

**Article XVI.—DESCRIPTIVE CATALOGUE OF THE BUTTERFLIES FOUND WITHIN FIFTY MILES OF NEW YORK CITY, TOGETHER WITH A BRIEF ACCOUNT OF THEIR LIFE HISTORIES AND HABITS.**

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The present paper is based upon the list of butterflies given by me in my 'Catalogue of Lepidoptera found within fifty miles of New York City, with their Food-plants,' published in the Annals of the New York Academy of Sciences, Vol. V, 1890, pp. 199-230, and is the beginning of a series of similar papers on the moths of the region which I intend soon to publish. The descriptions of the species in this work have been made from specimens contained in the collection of the American Museum of Natural History, viz.: S. L. Elliot, James Angus and Henry Edwards Collections, and also from material collected in this vicinity by me for the Museum during the past four years. The earlier stages have been described either from living specimens or have been condensed from the writings of W. H. Edwards, S. H. Scudder, and others. Free use has also been made of Prof. John B. Smith's 'Catalogue of Insects found in New Jersey,' and Wm. T. Davis's 'List of Butterflies found on Staten Island.'

**PAPILIONIDÆ.**

Subfamily PAPILIONINÆ.

***Papilio ajax* Linn.**

*Butterfly*.—Pale green with black borders and transverse markings. Hind wings with a red spot on the anal angle; tails black, long. Expanse,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches.

*Caterpillar*.—Gray with white, black and yellow transverse bands on the fourth and fifth segments, and the segments after the fifth with a yellow and two dull white bands; sometimes the larva is green and each segment crossed

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by gray, yellow and blue bands ; sometimes the larva is pale green with blue, black and yellow bands. Length, about  $1\frac{1}{2}$  inches.

- *Chrysalis*.—Bright green or light brown, with a few darker markings. Head-case with short prominences and a triangular process on the thorax, which has a median carina and a similar pair at the sides of the body. Length, 1 inch.

*Food-plant*.—Paw-paw.

Only a few occasional specimens have been seen flying in this vicinity, and the occurrence of the insect here is probably accidental. It is common in the Southern and Western States.

### **Papilio philenor Linn.**

*Butterfly*.—Velvety black with greenish or bluish metallic reflections. Fore wings with a row of whitish spots near the outer margin. In some specimens these spots are sometimes absent. Hind wings have also a row of five or six whitish spots, which are more prominent than those on the fore wings. Tails black. The underside of the hind wings have a row of seven large orange spots which are surrounded with black, and also a row of cream-colored semi-lunate spots along the outer margin ; the spots decreasing in size as they reach the inner angle. Expands 3 to  $3\frac{1}{2}$  inches.

*Caterpillar*.—Velvety black with long black and orange fleshy tubercles and orange spots. Length, 2 inches.

*Chrysalis*.—Yellowish green, marked with gray and violet, with more or less yellow on the back. Length,  $1\frac{1}{2}$  inches.

*Food-plant*.—Dutchman's Pipe (*Aristolochia*).

Rather common in this vicinity, but is rather local owing to the scarcity of the food-plant. May be found in May and June, and again in August and September, in gardens and open places in woods. Double brooded.

### **Papilio asterias Fabr.**

#### PLATE II, FIG. I.

*Butterfly*.—Black with two bands composed of yellow spots on each wing. The spots of the inner band much larger than the outer ones. Hind wings with blue lunules or dashes between the yellow bands. Anal spot round with a black spot in the centre. In the female the yellow spots are much smaller and the blue lunules very prominent. On the underside the markings are similar to those above, but the yellow spots are more or less orange instead of light yellow. Expands 3 to 4 inches.

Var. *calverlyii* Grote.—Black with the outer half of wings yellow, with a narrow black outer margin, including the tail on the hind wings. Underside, with outer half of wings, orange.

*Caterpillar*.—Bright pea green, with a transverse black band on each segment, containing a row of yellow spots. Length,  $1\frac{1}{2}$  inches.

*Chrysalis*.—Dirty yellowish brown or light yellowish, more or less dotted with black and marked with griseous. Head-case with two projections directed forward. Length,  $1\frac{1}{4}$  inches.

*Food-plants*.—Parsley, Parsnip, Celery, Carrot and other allied plants.

Very common in open fields, especially where wild parsnips grow, from May to October, but is most numerous in August. Double brooded. A single specimen of the curious variety *calverlyii* was taken at New Lots, Queens Co., L. I., in August, 1863.

### *Papilio troilus* Linn.

*Butterfly*.—Black; fore wings with a row of pale greenish yellow spots near the outer margin; and sometimes traces of another row of very small spots in front of this row. Hind wings with a row of green lunules close to the outer margin, the upper spot being orange. Across the middle is a band-like cloud composed of green scales, beyond which the scales gradually become thinner as they reach the green lunules. In the female these scales are blue and somewhat of a metallic color. Underside with two rows of small yellowish or greenish spots on the upper wings near the outer margin, and two rows of large orange spots on the hind wings; space between the orange spots thickly scaled with blue and green. Body black with two rows of small yellow spots on each side. Expands  $3\frac{1}{2}$  to  $3\frac{3}{4}$  inches.

*Caterpillar*.—Green above, with four small blue spots on each of the segments from the 6th to the 11th. A yellow band along the sides and a transverse yellow band edged with black on the anterior part of the first segment. On the third segment are two very large yellow eye-like spots edged with black, and a large black spot filling the lower part. On the fourth segment are two more somewhat smaller eye-like spots. Length,  $1\frac{3}{4}$  inches.

*Chrysalis*.—Head-case with two prominences, projecting forward. Sides with an elevated ridge; thorax with a short, pointed elevation. Wing-cases much elevated in the middle. Color, orange, green or pale brown, with a few brownish spots. Length,  $1\frac{1}{8}$  inches.

*Food-plant*.—Spice-bush (*Lindera*) and Sassafras.

Common during the latter part of May and June, and again in August. Double brooded. Found in open, sunny spots and along wood paths. The larva spins a silken web on a leaf, and its habits are like those of the following species.

***Papilio turnus* Linn.**

PLATE II, FIG. 2.

*Butterfly*.—Yellow; upper wings with a transverse black band near the base and followed by three shorter stripes not extending across the wing. Costa narrowly edged with black and the outer margin with a broad black band in which is a row of small yellow spots. Hind wings also broadly margined with black from the apex to the inner angle, with a row of yellow crescent-shaped spots near the outer edge, the first and last spot orange, as is also the spot on the anal angle. In the black margin are a few blue scales in the male, and in the female thickly scaled; the scales forming a series of regular lunules. Along the inner margin is a narrow band which unites at the end with a band of the same color running to the costa about one-third from the base. Expands  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches.

*Female aberration, glaucus* Linn.—This form is sooty brown instead of yellow, with the black markings faintly visible. The yellow spots near the outer margins of the upper and hind wings remain the same, and the hind wings are more heavily scaled with blue.

*Caterpillar*.—Head purplish brown. Body bright green above, whitish beneath. On each side of the third segment is a suboval, greenish, yellow patch edged with black, and enclosing a purple spot. On the junctions of the fifth and sixth segments is a transverse, narrow, yellow and velvety-black band. Along the body are also rows of small blue spots. Length,  $1\frac{1}{8}$  to  $1\frac{1}{4}$  inches.

*Chrysalis*.—Grayish brown, mottled and streaked with brown, green and black; on the back of the body are two rows of blunt tubercles, four in each row; on the thorax is a blunt process projecting forward, and on the head-case are two processes. Length,  $1\frac{1}{2}$  inches.

*Food-plants*.—Apple, Quince, Plum, Thorn, Cherry, Birch, Basswood, Ash, Alder, Willow, Oak, Tulip-tree, etc.

This butterfly inhabits all sections of the United States, from the Atlantic to the Rocky Mountains, also British America and Newfoundland. In the vicinity of New York City it is common and is double brooded, the first brood appearing in the latter part of May and June, and the second brood in July and August. The female lays her eggs singly on the upper surface of a leaf, and the young caterpillar takes its abode on the same side, repos-

ing on a bed of silk, which it spins for the purpose, and going to the edge to feed when disposed. As it increases in size the leaf is somewhat drawn together, making it difficult to discover the caterpillar. When fully grown it changes from green to brown, and at this stage deserts the tree to form its chrysalis. The caterpillar may be found in July and September.

