. Gibson states that in one of the two paratypes this is also the case. The male from Black Mtn. has an alar expanse of 48 mm. and the female 50 mm.

Dr. Gibson in his description states that *distincta* is close to *B. alberta*, but compares it also with *astarte*. Judging from the two specimens before me it is my opinion that it is rather closer to *astarte*. Although duller on both upper and under surface than that species, and entirely lacking the bright red surrounding the median band of light spots on under side of secondaries, it is still possible to trace out the *astarte* pattern of markings in *distincta* notwithstanding that only two of the spots of the median band so prominent in *astarte* are at all whitish in *distincta*, and these a dull dirty white instead of the clear white of *astarte*.

It seems to be a true mountain form occurring only, so far as Bryant's observation went, on the ridge leading to Black Mtn. at about 500 ft. And it must be remembered that 500 feet on Black Mountain is an Arctic alpine region characterized by ground birch, prostrate willows, one to two inches high, and a typical alpine flora such as is found on the mountain tops of the Canadian Rockies.

31. *Phyciodes campestris* (Behr.).

Three specimens, Base Camp, July 20, 1931. Very similar to *campestris* from California. Also one specimen, July 27, 1932, apparently of this species but so badly worn and torn that its identity cannot be established with certainty.

32. *Polygonia faunus* (Edw.) race *arcticus* new race.

A series of 7 males and 7 females of this *Polygonia* was taken May 18, 1931, in grass, and on the border of woods about a lake at the base of Black Mountain, near Aklavik, N. W. Terr.

These are the first butterflies collected on the trip although some *Polygonia* were observed May 13, on the slope of Black Mtn., at 500 to 1,000 ft. altitude.

Although probably hibernated the specimens are quite fresh and clean looking. They are much smaller than typical *faunus* and much greyer on the under surface. In fact, they resemble the Rocky Mountain form *hylas* more closely than typical *faunus*. I regard this Arctic *Polygonia* worthy of at least a racial name and propose for it the name *arcticus*.

Holotype. Male. Upper side of wings reddish fulvous at base, shading off to a pale yellow fulvous towards apex of primaries. Borders of primaries dark fuscous, cleanly set off from remainder of wings; on secondaries this border is not as dark and shades off into reddish fulvous. The black spots arranged as in *faunus*, *rusticus* and *hylas*. The submarginal light spots, particularly those of secondaries, are exceedingly pale and clear cut, making them stand out conspicuously.

Under side: basal area brown mottled with grey, the brown being intensified on its outer edge; borders of primaries brownish, defined inwardly by a black wavy line, inside of which there is a series of greenish crescents; this dark border does not quite reach the inner margin of wing and fades perceptibly before reaching the apex. Borders of secondaries not as dark as those of primaries and less clearly defined; through this dark border runs a series of greenish crescents in a row parallel to the outer margin of wings, and these crescents are surmounted by light grey. The space between the dark basal area and the dark submarginal border is light grey traversed by very fine brown lines. The discal silver mark of secondaries is slender with the upper limb slightly bent, and the lower one straight and short.

The contour of both fore and hind wings is less incised or dentate than either typical *faunus* or *hylas*, and the tails are short and blunt much as in *gracilis*.

Allotype. Female. Upper side similar to male, with the submarginal light spots a trifle larger. Under side almost uniform grey brown, with the submarginal area only slightly darker than remainder of wing. Discal mark of secondaries exceedingly slender.

Expanse: Male 48 mm. Female 48 mm.

The remaining 6 males and 6 females, which I hereby designate paratypes, are very similar to the above types, the only variation worth mentioning being that in two of the females the under side is slightly more contrasty.

A few additional specimens were taken July 1 and 20. All of these, however, were badly worn and battered.

33. *Polygonia gracilis* (G. & R.).

One specimen, Black Mtn., 1,000 ft., June 12, 1931, one taken at base of Black Mtn., June 20, and two at Aklavik, July 1, 1931. All worn, having the appearance of hibernated specimens. Undoubtedly all of *Polygonia* north of the Arctic Circle are single brooded. Apparently the fresh specimens make their appearance during the latter part of the brief summer and hibernate shortly afterward, as specimens of the small Arctic *faunus* taken May 18, were fresh and clean looking while all *Polygonia* taken later in the season up to July 20 were badly worn.

The above specimens are identical with specimens from Dawson, Yukon Terr., Chatanika, Alaska, and Circle, Alaska.

34. *Aglais j-album* (Bdv. & Lec.).

A single specimen was taken at Norman, N. W. Terr., Sept. 1, 1932. Quite typical but small (expanse 66 mm.) and the tails rather short and pointed.

35. *Aglais antiopa* race *hyperborea* Seitz.

