
CHAPTER VIII.

REPORT

UPON

THE COLLECTIONS OF DIURNAL LEPIDOPTERA

MADE IN PORTIONS OF

COLORADO, UTAH, NEW MEXICO, AND ARIZONA,

DURING

THE YEARS 1871, 1872, 1873, AND 1874,

WITH NOTES UPON ALL SPECIES KNOWN TO INHABIT COLORADO.

BY

THEODORE L. MEAD;

AND A LIST OF ALL SPECIES COLLECTED,

BY

W. H. EDWARDS.

CHAPTER VIII.

The following notes upon the distribution of these butterflies have been largely made out from data furnished by Dr. H. C. Yarrow, of the expedition. The observations upon the Colorado species were made by me during the summer of 1871.

My thanks are due to Henry Edwards, esq., of San Francisco, for notes upon some species whose habits were unknown to me. These will be found under the headings of the respective species.

All the *Diurnal Lepidoptera* taken by the expedition were confided to W. H. Edwards, esq., of Coalburgh, W. Va., for determination; and his original descriptions of the new species discovered by the expedition have been introduced in their appropriate places in this report. Descriptions by the same author of one or two other species have been reprinted here where there were special reasons for it; but it was not thought necessary to give descriptions of all, since much the larger number are contained in the proceedings of two or three societies, which are readily accessible to most entomologists who would be likely to possess Rocky Mountain butterflies.

In regard to the synonymy, only those names have been given concerning which any doubt is likely to arise, since synonyms which have been entirely disused for half a century or more would uselessly encumber the pages of any work, except a mere synonymic list, the more so as the entomological world now displays such activity in the production of books of this latter class.

The reference immediately following the name of the species is to the best description or figure readily accessible to American students.

One hundred and twenty-one species are now known to inhabit Colorado; in 1867, but seventy-two were recorded as from the Rocky Mountains.

For convenience of reference, a sign (+) is prefixed to species not known to be found in Colorado.

PAPILIO, (Linn.) Latr.

PAPILIO ZOLICAON, Boisd.

Papilio Zolicaon, STRECKER, "Lepidoptera," pl. 6.—MORRIS, Syn. Am. Lep., 4.

In Colorado, *Zolicaon* appears two or three weeks later than the other Papilios. It inhabits all the mountainous parts of the Territory, was brought by the expedition from Southern Utah, and occurs westward to the Pacific Ocean.

This species may be at once separated from *P. Machaon*, or its variety, *Aliaska*, by the pupillated ocellus at the anal angle of secondaries.

PAPILIO ASTERIAS, Drury.

Papilio Asterias, HARRIS, Insects Injurious to Vegetation.

Papilio Polyxenes (obsolete), KIRBY, Cat. Di. Lep., 1871.

A. Polyxenes, SCUD., Syn. List., 1875.

This butterfly occurs rarely in Colorado, New Mexico, and California; eastward becoming more abundant. I have not found the species at elevations greater than 7,500 feet. Its time of flight is June and July.

†PAPILIO BAIRDII, Edw.

Papilio Bairdii, EDW., Proc. Ent. Soc. Phila., 1866.

Allied to *Asterias*; primaries more produced and narrower, and secondaries more rounded than in that species.

Male.—Expands four inches; upper side black; both wings crossed by yellow bands as in *Asterias*, the spots being similarly shaped, but larger than in that species, and fading gradually into the black ground on the inner side; at the anal angle a rounder black spot within a spot that is fulvous above, yellow below. There is no trace of blue between the yellow bands on secondaries, as there is in *Asterias*.

Under side black; marked as above, the yellow paler; the end of the cell on primaries a little yellow; the outer ends only of the spots beyond the cell on secondaries very slightly fulvous; each of the black spaces between the yellow bands on secondaries a little sprinkled with blue scales.

Body black; shoulders brown-yellow; two dorsal and a lateral row of yellow spots on the abdomen.—*Edwards, l. c.*

This species belongs to the group of Papilios, of which *Machaon* is the type, and is one of a number of forms closely related to *Asterias*, and probably derived from that species. All of these are characterized by the spotted abdomen; that of *Machaon* is banded. The larvæ of the whole group feed on umbelliferous plants. *P. Bairdii* is still excessively rare in collections. A single specimen, the original type, was brought from Arizona in 1865, and the expedition took specimens in New Mexico in 1871, and in Arizona in 1873.

† PAPILIO PILUMNUS, Boisd.

Papilio Pilumnus, STRECKER, Illustrations of Lepidoptera, 1873.

This species was taken by the expedition in 1871. It occurs in New Mexico and southward.

PAPILIO TURNUS, Linn.

This common eastern species has occasionally been found in the Rocky Mountains, which seem to be the limit of its westward range.

PAPILIO RUTULUS, Boisd.

Papilio Rutulus, EDW., Butterflies N. A., ii.—REAKIRT, Proc. Ent. Soc. Phila., 1866.

This species is very closely allied to *P. Turnus*. The only constant distinction seems to be that in *Rutulus* the submarginal ray on the under side of secondaries is continuous; in *Turnus* it is broken up into distinct spots. No melanized females of this species are known. All the specimens have rather elongated hind wings, as is the case with New England specimens of *Turnus*. The female is not so heavily marked with blue on the secondaries as in the latter species, but occasional specimens from the Eastern States approach very closely in marking to the normal female of *Rutulus*.

Rutulus was brought by the expedition from Southern Utah; is taken in Colorado in the month of June, there frequenting open woods and hill-sides where flowers are abundant. It is common in California. In Colorado, there is no second brood of Papilio.

PAPILIO DAUNUS, Bois.

Papilio Daunus, EDW., Butterflies N. A., ii.—RIDINGS, Proc. Ent. Soc. Phila., 1862.—STRECKER, "Lepidoptera."

This species may be at once distinguished from others nearly allied by

the narrow black markings, strongly arched primaries, and the three long tails of the secondaries.

Though apparently a mountain species in Colorado, it rarely occurs far above 7,500 feet elevation. It is an exceedingly rapid flier. The species has not been recorded from any locality north of Colorado. It was taken by the expedition in Southern Utah, and is known to range southward into Mexico. The Mexican specimens are more brightly colored, and are much larger than those found farther north. In Colorado, the species does not usually exceed four inches in expanse; those from Mexico sometimes measure five and one-half inches.

In Colorado, the species should be looked for during the month of June.

PAPILIO EURYMEDON, Boisd.

This species I have taken in the mountains of Colorado at 7,500 feet elevation; the species resembles *Rutubus*, but is easily distinguished by its pale ground color. On the Pacific slope, it occurs as far north as Washington Territory.

PARNASSIUS, Latr.

PARNASSIUS SMINTHEUS, Doubleday.

Parnassius Smintheus, EDW., Butterflies N. A., i.

Parnassius Delius, var., auct.

Parnassius Phæbus, var., KIRBY, Cat.

Parnassius Smintheus was brought by the expedition from Gray's Peaks, Colorado, and from the mountains of Southern Utah. It is found throughout the Rocky Mountain region, and a single specimen has been taken near the Yosemite Valley, California, where, however, *Clodius*, as a rule, takes its place. In Colorado, the species is abundant from the first foothills to the highest peaks. At moderate elevations, the first specimens come from chrysalis in May, and are seen flying or sucking the nectar from flowers of a common species of *Sedum* before their wings have thoroughly stiffened. Two or three weeks later, the females begin to appear; they are more heavily dusted with gray than the males, and at the highest elevations are often very dark, almost black, and smaller. Probably this darker color, harmonizing with the rocks and lichens, serves as a protection to the females, which is less needed by individuals inhabiting lower and more fertile local-

ities, where they can better conceal themselves in the herbage for the night, and where the general color given by the vegetation is more brown than black.

At the higher elevations the species appears later in the season, and at 12,000 feet may be found until the last of August.

The eggs are laid on *Sedum*; in shape they are flattened spheres, above with a small conical depression, in the center of which is the micropyle. The egg is chalky-white, and to the naked eye seems covered with little granulations, except a smooth round spot below, which is the surface of attachment to the plant.

The eggs do not hatch until the following spring, when a hole is eaten through the side of the egg by the larvæ. At first these are black, with a few bristling hairs. The adult caterpillar is not known, but probably resembles that of allied European species in being smooth and nearly black, with orange dots.

† PARNASSIUS CLODIUS, Ménétriés.

Parnassius Clodius, EDW., Butterflies N. A., i.

This species was brought by the expedition from Southern Utah; specimens have been taken in Montana, but the proper home of the species seems to be nearer the Pacific coast. It has not been found in Colorado.

NEOPHASIA, Behr.

NEOPHASIA MENAPIA, Felder.

Neophasia Menapia, EDW., Butterflies N. A., i.

This western species was taken in some numbers in Colorado by the Allen expedition of 1871. They were found early in August, but the precise locality I do not know. Colorado specimens have the outer half of costal margin of secondaries tinged with vermilion *in the male*. This, I believe, is not shown by Californian examples.

The larva is unknown. I copy the following description of the chrysalis of *N. Menapia*, from a very interesting paper by Henry Edwards, esq., on the Early Stages of Pacific Coast Lepidoptera, published in the Proceedings of the California Academy of Science for 1873:—

“*Chrysalis*.—Very long and tubular, with the beak sharply pointed;

slightly thickened toward base of abdomen. A small ridge-like protuberance on the thorax, and a smaller one near the head. Color immediately after change pale yellowish-green, with three narrow dorsal stripes silvery white. The lateral stripes inclosing the stigmata are a little broader, and bent upward anteriorly. Stigmata brownish. The neuration of the wings is plainly seen, and at their base is a well defined black spot. Toward the period of emergence, the chrysalis loses its bright-green color, and becomes of a dark-olive hue, almost black above; the silvery tone of the stripes changing to dirty white, the coloration of the wings and various organs being more distinctly seen. The chrysalis is attached to the trunks of pine and fir trees, with the head invariably directed upward, and to the fronds of *Pteris*, with the head always toward the point of the frond.

“Length, 0.80 inch; width, 0.15 inch.

“I was fortunate enough to discover the chrysalis of this highly interesting species during a recent trip to Vancouver Island, but the most diligent search did not reward me with the caterpillar. It doubtless feeds upon the Douglas spruce fir (*Abies Douglasii*), and should be sought for in the early part of July.”

PIERIS, Schrank.

PIERIS OLERACEA, Boisd.

Pieris Oleracea, HARRIS, Insects Injurious to Vegetation, 1862.

P. Oleracea I met with first near Fairplay (elevation 10,000 feet), June 12, where they were not uncommon at the edges of the woods. The specimens were fresh from chrysalis, and nearly pure white below. Later in June they were seen in most places where collections were made, though not in very great numbers; the species disappeared entirely by the last of July, and there is no second brood.

PIERIS PROTODICE, Boisd.

Pieris Protodice, RILEY, Am. Ent., ii, 77.

This species occurs everywhere in Colorado below timber line, and remains nearly all summer. Specimens were brought by the expedition from Arizona, and it is known to occur in California.

PIERIS VERNALIS, Edw.

Pieris Vernalis, EDW., Butterflies N. A., i.

P. Vernalis has been found in company with *Protodice* and *Occidentalis* in the mountains of Colorado; it is widely distributed, and as yet little is known of its habits. Usually it is only seen in early spring; but my friend, Mr. G. M. Dodge, late in autumn captured a single male near Princeton, Ill.

PIERIS OCCIDENTALIS, Reakirt.

Pieris Occidentalis, REAKIRT, Proc. Ent. Soc. Phila., 1866.

Pieris Callidice, var., STAUDINGER *in litt.*

This species was brought by the expedition from Southern Utah; its range commences near the Rocky Mountains, and extends to the Pacific Ocean. In Colorado, it is found on the plains as well as at considerable elevations, and remains from May till August.

†PIERIS BECKERII, Edw.

Pieris Beckerii, EDW., Butterflies N. A., i.

Pieris Chloridice, var., ZELLER.

Primaries produced apically; slightly excavated on costal and hind margins.

Male.—Expands two inches. Upper side pure white; the texture of the secondaries slighter than that of the primaries, discovering the spots of under surface; base of wings not powdered with black, as in allied species; primaries have the apical half of hind margin bordered by small black patches or clusters of scales, diminishing in size to middle of margin; anterior to these, two similar subapical patches, and a third in upper median interspace; on the arc a dense subrectangular spot (not reaching the costa) with a central white streak; secondaries immaculate. Fringes white, except against the apical spots; there black.

Under side white; the nervules at apex and on upper hind margin bordered by black scales and suffused with greenish-yellow; the spot on interspace black as on upper side; cellular spot enlarged, its base broadened and the posterior edge excavated.

Secondaries have all the nervures and their branches yellow; those

terminating on hind margin edged by broad bands of yellow-green, reaching to the middle of disk, and connected anteriorly; three large spots of same color about the cell, two being at the outer angles, and one above and reaching the costa; another large triangular subapical spot on costa; the nervures at base also banded with green; all these bands and spots slightly sprinkled with black scales.