### ***Papilio cresphontes Cramer.***

*Butterfly*.—Sooty black with a series of large rounded spots running obliquely across the wings from the apex to near the base; from about the middle of this row begins a row of three spots which run to the hind angle. Hind wings with a rather broad yellow band across the base and a series of large yellow spots running from the apex to the inner angle. Anal spot black, with a red bar and a few blue scales. Tails black, with a large oval spot near the tip. Underside almost entirely yellow, with an orange patch at the end of the discal cell in the hind wings, which also have a series of blue lunules across the middle in the black ground. Expands 4 to  $5\frac{1}{4}$  inches.

*Caterpillar*.—Dark brown with a white band on each side extending from the head to a large whitish patch, mottled with olive and brown. At the end of the body is also a patch of the same color. Several whitish rings are scattered over the body, especially on the anterior segments. Length, 2 inches.

*Chrysalis*.—Brown, sometimes tinged with green, and more or less marked with dark brown. Body roughened and a little bent; wing-cases protuberant beneath, all the larger projections anterior and directed forward. Length,  $1\frac{1}{2}$  inches.

*Food-plants*.—Hop-tree (*Ptelea*), Prickly Ash, Orange and *Dictamnus fraxinella*.

In this vicinity this insect is quite rare, and the larva feeds on the hop-tree. But in the South it is one of the commonest butterflies, and is seen everywhere flitting about in the orange groves. In Florida, where the insect abounds very plentifully, it is a pest to the orange, and, on account of the large size and voracity of the caterpillar, it is commonly known as the 'Orange Dog.' It does considerable damage, especially to young trees, which are sometimes completely defoliated.

The female deposits about five hundred eggs; she scatters them over a wide area, seldom laying more than four or five upon a single plant. In the vicinity of New York there are two broods—the first in June and the second in August.

*Synopsis of the Species of Papilio.*

With long tails :

Pale green, with black borders and markings . . . . . *P. ajax*.

With short tails :

Ground color black.

With greenish or bluish metallic reflection. . . . . *P. philenor*.With bands composed of yellow spots. . . . . *P. asterias*.Hind wings thickly covered with green scales. . . . . *P. troilus*.With yellow spots and a broad yellow band near the base of the hind wings . . . . . *P. cresphontes*.

Ground color yellow.

With black bands and stripes. . . . . *P. turnus*.

## Subfamily PIERINÆ.

*Pieris rapæ* (Linn.).

## PLATE II, FIG. 3.

*Butterfly*.—Wings white with a blackish patch at the apex of the fore wings and a small black spot a little beyond the middle. Hind wings with a black spot on the costa beyond the middle. Base of all the wing dusted with blackish scales, more so in the female, which differs from the male in having two black spots on the fore wings instead of one. Underside of fore wings white, with the apex yellow and with two black spots. Hind wings yellow, with a few black scales. Expands  $1\frac{3}{8}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Pale green, with a narrow stripe along the middle of the back and a row of yellow spots along the sides. The body is also finely dotted with black. Length, about 1 inch.

*Chrysalis*.—Varies in color from a dull greenish to light gray, or brown, with a number of black points. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Cabbage, Turnip, Mignonette, and other allied plants.

This species is an importation from Europe, and is exceedingly common in this vicinity from May until November. It may be seen everywhere, in pastures, gardens and other places, but especially in cabbage-fields, to which plant the insect is very injurious. Three brooded.

*Pieris protodice* (Bdv.).

## PLATE II, FIG. 4.

*Butterfly*.—Upper wings white, with a large black spot at the end of the discal cell, and a submarginal row of three spots running across the wing. At the outer margin is a row of black dashes. Hind wings without marking but

slightly showing traces of the marking beneath. Underside of upper wings same as above. Hind wings with the veins more or less broadly margined with blackish or greenish yellow. In the female all the markings are much heavier. The three spots across the fore wings are connected with the dashes along the outer margin. Hind wings with a zig-zag band near the outer border, which is connected with the subtriangular spots along the margin, and each enclosing a diamond-shaped spot. The base of the wings to nearly the middle is also heavily marked with grayish scales. The markings on the underside of the fore wings are repeated but not so heavily as above; the apex is tipped with yellow. Hind wing with the veins broadly bordered with yellowish green, and the zig-zag band and spot along the outer margin is of the same color. In the spring brood the markings are more or less distinct, and are often, especially in the males, quite obliterated. Expands  $1\frac{3}{8}$  to 2 inches.

*Caterpillar*.—Green, with two longitudinal yellow stripes along each side, and interrupted on each segment by two blue spots. Each segment has six transverse wrinkles, on each of which is a row of different sized round, piliferous spots, those on the first and fourth wrinkle being the largest; from each of these spots arises a short black hair. The head is green, with black spots and usually with a yellow patch on each side. Length, about  $1\frac{1}{8}$  inches.

*Chrysalis*.—Much the same as that of *Pieris rapæ*, varying in color, but is usually bluish gray, sprinkled with black. The ridges and other prominences are edged with buff or flesh color. Length,  $\frac{3}{4}$  inch.

*Food-plant*.—Cabbage, *Erigeron canadense*, etc.

This butterfly was common in former years about New York, but since the introduction of the imported Cabbage Butterfly (*Pieris rapæ*) it has disappeared almost entirely, in fact only a few single examples have been taken within the last ten years. It is yet quite abundant in southern New Jersey. In 1886 I captured in Camden about two hundred specimens inside of two hours. It is also common in the Southern and Western States.

### ***Pieris oleracea* (Harris).**

*Butterfly*.—This species may be readily distinguished from its allies by the absence of the black spots on the wings. It is pure white, with a few black scales at the base of the wings. On the underside it is pale yellow with the veins more or less dusted with blackish scales. Expands  $1\frac{3}{4}$  to 2 inches.

*Caterpillar*.—Body pale green covered with fine, short, sordid white hairs; a darker green dorsal line. Length, 1 inch.

*Chrysalis*.—Shape and size same as in the preceding species, and varies from a dirty whitish to greenish, regularly dotted with black. Length,  $\frac{3}{4}$  inch.

*Food-plants*.—Cabbage, Turnip, Mustard, Radish, etc.

Very rare in this vicinity, but more common northward. Prof. J. B. Smith records it from the Orange Mountains, N. J.

### ***Anthocharis genutia* (Fabr.).**

PLATE II, FIG. 5.

*Butterfly*.—White, with a large orange patch at the apex of the fore wings, which are marked outwardly with black. At the end of the discal cell is a small black spot. Hind wings white, with a series of small black spots on the outer margin. Underside of fore wings white, slightly tinged with yellow, and the apical area speckled with greenish yellow and the orange shade showing faintly through the wing. Hind wings wholly mottled with greenish patches. The female differs from the male by the absence of the orange patch on the fore wing. Expands about  $1\frac{1}{2}$  inches.

*Caterpillar*.—Body dark yellowish green, glossy, with a yellow longitudinal dorsal stripe and a broader white one along the sides. The upperside is furnished with six rows of shining tuberculate spots and another row along the sides beneath the spiracles. Each spot has a short black hair or process, which tapers slightly and is thickened at the end. Underside paler than above. Head whitish and pale green, with four brownish spots. Length, nearly 1 inch.

*Chrysalis*.—Slender, abdomen long, rounded, and tapering to a point. Head-case extending into a long cone-like process, so that both ends of the chrysalis look much alike. Sometimes the process on the head is arcuated. Wing-cases prominent, forming a sub-triangular process with the sides compressed. Color pale yellowish brown, with a reddish tint, mottled with white and darker brown on the thorax; the process on the head brown. Wing-cases dotted and streaked with black. Body with a dorsal row of black dots, and also a row along the subdorsum. Length, about  $\frac{3}{4}$  inch.

*Food-plants*.—*Arabis* and *Sisymbrium*.

This pretty species is quite local, and appears to be restricted to certain localities. In this vicinity it has been taken at Nyack and Newburgh, N. Y., also at Delaware Water Gap, Pa., in May. Prof. J. B. Smith records it in his 'Catalogue of Insects found in New Jersey,' from Westville, Mount Holly, Seven Mile Beach and Timber Creek. Single brooded.

### ***Callidryas eubule* (Linn.).**

*Butterfly*.—Upperside bright lemon yellow, with a zig-zag border of raised scales, of almost the same color, along the outer margin, and a few streaks of



the same color along the costa, near the apex. The hind wings have also a narrow margin of raised scales. Underside paler than above, and not so bright, with a ferruginous elongated spot at the end of the discal cell and two silvery spots about the middle of the hind wings; over all the wings are scattered a number of reddish brown patches which are more or less distinct in some individuals. The female differs from the male by having a rather large spot at the end of the cell in the fore wings and a series of brown spots along the outer margin. The hind wings are narrowly margined with orange, otherwise much as in the male. Some specimens have the margins of the wings on the underside narrowly bordered with pink, and the ground color pale orange. Expands  $2\frac{1}{2}$  inches.