One worn specimen from Aklavik, July 1, 1931. Agrees perfectly with fig. 93f, Seitz Macro Lep., Vol. V, in its smaller size, lighter ground color, white marginal band sprinkled with blackish and in having the black submarginal band enclosing the blue spots, more clearly set off from the rest of the wing than in the typical form. The under side is paler and has an indistinct curved pale band crossing both wings.

36. *Lycaena dione* (Scud.).

One male specimen bred from larva collected at Tilley, Alta., just before starting to go north. Quite typical.

37. *Lycaena helloides* race *flerus* (Edw.).

Seven females from Base Camp, July 27, 1932. These were taken on flowers of *Potentilla* and are much worn. They are small, measuring 28 to 32 mm., and quite dark, with the fulvous submarginal crescents of hind wings obsolescent.

38. *Everes amyntula* (Bdv.).

A small series was taken at Aklavik, Base Camp and Black Mountain, July 1 to 24, 1931. The specimens are all worn.

The males are quite dark purple above and both sexes are more greyish beneath than typical *amyntula* from California and Vancouver Island, with the black spots small but distinct.

They are also smaller, and in fact seem intermediate between *amyntula* and *comyntas* in some respects.

39. *Plebejus scudderii* (Edw.).

Two females from 50 miles northeast of Aklavik, August 9, 1930. Although captured in the same locality and on the same day, they are quite unlike each other. One seems nearest race *kodiak* (Edw.) while the other is very much nearer race *aster* (Edw.) in appearance. It resembles that form in size and in the black spots on the margin of the wings and in the entire absence of orange lunules and black crescents on the upper side of hind wings. The color of the upper surface is a dull purplish-blue with fuscous only on margin of primaries and costa of secondaries. The under side, however, is more like a weakly marked *scudderii* or *kodiak*.

A good series of *scudderii* from this region would most likely prove exceedingly interesting.

40. *Plebejus aquilo* race *suttoni* Holland.

A small series from Churchill, June 25, 1930. Males silvery grey above, females smoky grey. On under side all the markings are more sharply defined and blacker than in specimens of *aquilo* from Labrador, reaching the costa of hind wings as described by Dr. Holland. The black spots on under side of primaries are prominently ringed by white, making them stand out conspicuously. In size these specimens average a trifle larger than Labrador *aquilo*.

41. *Plebejus aquilo* race *bryanti* new race.

From Black Mountain, 500 ft. altitude, there are 2 males, captured July 24, 1931, which differ from all of the described forms of *aquilo*. They are larger than race *suttoni*, measuring 26 mm. and 28 mm., respectively. On the upper side they are a dark

smoky blue-grey, with still darker margins somewhat on the order of *rustica* (Edw.). On the under side the primaries are like *suttoni* but the secondaries are practically devoid of black spots, the white spots standing out prominently against the dark brown ground. There is also one female, extremely dark blackish-brown on upper surface, but with under surface identical with that of the 2 males.

This specimen was reared from a red and green slug caterpillar collected by Bryant, June 20, on Black Mtn. at 2,000 ft.

The mature insect emerged July 10, and is dwarfed.

For this new race I propose the name *bryanti* in honor of Mr. Owen Bryant, who discovered it and whose tireless work in the field of entomology has contributed much to our knowledge.

There is a fourth specimen, a male, captured also on Black Mountain at 2,000 ft. on the same date as the foregoing males, which strangely enough is a pale silver grey above, and resembles *rustica* beneath. This may be an aberrant individual.

Aquilo, like many of the blues, seems to vary greatly according to locality.

42. *Plebejus saepiolus* (Bdv.).

A few specimens were taken at Aklavik, July 1, and at Base Camp, July 15, 1931. These are small and come nearest to race *insulanus* Blackmore, but are paler and duller looking above. They fit the description of *amica* Dew. somewhat indifferently.

43. *Plebejus optilete* race *yukona* Holland.

A small series of this pretty and interesting little blue from Black Mtn., 500 ft., July 11 to 24, 1931. The specimens are quite typical, agreeing perfectly with Holland's figures; the color of the upper side and markings of the under side are so characteristic that there is no mistaking the species.

44. *Glaucopsyche lygdamus* race *couperi* Grt.

About a dozen specimens taken at Aklavik and Base Camp between June 24 and July 20, 1931. The males are very pale silvery blue above, and fairly dark beneath, with black spots on both wings distinct and ringed with white. They agree most nearly with Holland's figures of *afra* Edw. on Plate LXXIII of the revised Butterfly Book. The females vary in the amount of fuscous of upper surface, and also in the degree of dark color of under side. This is another of those blues which change their appearance with nearly every change in locality.

45. *Lycaenopsis pseudargiolus* form *marginata* (Edw.).