Body above covered with gray hairs; beneath, abdomen yellowish; thorax white; legs white; palpi white, gray on upper side and at tip; antennæ white above and at base below, beyond brown; club black, nearly covered with rows of white scales; tip pale fulvous.

Female.—Expands two inches. Primaries less produced and broader than in male; same shade of color; the marginal spots enlarged and extended to second branch of median; in addition to the three submarginal spots, which are also enlarged, is another in submedian interspace, and a streak below this along inner margin; the cellular spot much enlarged, rhomboidal, with slight central streak; secondaries have a patch on costa, and four on the marginal nervules commencing at and posterior to subcostal; also an interrupted submarginal stripe opposite cell, posteriorly indistinct; under side as in male, except that a round black spot appears in submedian interspace on primaries.—*Edwards, l. c.*

This species has recently been asserted to be identical with *Chloridice* of Europe; but this seems to me extremely doubtful, since the same thing has been lately maintained regarding *P. Occidentalis* and *Callidice*, and even *Grapta Faunus*, *Satyrus*, and *Comma* have been called varieties of *C. Album*; all these species being abundantly distinct.

P. Beckerii was found by the expedition in Southern Utah. Regarding its habits, Mr. Henry Edwards, its discoverer, writes as follows:

“This beautiful species, characterized by Mr. W. H. Edwards as the finest of the North American *Pierides*, appears to be extremely limited in its range; the only locality at present known by me being the neighborhood of Virginia City, Nev. It is an early insect, being seen on the wing, if the weather be favorable, somewhere about the 10th of April, disappearing toward the close of May. It is a rapid flier, and is taken with great difficulty. The best time for its capture is in the early morning, when it

alights frequently on the flowers of the wild mustard and other cruciferous plants; but as soon as the sun is well up, it darts away on prolonged flights, and is rarely seen by the collector.

“I observed it once in the vicinity of Washoe Lake, Nevada, in some numbers, but the day was warm, and the insects extremely wild. Nothing is known at present of the earlier stages.”

NATHALIS, Boisd.

NATHALIS IOLE, Boisd.

Nathalis Irene, FITCH, 3d N. Y. Rep.

N. Iole is found throughout the Southwestern States and in Colorado. Specimens were also brought by the expedition from Utah, the most western point from which the species has been recorded. In Colorado, at 7,500 feet elevation, the species was met with about the 20th of June; and a few days later one or two were seen in the South Park. It is not uncommon in the mountains, like several other species which at the East are rarely found north of the cotton States, although, even in New England, they would hardly be subjected to as great or such continued extremes of cold as in these parts of Colorado. *D. Berenice* and *E. Claudia* are similar examples. A partial explanation might be found in the supposition that some bird which preys upon them or their larvæ at the East may be absent in the Rocky Mountains, though, as all birds reject the *Danaidæ*, this will not explain the occurrence of *Berenice*.

ANTHOCHARIS, Boisd.

ANTHOCHARIS AUSONIDES, Boisd.

Anthocaris Ausonides, EDW., Proc. Ent. Soc. Phila., 1863.

Anthocaris Ausonoides, auct. Amer.

Taken by the expedition in Colorado, where, in June, it is quite abundant throughout the mountain district, and may then be seen depositing its eggs upon wild *Cruciferae*. The larva is yellow, striped longitudinally with lead color, and dotted with black granulations; it attains its growth early in July, and changes to a curiously horned chrysalis, pale brownish in color, with a darker lateral line. The chrysalis tapers gradu-

ally and almost equally toward either extremity, and at first glance much resembles a curled and withered leaf.

The pupa state is assumed early in July; the perfect insect escapes the following season.

A. Ausonides is also found in California, where the specimens are usually larger and the females often have the secondaries suffused with a pale-yellow or creamy tint, rarely seen in Rocky Mountain specimens.

ANTHOCHARIS CREUSA, Doubleday.

A. Creusa from Colorado very closely resembles the preceding species; the difference mainly consisting in the greater amount and darker shade of the green on the lower surface of secondaries. *Creusa* seems to be confined to the Rocky Mountains.

ANTHOCHARIS JULIA, Edw.

Anthocaris Julia, EDW., Proc. Am. Ent. Soc., 1872.

This species has only been taken near Fairplay, South Park, Colo., where I found a number of specimens, June 12 to 14, in the woods and on the banks of Beaver Creek. It is the Rocky Mountain representative of the two Californian species *Sara* and *Reakirtii*.

COLIAS, (Fabr.) Leach.

COLIAS EURYTHEME, Boisd., and COLIAS KEEWAYDIN, Edw.

Colias Eurytheme and *Colias Keewaydin*, EDW., Butterflies N. A., i.

Both species were taken by the expedition. They range from the Mississippi Valley to the Pacific Ocean, and from the level of the sea to upward of ten thousand feet elevation. They are abundant from early spring until frost. Above eleven thousand feet, they are rarely found in Colorado; in fact, the usual American types are there almost entirely replaced by Arctic species, a considerable proportion of which are common to both hemispheres.

COLIAS PHILODICE, Godart.

This is not so abundant in Colorado as either of the preceding species. Most of the specimens were taken in June. Some of them exactly resemble eastern specimens; others are paler, and have a somewhat greenish tint on both surfaces.

COLIAS ALEXANDRA, Edw.

Colias Alexandra, EDW., Butterflies N. A., i.

This species was brought from the South Park, Colorado, by the expedition in 1873. The species appears about the middle of June, and for a time is abundant on all the headwaters of the Platte. Occasionally it may be taken on the Upper Arkansas, though there it is largely replaced by *C. Scudderii*.

The eggs are deposited on wild lupines, and the young larva closely resembles that of *Philodice*. By the last of August, the species has quite disappeared. There is but one brood in the season.

†COLIAS EDWARDSII, Behr.

Colias Edwardsii, EDW., Butterflies N. A., i.

Specimens were taken by the expedition at Owen's Lake, California. Concerning the species, Mr. Henry Edwards writes as follows:

"How far this may be found in a long series to differ from *C. Alexandra*, I am unable to determine at present. It may probably prove to be an extreme variety. It is only known to me from Virginia City, Nev., where it frequents the sides of mountains, flying with great rapidity, and evidently delighting in long and restless flights. It makes its first appearance about the beginning of April, and continues on the wing to the end of June. It is decidedly a rare insect."

COLIAS SCUDDERII, Reakirt.

Colias Scudderii, EDW., Butterflies N. A., i.

C. Scudderii was found by the expedition at Twin Lakes, Colorado, where it is not uncommon in July, appearing a little later than *Alexandra*. Nearly all the females of *Scudderii* are albinoes, while in *Alexandra* white females are the rare exception.

A female, *C. Scudderii*, apparently mature, was inclosed in a box with dwarf lupines, but refused to lay eggs, although *Alexandra* laid freely upon the same. This would indicate that the species have different food plants, though of course the experiment is not conclusive.

COLIAS MEADII, Edw.

Colias Meadii, EDW., Butterflies N. A., i.

C. Meadii was first met with on the Arkansas divide, between Fairplay and California Gulch, Colorado, on the 8th of July. In the same locality, two weeks later, it was especially abundant, and thirty-four specimens were taken. Others were found on Mount Lincoln and Gray's Peaks. It is a strictly alpine insect, being scarcely ever found as low as 10,000 feet above the sea, and having its proper home just at timber line, or a little above. It disappears about the middle of August. In the Arctic regions of Europe and America, a species (*C. Hecla*) is found, resembling this in color and marking, but differing structurally; and Dr. Staudinger informs me that a very similar species is met with at high elevations in the Himalayahs.

TERIAS, Swain.

†TERIAS NICIPPE, Cramer.

This, unlike many other southern forms, does not seem to range northward in the Rocky Mountains. Specimens were taken by the expedition in Arizona; and it is recorded from San Diego, Cal.

DANAIS, (Latr.) Godart.

DANAIS ARCHIPPUS, Cramer.

Danais Erippus (obsolete), KIRBY, Syn. Cat.

Danais Plexippus (obsolete), SCUD., Syn. List, 1875.

Abundant everywhere in the Rocky Mountains below timber line.

DANAIS BERENICE, Cramer.

Danais Gilippus, SMITH-ABB., KIRBY, Cat.

Taken by the expedition in Southern Utah. In Colorado, this species is rare; one specimen was seen near Georgetown. It should be looked for early in August.

EUPTOIETA, Doubleday.

EUPTOIETA CLAUDIA, Cramer.

Argynnis Columbina, MORRIS, Syn. Lept. N. A.

Brought by the expedition from Arizona and Colorado. The species may be found among the foot-hills of the Rocky Mountains in May, and

soon becomes very abundant throughout the whole region. The specimens are quite similar to those of the Southern States, though perhaps a shade paler below. During July, the eggs are laid upon a species of *Sedum*; in some localities, on almost every little clump of the plant one or several eggs of *Claudia*, with occasionally one of *P. Smintheus*, may be found.

The eggs soon hatch, but the season is so short that in all probability the larvæ hibernate when half grown. The mature larva is dark reddish-brown, with steel-blue spines; the skin is highly polished, seeming to have a glaze like that of some stone ware. The chrysalis somewhat resembles that of *Melitæa*; it is pale-gray, with some yellow dots.

ARGYNNIS, Fabr.

† ARGYNNIS NOKOMIS, Edw.

PLATE XXXV, FIGS. 1, 2, 3, 4.

Argynnis Nokomis, EDW., Butterflies N. A., i.

Specimens of this magnificent insect were brought by the expedition from Arizona in 1871. Until that time but a single male was known—from the Bitter Root Mountains of Montana.

† ARGYNNIS NITOCRIS, Edw.

Argynnis Nitocris, EDW., Trans. Am. Ent. Soc., v.

Male.—Expands three inches. Upper side bright fulvous, much obscured by brown from base to middle of disk, except upon a portion of cell of primaries; both wings edged by two parallel, fine, black lines, which, on secondaries, inclose a rather broad fulvous space, on primaries a narrower space, divided by the black nervules; anterior to these lines on primaries a series of black lanceolate spots, the three or four next apex connected and resting upon the inner line, the others separated and not touching the line. On secondaries, a series of lunular separated spots; the rounded, extradiscal spots, as in *Nokomis*; small on secondaries, rather large on primaries. The markings on disk and to base as in *Nokomis*, heavy on primaries, light on secondaries; the discal band on the latter broken into small, separate lunules. The spot on the arc like the letter S. Fringe of secondaries light-fulvous; of primaries deep-fulvous. Black at tips of nervules.

Under side of primaries cinnamon-red from base to hind margin, and over entire wing, except a small subapical space across the subcostal nervules, which is bright ochraceous-yellow, and a brown patch just anterior to this on costal margin. The black markings repeated. The five lanceolate spots next apex inclosing silver lunules. Three silver spots on the brown costal patch, one of them minute.

Secondaries deep ferruginous from base to outer edge of the second row of spots; between this and the outer row a clear space, as in *Cybele*, bright ochraceous-yellow. The seven submarginal spots narrow segments of circles, edged above with ferruginous; the second row seven, rather small; the first, second, and sixth equal, subrotund; the third and fifth long oval; the fourth minute, and seventh sublunate; all heavily edged above with black. The third row of three large spots, the first and third sublunate, the second rounded, edged above with black. In cell a round spot, and below cell an oval, both ringed with black; all these spots well silvered; a silver patch at base of cell, and another at base of subcostal. Shoulder and abdominal margin lightly silvered.

Body above fulvous; beneath fulvous, with buff and gray hairs; legs fulvous; palpi fulvous, buff at sides; antennæ fuscous above, fulvous below; club black; tip fulvous.

Female.—Unknown.

From one male taken at White Mountains, Arizona, by H. W. Henshaw, August, 1873.—*Edwards, l. c.*

ARGYNNIS APHRODITE, Fabr.

Argynnis Aphrodite, EDW., Butterflies N. A., i.

This species was taken by the expedition in Arizona, and occurs also in Colorado, though it is very rare. These far western specimens differ considerably from the usual eastern type in being of a deeper hue; the males especially being darker red-brown below.

†ARGYNNIS NAUSICAA, Edw.

Argynnis Nausicaa, EDW., Trans. Am. Ent. Soc., v.

Male.—Expands 2.5 inches. Primaries strongly arched, moderately produced; hind margin straight.

Upper side deep-red fulvous on primaries, brightest on outer limb of secondaries, much obscured on basal area of each wing, but especially on secondaries, the dark portion reaching quite to the mesial band; hind margins edged by two heavy parallel lines, inclosing very narrow fulvous spaces throughout, divided by the black nervules; the submarginal lunules large, not touching the marginal lines, and inclosing spots of the ground color, except at apex of primaries, where they are paler; the rounded spots large; the mesial band heavy, confluent on secondaries; the marks in cell of primaries as in the allied species; on disk of secondaries a mark like the letter C inverted; fringes fulvous, fuscous at ends of nervules.