*Caterpillar*.—Body pale green, with a bluish tinge, and sparsely covered with minute hairs. Along the sides is a yellow band, and each segment has a transverse row of small black elevated points. Head green. Length,  $1\frac{3}{4}$  inches.

*Chrysalis*.—Pale green with yellowish stripes; sometimes pale yellowish green or roseate and minutely dotted on the back with lighter points. The body is much bent in the middle, and the wing-cases are much protuberant and the head-case very long and horn-like. Length,  $1\frac{1}{8}$  inches.

*Food-plant*.—*Cassia*.

This species, which is very common in the South, is rarely met with in the vicinity of New York, and only a few occasional specimens have been taken in recent years. In 1870 it was taken in abundance on Fire Island, L. I., and numbers were also seen by the late Hy. Edwards at Long Branch, N. J. It has also been taken in different places on Long Island, Staten Island, Westchester County, and New Jersey. September–October.

### ***Colias philodice* (Godt.).**

PLATE II, FIG. 6.

*Butterfly*.—Wings sulphur yellow, with the outer margin of both broadly bordered with black, and a black spot at the end of the cell in the fore wings and an orange spot in the hind wings. Underside pale orange, with the hind wing dusted more or less with blackish scales. On both wings there is a row of blackish spots beyond the middle, which are sometimes pinkish on the hind wings, and sometimes wanting entirely. The black spot on the fore wing is the same as the one above; hind wings with a large silvery spot followed by a smaller one of the same color, and both are surrounded with a broad pinkish border. The female differs from the male by having the black border on the fore wings much broader and containing a row of yellow spots. Expands  $1\frac{1}{2}$  to 2 inches.

*Caterpillar*.—Head pale green; body above dark green, paler beneath; on each segment above are four or five transverse creases, with rows of minute whitish tubercles tipped with black on the spaces between. Each tubercle has a short creamy white hair. Along the sides of the body is a rather broad white stripe, through which runs a narrow, broken crimson line. Beneath the white stripe there is sometimes a row of lunate black spots. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Yellowish green, with a red line along each side from the wing-cases to the end of the body. Length, 1 inch.

*Food-plants*.—Clover, Pea, Lupine, etc.

Very common everywhere in this neighborhood. It is found along roadsides, in open fields, gardens, and is especially abundant when the common red clover is in blossom. Sometimes hundreds of these yellow butterflies may be seen in dense masses upon wet spots in the road, swarming when disturbed and settling again when the interruption ceases.

The species varies in size and color from pale sulphur to lemon and bright yellow; also in the breadth of the black borders, and in the degree of dusting of both sides. The color of the under-side varies from pale to bright yellow.

In the female a form occurs (albinic var.) which has its ground color pale yellowish white or nearly white instead of yellow. In the male a form occurs (melanic var.) which is thickly covered with black on both sides so as to obscure the ground color. A single specimen of this rare form was taken at Fordham, N. Y. City. The variety *anthyale* Hubner differs from the type form by its small size and narrow black borders.

### ***Colias eurytheme* (Bdv.).**

*Butterfly*.—Differs from *C. philodice* in having the upperside of the wings orange instead of yellow, and also tinged with orange beneath. Expands 2 to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Similar to *C. philodice*, but has on each side a subdorsal, broken, white and crimson streak, which is absent in *C. philodice*. Length,  $1\frac{1}{8}$  inches.

*Food-plant*.—Clover.

A single pair of this species was taken by the late S. L. Elliot at Astoria, Long Island. The specimens are not as deeply orange as the type form. The male is sulphur yellow with a

large orange blotch on each of the fore wings, while the female has all the wings quite heavily shaded with orange. The species has also been recorded by Prof. J. B. Smith from Newark, New Jersey. Common in the Western States.

### ***Terias lisa* (Bdv.).**

PLATE II, FIG. 7.

*Butterfly*.—Bright lemon yellow, with the fore wings bordered with black from the middle of the costa to the hind angle, the border broadest at the apex. Hind wings with a narrow border which is dentate within. Underside wholly yellow, with a few scattered brownish scales on the hind wing and a rather large pinkish-brown spot near the apex. The wings beneath are also narrowly bordered with orange red, which is more or less distinct. The female differs in being somewhat paler, and the black border on the hind wings above being broken. Expands 1 to 1½ inches.

*Caterpillar*.—Body grass green, with minute hairs and white elevations. Head grass green, with a few white elevations. Length, about ⅔ inch.

*Chrysalis*.—Transparent green, with a few black dots. Wing-case slightly protuberant; head case conical. Length, ⅔ inch.

*Food-plants*.—Clover and *Cassia*.

Occurs in June and again in the latter part of August and early in September. Rather common in sandy places.

### ***Terias nicippi* (Cram.).**

PLATE II, FIG. 8.

*Butterfly*.—Upperside deep orange, with a black border running from the base of the costa to the hind angle, broadest at the apex, and very narrow along the basal half of the wings along the costa, where the black margin is covered with yellow scales. At the end of the discal cell is a small elongated black spot. Hind wings also with a broad margin running from the apex to the hind angle, with the inner portion irregularly undulated. Underside of fore wings pale orange, with the discal spot broken and the black margin absent. Hind wings bright canary yellow with numerous fine, brown scales scattered over the surface, forming no regular pattern; about the middle of the wing a few reddish-brown patches and one at the apex. The female varies from lemon yellow to pale orange, with the black border broken at the hind angle of the fore wings, and on the hind wings the black border is more or less broken and washed with

yellow scales. Hind wings beneath in some specimens much as those of the male only with the brown patches about the middle of the hind wings more prominent and heavier. Some individuals have the hind wings and the outer part of the fore wings light chocolate brown, with numerous, somewhat darker irrorations and darker patches about the middle of the hind wings. Expands  $1\frac{3}{4}$  to 2 inches.

*Caterpillar*.—Body pale green along the dorsal surface, whitish green along the sides; each segment has four or five transverse creases with a number of small tubercles on the ridges, each of which sends out a whitish or black hair. Along the sides is a whitish longitudinal stripe, sometimes containing an orange spot on each segment, or there is an orange line along the whole length. Under-side, feet and legs pale green. Length, about 1 inch.

*Chrysalis*.—Green with raised white corrugations, and sprinkled more or less with brown. Wing-cases very protuberant; head-case long, conical. Length,  $\frac{5}{8}$  inches.

*Food-plants*.—*Cassia marylandica*, Clover, etc.

About 1880 this species appeared in considerable numbers in Central Park, New York City, and other places around New York; but since then only a few specimens have been taken.

### *Synopsis of the Species of Pierinæ.*

#### **Pieris.**

White, with black spot on fore wings (two in the female). . . . . *P. rapæ*.  
Pure white, without markings. . . . . *P. oleracea*.  
With veins on underside of hind wings heavily bordered with greenish  
scales . . . . . *P. protodice*.

#### **Anthocharis.**

Upper wings falcate, tipped with orange in the male. . . . . *A. genutia*.

#### **Callidryas.**

Large size. Wings bright lemon yellow. . . . . *C. eubule*.

#### **Colias.**

With silvery spot, in middle of hind wings beneath.  
Wings sulphur yellow, with black borders. . . . . *C. philodice*.  
Wings orange, with black borders. . . . . *C. eurytheme*.

#### **Terias.**

With no silvery spot in middle of hind wing beneath.  
Wings bright orange, with black borders. . . . . *T. nicippi*.  
Wings lemon yellow, borders black, with ferruginous spot on apex  
of hind wing beneath. . . . . *T. lisa*.

## NYMPHALIDÆ.

### Subfamily NYMPHALINÆ.

#### ***Danais archippus* (Fabr.).**

PLATE III, FIG. 1.

*Butterfly*.—Upperside foxy red or fulvous, with the veins heavily marked with black and the borders black, containing two rows of white spots, and a few lighter fulvous spots in a black field before the apex of the fore wings. Underside paler than above, especially the hind wings, and the white spots are more prominent. Expands  $3\frac{1}{4}$  to 4 inches.

*Caterpillar*.—Head yellowish, marked with two triangular black stripes. Body above with transverse stripes of black, yellow and white. On the second segment is a pair of long fleshy horns pointing forward, and a similar pair on the eleventh segment pointing backward. Underside black, with greenish between the segments. Length,  $1\frac{3}{4}$  inches.

*Chrysalis*.—Bright pea green dotted with gold, and a row of golden dots extends more than half way around the body. This band is shaded with black. The chrysalis is suspended by a silken button. Length, 1 inch.