One male from Base Camp, June 17, and 3 males and 1 female from Aklavik, July 1, 1931, the latter already badly worn. The Base Camp specimen has the brown spots at base of secondaries somewhat enlarged but not fused so as to form a blotch as in form *lucia*. One worn female from McPherson, July 27, 1932, has these brown spots somewhat fused.

46. *Pyrgus centaureae* Ramb.

A single specimen taken at Base Camp, July 11, 1931. This is somewhat smaller than Labrador specimens. Ground color of upper surface a more decided black; the white spots smaller, those of primaries clear cut. Under surface very dark, the white spots clear cut and prominent. It is the only Hesperiid taken in the four seasons' collecting in the Arctic.

SUMMARY.

While each of the localities in which collections were made by Owen Bryant has peculiar conditions of its own, as pointed out by him, and which may affect their respective fauna, it is thought that for the purposes of a summary of the butterflies collected, these localities may be divided into three divisions, namely: Churchill, Man.; Herschel Island, Yukon Terr.; and Mackenzie Region, N. W. Terr.

At Churchill the following species were taken:

Colias gigantea
Colias palaeno chippewa
Colias hecla glacialis
Oeneis taygete
Oeneis polixenes
Oeneis melissa semidea
Erebia rossii ornata
Brenthis aphirape dawsoni
Brenthis frigga saga
Plebejus aquilo suttoni

On Herschel Island the following were found:

Colias hecla glacialis
Colias nastes rossii
Erebia fasciata
Erebia herscheli
Brenthis aphirape dawsoni

Brenthis chariclea arctica

Brenthis polaris

Brenthis frigga improba

And in the Mackenzie Region, where most of the collecting was done, were found:

Papilio machaon aliaska

Ascia napi arctica

Colias hecla glacialis

Colias eurytheme eriphyle

Colias pelidne

Colias palaeno chippewa

Colias nastes subarctica

Coenonympha kodiak yukonensis

Oeneis jutta

Oeneis cairnesi

Oeneis taygete

Erebia discoidalis

Erebia fasciata

Erebia youngi

Brenthis aphirape alticola

Brenthis chariclea arctica

Brenthis pales alaskensis

Brenthis freija tarquinius

Brenthis polaris

Brenthis frigga gibsoni

Brenthis frigga improba

Brenthis distincta

Phyciodes campestris

Polygonia faunus arcticus

Polygonia gracilis

Aglais j-album

Aglais antiopa hyperborea

Lycaena helloides florus

Everes amyntula

Plebejus scudderii

Plebejus aquilo bryanti

Plebejus saepiolus

Plebejus optilete yukona

Glaucopsyche lygdamus couperi

Lycaenopsis pseudargiolus marginata

Pyrgus centaureae

In the summer of 1933, Mr. A. T. Harper, of McCready, Man.,

collected at Churchill, and in the month of July took some species of butterflies not met with by Mr. Bryant, whose collecting there did not extend into July.

Merritt Cary in his paper "On the Diurnal Lepidoptera of the Athabaska and Mackenzie Region, British America," Vol. XXI, Proc. U. S. Natl. Museum, pages 425-457, includes a fairly large number of species not encountered by Bryant, many of them, however, from the Athabasca District, not as far north as the region where Bryant's collecting was done.

In the valuable paper referred to, Merritt Cary also includes a Bibliography of works dealing with the butterfly fauna of Arctic America, which the reader will find of great interest.

An Infestation of *Blissus leucopterus* in the Catskills.—During the summer of 1932, this species was found in grassy places in no great abundance—in ones and twos here and there. On September 3, however, my field notes say it was fairly abundant at Onteora, 2 miles from Tannersville. On July 22, 1933, I was told, with the usual vague description of an insect by a non-entomologist, of an insect that was destroying lawns, which, to judge from these descriptions, might have been the Oriental beetle. It turned out to be the chinch-bug. The bugs were to be found in enormous numbers on the lawn of one of the places, from very young to last instar nymphs, but no adults, nor any of their predators. Up to this date the weather locally had been exceedingly dry for some six weeks. Again, on July 27, I found at the same place great numbers of nymphs, but no adults. The grass of this lawn was badly destroyed. Among these myriad nymphs I found one *Pagasa fusca* nymph and one *Orius insidiosus*. From this time on the seriousness of the infestation was obvious to everyone. On the dry and destroyed greens and fairways of the golf course they were in all stages. With them were to be found great numbers of the predatory lygaeid *Geocoris bullatus* Say. The bugs were still active and numerous into early September. On the other hand, at Tannersville, two miles away, they were to be found only occasionally. In the summer of 1934, however, *Blissus* was again uncommon—so much so that only one was found in early July. This possibly was because of the extreme low temperatures of the preceding winter—during 61 days the temperature did not rise above 0° at Tannersville.—J. R. DE LA TORRE-BUENO, Tucson, Arizona.