Under side of primaries almost wholly cinnamon-red, there being but a ferruginous patch near apex and buff in the middle of the subcostal interspaces; the markings repeated; the submarginal lunules black, the upper ones edged above by buff; the four or five inclosed spots next apex lightly silvered. Secondaries dark ferruginous, mottled very slightly with buff; the band between the two outer rows of spots clear buff, narrow, much encroached on by the ground color; all the spots well silvered; those of the outer row long, narrow next inner angle, lunular, and broad on the upper half of the wing, all edged anteriorly by ferruginous; of the second row, the first and fifth are largest and equal, long semi-oval, the sixth same shape, one-half the size of the fifth; the second and third equal, long, and narrow; the fourth minute; the seventh sublunate, all edged anteriorly by black; the third row of three spots sublunate, edged with black, in the cell two round spots, and below cell an oval, all ringed with black; a silver spot in subcostal interspace; the shoulder and inner margin lightly silvered.

Body dark fulvous, beneath gray fulvous on thorax; the abdomen buff; legs buff; palpi buff at sides, fulvous in front and at tip; antennæ fuscous above, fulvous below; club black; tip ferruginous.

Female.—Same size. Upper side deep fulvous, less obscured at base; the marginal lines on primaries confluent, and the lunules large, resting on the lines; the inclosed spots whitish next apex.

Under side of primaries as in the male, except that the upper outer part of cell is buff as well as the subcostal interspaces; on the ferruginous

ains at all elevations up to timber line, and continues on the wing till late in August. Like many other *Argynnides*, the species becomes very scarce after its first appearance; in August suddenly re-appearing, the females seeming fresh though never quite perfect, while the males are old and worn.

At this time, the females begin to lay their eggs, and do not finally disappear until killed by the September frosts.

†ARGYNNIS NEVADENSIS, Edw.

Argynnis Nevadensis, EDW., Butterflies N. A., i.

This species seems to represent *A. Edwardsii* on the Pacific slope of the Rocky Mountains. It was originally discovered by Mr. Henry Edwards near Virginia City, Nev., and subsequently brought by the expedition from Southern Utah.

ARGYNNIS MEADII, Edw.

Argynnis Meadii, EDW., Trans. Am. Ent. Soc., 1872.

One specimen of this species was taken by me in Colorado at Turkey Creek Junction on the 6th of June. Several specimens have been brought from Montana.

The three closely allied species, *Edwardsii*, *Nevadensis*, and *Meadii*, seem to be related to each other in very much the same way as the eastern *Aphrodite*, *Cybele*, and *Atlantis*. In *Edwardsii*, the pale submarginal band below is narrower and sometimes almost obsolete, as in *Aphrodite*, and it ranges up to greater elevations than *Nevadensis*, which has this band comparatively broad in both sexes, as we see in *Cybele*. *Meadii* differs from either in tint, especially in the female; it is somewhat smaller, and probably, like *Atlantis*, is exclusively confined to the mountains. The peculiar bright-green coloration of the under side of secondaries in *Meadii*, however, has no parallel among our fritillaries.

ARGYNNIS EURYNOME, Edw.

Argynnis Eurynome, EDW., Trans. Am. Ent. Soc., 1872.

A. Eurynome was brought by the expedition from Twin Lakes, 1873. I found my first specimens, July 6, at Fairplay. After this, the species became quite abundant. It was taken in all parts of the South Park, on the Continental Divide, and in the Middle Park. A single specimen was

taken in California Gulch, which showed no trace of the usual silvering on the under side.

A female was placed in an ordinary tin vegetable can containing violet plants, and top covered by a cloth. Numerous eggs were obtained. These are more rounded than those of *Atlantis*, and their marking is more delicate.

ARGYNNIS MYRINA, Cramer.

Argynnis Myrina, HARRIS, Insects Injurious to Vegetation.

A few specimens were found in the Middle Park, Colorado, early in August. The species is said to occur in California.

ARGYNNIS BELLONA, Fabr.

Argynnis Bellona, HARRIS, Insects Injurious to Vegetation.

A single specimen, fresh from chrysalis, was taken near the Hot Springs, Middle Park, August 14.

The larva of *Bellona* resembles more closely that of *Cybele* than that of *Myrina*, thus affording additional evidence of the artificial character of the genus *Brenthis* erected to contain these smaller *Argynnides*.

ARGYNNIS EPITHORE, Boisd.

Argynnis Epithore, EDW., Proc. Ent. Soc. Phila., 1864.

Specimens from Colorado differ from Pacific coast individuals in having the dark markings of the upper side coalescent toward the base; below, the secondaries are darker purple, and show slight differences in the arrangement of the median band of spots. In Colorado, the species frequents the same localities as *A. Freya*, and has similar habits, but appears from one to two weeks later in the season, disappearing about the last of June. Both were found on Beaver Creek, near Fairplay, and near the Kenosha House, four miles from the South Park; elevation, 9,000 feet.

ARGYNNIS FREYA, Thunberg.

Argynnis Freya, GODART, Encyc. Méth. IX.,

A. Freya occurs in Arctic Europe, Labrador, and Colorado. It is first to appear of the small species of *Argynnis*. In May, or early in June, it may be found in some numbers near the South Park.

LEPIDOPTERA—NYMPHALIDAE—MELITÆA CHALCEDON. 757

The small mountain streams in Colorado often widen and form swampy belts, perhaps fifty yards in width, overgrown with willows, grass, and herbage; violet plants are also abundant. Such boggy places are the favored resort of these butterflies. They often alight on the bushes and also on flowers, when alarmed flying up like some moth. Their wings move rapidly, and in this respect almost remind one of *Alypia*. The species almost entirely disappears by the 20th of June.

ARGYNNIS TRICLARIS, Hübn.

Argynnis Triclaris, HÜBN., Exotische Schmetterlinge.

The first specimens of this species were taken near the Kenosha House, June 29, but it was found more abundantly near Fairplay.

The species has been considered a mere Arctic variety of a European species (*A. Apherape*, Hübner), but all the Colorado specimens show great uniformity of marking; and the asserted existence of intergrades upon the continent of Europe cannot affect the status of our species, though perhaps furnishing an indication of the origin of the European form, as it would seem probable that the widely distributed and hardy *Triclaris* may be the parent species.

The last specimen of *Triclaris* was taken in the Arkansas Valley, July 14; the species seems to be rather local, though abundant near Fairplay.

ARGYNNIS HELENA, Edw.

Argynnis Helena, EDW., Trans. Am. Ent. Soc., 1871.

This species is nearly allied to *Chariclea*, Herbst, and seems to be its Rocky Mountain representative. It inhabits the highest peaks, and was found throughout all parts of the Snowy range which were visited. At 13,000 and 14,000 feet, though the temperature must descend below the freezing point every night through the summer, the species seems perfectly at home, and is often more abundant than below. Specimens may be found until the first of August.

MELITÆA, (Fabr.) Westwood.

MELITÆA CHALCEDON, Doubleday.

Melitæa Chalcedon, EDW., Butterflies N. A., i.

Said by Reakirt to be found in the Rocky Mountains. I took one

MISSISSIPPI
EXPERIMENT STATION,
NO.

specimen at Turkey Creek Junction, which may be referable to this species, but it is certainly not a common species in the Territory.

MELITÆA ANICIA, Doubleday.

Melitæa Anicia, EDW., Proc. Ent. Soc. Phila., 1862.

The expedition of 1873 took this species in the South Park, Colorado; I did not meet with it in the Territory. Mr. Henry Edwards writes concerning it:—

“About this species there has been considerable confusion, Boisduval having unhesitatingly stated its identity with *Editha*, Boisduval. This, however, is an error. In a long series of this species, the form of the wing will alone be sufficient to distinguish the two forms.

“In *Editha*, the apices are rounded, and the wings are broader than in *Anicia*, while the ground color of the latter may be called red, that of *Editha* being black with red and white tessellations. *Anicia* is a mountain species, and is extremely abundant near Virginia City in May. I have taken it in several spots in the Sierra Nevada, particularly in Bear Valley, Placer County, and near Donner Lake. The caterpillar has been described to me as wholly black, feeding on a species of *Prunus*, but I am unable to verify this statement from my own observations. I am inclined to think that *M. Nubigena*, Behr. will be found to be a depauperated form of this species.”

MELITÆA NUBIGENA, Behr.

Melitæa Nubigena, BEHR., Proc. Cal. Acad. Nat. Sci., 1863.

M. Nubigena is quite common throughout the mountain district of Colorado in June and July. Several larvæ, probably of this species, were found, usually near the ground, concealed in the herbage or on the stems of their food plant, an indigenous species of *Plantago*. The ground color of these larvæ is white, slightly marbled with black; the head is black, bilobed, hairy. On the second segment is a black, collar-like mark. Each of the succeeding segments, except the last, bears seven black spines, finely bristled. The bases of the dorsal row yellowish; those of the adjacent rows black, and so on, alternating. Length, 1 inch. One larva suspended itself June 19, and became a chrysalis the next day. Pupa whitish-gray, marked with black and yellow dots, much as in *Phaeton*.

Unfortunately, none of the specimens reached maturity, so that the species remains a matter of conjecture; but *Nubigena* is by far the most abundant *Melitæa* in their locality.

MELITÆA EURYTION, Edw.

Melitæa Eurytion, EDW., MS.

This species is found associated with *Nubigena* in Colorado, but is much rarer, and does not seem to range to quite so great elevations. The most obvious point of distinction from *Nubigena* is that the yellow spots of the latter are largely obscured in *Eurytion* by fulvous.

†MELITÆA LEANIRA, Felder.

PLATE XXXVII, FIGS. 5, 6, 7, 8.

Melitæa Leanira, FELDER., Lep. Frag. Wien, 1859.

This species, which is by no means rare in California, has been taken in Southern Arizona by the expedition.

†MELITÆA PALLA, Boisd.

Melitæa Palla, BEHR, Proc. Cal. Acad. Nat. Sci., 1863.

This species was taken by the expedition of 1871, probably in Utah or Nevada. It is not known to occur in Colorado. Mr. Henry Edwards writes regarding it:—

“This is one of the commonest and most variable of Pacific coast butterflies, and is found in every cañon in California and Oregon from April to July. It is dimorphous—one form of the female being blackish, while the other is foxy-red. All intermediate grades are found, and suffused varieties are by no means rare.

“On a sunny day in May, this insect may be seen in countless numbers settling upon flowers; and as it is rather a lazy species, good specimens are easily obtained. The form described by Dr. Behr as *M. Whitneyi* is, I think, only a mountain variety, as I have recently met with some specimens near San Francisco which bear a remarkable resemblance to his types.”

“*Larva*.—Dull-black, with a double dorsal row of orange spots, forming, when viewed longitudinally, two interrupted lines. In the spaces between the spots are some irregular white patches. Along the sides are two simi-

lar double rows of orange blotches, with white spaces about the spiracles. The spiracles themselves are black. Each segment is provided with five rather long spines, from each of which project about sixteen or eighteen long black hairs. The base of each spine is surrounded by a dirty-white ring, and some minute white irrorations are scattered over the whole upper surface between the spines. Head rather small, black, very glossy. Feet ash-color, banded with black. Length, 1.05 inch. Food-plant, *Castilleja breviflora*.

"The caterpillars feed chiefly on the flowers, and are solitary in their habits, only one being usually found on each plant.

"*Chrysalis*.—Fawn-color, very faintly marked with pale-brown dots and dashes over the entire surface. On the thorax are two raised, shining points, and each of the segments, except the two last, possess a treble row of small, shining tubercles."

†MELITÆA HOFFMANNII, Behr.

Melitæa Hoffmannii, BEHR, Proc. Cal. Acad. Sci., 1863.

This species was also brought in by the expedition of 1871, but is not known from Colorado. Of it Mr. Henry Edwards writes:—

"*M. Hoffmannii*, Behr.—A very distinct and rather rare species, found only in the warm valleys of the Sierra Nevada, where it loves to fly among the flowers of *Compositæ*, and particularly the various species of *Artemisia*. I have taken it from May to July, but only at distant intervals, and never at a less altitude than from 2,500 to 3,000 feet above the sea level."

MELITÆA CALYDON, Edw.

Melitæa Calydon, EDW., MS.

M. Calydon was only found at Turkey Creek Junction, Colorado, June 20 to 30. About twenty-five specimens were taken. This species is allied to *Palla* of California, to which the males are very similar; the resemblance between the females, however, is less noticeable.

MELITÆA ARACHNE, Edw.

Melitæa Arachne, EDW., Trans. Am. Ent. Soc., 1869.

This species was quite rare, but occurred here and there in the mountain district below 9,000 feet, and one specimen was also taken on the plains

near Denver. Specimens were taken on Turkey Creek in June, at Twin Lakes about the middle of July, and near Denver on the 20th of August; this last specimen was quite fresh, so probably there is a second brood in the warmer parts of Colorado.

†MELITÆA MINUTA, Edw.

PLATE XXXVI, FIGS. 1-2.

Melitæa Minuta, EDW., Proc. Acad. Nat. Sci. Phila., 1861, 161.