*Food-plants*.—Different kinds of Milk weeds (*Asclepias*).

Very common in this vicinity, appearing in June and July, but becomes more numerous in August and September, and may be seen until November. Double brooded. In years when conditions have been favorable to the insects' increase, immense swarms of the butterfly may often be seen in autumn migrating southward in streams like birds. According to Dr. S. H. Scudder it leaves its winter quarters in the extreme south with the opening of spring and flies northward, not in flocks or streams, but singly.

#### ***Argynnis idalia* (Drury).**

PLATE III, FIG. 2.

*Butterfly*.—Upperside of fore wings bright orange brown, with the costa and outer margin narrowly bordered with black. Across the cell are three black streaks, and at the end of the cell an irregular round spot enclosing a fulvous spot. Across the middle of the wing is a broken, zig-zag band, beyond which is a row of black spots, and before the outer border is a row of crescent-shaped spots. Hind wings velvety black with a bluish reflection, and the base washed with fulvous; across the middle is a row of cream-colored spots and a

row of orange spots near the outer border. Underside of fore wings paler than above, with the black marking repeated. The black crescent-shaped marks before the outer border enclosing a pearly white spot and a few dashes of the same color before the costa near the apex. Hind wings brown, with three rows of silvery white spots across them and four spots at the base. The inner margin and base of costa also silvery white. The female differs from the male by being larger, and the wings broader. The terminal black band of the fore wings is broader and contains a row of white spots. Apex black, with a few white spots. Hind wing with two rows of creamy white spots. Underside similar to the male. Expands 3 to 4 inches.

*Caterpillar*.—Body velvety black, with a broad ochreous-yellow stripe along the dorsum, enclosing a narrow macular black line, which is sometimes obsolete. Along the sides is a darker stripe; at the junction of segments three transverse bands ending at the one along the sides. The black spaces on each side are crossed by short yellow stripes. Last segment wholly yellow. The body is also furnished with six rows of tapering, fleshy spines; the two rows along the dorsum silvery white, tipped with black. The rows along the sides are smaller and yellowish or orange at base. Head reddish brown on upper half, black below. Underside of body olive brown, with the legs smoky brown. Length,  $1\frac{3}{4}$  inches.

*Chrysalis*.—Brown, tinged with pink, and marked with black in rather small spots scattered over the thorax and wings and in front of, sometimes including, the tubercles. Length, about 1 inch.

*Food-plant*.—Various kinds of Violets.

Found during July and August in swampy meadows or adjacent fields, and is common locally. When feeding, the butterfly nervously flutters its wings and darts off at the least disturbance.

### ***Argynnis cybele* (Fabr.).**

PLATE III, FIG. 3.

*Butterfly*.—Wings orange ochraceous, with the bases black to nearly the middle and covered with orange-ochraceous scales; across the cell are three black bars and an irregular pear-shaped spot at the end of the cell enclosing an orange-ochraceous spot. Across the middle of the wing is a rather broad zig-zag band, beyond which is a row of round spots. The outer border of the wing is edged by a narrow black line, preceded by a second, upon which rests a series of black lunules. The two black lines on the outer border are crossed by black dashes, one on each nerve. Hind wings with a transverse band across the middle composed of irregular spots, followed by a row of spots. Outer border similar to that of the fore wing, and preceded by a series of detached crescent-shaped spots. Underside of fore wings much paler than above, with outer mar-

gin ochraceous, and a patch of the same color before the apex containing two silvery spots. The lunules near the outer border are brown, and each contains a silver spot; the three nearest the inner angle are black and enclose the ground color. Hind wings cinnamon brown at the base to beyond the middle of the wing, more or less sprinkled with yellow scales, then followed by a broad, conspicuous yellowish space. Outer border cinnamon brown fading more or less into yellow towards the anal angle. At the edge of the dark ground color is a row of silvery spots and a row of the same color before the dark outer margin. At the base of the wing are eleven silvery spots of different sizes. The female differs in having the markings heavier and the basal half of the wings darker. Expands 3 to  $3\frac{1}{2}$  inches.

*Caterpillar*.—Velvety black, with six rows of black spines beset with short black bristles; the bases of the spines are reddish yellow, and the spines on the second segment are wholly black. Between the dorsal tubercles are two transverse gray dots. Underside of body chocolate brown. Head small, subcordate, flattened in front and finely tuberculated, the back much rounded, the vertices subconic, and each on its anterior side giving a small black conic process; the face much covered with black hairs of irregular length; color of front dull dark brown; of back, reddish yellow. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Dark brown mottled with drab or reddish brown or almost leaf-brown, more coarsely angulose than *A. aphrodite*, and with more prominent tubercles. Basal segments of body unicolorous. Length, about 1 inch.

*Food-plant*.—Violets.

Rather common in swampy places. Makes its appearance in the latter part of June, and is found through July and the early part of August. Its habits are much the same as those of *A. idalia*, and it is more abundant. The eggs are laid singly, and they hatch in about fifteen days. The caterpillars go at once into hibernation, and become full fed the following June.

### **Argynnis aphrodite (Fabr.).**

*Butterfly*.—Closely allied to *A. cybele*, but may be separated from that species by its smaller size and by the absence of the dark basal area on the fore wings above in the male, or by its being only slightly indicated; also by the narrow yellow field or band between the outer margin and the brown basal color on the underside of the hind wings. This yellow field is twice as wide in *cybele*, otherwise the markings are much the same only not so heavy. Expands about  $2\frac{1}{2}$  inches.

Found in same situations as *A. cybele*, but not so common. June–July. The larva is very similar to that of *cybele*, and also feeds on violets.

***Argynnis myrina* (Cram.).**

PLATE IV, FIG. 1.

*Butterfly*.—Deep orange fulvous with four transverse bars in the cell, more or less united ; about the middle of the wing a transverse zig-zag band, from which runs an irregular dash to the base of the wing ; beyond the zig-zag band is a row of spots. Outer border black, preceded by a series of crescent-shaped spots which are connected with the border, each containing a fulvous spot. Hind wings with the outer border like that of the fore wings ; across the middle is an irregular zig-zag band not reaching the inner border, with another shorter band of the same pattern before it ; near the base of the wing is a round black spot. Underside of fore wings paler than above, with the outer margin and apex ferruginous ; before the outer border, the black crescent-shaped spots from above are repeated, each enclosing a silvery spot. Before the apex is also a silvery patch which is sometimes double. Hind wings ferruginous with yellowish patches, and crossed by three rows of silvery spots ; one row close to the outer border, one a little beyond the middle, and one near the base composed of large spots before which are a few silvery spots, one having a black centre. Expands  $1\frac{1}{2}$  inches.

*Caterpillar*.—Body cinereous brown, mottled with velvety black, there being a large patch at the base of each spine of the two dorsal rows, and is edged with a pale color. The spines are long, tapering and honey-yellow, often orange at the base, with black bristles ; those on the second segment longer than the rest and directed forward. Legs and feet black ; head cordate, bronze, with rounded vertices, with black bristles over the surface. Length, about 1 inch.

*Chrysalis*.—Dark luteous ; abdomen darker, marked with fuscous ; tubercles of body uniformly conical, those on the third segment between the dorsal and lateral pair very prominent, and those of the first segment smaller than the ones of the second. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Different kinds of Violets.

This species may be easily known by its small size and silvery spots on the underside of the hind wings. It is common in swampy places and damp meadows, where it usually occurs in abundance. It is on the wing from the latter part of May until early in September, and is probably three brooded. The flight of *A. myrina* is not so rapid as that of *A. cybele* or *A. idalia*. It flies rather slowly amongst tall grass, when not feeding on flowers, and when alarmed will only fly a short distance, and settle again in the grass.



***Argynnis bellona* (Fabr.).**

*Butterfly*.—Differs from *Argynnis myrina* by the absence of the black outer border on all the wings, which are only slightly edged or tipped with black. Inside the outer border is a row of black spots instead of crescents, as in *A. myrina*; otherwise the markings are very similar. Underside, before the apex of the fore wings, rusty brown tinged with purplish, and the black marking from above not so heavily indicated; outer row of black spots absent. Hind wings wanting the silvery spots, rusty brown tinged with purplish and yellowish brown nearer the base. Beyond the middle of the wing is a row of indistinct darker spots, and near the base a rather broad, patch-like band, slightly yellowish and scaled with rusty brown. Expands  $1\frac{1}{2}$  inches.

*Caterpillar*.—Head shining, blackish green. Body spined, purplish black, mottled with yellowish and with a velvety-black broken lateral stripe. Spines all of nearly the same size, dull luteous tipped with fulvous. Length, about 1 inch.

*Chrysalis*.—Yellowish brown with dark yellowish-brown creases; the tubercles on the first and second segments of equal size; those on the third segment, between the dorsal and lateral pairs, very prominent. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Different species of Violets.

Common in this neighborhood, and is found together with *Argynnis myrina*, but is not so abundant. June to September.

***Euptoieta claudia* (Cram.).**

PLATE III, FIG. 4.

*Butterfly*.—Upperside fulvous with two zig-zag bands across the fore wings, with the color between a little paler, the inner band being heavier and blacker. At the end of the cell is an oval black circle, and in the middle of the cell a short bar and another one beneath it; beyond the outer zig-zag line is a row of rather large black spots, followed by a narrow transverse line a little before the outer border, which is also black. Hind wings with the marking much the same as on the fore wings. Underside of fore wings paler than above, with paler space between the two zig-zag bands also lighter, the outer zig-zag band and the black outer border absent, and the narrow band before more or less indicated. Before the apex on the costa is an ashen gray triangular mark; apex brownish. Hind wings with basal half brown, beyond which is a broad light brownish band-like shade, finely speckled with darker scales; at the costa this band is paler. This band is followed by a broad brown shade nearly the same as the color at the base of the wing, and is edged off by a terminal pale line. The veins are light grayish, and the round spots from above are faintly reproduced

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with a small light centre. The female differs by being somewhat deeper in color with the black marking heavier. The markings beneath are also more distinct. Expands 2 to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Orange ochre, smooth, striped longitudinally with black, which is almost concealed by the white spots which cover it. Two stripes are on the subdorsum and one on each side above the spiracles; beneath the spiracles, at the base of the legs, is a maculate white stripe. On back of each segment from the third to the twelfth is a small, elongated white spot, edged with black. On the body are six rows of spines; two subdorsal standing on the black stripes and running from the first to the twelfth segment; one on each lateral stripe and running from the fourth to the twelfth segment, in line with these is a spine placed between the first and second segment and one between the second and third. The other rows are beneath the spiracles. The dorsal spines on the first segment are orange at the base, as are also those between the anterior segments, but all the rest rise from lustrous blue-black conical tubercles, and all spines are blue-black, slender, a little thickened at top and beset, thickly, with fine short black bristles. The spines are of nearly uniform length, except the two dorsal ones on the first segment, which are slender and enlarged into an ovate club at the tip; they are directed forward over the top of the head. Between this pair of spines is a black patch, and on the edge of the segment a white spot. Underside blackish brown. Head small, subcordate, flattened in front; surface lustrous, brown black, with orange patches. Length, about  $1\frac{1}{2}$  inches.

*Chrysalis*.—Pearly, with the surface giving all the colors of the rainbow, while the tubercles are golden and the spots here and there orange. Length,  $\frac{3}{4}$  inch.

*Food-plants*.—Violets, Mandrake, Passion-flower, *Sedum*, *Portulacca* and *Desmodium*.

Not common in this vicinity, and usually found in damp, open places where species of *Argynnis* occur. There are probably two broods here, one in June and July, and the other in August and September.

### **Melitæa phaëton** (*Drury*).

PLATE IV, FIG. 2.

*Butterfly*.—Upperside black with two or three rows of yellowish-white spots beyond the middle of the fore wings and a row of larger brick-red spots along the outer borders, and two patches of the same color in the cell. Hind wings also black with two rows of yellowish-white spots before the row of brick-red spots along the outer border and two patches of brick-red near the base of the wing. Underside with the yellowish-white and brick-red spots repeated and

more distinct ; and a few additional yellowish spots at the basal part of the fore wings. On the hind wings there are four rows of yellowish-white spots, the outer one being crescent-shaped like those on the upper side. Before the middle of the wing is a broad patch-like brick-red band, and a few spots of the same color and a few smaller yellowish-white ones before it, near the base of the wing. Expands about 2 inches.

*Caterpillar*.—First, second and part of the fourth segment and the last two segments black ; the remaining segments deep fulvous red, with narrow black transverse bands : one band running with the spines, one on the junction of the segments, and one before this last. On the dorsum and sides are seven rows of long, fleshy, black spines, each arising from a round, shining blue-black tubercle ; each spine is provided with a number of bristling black hairs ; beneath the spiracles is another row of smaller spines. Underside orange, with a black ventral stripe. On the fourth and fifth segments is a small black tubercle, with short spines, and between the pairs of legs are several minute tubercles with short hairs ; legs black ; head black, bilobed, tuberculated, and with short black hairs. Length,  $1\frac{1}{4}$  inches.

*Chrysalis*.—Varying from pearly to pure white, spotted and marked with brownish black, with the tubercles on the abdomen and thorax orange, each marked anteriorly by a black crescent. On the lower side is a black stripe, running from anal extremity to the head, on top of which it is bifurcated. Across the wing-cases is an irregular band edged with orange, and at the hind-borders are brown serrations. Length,  $\frac{4}{5}$  inch.

*Food-plants*.—*Chelone glabra*, *Viburnum dentatum*, *Lonicera ciliata*, *Gerardia*, etc.

This species is single brooded, and is not rare in this vicinity, but is very local in swampy places. It is found on the wing about the middle of June. In flight the butterfly is slow and sluggish, alights on the leaves, shrubs, grasses and on the ground. The eggs are laid in masses, and the young larvæ spin a web in which they live in colonies until the following spring ; after the larvæ become older they leave the web and live singly on the leaves.

### **Phyciodes tharos (Drury).**

PLATE IV, FIG. 3.

*Butterfly: Winter form, marcia Edw.*—Upperside reddish fulvous, marked and bordered with black. Outer margin broadly bordered with black, through which runs a narrow wavy line or a series of small crescent-shaped fulvous spots, the one about the middle being quite large, while the others are often obsolete. Costa and inner margin narrowly bordered with black. Near the base of the

wings is a band composed of small black circles which are more or less confluent. Base of wings blackish, with traces of a few black circles. At the end of the cell is an oblong black circle, and at middle of the wing, on the costa, is a large oblique subtriangular patch and one on the inner margin; these patches are connected with a narrow dentate line. Then comes a broad fulvous band followed by a narrow dentate or wavy line, after which is a series of fulvous spots which are immediately before the black outer border. Hind wings with basal portion much like the fore wings; beyond the middle there is a narrow wavy line followed by a series of black spots; then comes the broad black outer border in which is a row of more or less distinct, pale yellowish crescents. Underside pale fulvous, marked with yellowish patches, often near the outer border, before which is a crenated narrow line; parts of the black marking from above are repeated. Hind wings with grayish-white, ochreous and brown patches; a double line near the outer border, forming irregular crescent-shaped spots, of which the middle one is white and conspicuous; before these markings is a row of small black dots, and at the basal half the markings are similar to those above, but composed of brown lines. The female is much like the male. Expands 1 to  $1\frac{1}{2}$  inches.

This form varies considerably, especially in the underside of the hind wings, being more or less washed with brown, yellowish or grayish white, and the markings also more or less distinct. Sometimes the white crescent-shaped spots are obscured with rusty brown. It is almost impossible to give an accurate description of this species which would apply to it as a whole. It, however, is so common that any one finding it cannot fail to recognize it.

*Summer form, morpheus* Edw.—Same size as *marcia*, with the upperside much the same. The underside of the hind wings are yellow with the narrow transverse marking brown or only faintly indicated, and the outer border brown concealing the crescents; at the angles the crescents are the same as the ground color, and only in some individuals the middle crescent is whitish. There is also as much variation in this form as in *marcia*.

*Caterpillar*.—Dark brown dotted with yellow and striped with yellow and black, the yellow always dull; armed with seven rows of spines, one dorsal and three on either side, besides smaller and similar spines at base of body, one on each segment from the third and over the pro-legs two on each. The spines are stout, tapering, dark brown, partly white-tipped; those of the upper and lower lateral rows more or less orange-tinted at base, each beset with many straight black bristles. Head cordate, either black or bronze, shining; on each vertex a cordate yellow spot, and on each side a sickle-shaped stripe. Length,  $\frac{3}{4}$  inch.

*Chrysalis*.—Grayish white with darker creases, darker on the body, which has a dull band below the spiracles. Length,  $\frac{2}{3}$  inch.

*Food-plants*.—Various kinds of Asters.

Very common from May to the latter part of September and early in October. It is found in open meadows and fields, and is probably three brooded in this vicinity. The form *marcia* appears in May and June, and produces the form *morpheus*.

### **Phyciodes nycteis (Doub.).**

PLATE IV, FIG. 4.