This beautiful species, originally described from Texas by Mr. Edwards, was taken in the vicinity of Santa Fé, N. Mex., by Mr. H. W. Henshaw. Not known to occur in Colorado.

†MELITÆA ACASTUS, Edw.

Melitæa Acastus, EDW., Trans. Am. Ent. Soc., 1874.

Male.—Expands 1.5 inches. Size and form of *M. Palla*; *paler fulvous*; the spots and bands closely like that species, and on a fuscous ground; fringes similar also.

Under side of primaries pale fulvous, reddish next base and across the disk next the submarginal spots, yellow fulvous at extremity of and below cell and along the origin of the nervules; a fuscous patch on middle of inner margin, and four fuscous, rounded spots forming a bent oblique line reaching from costal edge to median nervule; hind margin edged by a narrow fulvous band, slightly wavy on inner edge; submarginal spots large, lanceolate, yellow-white, the three next inner angles suffused with fulvous; the three subapical spots yellow-white on fuscous ground; costal edge yellow-white.

Secondaries nearly covered with large yellow-white spots, in bands, separated by fuscous lines; the marginal edge bordered as in primaries; the submarginal spots lunular; the spots of second row small, subrectangular, and each except the two outer having a minute orange spot near its posterior edge, sometimes represented by a few scales only; the spots of the third, or discal row, long, conforming to the interspaces, almost a continuous band, the nervules that divide them being but partially fuscous; the anterior portion of these spots, on both margins, cut off by an irregular black line; the fourth row is basal and is separated from the third by a

broad space, and consists of four irregular, confluent spots; the outer edges of the band thus formed edged with black; the fourth spot confluent with the concolored abdominal margin; in cell, an orange bar on either side the triangular spot; a similar bar in the interspace above cell, and an orange lunule in submedian interspace next submedian nervure, and a small orange triangle at origin of lower branch of median; an orange bar also next the basal side of the fourth band. Body above black, with fulvous hairs; rings of abdomen edged with yellow; below, thorax and abdomen yellow-white; legs pale fulvous; palpi same above, yellow-white in front; antennæ fuscous, with narrow, white rings, below orange cretaceous next base; club fuscous, orange below and at tip.

Female.—Expands 1.9 inches. Color of upper side sometimes like male, sometimes paler. In some individuals, the submarginal spots and the third, or discal row, are paler than the rest of the wing, and the three outer rows on primaries likewise paler. Under side similar in color and markings to male.

From Montana, Nevada, and Southern Utah. Specimens have been received from the geological expedition for exploration of the Territories, and from this survey of 1872; also from Henry Edwards, esq. This species is at once distinguished from its allies by the yellow-white under surface, especially of secondaries; this color nearly occupying the whole wing.—*Edwards, l. c.*

PHYCIODES, Hübn.

PHYCIODES NYCTEIS, Doubleday.

Phyciodes Enone, SCUD., Proc. Essex Inst., 1863.

Occurs occasionally in the mountains at about 7,500 feet elevation late in June. Colorado specimens are much darker than those from the Eastern States; the black sometimes covering two-thirds of the surface above. Specimens from Texas in my collection are about intermediate between this heavily marked form and the usual eastern type.

PHYCIODES CARLOTA, Reak.

Phyciodes Carlota, REAKIRT, Proc. Ent. Soc. Phila., 1867.

M. Ismeria, 1833, BOISD. (never recognizably described or figured).

Not uncommon at the lower levels and near Denver. Females much

worn were taken early in June, so it is probable that the species appears about the first of May on the plains, though somewhat later in the mountains. None were seen in the neighborhood of the South Park at above 8,000 feet.

PHYCIODES THAROS, Boisd.

Phyciodes Tharos, HARRIS, Insects Injurious to Vegetation.

P. Tharos was found quite abundantly on Turkey Creek with *Carlota* and *Nycteis*. Like the latter, these are slightly darker than eastern specimens, but otherwise quite indistinguishable.

PHYCIODES MARCIA, Edw.

Phyciodes Marcia, EDW., Trans. Am. Ent. Soc., 1868.

With *Tharos* were also found one or two specimens of *Marcia*, in no wise differing from types of the species. It was also taken by the expedition in 1871, but the precise locality is not given.

PHYCIODES PALLIDA, Edw.

Phyciodes Pallida, EDW., Proc. Ent. Soc. Phila., 1864.

Brought by the expedition from Southern Utah. One specimen was taken in Colorado, probably at a low elevation.

PHYCIODES MATA, Reakirt.

Phyciodes Mata, REAKIRT., Proc. Ent. Soc. Phila., 1867.—STRECKER, Illustrations Lepidoptera, 1874.

The type of this species was collected in Colorado; since then none have been seen. The original description states that the specimen was bleached and faded. This is contradicted by Mr. Strecker in No. 8 of his "Illustrations", because the specimen had not been exposed to light after its capture; but I have taken several specimens of a *Phyciodes* near Salt Lake City, which had certainly been bleached by the action of the weather, and it seems to me probable from the figure and description that *P. Mata* is a faded specimen of *P. Pallida*, having the pale bands slightly more pronounced than in the usual type. This manner of variation is well exemplified in *P. Camillus*, the females of which sometimes have the usual yellow median and marginal bands pure white below (var. *Emissa*, Edwards).

PHYCIODES CAMILLUS, Edw.

Phyciodes Camillus, EDW., Trans. Am. Ent. Soc., 1871.

This is the most abundant *Phyciodes* in the mountains of Colorado, and is found at all elevations below timber line during the whole summer. These butterflies are very fond of flowers but do not often congregate at wet spots in the road like *Tharos*. Some of the males resemble that species quite closely, though of a different shade of fulvous above, and the under surface more resembles *Batesii*, Reakirt. The females are quite distinct; the most nearly allied species is the Californian *P. Pratensis*, Behr.

† PHYCIODES CANACE, Edw.

Phyciodes Canace, EDW., Proc. Am. Ent. Soc. Phila., 1871.

The type of this species was taken in Southern California. The only other known specimens are those collected by the expedition in 1871, probably in Arizona.

† PHYCIODES MYLITTA.

This species is not known to occur on the eastern slope of the Rocky Mountains; but the expedition obtained specimens from Southern Utah and Arizona.

Mr. Henry Edwards writes me as follows concerning its habits :

“ *Ph. Mylitta* is a common species in California, appearing about April, and apparently double brooded, as I have taken fresh specimens as late as August. It is an extremely restless insect, much more so than any other of the genus with which I am acquainted, and, though settling frequently, it rarely remains long in one place. The larva feeds on various species of thistles (*Carduus*, *Cnicus*, &c.). Its published description is as follows:—Head small, bronze-black, entirely covered with short black hair. Viewed from above, the whole upper surface is velvety black, each segment being provided with six tubercular spines, very hairy to their tip. The lateral row of spines is dull ash color, with black hairs; the spines being shorter than those of the dorsal region. Feet and pro-legs dull ash color; the underside of the body with a fleshy tinge. Length, 0.75 inch. This species is gregarious in its habits, and terribly destructive to the plant on which it may be hatched; in many cases only the nerves of the leaves remaining. The caterpillars spin

a small web, and draw the leaves of the plant together. Chrysalis, ash color, with a slight metallic reflection. Dorsal region with three rows of slightly raised tubercles. The anal extremity is much incurved."

SYNCHLOE, Boisd.

†SYNCHLOE CROCALE, Edw.

PLATE XXXVII, FIGS. 1, 2, 3, 4.

Synchloe Crocale, EDW., Trans. Am. Ent. Soc., 1874.

Male.—Expands 1.7 to 1.9 inches. Upper side brownish black, spotted with white; primaries have a submarginal row of points, sometimes complete from apex to lower branch of median, but usually in part obsolete, the two spots on first and second median interspaces only appearing; a sinuous extradiscal row of points or small spots across the entire wing, seven in all, but sometimes the one next inner margin accompanied by an eighth; a discal row of conspicuous spots, also sinuous, usually incomplete by the absence of one spot from upper median interspace; this spot when present minute, and a narrow spot in cell often wanting; secondaries have a transverse row of spots on middle of wing, which are regular, narrow, elongated, and equal; at anal angle, a fulvous patch, which extends a little distance up the abdominal margin; fringes white; black at tips of nervules. Under side more decidedly brown; the spots on primaries repeated; the submarginal enlarged, mostly lunate; the extradiscal also enlarged; the discal nearly as above; two spots in cell, one near arc, one near base; a third below the origin of lower branch of median; shoulder ferruginous; secondaries have a submarginal series of yellow lunules; a broad yellow band across disk; a narrow yellow stripe near base, from costal edge to submedian nervure; half way between submarginal spots and discal band a series of yellow points, tortuous, commencing on costal margin near the band, crossing the wing in a double curve, the last point being on submedian interspace; these marks vary from points to conspicuous spots, and sometimes are nearly or quite obsolete; in middle of cell a yellow point; anal spot as above, ferruginous; the upper part of abdominal margin edged with yellow; a yellow patch on shoulder.

Body above blackish-brown, below gray-brown; legs ferruginous;

palpi white in front, black above and at tip; antennæ fuscous, finely annulated with white; club black above, gray below, fulvous at tip.

Female.—Expands 2.1 inches. Similar to male. In the only specimen examined, the fulvous patch at inner angle of secondaries was absent. Below cell of primaries two white points.

From several males and one female, taken at White Mountains, Arizona, in 1873, by H. W. Henshaw, of this expedition.

I submitted one of these specimens to Mr. A. G. Butler for determination, and he informed me that two examples from Mexico were in the British Museum collection, and that they were regarded by him as a distinct species, allied to *Lacinia* and *Hippodrome*.—*Edwards, l. c.*

GYROCHEILUS, Butler.

GYROCHEILUS TRITONIA, Edw.

Geirocheilus Tritonia, EDW., Trans. Am. Ent. Soc., 1874.

Male.—Expands 2.3 inches. Upper side velvety, blackish-brown, changing to brown on hind margin of primaries, with an olivaceous tint at apex; costal edge of primaries near apex yellow-white; beyond disk a transverse row of four white points, set in middle of the upper discoidal, and three next lower interspaces; the last point sometimes wanting on upper side; secondaries have a broad marginal band of dull ferruginous, even-edged within, reaching the margin on that part of wing between submedian nervure and the upper branch of median, beyond this last receding from the margin, but usually continued past the upper branch of sub-costal, and gradually diminishing to a point, sometimes, however, terminating squarely at the lower branch of same nervure; through this band runs an indistinct undulating brown line, parallel to and near the margin; beyond upper branch of median the space between this line and margin is brown, color of apex of primaries; fringes of primaries black at tips of nervules, yellow-white in the interspaces, of secondaries nearly all fuscous, there being but a few gray hairs in each interspace.

Under side smoky-brown; the white spots repeated, enlarged three fold, each forming the pupil of a rounded, black ocellus; secondaries have a broad extradiscal band, ferruginous and lilac, with scattered yellow scales

on the posterior half of wing, lilac on brown ground apically; on the anterior edge of the band, upon small ferruginous spaces free from lilac, is a row of straw-colored points and spots, commencing in a point on the lower subcostal interspace, and continuing to submedian nervure, just before which are two points; the three spots on the three median interspaces crescent or V-shaped; in some cases these larger spots re-appear on upper side; posterior to the band the submarginal area is brown, sharply lunated, each lunation forming internally a semi-circle, and through all runs a streak of ferruginous, more or less irrorated with yellow; sometimes the streak is limited to the three interspaces next abdominal margin.

Body blackish-brown; legs brown and gray; palpi gray in front, blackish above and at tip; antennæ brown, grayish next club, gray below; club yellowish.

From White Mountains, Arizona, and taken by H. W. Henshaw in 1873. This species is near *Patrobas*, Hewitson.—*Edwards, l. c.*

GRAPTA, Kirby.

GRAPTA SATYRUS, Edw.

Grapta Satyrus, Edw., Butterflies N. A., i.

A single specimen, taken on the 24th of June, at Turkey Creek Junction, shows this species to be an inhabitant of Colorado, but it must be extremely rare, as no others were seen during the season. This species approaches more nearly the usual type of the European *C. album* than any of the numerous other American species which have been confounded with that very variable butterfly; however, the discovery of the larva of *Satyrus* has proved its distinctness beyond a doubt. *Grapta C. album* varies toward all the forms which are represented by distinct species on this side of the Atlantic, and, also, toward several besides, while our corresponding species are all remarkably constant to their types, and a glance will show to which species any specimen should be referred. It may help to explain these facts to take into consideration the differences in the geological history of the two continents. As the genus is confined to temperate climates, it is quite possible that its archetype could not be produced or exist during a geologic era when the earth was so heated as to maintain a torrid temperature over its whole surface. At the close of this period, the climate of Central North

America passed at once to a warm-temperate on account of the extension of the continent into the arctic zone, while the climate of Europe passed in succession through a tropical and then subtropical condition before becoming adapted to the well-being of organisms requiring a moderate temperature (see Dana, Geology, p. 532). Hence we may regard these varieties of *C. album* as nascent species; our corresponding forms, having been long subjected to the action of natural selection and other segregating causes, have established themselves as independent species.

GRAPTA HYLAS, Edw.

Grapta Hylas, EDW., Trans. Am. Ent. Soc., 1872.

This pretty species seems quite local; in this respect resembling its near congener, *G. Faunus*. The first specimens were seen quite high up the mountain, near Berthoud's Pass, August 16, where, at a small patch of flowering plants, fifteen specimens were netted in the course of half an hour. A few *G. Zephyrus* were seen in the same locality. On the 28th, about twenty miles from the South Park, on the South Park road, a few more were found, with many *Zephyrus* and some *Vanessas*.

G. Hylas is uniformly smaller than *Faunus*, and the exquisite gray marbling of the under surface is quite different from the marking of any *Grapta* with which I am acquainted.

Mr. Scudder has ranked this species as a dimorphic form of *G. Zephyrus*, but for this he gives no reason, and I am at a loss to imagine one, unless it be assumed that every *Grapta* is necessarily dimorphic, and that only *Hylas* can correspond to *Zephyrus*.

It seems to me, though possible, highly improbable that this will prove to be the case, as *Zephyrus* is much like *Progne*, and the characteristic mark of the under surface of secondaries is angular as in that species, while that of *Hylas* is a well formed C, resembling the mark of *Faunus* or *Comma*.

It seems also unnecessary to create a possible synonym for *Zephyrus* true type (= var. *Thiodamas*, Scudder) before any experiments in rearing the two species have been made. The case of *Faunus* and *Gracilis* is similar to this, and here the only experiment in rearing which has been tried gave a negative result; the female *Gracilis*, which Mr. Scudder obtained, refused to lay eggs upon the food plant of *Faunus* (willow), and thus died.

GRAPTA ZEPHYRUS, Edw.

Grapta Zephyrus, EDW., Butterflies N. A., i.
P. Zephyrus var. *Thiodamas*, SCUD., Syn. List, 1875.

This was by far the most abundant species of its genus in Colorado. It was first seen June 5 at Turkey Creek (7,500 feet), but did not appear until about three weeks later near the South Park (9,000 feet). About twenty-five specimens were taken in June; probably these all had hibernated. Scarcely any were seen in July, while in August about thirty more were captured. The species was brought by the expedition from Arizona and Southern Utah. It is not uncommon in California.

VANESSA, (Fabr.) Westwood.

VANESSA ANTIOPA, Linn.

Was seen here and there through the mountain region, but was not common. It was brought by the expedition from Arizona and Utah.

VANESSA MILBERTII, Godart.

Vanessa Milbertii, HARRIS, Insects Injurious to Vegetation.

In the waste places, on the outskirts of Denver, nettles were abundant, and early in June almost every plant had upon it many caterpillars of *V. Milbertii*, in various stages of growth, and the females were still depositing their egg clusters. Some of the larvæ were reared, the perfect insects emerging early in July. The species is found throughout the mountains in considerable numbers.

VANESSA CALIFORNICA, Boisd.

Vanessa Californica, BOISD., Ann. Soc. Ent. de France, 1852.

But three or four specimens were seen in Colorado, all near Turkey Creek, toward the last of June. They alight frequently in the road, or on tree trunks, but are wary and difficult to approach.

PYRAMEIS, Hübner.

PYRAMEIS HUNTERA, Drury.

Cynthia Huntera, HARRIS, Insects Injurious to Vegetation.

Not at all a common species. One or two specimens were taken about the middle of June, and also later in the season in Colorado. The expedition also found the species in Arizona.

PYRAMEIS CARDUI, Linn.

Occurs here and there in Colorado and Utah in about the same numbers as *Huntera*.

†PYRAMEIS CARYE, Hübner.

Was brought in by the expedition of 1871, probably from Arizona. It is abundant in California; specimens may often be seen even in the streets of San Francisco.

PYRAMEIS ATALANTA, Linn.

Was met with, now and then, wherever nettles were abundant.

LIMENITIS, Fabr.

LIMENITIS WEIDEMEYERII, Edw.

PLATE XXXVIII, FIGS. 1, 2.

Limenitis Weidemeyerii, EDW., Butterflies N. A., i.

A specimen was taken June 6, but no more were seen until the 24th, in Colorado. By the last of July, the species has entirely disappeared. It frequents the banks of small creeks and neighboring road sides in the mountains, but at not more than 7,500 or 8,000 feet above the sea level. The expedition took specimens in Southern Utah and Arizona; those from the latter locality unusually large and handsome.

APATURA, Fabr.

†APATURA LEILIA, Edw.

Apatura Leilia, EDW., Trans. Am. Ent. Soc. Phila., Oct., 1874.

In markings allied to *Celtis*, but with the shape of *Clyton*, the primaries being more produced and hind margin more excavated than in *Celtis*; the hind margin of secondaries more sinuous, and the inner angle more produced.

Male.—Expands 1.8 inches. Upper side of primaries next base, and partly in the median interspaces, and of secondaries throughout, light red-brown; the remainder of primaries, which comprises the apical area to median and to cell, and the discal portion of the median interspaces, fuscous; hind margins bordered narrowly by fuscous; both wings have a submarginal black stripe, and a little anterior to this, a second, which on secondaries

ries is either very slightly crenated, or is crenated next outer angle, and serrated posteriorly; primaries have a transverse discal row of seven white spots arranged in a double curve, the first two and fifth nearly equal, the third and fourth minute, the sixth and seventh, near inner margin, equal, rather smaller than the fifth, and sometimes confluent; midway between this row and the margin is a second row of white spots and ocelli, the spots, two in number, being placed on the upper subcostal and the discoidal interspaces; the three ocelli, on the lower subcostal and the median interspaces, are black, rounded, the upper one small, with an indistinct pale iris, the others large, nearly equal, and each surrounded by a pale-brown nimbus; in the cell, two transverse, equal, subreniform spots, one at the outer extremity, the other near the middle; these spots are obscure brown centrally, black at the edges, and are separated by a space that is white, irrorated with brown scales.

Secondaries have the costal margin fuscous; upon the extradiscal area a series of six black ocelli arranged as in *Clyton* and *Celtis*, the second from costa largest and back of the line, the sixth minute, the others nearly equal, rather more than half the size of the second; each surrounded by a shade slightly paler than the ground, and several having within small eccentric clusters of blue scales; on the middle of costal margin a white patch, and five small, white spots in line with this pass round the extremity of the cell; in the cell, two faint fuscous spots; fringes white in the emarginations, fuscous at the ends of the nervules.

Under side of primaries chestnut-red at base below the cell, also within the cell next base, but partly covered with gray, especially along the subcostal nervure; remainder of wing pearl-gray, showing a brown subcolor on disk, and in the middle of each interspace on the apical area, and at inner angle; the gray becoming suffused with pale-blue as it approaches the hind margin; this margin narrowly edged with yellow-brown; the submarginal lines repeated, distinct, blackish-brown; the white spots repeated, enlarged, and in addition a white patch in the outer row on costa; the lower spot of this row, in discoidal interspace, nearly conceals a small ocellus, a narrow edge of black being discernible on the anterior side, and the yellow iris being nearly complete; the other three ocelli re-appear,

enlarge, each with blue scales and a well-defined yellow iris; the cellular spots as on upper side, the intervening space being clear white.

Secondaries pearl-gray, tinted with blue near hind margin; the gray shade least dense on the disk next before the ocelli, allowing a brown sub-color to appear; the submarginal lines repeated; the inner margin also bordered by a brown line; the white discal patch and spots repeated, and the line of spots extended across the wing to inner margin, following the course of a dark, wavy line; the spots in the cell distinct, being transverse bars; the interior one prolonged into the next upper interspace; the ocelli repeated, and each containing a large, blue patch, and edged by a narrow, yellow ring, which itself is edged indistinctly by fuscous; an additional ocellus on the inner margin, small, oval, also marked with blue.

Body above reddish-brown, beneath gray on thorax, yellowish on abdomen; legs ochraceous, the tibiæ gray; palpi clear white, fulvous above and at tip; antennæ yellow-fulvous, partly annulated with white; club fuscous at base, yellow at tip.

From two ♂, taken by H. W. Henshaw, August, 1874, at Camp Lowell and in Sonoita Valley, Arizona.—*Edwards, l. c.*

LIBYTHEA, Fabr.

†LIBYTHEA CARINENTA, Cramer.

Libythea Carinenta, CRAMER, ii, pl. 108.

This rare species was brought in by the expedition of 1871, probably from near the borders of Mexico; it occurs also in Texas, and ranges southward to Brazil.

CÆNONYMPHA, Hübner.

CÆNONYMPHA OCHRACEA, Edw.

Cænonympha Ochracea, EDW., Proc. Acad. Nat. Sci. Phila., 1861.

This species was brought by the expedition from the South Park. It abounds throughout all the mountainous region of Colorado during June and July; but none were seen later than August. Seventy-five specimens were taken by me; they show no very great variations.

SATYRUS, (Latr.) Westwood.

SATYRUS NEPHELE, Kirby.

Hipparchia Nephele, HARRIS, Insects Injurious to Vegetation.

Two specimens were taken at Apex Gulch, just within the foot hills of the Rocky Mountains, early in August. No others were seen.

†SATYRUS WHEELERII, Edw.

PLATE XXXIX, FIGS. 1, 2, 3, 4.

Satyrus Wheelerii, EDW., Trans. Am. Ent. Soc., March, 1873.

Satyrus Hoffmani, STRECKER, Illustrations of Lepidoptera, June, 1873.

In the spring of 1873 Mr. Strecker called upon me, and noticing in my collection a specimen of this *Satyrus* ticketed *Wheelerii*, Edw., stated that he had possessed the species for some time, and at first had made out a manuscript description, supposing it distinct, but finally concluded it was merely a variety of *S. Gabbii*, Edw. In No. 4 of Mr. Strecker's "Illustrations of Lepidoptera", which reached me, I believe, in the early part of July, the species was figured as *Satyrus* var. *Hoffmani*; Mr. Strecker being under the impression that the name *Wheelerii* was yet unpublished. The latter name, however, has several months' priority, and must designate the species.

SATYRUS CHARON, Edw.

Satyrus Charon, EDW., Trans. Am. Ent. Soc., 1872.

Satyrus Cetus, BOISD., Ann. Soc. Ent. France.

This species was first met with near Twin Lakes on the 9th of July. It was quite abundant in the sage brush and on flowers at the edge of the lake. Later in the season, it was found in both the South and Middle Parks, though not so abundantly as in the Arkansas valley, whence the expedition also brought specimens. Altogether one hundred and thirty-one specimens were taken by me. In August, females were obtained and inclosed with grass; several eggs were laid; they are whitish and very similar to those of *Nephele*.

†SATYRUS ARIANE, Boisd.

Satyrus Ariane, BOISD., Ann. Soc. Ent. France, 1853.

This species, though rare, is known to occur in California and Nevada. It was brought from Southern Utah by the expedition.

SATYRUS MEADII, Edw.

Erebia Meadii, EDW., Trans. Am. Ent. Soc., 1872.

While riding along the South Park road, this species was discovered near Bailey's ranch, about forty-five miles from Denver, and two specimens were taken on the 26th of August. None were to be found a few miles on either side of this point, so I returned and spent a week in observing the species and noting its habits. It must be very local, since, though not at all uncommon where first met with, none were seen elsewhere during the season. It evidently first appears there about the last of July, since nearly all the specimens were dilapidated, the males especially so. The species in mode of flight much resembles *S. Charon*, often alighting on dry bare spots in the grass and walking a few steps, then, after resting a few moments, flying off to some flower or other bare spot. A few eggs were obtained; they are like those of *Charon*; when first laid the eggs are nearly white, but in the course of two or three days become mottled with pale purple.

S. Meadii was at first referred to the genus *Erebia*. In some specimens, the fulvous spots in arrangement and tint are quite similar to *E. Epipsodea*, Butler; but the strongly dilated bases of the three principal veins of primaries would indicate that it is a true *Satyrus*, and this view receives support from the fact that the marking on the under side consists of short, transverse striæ, as in the undoubted *Satyri*. This, like *S. Ridingsii*, stands alone in a group, apart from the rest of the genus, and having no known analogues on this continent though similar species are found in Europe.

SATYRUS RIDINGSII, Edw.

Satyrus Ridingsii, EDW., Proc. Ent. Soc. Phila., 1865.

About the first of June, on the plains near Denver, a few specimens were found hiding in the short, parched grass, and flying up when disturbed, exactly as is the habit of *Drasteria* among the moths. The color of these butterflies harmonizes excellently with that of the dry herbage, and renders them quite difficult of detection, even when near at hand. It appears to be a rare species about Turkey Creek, but in the sage brush country, about Twin Lakes, (Arkansas Valley, 8,000 feet elevation), is very abundant in July, appearing there in company with *Satyrus Charon*. It is, however,

much less partial to flowers than is the case with that species, and has almost entirely the habits as well as the appearance of *Chionobas* rather than *Satyrus*. Specimens were brought from Southern Utah by the expedition.