*Butterfly*.—Upperside fulvous, with a broad black terminal border, broadest at the apex, and enclosing a row of fulvous spots which in some specimens are obsolete or wanting. About the middle of the wing is a long, irregular black patch which is connected by a narrow line with another patch on the inner border. At the base of the wing is a number of black circles more or less coalescing. Hind wings with the basal half similarly marked as the fore wings; across the middle is a narrow black band, followed by a row of black spots; outer border black. The fringes of all the wings are black with whitish patches. Underside of upper wings paler than above, with the black patch from above on the costa at the middle of the wing faintly repeated. The broad black terminal border is also faintly repeated, but is much broken by the fulvous ground color, and enclosing a few black spots. Before the fringes is a narrow fulvous border. At the apex are three connected silvery-white spots, and one or two near the middle before the fulvous outer border. Hind wings yellowish and dark brown. Near the base is a broad silvery-white band and a similarly colored band across the middle of the wing, broken by the brown veins. Between these two bands are a number of brown, wavy lines. Outer border with a terminal fulvous line like that on the fore wing, and on which rests a row of silvery white lunules, the two at the apex and the middle one being larger than the rest; before these lunules is a row of black spots. Expands  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Blackish brown above, with seven rows of long black spines, one dorsal and three lateral rows on each side, all arising from shining black tubercles, except lower lateral row which has yellowish tubercles, and each with bristling black spines. At the base of the body is a dull green stripe, with a yellow stripe in line with the lower lateral spines and a broken yellow line running with the spiracles. Sometimes this line is ochre or reddish yellow; the basal line is dotted with yellow. Underside greenish brown spotted with yellow. Head cordate, shining black, with black hairs. Length, 1 inch.

*Chrysalis*.—Similar in shape to that of *Melitæa phæton*, with five rows of tubercles on the abdomen. It varies much in color; some are greenish yellow, others pink brown, others gray brown, with a few dark markings. Length,  $\frac{3}{4}$  inch.

*Food-plants*.—Asters, Sunflower and *Actinomeris*.

Quite rare in this vicinity. In general appearance it very much resembles *Phyciodes tharos*, especially in color and in the marking on the upperside; but the underside of the hind wings is very different, being provided with silvery white bands and lunules which are absent in *P. tharos*. It is also a larger insect. June–July.

### ***Phyciodes harrisii* Scud.**

*Butterfly*.—Upperside very similar to *P. nycteis*. Underside with the outer border orange fulvous preceded by a row of whitish lunules and a row of spots of the same color. The lunules are in a narrow blackish-brown field, which is broadest before the apex; before the middle of the wing a few narrow black streaks. Hind wings with five large yellowish-white spots with narrow black borders in an orange field at the base. Across the middle of the wing is a band of large yellowish-white spots also narrowly bordered with black; then comes a brownish-black space in which is a row of black spots with a whitish pupil, and are surrounded with orange. The terminal border is orange, preceded by a series of rather large white lunules. Expands  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Body deep reddish fulvous with transverse black stripes, one before and two after each transverse row of spines, and a longitudinal black dorsal stripe; last two segments black; on the ninth to eleventh segments the fulvous bands are broken. The seven rows of spines stand on a broad black band, each spine with long hairs and arising from shining black base. Head black, granulated, and covered with short black hairs. Legs black. Length, 1 inch.

*Chrysalis*.—Pure white, marked and spotted with blackish and orange, last segment black; a broad black band on the ventral side reaching from the head-case to the lower end of the wing-cases. The abdomen has an orange band between each segment; on the abdomen are several rows of orange tubercles, and nearly all have a black crescent on the anterior side. On the wing-cases is a curved black longitudinal band, and the nervules of the wings are orange. Length, about  $\frac{2}{3}$  inch.

*Food-plants*.—Asters and *Diplopappus*.

Very rare in the vicinity of New York City. Single brooded. June.

### ***Grapta interrogationis* (Fabr.).**

*Butterfly*: *Form umbrosa* Lint.—Upperside fulvous with two round spots in the cell and at the end an oblong patch of the same color; a row of four round spots running from the inner margin to the end of the cell. Outer border ferru-

ginous with a subapical patch on the costa and one on the inner margin ; both these bars run together at the middle and appear to form part of the outer border. Hind wings blackish brown, with a short tail and a few black spots which are only dimly visible owing to the dark ground color ; base of wing ferruginous. Edges of both wings bluish gray. Underside much variegated with patches and spots of different shades of brown, olivaceous and more or less purplish. Across the middle of the wing is a narrow angulated band, beyond which is a row of minute black dots. Hind wings similarly marked, with the band wavy. In the middle is a silver C which is broken at the lower end. Expands 2 to 3 inches.

*Form fabricii* Edw.—Differs from the form *umbrosa* in having the fore wings more falcated, the tail on the hind wings longer and narrower, and the anal angle much produced. The fore wings above with the markings like *umbrosa*, but the ground color and outer border of a lighter shade. The hind wings are ferruginous instead of brownish black as in *umbrosa*, and have a row of fulvous spots before the outer border, and the black spots distinctly visible. The margins of both wings are bordered with lavender. Underside clouded in shades of brown and ferruginous, sometimes partly suffused by purplish. General pattern as in *umbrosa*, but without the striking diversity of color. In some specimens the brown color is quite evenly distributed over the wings. Size same as in *umbrosa*.

*Caterpillar*.—Color dull black, with white, yellow and red tubercles, and longitudinal lines and bands of red and yellow, varying greatly in distinctness. Some larvæ are black, finely specked with yellow without longitudinal lines on the upperside ; others have small spots in place of specks, and have more or less distinct longitudinal lines of either yellow or red or mixed ; others have the body russet brown, with many yellow spots, with the lines often obsolete. There are also intermediate variations. The seven rows of spines also vary in color from deep red to yellow or mixed. Length,  $1\frac{1}{2}$  inches.

*Chrysalis*.—Yellowish brown to dark brown in color, with a large, compressed, blunt beak-like process on the thorax and three rows of tubercles on the abdomen, on which are eight silvery spots. Length, 1 inch.

*Food-plants*.—Elm, Hackberry (*Celtis*), Hop, Nettle and Basswood.

Rather common during the warmer weather, but rather difficult to capture, as are also the other species of *Grapta*. In this vicinity there are probably three broods, the last one hibernating in the butterfly state.

### ***Grapta comma* (Harris).**

PLATE IV, FIG. 6.

*Butterfly*.—This, like the preceding, is a dimorphic species, the winter form being known as *harrisii* Edw., which over-winters, and the summer form as

*dryas* Edw. The color and markings much the same as in *Grapta interrogationis*, but instead of four black spots running from near the inner margin to the end of the cell there are only three. It also differs in having the wings more scalloped and regularly falcated in both forms, and the tails on the hind wings broader and shorter than in *interrogationis*; otherwise the markings above are similar. The form *harrisii* has the hind wings above ferruginous, and the form *dryas* has the hind wing dark brownish black with a subterminal row of fulvous spots which are more distinct in the form *harrisii*. The underside of both forms is distinctly marked by different shades of brown and washed with pinkish and olivaceous. The angulated band seen in *interrogationis* is also present. In the middle of the hind wing, on the angle of the band, is a distinct silvery-white open C, or comma. Some examples have the underside almost uniformly brown with faint, short streaks of a darker shade. It is also smaller than *interrogationis*. Expands  $1\frac{1}{2}$  to  $2\frac{1}{4}$  inches.

*Caterpillar*.—Very variable in color. The body in some is black with yellow spots, and spines tipped with black; others are cream white or greenish white, with almost no markings; others are velvety black with yellow bars and bands across the dorsum and a yellow band along the sides; in others again the body color is brown. In light examples the head is dull pink, in the dark ones black, sometimes with a forked white stripe down the front and covered with spines. Length,  $1\frac{1}{4}$  inches.

*Chrysalis*.—Same in shape and color as *G. interrogationis*, with golden protuberances on the abdomen. Length,  $\frac{1}{8}$  inch.

*Food-plants*.—Elm, Hop, Nettle, *Celtis* and Basswood.

Not quite so common as *G. interrogationis*, and probably is three brooded in this vicinity; the butterflies of the last brood over-winter.

### ***Grapta progne* (Cramer).**

*Butterfly*.—Upperside of both wings same as in *Grapta comma*. Underside grayish brown, closely streaked with fine, short lines. Beyond the dark portion on the fore wings the color is pale ashen gray, washed with pinkish, somewhat lighter towards the apex. This light color is also streaked with brown. Before the outer border of both wings is a narrow greenish-blue wavy line. In the middle of the hind wings is a white open L, which in some specimens is only faintly indicated. Expands  $1\frac{3}{4}$  to 2 inches.