EREBIA, Dalman.

EREBIA EPIPSODEA, Butler.

Erebia Rhodia, EDW., Trans. Am. Ent. Soc., 1871.

This species inhabits the mountains of Colorado below timber line. Specimens were brought from Fairplay by the expedition. It begins to appear about the first week in June, is common by the middle of that month, and remains until the last of July.

Dr. Staudinger, in a letter to me, claims that this species is identical with some varieties of the European *E. Medusa*. Not having specimens of the latter at hand, I cannot say how far this view may be well founded; but the species was originally described by Mr. Butler, of the British Museum, who certainly had abundant material for comparison, and it seems probable that the name will stand.

EREBIA TYNDARUS, Esper, var. CALLIAS, Edw.

Erebia Callias, EDW., Trans. Am. Ent. Soc., 1871.

Above timber line (about 11,000 feet) in Colorado, *E. Tyndarus* entirely replaces *E. Epipsodea*. It is a rare thing to find the former species below that elevation, though it is quite abundant on the bleak summits of the mountains. The first specimens seen were taken on the Arkansas divide, July 8, when six specimens were captured. A few were taken on peaks near Twin Lakes; but on recrossing the divide, July 21, the species had become much more abundant, and fifty specimens were secured in a short time. *E. Tyndarus* was also found on Mount Lincoln and Gray's Peaks. None were seen after the middle of August.

Dr. Staudinger, after receiving one or two specimens of this variety (*Callias*) of *E. Tyndarus*, wrote to me that the former was not a variety of *Tyndarus*, "because it was entirely identical with that species." After carefully examining all the European specimens at my command, it seems to me that there are sufficient differences to entitle our form to a separate des-

ignation as a variety, especially as those from Colorado are remarkably constant to their type; the seventy specimens taken showing scarcely a trace of variation among themselves. In comparing the two forms, the first noticeable point is the slender and delicate appearance of *Callias*; in specimens of each having the same breadth of wing the expanse of *Callias* is one-fifth greater than that of *Tyndarus*.

Among the minor points of difference may be enumerated the following:—In *Tyndarus*, on the under side of the primaries, the fulvous mark is bordered by a brown band parallel to the margin; while in *Callias* it shades off insensibly, extending much nearer the edge at the center of the outer margin than at the apex or external angle. The wavy bands and marbling are very indistinct in *Callias*, much more so than in any specimens of *Tyndarus* I have seen; and in the males it has almost exactly the appearance of moldiness. On the upper surface, the fulvous, which in *Tyndarus* forms five or six well defined spots, in *Callias* is represented by a patch, covering a considerable portion of the wing, and scarcely showing the nervures.

CHIONOBAS, Boisd.

CHIONOBAS SEMIDEA, Say.

Hipparchia Semidea, HARRIS, Insects Injurious to Vegetation.

C. Semidea is exceedingly rare in Colorado, and is only found on the extreme summits of the mountains. Near Twin Lakes, two specimens were taken, and others seen at an elevation of 13,000 feet, on a very steep mountain. The mountain side rose so precipitously that boulders loosened near the top might sometimes be watched in their descent till lost to view three-quarters of a mile below; and just at the summit where these butterflies were found the ascent was even more difficult than lower down. The butterflies were very shy and wary; when alarmed, they usually flew, not along the side of the mountain, but either up or down, rendering pursuit almost impossible.

CHIONOBAS UHLERII, Reakirt.

Chionobas Uhlerii, REAKIRT, Proc. Ent. Soc. Phila., 1866.

C. Uhlerii was abundant in the lower mountain regions of Colorado, inhabiting grassy spots, and making only short flights when disturbed or otherwise, soon alighting and being lost to view in the short dry grass. It

may be found during the months of June and July. Seventy-three specimens were taken.

In this species, the number of ocelli above and the ornamentation of the secondaries below are quite variable. In some specimens, there is but a single ocellus—on the primaries; in others, four are present on the fore wings, and five upon the secondaries. On the under side of secondaries, some indication of the median band may generally be seen, but in some specimens the hind wings below are uniformly mottled with blackish transverse streaks; these about equally dividing the surface with the white ground color. In others, these streaks may become pale ochraceous, and quite indistinct on the outer half of the wing.

CHIONOBAS CHRYXUS, Hewitson.

Chionobas Chryxus, SCUD., Proc. Ent. Soc. Phila., 1865.

This *Chionobas* was found in more elevated regions than *C. Uhlerii*, still keeping, as a rule, below timber line. It was brought by the expedition from Gray's Peaks. My first specimens were taken July 8 on the Arkansas divide, in company with *Colias Meadii*, and other rare mountain species. It was not very uncommon by the road side. In the course of the day, eleven specimens were taken. One female was found with an egg adhering to the abdomen; this was white, melon-shaped, and considerably larger than the egg of *Satyrus Nephela*.

C. Chryxus seems to be found in small numbers through all the mountain region around the South Park, rarely, however, below 9,000 feet. None were seen after July.

THECLA, Fabr.

†THECLA HALEBUS, Cramer.

Thecla Juanita, SCUD., Proc. Bost. Soc. Nat. Hist., 1868.

Brought in by the expedition of 1871. It is a subtropical species, and occurs from Florida to California.

THECLA CRYNALUS, Edw.

Thecla Crysalus, EDW., Proc. Am. Ent. Soc., 1873.

A few specimens of this perhaps the most beautiful of our *Theclas* were brought from Lake Pass, Colorado, by the Allen expedition of 1871. They were taken early in July.

THECLA NINUS, Edw.

Thecla Ninus, EDW., Trans. Am. Ent. Soc., 1871.

Three specimens of this species were taken on willow blossoms on the South Park road, four miles from the park, on the 17th of June. No others were seen during the season.

THECLA MELINUS, Hübner.

Thecla Humuli, HARRIS, Insects Injurious to Vegetation.

This was brought by the expedition from Colorado in 1871. I took one specimen, August 3, on the Georgetown road, in the mountains.

†THECLA SYLVINUS, Boisd.

Thecla Sylvinus, BOISD., Ann. Ent. Soc. France, 1852.

This Californian species was brought in by the expedition of 1871; but the precise locality was not noted.

†THECLA SIVA, Edw.

Thecla Siva, EDW., Trans. Am. Ent. Soc. Phila., 1874.

Male.—Expands 1 inch. Upper side castaneous, slightly brown at base; the costal margin of primaries and both hind margins rather broadly bordered with fuscous; secondaries have two tails, the outer one short, the other long, 0.16 inch; both dark fuscous, tipped with white; fringes fuscous.

Under side light fulvous, washed with pale metallic-green, densely on the costal and upper part of hind margins of primaries, and over the whole of secondaries; a common pure white band crosses the disks of both wings, on primaries a little convex outwardly, and formed of lunules which are not quite confluent; on secondaries, slightly wavy, and confluent; on the basal side of this band, the fulvous ground color is deeper than elsewhere, and on secondaries several of the white spots are edged by a line of black scales; between the band and base no spots or markings on either wing; secondaries have the hind margin edged with white, the outer angle fulvous; the interspaces along the margin between the discoidal nervules and anal angle gray, caused by black scales on a white ground; on the lower median interspace above, the gray patch is a rounded blackish spot on ferruginous ground, and

this, as well as the next patch on either side, is surmounted by a black lunule; anal angle black.

Body gray-brown above, beneath dark brown, with white hairs interspersed; the abdomen yellow-gray; legs dark brown and white; palpi white, fuscous at tip; antennæ annulated white and black; club black, tipped with pale fulvous.

From 2 ♂ taken by H. W. Henshaw at Fort Wingate, Ariz., July, 1874.

This species is allied to *Castalis* and *Smilacis*, being of similar size and shape. On the upper side deeper red than *Castalis*; on the under side there is much resemblance to *Castalis* in the shades of color and in the common band. But this last is much less irregular than in *Castalis*, in which the separate spots that compose the band are not confluent, and the two in the median interspaces are much behind the line of the rest. In *Siva*, the line is scarcely broken at this point, and is confluent. In *Castalis* are two conspicuous white spots nearer base of secondaries, which are not represented in *Siva*. *Smilacis* is fuscous on upper side, and below is most like *Castalis*; the band being very irregular and the two spots next base appearing.—*Edwards, l. c.*

†THECLA CALIFORNICA, Edw.

Thecla Californica, EDW., Proc. Acad. Nat. Sci. Phila., 1862.

T. Californica resembles *T. Cygnus* very closely. In the latter, however, the stigma upon the primaries of the male ends in a blunt point; in the former, it is rounded. The species was taken by the expedition in Southern Utah.

THECLA SÆPIUM, Boisd.

Thecla Sæpium, MORRIS, Syn. Am. Lep., 99.

The first specimens seen were near Apex Gulch, Colorado, August 3. In the course of about two hours, fifty specimens, mostly females, were taken on the Goldenrod flowers (*Solidago*). No specimens were taken elsewhere.

THECLA MOPSUS, Hübner.

Thecla Mopsus, HARRIS, Insects Injurious to Vegetation.

A few specimens were taken at Apex Gulch with *T. Sæpium*, and others were obtained toward the last of August at Bailey's ranch, on the South Park road.

THECLA IROIDES, Boisd.

Thecla Iroides, MORRIS, Syn. Am. Lep., 100.

The Colorado specimens of this species differ a little from the usual Californian types. In the male, the stigma upon primaries is longer and more sharply pointed.

Both sexes have scarcely any lobe at the anal angle of secondaries. The under surface is usually suffused with vinous; and the anal third of secondaries is densely powdered with gray scales. The fringe is dark-brown, except between the nervures, where its inner half is gray.

The species may be found toward the last of May and early in June among the foot hills of the Rocky Mountains, at above 7,000 feet elevation, usually flying by the road side or alighting upon damp spots.

THECLA ERYPHON, Boisd.

Thecla Eryphon, MORRIS, Syn. Am. Lep., 100.

A few specimens were taken early in June in Colorado, associated with *T. Iroides*.

CHRYSOPHANUS, Hübner.

CHRYSOPHANUS HELLOIDES, Boisd.

Polyommatus Helloides, MORRIS, Syn. Am. Lep., 86.

This species was brought by the expedition from Southern Utah. It is moderately abundant in all parts of Colorado; being found on the plains as well as near the summits of the highest peaks, and may be found from the first of June to the last of August.

In the South Park, and also near Turkey Creek Junction, a number of caterpillars were found, probably of this species. When full grown, they measured three-fourths of an inch in length. In shape, they were onisciform. The head is brownish, entirely retractile within the first segment. Body grass-green, covered with a slight reddish down. Young larva with a reddish-brown dorsal stripe. It feeds upon the Yellow Dock (*Rumex*). Those taken in the South Park were hidden on the surface of the ground under leaves or sticks, but the others were on plants growing in cultivated ground. During the day, these latter buried themselves to a depth of from one to two inches in the loose soil at the base of the plant; always, however, remaining

on the stem. Several changed to chrysalis, which is pale-greenish, finely mottled with dark-brown, but all died before completing their transformations. The larvæ are full grown by the last of June.

CHRYSOPHANUS CASTRO, Reakirt.

Polyommatus Castro, REAKIRT, Proc. Ent. Soc. Phila., 1867.

Whether this species is *Helloides* or not is difficult to determine; the only notable discrepancy in the descriptions is that *Castro* is said to have a "long discal bar" on secondaries, while in *Helloides* this is no longer than the discal spot of primaries. Dr. Boisduval, however, gives a description of *C. Nivalis*, which has been considered a synonym of *Castro*, and says that although allied to *Helloides*, it is "very distinct".

†CHRYSOPHANUS IANTHE, Edw.

Chrysophanus Ianthe, EDW., Trans. Am. Ent. Soc., 1871.

Specimens were brought by the expedition from Southern Utah; the original types were from Virginia City, Nev.; and these two are the only localities from which the species is recorded.

CHRYSOPHANUS SIRIUS, Edw.

Chrysophanus Sirius, EDW., Trans. Am. Ent. Soc., 1871.

This species was first discovered at Twin Lakes, July 12. On the 13th, forty males and two females were taken at a grassy spot near the head of the upper lake, in company with *Lycæna Heteronea*, the females of which closely resemble some varieties of *C. Sirius* ♀ both above and below. *C. Sirius* was also taken near Mount Lincoln, and at various points in the South and Middle Parks, but was quite rare except in the immediate vicinity of Twin Lakes.

LYCÆNA, (Fabr.) Oken.

LYCÆNA HETERONEA, Boisd.

Lycæna Heteronea, MORRIS, Syn. Am. Lep., 89.

The expedition brought specimens of *L. Heteronea* from Southern Utah. In Colorado, the first individuals were seen June 23 on Turkey Creek; but it was much more abundant at Twin Lakes early in July. Altogether fifty-nine specimens were taken. It occurs also in California.

LYCÆNA BATTOIDES, Boisd.

Lycæna Battoides, BOISD., Lépidoptères de la Californie, 1869.

This species is very similar to *Glaucion*, Edw., but is much darker, and more heavily marked beneath. A few specimens were taken in Colorado, nearly all on the headwaters of the Platte River, at moderate elevations. The species should be looked for in June and July.

LYCÆNA GLAUCON, Edw.

Lycæna Glaucion, EDW., Trans. Am. Ent. Soc., 1871.

Two or three specimens, apparently referable to this species, were taken on the South Park road in the latter part of June. It is also found in Nevada.

LYCÆNA ACOMON, Hewitson & Westwood.

Lycæna Acmon, MORRIS, Syn. Am. Lep., 87.

This is an abundant species in Colorado, occurring at nearly all elevations from May to the 1st of September; and near the Yosemite Valley, California, I have taken specimens as late as the middle of October. The females of *L. Acmon* are usually brown, but occasionally varieties are found having the whole surface covered with blue scales, except a rather broad, marginal band of brown, which, on the secondaries, contains the orange streak. Between these extremes all intermediate variations may be found. *L. Acmon* was brought by the expedition also from Southern Utah.

LYCÆNA CALCHAS, Behr.

Lycæna Calchas, BEHR, Proc. Cal. Acad. Nat. Sci.

A single specimen was taken August 5, on Gray's Peak, at an elevation of 12,000 feet. One other was seen on a mountain near Twin Lakes at a similar elevation. The original types were found in the Sierra Nevada of California at high elevations.

†LYCÆNA ANNA, Edw.

Lycæna Anna, EDW., Proc. Acad. Nat. Sci. Phila., 1862.

Lycæna Cajona, REAKIRT, Proc. Ent. Soc. Phila., 1867.

I have no knowledge of specimens of this species from Colorado. It is probably not found east of Nevada. Until recently, it has been confounded with the following species.

LYCÆNA MELISSA, Edw.

PLATE XXXVI, FIGS. 5, 6, 7, 8.

Lycæna Melissa, EDW., Trans. Am. Ent. Soc., 1873.

This is a not very uncommon species near Denver in May or June. In the South Park and about Twin Lakes, it is abundant by the first week in July. Specimens were brought in by the expedition of 1871, probably from the vicinity of Fairplay. This is a much more heavily marked species than *Anna*, and the ground color below is gray instead of white.

LYCÆNA COMYNTAS, Godart.

Lycæna Comyntas, HARRIS, Insects Injurious to Vegetation.

This species is found occasionally in Colorado, and I have taken a single specimen in California, near Sacramento, October 6. In California, *L. Comyntas* is largely replaced by *Amyntula*, Boisd., which I believe to be distinct. *Amyntula* may be distinguished by the more delicate marking below. It is slightly larger, and the ground color of the under side is of a paler gray, often with a bluish tinge toward the base of the wings.

LYCÆNA ISOLA, Reakirt.

Lycæna Isola, REAKIRT, Proc. Acad. Nat. Sci. Phila., 1866.*Lycæna Alce*, EDW., Trans. Am. Ent. Soc., 1871.

A few specimens were taken on Turkey Creek late in June, and near Georgetown about the middle of August. The latter specimens were much worn and faded. *L. Isola* has been sent to me from Eastern Nebraska by Mr. George M. Dodge, and is of common occurrence in Texas.

LYCÆNA RUSTICA, Edw.

Lycæna Rustica, EDW., Proc. Ent. Soc. Phila., 1864.

L. Rustica frequents sunny places in the open pine forests, where it may be seen on flowers of *Compositæ*, in company with *Melitæa Nubigena* and many *E. Claudia*. The species appears early in June, is quite abundant at from 7,000 to 10,000 feet elevation, and remains on the wing until the last of August. Seventy-five specimens were taken during the season; they presented no very noticeable variations.

LYCÆNA RAPAHOE, Reakirt.

Lycæna Rapahoe, REAKIRT, Proc. Ent. Soc. Phila., 1867.

My specimens of *L. Sæpiolus*, Boisd., from Colorado, are somewhat darker on the under surface than Californian examples, but whether they are referable to *L. Rapahoe* could only be determined by reference to the type specimens.

LYCÆNA SÆPIOLUS, Boisd.

Lycæna Sæpiolus, MORRIS, Syn. Am. Lep., 88.

This is altogether the most abundant *Lycæna* of Colorado. It was brought by the expedition from the South Park, and seems to occur at all elevations below timber line.

A larva was found on Turkey Creek, which may be of this species. It was slug-shaped; body flesh color, obliquely striped with crimson. It fed upon *Sedum*. Unfortunately, the specimen was lost before it had completed its transformation, so its precise species is doubtful.

Of *L. Sæpiolus*, one hundred and twenty-four specimens were taken in June and July. The species is found in damp places rather than at flowers, often with *L. Lygdamas* and *Argynnis Epithore*.

LYCÆNA RUFESCENS, Boisd.

Lycæna Rufescens, BOISD., Lépidoptères de la Californie, 1869.

Two or three females were taken in company with *L. Sæpiolus*. They are distinguished by the plain fulvous color above, and deep brown under surface. I believe, however, that this will prove to be a female variety of the preceding species.

LYCÆNA LYGDAMAS, Doubleday.

Lycæna Lygdamas, EDW., Butterflies N. A., i.

This *Lycæna* is not uncommon in the mountains. The expedition brought specimens from the South Park. The species disappears by the last of June. In a female specimen in my collection, three of the dark spots on the under surface of each wing are reproduced above.

LYCÆNA ANTIACIS, Boisd.

Lycæna Antiacis, MORRIS, Syn. Am. Lep., 90.

A single female taken June 15 near the South Park seems to be of this

species. The shade of blue above is quite different from that of *Lygdamas*, and more inclined to purple.

LYCÆNA LYCEA, Edw.

Lycæna Lycea, EDW., Proc. Ent. Soc. Phila., 1864.

This species is especially abundant on the outskirts of Denver early in June. They are usually found among wild Blue Lupines, which there are common weeds, and very possibly the larva may feed upon this plant. Later in the season, in the South Park an empty egg and a caterpillar, both evidently of some *Lycæna*, were found on wild lupines. The larva was pale green, with one or two whitish dorsal stripes, but was lost before I had an opportunity to make a detailed description. *L. Lycea* is a very variable species; the black dots on the under surface are often encroached upon by their white margins to such an extent that only minute points remain. The species remains on the wing till August. About seventy specimens were taken. It was brought from the South Park by the expedition, but is not known to occur outside of Colorado.

† LYCÆNA PHERES, Boisd.

Lycæna Pheres, MORRIS, Syn. Am. Lep., 88.

Specimens of this species were brought by the expedition from Southern Utah; it occurs also in Nevada and California.

LYCÆNA DAUNIA, Edw.

Lycæna Dawnia, EDW., Trans. Am. Ent. Soc., 1871.

Three specimens of this species, the only known examples, were taken on Turkey Creek during the last week in June.

LYCÆNA PSEUDARGIOLUS var. VIOLACEA, Edw.

Lycæna violacea, EDW., Butterflies N. A., i.

One specimen was taken, either near Denver or on Turkey Creek, early in June.

† LYCÆNA PIASUS, Boisd.

Lycæna Echo, EDW., Proc. Ent. Soc. Phila., 1864.

L. Piasus was collected by the expedition of 1871. Though not rare in California, it is not known to occur as far east as Colorado.

LYCÆNA NEGLECTA, Edw.

Lycæna Neglecta, EDW., Butterflies N. A., i.

This species occurs rarely in Colorado. One or two specimens were taken in June.

LEMONIAS, (Illiger) Westwood.

†LEMONIAS DUMETI, Behr.

Lemonias Dumeti, BEHR, Proc. Cal. Acad. Nat. Sci., 1865.

This species was taken by the expedition of 1871, probably in Utah or Arizona. It inhabits the extreme southwest of the United States.

†LEMONIAS CYTHERA, Edw.

PLATE XXXVI, FIGS. 3, 4.

Lemonias Cythera, EDW., Proc. Am. Ent. Soc., 1873.

Three males were collected by the expedition in Arizona. They are the only known examples

EPARGYREUS, (Hübner) Scud.

EPARGYREUS TITYRUS, Fabr.

Epargyreus Tityrus, HARRIS, Insects Injurious to Vegetation, pl. v.

I did not meet with this species in Colorado; but my brother, S. H. Mead, jr., gave me three specimens, which he took in the mountains near the South Park. They did not differ from eastern examples.

NISONIADES, Hübner.

NISONIADES PERSIUS, Scud.

Nisoniades Persius, SCUD., Proc. Essex Inst., 1862.

N. Persius is the most common species of its genus in Colorado. About twenty-five specimens were obtained. They differ somewhat from eastern individuals; but Mr. Scudder informs me that in Arizona still more aberrant forms are found, all of which, however, seem too near *Persius* to be separated specifically.

NISONIADES PETRONIUS, Scud.

Nisoniades Petronius, SCUD., MS.

Mr. Scudder writes, in a recent letter, that he has received from Mr. Edwards an undescribed Colorado *Erynnis* (*Nisoniades*), and will give it this name.

NISONIADES RUTILIUS, Scud.

Nisoniades Rutilius, SCUD., MS.

One individual, now in Mr. Scudder's hands for description, was taken June 23 at Turkey Creek Junction.

NISONIADES ICELUS, Lintner.

Nisoniades Icelus, LINTNER, 23d Rep. N. Y. State Illus. Nat. Hist., 1872.

One specimen was taken June 10 near Fairplay, South Park.

PHOLISORA, Scud.

PHOLISORA CATULLUS, Cramer.

Nisoniades Catullus, MORRIS, Syn. Am. Lep., 115.

Specimens were brought by the expedition from Southern Utah. One or two were seen near Denver early in June.

LEUCOSCIRTES, Scud.

†LEUCOSCIRTES ERICETORUM, Boisd.

Syrichthus Alba, EDW., Proc. Ent. Soc. Phila., 1866.

Brought in by the expedition of 1871, probably from Utah or Arizona. The species is also found in California.

HESPERIA, (Fabr.) Kirby.

HESPERIA TESSELLATA, Scud.

Hesperia Tessellata, SCUD., Rep. Peabody Acad. Sci., 1871.

This species is abundant throughout the West. In Colorado, it is found on the wing during June and July.

HESPERIA, *sp.* (?).

A *Hesperia*, very closely allied to *Centaurea*, Rambur, frequents the high peaks about Twin Lakes, where seventeen specimens were taken in July, all above 11,000 feet elevation (timber line).

Mr. Scudder assures me that this species is distinct from *Ruralis*, Boisd., to which it was at first referred. It is probably not *Centaurea*; but I have scarcely sufficient material for comparison at hand to safely describe it as distinct.

OARISMA, Scud.

OARISMA GARITÁ, Reakirt.

Hesperia Garitá, REAKIRT, Proc. Ent. Soc. Phila., 1867.

T. Hylax, EDW., Trans. Am. Ent. Soc., 1871.

This is a rather rare species, and so far has not been taken outside of Colorado. A closely allied species, undescribed, unless a variety of *O. Powesheik*, is, however, found in the Yellowstone region of Montana. *O. Garitá* was collected by the expedition in the South Park. It occurs also at Twin Lakes, and may be found during June and a part of July.

POTANTHUS, Scud.

POTANTHUS OMAHA, Edw.

Hesperia Omaha, EDW., Proc. Ent. Soc., Phila., 1863.

Habitat: "Pike's Peak, Colorado; Kanawha County, West Virginia" (Edwards).

I do not know this species.

AMBLYSCIRTES, Scud.

AMBLYSCIRTES KIOWAH, Reakirt.

Habitat: "Rocky Mountains." With this species, I am also unacquainted.

OCYTES, Scud.

OCYTES RIDINGSII, Reakirt.

The male of this species appears to be undescribed. It is very similar to the female, and differs chiefly in being of a brighter fulvous above, and in the possession of the black, velvety, discal bar, or stigma, on the primaries; this shows beneath as a blackish line. The species was found at Twin Lakes in July, generally upon or near the Dwarf Lupines, which grew with bunch grass and low herbage, in open spaces between the plants of sage brush.

Altogether thirty-one specimens were taken.

PAMPHILA, (Fabr.) Westwood.

PAMPHILA NAPA, Edw.

Hesperia Napa, EDW., Proc. Ent. Soc. Phila., 1864.

Brought by the expedition from Colorado. I found a few specimens in August near Georgetown, Colo., and two in the Yosemite Valley on the 21st of October.

†PAMPHILA JUBA, Scud.

Pamphila Juba, SCUD., Rep. Peabody Acad. Sci., 1871.

I do not know this species from Colorado, though very probably it may be found there. All my specimens were taken near Salt Lake City, Utah, early in October. There it seems to be not uncommon.

PAMPHILA COLORADO, Scud.

Pamphila Colorado, SCUD., Memoirs Bost. Soc. Nat. Hist., ii, 1874.