*Caterpillar*.—Color, buff; the cross stripes on the posterior parts of segments black and pale buff; in front of each dorsal spine is a V-shaped reddish bar, which passes round the spine, and there is an oblique bar of the same color in front of each of the first laterals, and from its base directed forward and down-



ward ; the second laterals stand on a straight or slightly arched bar of the same color. The spines on the third, fourth and fifth segments larger than elsewhere ; the dorsals white, reddish or honey yellow at bottom, and from yellow tubercles ; the first laterals white from fourth to eleventh segments, but on third, fourth and twelfth segments are black with buff branches ; the second laterals are all black, yellow at base and stand on yellow tubercles ; the lower laterals all white, on yellow tubercles. The color of spines on second segment is yellow ; spiracles black in yellow ovals ; feet black, prolegs yellow and brown. Head subcordate ; on each vertex a large compound spinous process, the main stem black, the branches partly black and yellow ; the face and sides thickly covered with simple conical spines of irregular sizes, buff or yellow ; the sides and frontal triangle black, the rest yellow. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Like that of *G. comma* in shape. Color dull green, brown and pinkish white.

*Food-plants*.—Wild and cultivated Currant and Gooseberry.

Less common than *G. interrogationis* and *G. comma*. It is double brooded, the first brood of butterflies appearing in early summer and the last in August, which over-winters.

### ***Grapta faunus* Edwards.**

*Butterfly*.—May be easily recognized by the deeply incised and notched outer margins of both wings. The pattern and color are about the same as in *G. comma* ; it is deeper colored than its allies, and the black markings are more prominent, making it a rather conspicuous species. The underside is beautifully marbled with various shades of brown, from light to dark brown, and mottled with gray white, and streaked with black lines, especially beyond the angulated band across the middle of the wings. In this light shade is a row of olive green spots, followed by a wavy line of the same color before the outer borders. The green spots and line are larger on the hind wings, which have a silvery white C-shaped mark in the middle, varying in form. Expands about  $2\frac{1}{4}$  inches.

*Caterpillar*.—Body brownish yellowish with white spines and a large white patch on the dorsum on the posterior half of the body. Head black, with a light W-shaped mark on the front and a number of black spines. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Pale brown streaked with green, with the ocellar tubercles equal on basal half, conical beyond, the notch between them deeper than broad. Tubercles on body not much larger than the others. Length, about 1 inch.

*Food-plants*.—Birch (*Betula lenta*), Willow, Wild and Cultivated Gooseberry.

Very rare in this vicinity, and only a few examples have ever been taken. It is a mountain insect, common in the Catskill Mountains and northward.

### **Grapta j-album** (*Bd.-Lec.*).

*Butterfly*.—Upper wings dull yellowish washed with rusty brown ; basal half ferruginous. In the cell is a large black spot, and on the costa at the end of the cell a larger patch, beyond which is another costal patch, connected by a white subapical spot with the black border, which is before the outer yellowish and black margin. Beneath the cell between the veins are four large black spots. Hind wings ferruginous, with a broad dull yellow outer border through which runs a ferruginous or blackish band ; on the costa about the middle is a large black spot, to which is connected a white spot. Underside of wings with basal half brownish, with light and dark wavy lines ; then grayish white smeared with light brown, in which is a row of minute black spots ; before the outer margin is a narrow wavy greenish band, followed by a violet-brown shade. Expands 3 inches.

*Caterpillar*.—Body light green with seven rows of spines, with long bristles. The three upper rows of spines are black and the others reddish. Sometimes the larva is black with white spots, and the underside greenish. Length, 2 inches.

*Chrysalis*.—Pale green or flesh-color, sometimes tinged with reddish, with two rows of tubercles, eight in each row, of which six are bright, shining silver. Length, about  $1\frac{1}{4}$  inches.

*Food-plant*.—Paper Birch (*Betula papyrifera*).

This species is very rare, and only a few examples have been captured in the vicinity of New York. It is recorded from Newark and Caldwell, N. J., Staten Island, Central Park, New York City, and different places on Long Island. May, August and October. In the Northern States the butterfly is quite plentiful.

### **Vanessa antiopa** (*Linn.*).

*Butterfly*.—Uppersides of both wings rich velvety brown with a broad yellow outer border, speckled with black ; before the yellow border is a row of blue spots. On the costa of the fore wings are two yellow spots beyond the middle. Underside deep brownish, with numerous black transverse lines. Outer borders dirty white, sprinkled with brown. In the aberrant form *hygiae* Hey. the yellow outer borders are about twice as wide and the blue spots are absent. Expands  $2\frac{1}{2}$  to 3 inches.

*Caterpillar*.—Body black, covered with numerous small white dots; along the back is a row of large red spots, and seven rows of rather long, sharp spines, the dorsal row being shorter. Length, 2 inches.

*Chrysalis*.—Grayish brown with a pointed prominence on the thorax and two rows of short spines along the back of the body and two on the head-case. Length, 1 inch.

*Food-plants*.—Elm, Willow, Poplar and Hackberry (*Celtis*).

This species over-winters in the butterfly state in sheltered places. It may be found under stones, stumps of trees, or sticking to the rafters of a barn and in crevices of walls, huddled together sometimes in numbers, with the wings doubled together above the back and apparently lifeless. During the first warm days of April and May it crawls forth from its winter quarters, and hovers in numbers about sappy stumps of recently felled trees. About the middle of July the butterfly becomes scarce until the advent of the second brood in August. The female deposits her eggs in a cluster around the twig near the petiole of a leaf. The caterpillar is gregarious in habits, living together in companies. The first brood of caterpillars appears in June and the second in August.

### ***Vanessa milberti* (Godt.).**

PLATE IV, FIG. 5.

*Butterfly*.—Upperside blackish brown, with a broad fulvous band across both wings beyond the middle; outer edge blackish brown with a row of blue spots on the hind wings. In the cell and the fore wings are two fulvous spots and a blackish one on the costa in the fulvous band followed by a small white spot. Underside blackish brown with the band from above chocolate brown, and a number of black and brown transverse lines. Expands  $2\frac{1}{4}$  inches.

*Caterpillar*.—Black covered with numerous yellow and white points, each with a short white hair; along the sides, in line with the lower lateral spines, is a bright yellow stripe and another similar stripe above the spiracles. Between these stripes is an orange shade. Sometimes these lines are broken and reduced to patches. The spines are arranged as in *Vanessa antiopa*. The lower spines are yellowish and the others black. Head black, shining, with white and black tubercles sprinkled with white. Length, about 1 inch.

*Chrysalis*.—Same shape as in *V. antiopa* but smaller. Color variable; some are dull whitish with brownish stripes on the body; some are wholly light brown and bronzed, and others are dark brown. Length,  $\frac{3}{4}$  inch.

*Food-plant*.—Nettle.

Taken at West Farms, New York City, Orange Mountains, N. J., Staten Island and Long Island. Very rare in June, September and October. More common throughout the Northern States, Canada, and westward to the Pacific. The eggs are laid in masses usually on the underside of the leaves, and the caterpillars live in swarms.

### ***Pyrameis atalanta* (Linn.).**

*Butterfly*.—Upperside of fore wings with the basal half velvety brown and an oblique, broad, bright red band running from the costa before the middle to nearly the hind angle; above this band the wing is black with six white spots, the inner one being an oblique dash on the costa. Hind wings velvety brown with a broad red band on the outer edge, in which is a row of small black spots. Underside of fore wings with the red band repeated but lighter, followed by an irregular blue ring near the costa. The white spots are also repeated; apex light brown tipped with lilac. Hind wings marbled with brown, with darker brown indistinct spots and wavy transverse lines; a whitish patch on the middle of the costa, and a row of round, indistinct, submarginal eye-like spots, the centre of some being olive green. Expands 2 to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Black with seven rows of branching black spines, which are sometimes yellow; along the sides is a variable broken band composed of yellow patches. The body is also covered with fine yellow points. Underside smoky brown. Head black, with short spines. Length,  $1\frac{1}{3}$  inches.

*Chrysalis*.—Blackish gray with a delicate bloom, and the dorsal tubercles more or less gilded. Sometimes it is greenish gray with a bronzy shade over the dorsal area. In shape it is much like that of *V. milberti*. Length, 1 inch.

*Food-plants*.—False Nettle (*Bahmeria*) and Hop.

Common from the latter part of May until November, and is double brooded. The caterpillar draws together the edges of the leaf and forms a commodious cavity which shelters the larva within. The butterfly is usually found along wood paths or open woods and fields. It occurs all over North America and also Europe.