This species, with the following, appears late in the season. Specimens were taken on the Georgetown and South Park roads during the latter part of August.

PAMPHILA MANITOBA, Scud.

Pamphila Manitoba, SCUD., Memoirs Bost. Soc. Nat. Hist., ii, 1874.

Of this species I have two males, taken August 19 and 30; one at Idaho Springs, the other on the South Park road.

PAMPHILA NEVADA, Scud.

Pamphila Nevada, SCUD., Memoirs Bost. Soc. Nat. Hist., ii, 1874.

This is a smaller species than either of the two preceding. It is quite common, in June, in the mountains about the South Park, and in the park itself. It does not seem to appear later than July.

ATALOPEDES, Scud.

†ATALOPEDES HURON, Edw.

Hesperia Huron, EDW., Proc. Ent. Soc. Phila., 1863, pl. i.

This species was brought in by the expedition of 1871, but the precise locality is not given. It occurs from New York to Texas.

POLITES, Scud.

POLITES DRACO, Edw.

Pamphila Draco, EDW., Trans. Am. Ent. Soc., 1871.

P. Draco was moderately abundant in the mountains during June and the early part of July. Specimens were brought by the expedition from Southern Utah, and from Twin Lakes, Colorado. It is also found in California.

OCHLODES, Scud.

OCHLODES SONORA, Scud.

Ochlodes Sonora, SCUD., Rep. Peabody Acad. Sci., 1871.

Individuals of this species, from Colorado, seem a little darker in color than those from California. Several specimens, all males, were obtained at Twin Lakes about the middle of July.

LIMOCHORES, Scud.

LIMOCHORES CERNES, Boisd. & LeC.

H. Ahaton, HARRIS, Insects Injurious to Vegetation.

One male and one female of this species were taken in Colorado. They differ somewhat from the ordinary eastern type in that the wings are much suffused with fulvous.

NOCTUIDÆ—CATOCALA, Schrank.

CATOCALA EDITHA, Edw.

Catocala Editha, EDW., Trans. Am. Ent. Soc. Phila., Oct., 1874, 112.

Male.—Expands 3.3 inches. Primaries light gray-brown, crossed longitudinally from base to a point just below apex by a blackish-brown stripe; the transverse lines distinct; the basal nearly entire from the costa to middle of submedian interspace, and there serrated in the form of the letter W, the middle serration being very small; the elbowed line has two prominent teeth, the upper one projecting about one-tenth inch; following these a deep obovate sinus that reaches nearly to the basal line; on the lower edge of this sinus the line is twice serrated, and then forms a re-entering angle to submedian nervure; a wavy, gray, serrated stripe crosses the extradiscal area, anteriorly following the course of the elbowed line, but posteriorly

nearly parallel to the hind margin; within the margin a series of brown points in the several interspaces, each on a gray streak coming from the margin, reniform, bright brown, edged on the basal side with black. Secondaries bright rosy-red; the median band rather broad, contracted on the middle on the outer side, even edged, and with a circular curve on the inner side, terminating in a blunt point a little within the abdominal margin; the marginal border broad, and somewhat sinuous within posteriorly; the margin narrowly edged with yellow-white, with fringes of same color.

On the under side, the red shade covers rather more than one-third of the wing, but is partly wanting on the submedian interspace outside of the median band.

From a single specimen taken in Sonoita Valley by H. W. Henshaw, July, 1874.

NOTE.—The plates to illustrate this report have been in some instances copied from those of Mr. W. H. Edwards in his recent work, *Butterflies of North America*, by permission; others have been figured from nature.

List of species of Lepidoptera collected in 1871, 1872, 1873, and 1874 in California, Nevada, Utah, Colorado, New Mexico, and Arizona, identified by

WILLIAM H. EDWARDS.

RHOPALOCERA.

PAPILIO, Fabr.

P. Pilumnus, Boisd.
Zolicaon, Boisd.
Daunus, Boisd.
Rutulus, Boisd.
Asterias, Drury.

P. Turnus, Linn.
Bairdii, Edw.
Americus, Kohl.
Philenor, Linn.

PARNASSIUS, Latr.

P. Clodius, Ménétriés.

P. Smintheus, Doubleday.

PIERIS, Boisd.

P. Protodice, Boisd.
Occidentalis, Reakirt.

P. Menapia, Felder.
Beckerii, Edw.

ANTHOCHARIS, Boisd.

A. Julia, Edw.

NATHALIS, Boisd.

N. Iole, Boisd.

COLIAS, Fabr.

C. Cæsonia, Stoll.
Eurydice, Boisd.
Eurytheme, Boisd.
Keewaydin, Edw.

TERIAS, Swains.

T. Nicippe, Cramer.

DANAIS, Latr.

D. Archippus, Cram.

EUPTOIETA, Doubleday.

E. Claudia, Cram.

ARGYNNIS, Fabr.

A. Nokomis, Edw.
Nitocris, Edw.
Nausicaa, Edw.

MELITÆA, Fabr.

M. Anicia, Doub.
Palla, Boisd.
Hoffmanni, Behr.
Acastus, Edw.

PHYCIODES, Doub.

P. Mylitta, Edw.
Camillus, Edw.

SYNCHLOE, Doub.

S. Crocale, Edw.

GRAPTA, Kirby.

G. Zephyrus, Edw.

VANESSA, Fabr.

V. Antiopa, Linn.

PYRAMEIS, Doub.

P. Huntera, Drury.
Cardui, Linn.

JUNONIA, Doub.

J. Lavinia, Hüb.

A. Ausonoides, Boisd.

C. Alexandra, Edw.
Scudderii, Reakirt.
Edwardsii, Behr.
Meadii, Edw.

T. Mexicana, Boisd.

D. Berenice, Cram.

A. Nevadensis, Edw.
Eurynome, Edw.

M. Nubigena, Behr.
Leanira, Felder.
Canace, Edw.
Minuta, Edw.

P. Pallida, Edw.
Marcia, Edw.

P. Carye, Hüb.
Atalanta, Linn.

LIMENITIS, Fabr.

L. Weidemeyeri, Edw.
Ursula, Fabr.

L. Lorquini, Boisd.
Californica, Butler.

APATURA, Fabr.

A. Leilia, Edw.

LIBYTHEA, Fabr.

L. Carinenta, Cram.

GYROCHEILUS, Butler.

G. Tritonia, Edw.

CENONYMPHA, Westwood.

C. Ochracea, Edw.

SATYRUS, Westwood.

S. Wheeleri, Edw.
Ariane, Boisd.
Ridingsii, Edw.

S. Silvestris, Edw.
Charon, Edw.

EREBIA, Dalman.

E. Epipsodea, But.

CHIONOBAS, Boisd.

C. Chryxus, Doub.
Semidea, Harris.

C. Uhlerii, Reak.

THECLA, Fabr.

T. Halesus, Cram.
Crysalus, Edw.
Humuli, Harr.
Sylvinus, Boisd.

T. Mopsus, Hüb.
Siva, Edw.
Californica, Edw.

CHRYSOPHANUS, West.

C. Helloides, Boisd.

C. Ianthe, Edw.

LYCÆNA, Fabr.

L. Piasus, Boisd.
Pheres, Boisd.
Battoides, Boisd.
Sæpiolus, Boisd.
Heteronea, Boisd.
Amyntula, Boisd.

L. Lycea, Edw.
Fea, Edw.
Melissa, Edw.
Helios, Edw.
Acmou, Doub.
Isola, Reak.

LEMONIAS, Westwood.

L. Dumeti, Behr.

L. Cythera, Edw.



FIG. 1 and 2. ARGYNNIS NOKOMIS. ♂
FIG. 3 and 4. ARGYNNIS NOKOMIS. ♀



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T. Sinclair & Son. Lith. Phila.

FIG 1-2. MELITÆA MINUTA ♂ FIG 3-4. LEMONIAS CYTHERA ♂
FIG 5-6. LYCÆNA MELISSA ♂ FIG 7-8. LYCÆNA MELISSA ♀

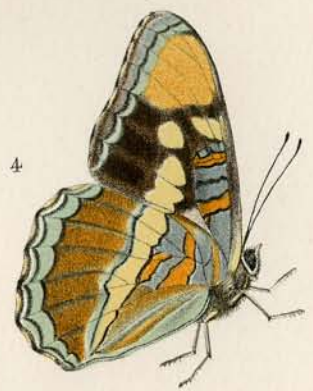


T. Sinclair & son Lith. Phila.

FIG. 1-2. SYNCHLOE CROCALE ♂ FIG. 3-4 SYNCHLOE CROCALE ♀
 FIG. 5-6. MELITÆA LEANIRA ♂ FIG. 7-8. MELITÆA LEANIRA ♀



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FIG. 1-2. LIMENITIS WEIDEMEYERII. ♂
 FIG. 3-4. LIMENITIS CALIFORNICA. ♂
 FIG. 5-6. LIMENITIS LORQUINI. ♂



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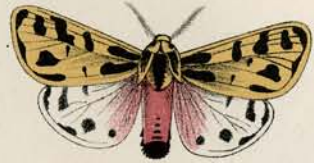
FIG. 1-2. SATYRUS WHEELERI. ♂
FIG. 3-4. SATYRUS WHEELERI. ♀



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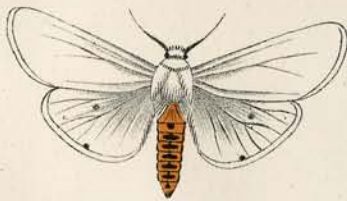
2a



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T. Sinclair & Son Lith. Phila.

FIG. 1-2. ARCTIA YARROWII. FIG. 2a. 3. ARCTIA DOCTA VAR. ARIZONENSIS.
FIG. 4-5. LEUCARCTIA ALBIDA. FIG. 5a. 6. EUCHÆTES ELEGANS.

PYRRHOPYGE, West.

P. Araxes, Hewitson.

EUDAMUS, Swains.

E. Cellus, Boisd.

NISONIADES, West.N. Funeralis, Scud.
Persius, Scud.

N. Catullus, Cram.

S. Tessellata, Scud.
Scriptura, Boisd.**SYRICHTUS, Boisd.**

S. Oceanus, Edw.

P. Huron, Edw.
Napa, Edw.
Draco, Edw.**PAMPHILA, Fabr.**P. Colorado, Scud.
Nevada, Scud.
Nereus, Edw.**ANCYLOXYPHA, Felder.**

A. Hylax, Edw.

HETEROCERA.**MEGATHYMUS, Scudder.**

M. Yuccæ, Boisd.

DEILEPHILA, Ochseneimer.

D. Lineata, Fabr.

SPHINX, Linn.

S. Carolina, Linn.

EUCHRONIA, Packard.

E. Maia, Drury.

ATTACUS, Linn.

A. Cecropia, Linn.

CATOCALA, Schrank.

C. Editha, Edw.

C. Faustina, Strecker.



FIG. 1 and 2. ARGYNNIS NOKOMIS. ♂
FIG. 3 and 4. ARGYNNIS NOKOMIS. ♀



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T. Sinclair & Son. Lith. Phila.

FIG 1-2. MELITÆA MINUTA ♂ FIG 3-4. LEMONIAS CYTHERA ♂
FIG 5-6. LYCÆNA MELISSA ♂ FIG 7-8. LYCÆNA MELISSA ♀



T. Sinclair & son Lith. Phila.

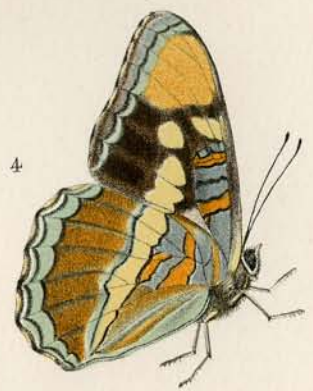
FIG. 1-2. SYNCHLOE CROCALE ♂ FIG. 3-4 SYNCHLOE CROCALE ♀
FIG. 5-6. MELITÆA LEANIRA ♂ FIG. 7-8. MELITÆA LEANIRA ♀



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1



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FIG. 1-2. LIMENITIS WEIDEMEYERII. ♂
 FIG. 3-4. LIMENITIS CALIFORNICA. ♂
 FIG. 5-6. LIMENITIS LORQUINI. ♂



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FIG. 1-2. SATYRUS WHEELERI. ♂
FIG. 3-4. SATYRUS WHEELERI. ♀



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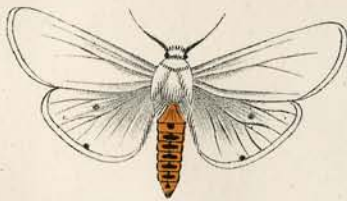
2a



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5a

T. Sinclair & Son Lith. Phila.

FIG. 1-2. ARCTIA YARROWII. FIG. 2a. 3. ARCTIA DOCTA VAR. ARIZONENSIS.
FIG. 4-5. LEUCARCTIA ALBIDA. FIG. 5a. 6. EUCHÆTES ELEGANS.