### ***Pyrameis huntera* (Fabr.).**

*Butterfly*.—Upperside fulvous; apical portion of the fore wing black, which is continued as a border to the hind angle. In the black field at the apex are four white spots, and a fulvous patch on the costa beyond the middle of the

wing. In the cell are two black marks, also one at the end and one beneath the cell, and a black band running from the end of the cell to inner border before the hind angle. Hind wing fulvous with a black outer border, containing a narrow, wavy fulvous line; before this is a row of black spots, two having blue centres. Underside of fore wings salmon red, with the black marking from above partly repeated. Apical area gray brown, with broken eye-like spots, and the fulvous mark from above white; extreme tip of apex lilac. Hind wings with a delicate whitish net-work at basal portion in brown field. Across the middle is a broad whitish band, sprinkled with brown, and the veins whitish; beyond this is a brown field containing two large eye-like spots with opalescent pupils. Outer border grayish with four narrow black lines. The space between the inner two lilac. Expands 2 to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Blackish, with four pale yellow transverse lines between the joints. Beneath the spiracles are two yellow lines, the lower interrupted, both spotted with black. The seven rows of spines are yellow or brown. Length,  $1\frac{1}{4}$  inches.

*Chrysalis*.—Yellowish with brown or olivaceous markings, sometimes golden green marked with purple and darker markings; an obtuse angle on the thorax, and two rows of spines on the body. Head-case projecting, bifid. Length,  $\frac{3}{4}$  inch.

*Food-plants*.—*Gnaphalium* and *Artemisia*.

Common in open fields and roadsides. The larva draws the leaves together and forms a rude case, within which it lives. Double brooded. May to October.

### ***Pyrameis cardui* (Linn.).**

PLATE IV, FIG. 7.

*Butterfly*.—Very similar to the preceding species, but may be distinguished by the white patch in the black apical area, instead of a fulvous patch as in *P. huntera*. The fore wings are also less concave on the outer border beneath the apex, and are also somewhat more angular. The underside of the hind wing is marbled with light brown and white, with the veins forming a delicate net-work; before the outer margin is a row of four eye-like spots, which are much smaller than the two in *P. huntera*. Expands 2 to  $2\frac{3}{4}$  inches.

*Caterpillar*.—Body varying from grayish to brownish; with a yellow, broken dorsal stripe and one along each side beneath the spiracles. The spines are yellow and placed like those of *P. huntera*. Over the body are also numerous minute yellow dots, from which proceed fine whitish hairs. Head blackish, covered with fine whitish hairs. Length,  $1\frac{1}{2}$  inches.

*Food-plants*.—Various kinds of Thistles, Burdock, Sunflower, Hollyhock, etc.

Common in this neighborhood, and may be seen flying in company with *P. huntera*. Double brooded. The larva lives singly within a few leaves spun together with silken threads. The chrysalis is similar to that of *P. huntera*. It is a cosmopolitan species.

### *Junonia cœnia* (Hübner).

PLATE IV, FIG. 8.

*Butterfly*.—Upperside of fore wings sepia brown, with an oblique dirty whitish band beyond the middle, and enclosing a large black eye-like spot with a blue centre, and above it a small spot which is sometimes absent. In the cell are two deep orange-fulvous bars, and outside the large spot also orange. Hind wings same in color as the fore wings, with two eye-like spots followed by a subterminal, orange-fulvous border. Underside very variable, from a light brown to a reddish brown; these colors being confined to the apex of the fore wings and hind wings, which have a few narrow, wavy transverse lines. The two eye-like spots on the fore wings are repeated, and the two bars in the cell are orange; on the hind wings are two or three small eye-like spots. Expands  $1\frac{3}{4}$  to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Black with fine white specks sprinkled over the dorsum, and a yellow band on each side, one along and one beneath the spiracles. Spines similar to those of *P. cardui*, black. The two stigmatal rows on each side yellowish. Head black, sprinkled with white and an orange triangle in the middle of the face. Length,  $1\frac{1}{2}$  inches.

*Food-plants*.—*Gerardia*, Plantain and Snap-Drageon.

Common from May to November, and is double brooded. It may often be seen flying on dusty roads, and may be easily recognized by the four eye-like spots on the upperside of the wings. The chrysalis is similar to that of *P. cardui* and *huntera*.

### *Limnitis disippus* (Godt.).

PLATE III, FIG. 5.

*Butterfly*.—Upperside of fore wing reddish fulvous, the veins heavily marked with black; costa, also inner and outer borders, black, the latter broader and containing a row of white spots; on the costa beyond the middle is a triangular patch connected with the outer border beneath the middle, and contains three white spots. Hind wings also reddish fulvous, veins black, and a transverse, narrow black band across the middle; outer border black with a row of white spots. Underside much paler than above with the black

markings the same ; outer borders with two rows of white spots ; hind wing sometimes with a row of white spots before the transverse black line. Expands  $2\frac{1}{2}$  to 3 inches.

*Caterpillar*.—Head olive green with numerous short tubercles, and a pair of short, blunt processes on the vertices. Second segment with two long horn-like processes with short conic tubercles. Along the sides is a rather broad whitish stripe, above which the body is mottled with different shades of olive green. First, second and eighth segments whitish, the first two speckled with brown ; on the third and fifth segments are two swollen humps on each ; those on the fourth segment more prominent. On each of the ninth and tenth segments are two short bunches of tubercles, and four on the twelfth segment. Length,  $1\frac{1}{2}$  inches.

*Chrysalis*—Grayish brown, shining, and marked with brown, flesh-color and silvery white. On the middle of the back is a prominent rounded appendage. Length, about  $1\frac{1}{2}$  inches.

*Food-plants*.—Willow, Poplar, Apple, Plum and Oak.

The butterfly in general appearance resembles *Danaïs archippus*, but may be at once distinguished by its small size, scolloped outer borders, and the black band across the middle of the hind wings. It is common in this vicinity, and Willow seems to be the most favorite food of the caterpillar. The butterfly is usually found along the borders of damp places and in waste fields. It is double brooded, the first brood appearing in June and the second in July and August. The young caterpillar of the last brood rolls a leaf together, in which it remains over winter and completes its transformations the following spring.

### ***Limnitis astyanax* (Fabr.).**

*Butterfly*.—Fore wings black with a bluish or greenish reflection. Along the outer border are two rows of blue spots, preceded by a row of orange spots, which are more or less distinct. Hind wings with the bluish reflection stronger and forming a metallic band of spots beyond the middle of the wing ; outer border with two rows of metallic blue spots larger than those on the fore wings. Underside brownish, partly tinged with bluish, with the blue and orange spots on the outer border of the fore wings repeated. In the cell are two orange patches. Hind wing with three orange spots at the base and a row of the same color followed by two rows of blue spots along the outer border. The male and female are similarly marked and colored. Expands  $2\frac{1}{2}$  to 3 inches.

The larva and chrysalis are similar to those of *D. disippus*. The larva feeds on Willow, Wild-gooseberry, Cherry, Apple, Plum, Thorn, Huckleberry, etc. The butterfly is double brooded, the first brood appearing in May and June and the second in July and August. The butterfly frequents orchards and feeds on fallen fruit.

*Synopsis of the Species of Nymphalinae.*

**Danaïs.**

Reddish brown, with black veins and borders ..... *D. archippus*.

**Argynnis.**

Large species.

Upper side of hind wings black, with a bluish reflection and two rows of spots. .... *A. idalia*.

Underside of hind wings with a broad yellowish band. .... *A. cybele*.

Underside of hind wings with a narrow yellowish band. .... *A. aphrodite*.

Small species.

With silver spots on underside of hind wings. .... *A. myrina*.

Rusty brown on underside of hind wings and without silver spots, ..... *A. bellona*.

**Euptoieta.**

Upperside fulvous, with black markings; hind wings beneath with brown and ashen-gray shades. .... *E. claudia*.

**Melitæa.**

Black, with rows of pale yellow spots, and a row of brick-red spots along the outer borders. .... *M. phæton*.

**Phyciodes.**

Upper surface fulvous, with black markings.

Underside of hind wings with silvery white bands . . . . . *P. nycteis*.

Underside of hind wings with yellowish white bands. .... *P. harrisii*.

Underside of hind wings with grayish, brown and ochraceous blotches (form *marcia*), or entirely ochraceous with a brown outer patch (form *morpheus*), and with transverse brown lines. .... *P. tharos*.

**Grapta.**

Wings falcate.

Hind wings beneath with a broken C. .... *G. interrogationis*.

Hind wings beneath with C not broken. .... *G. comma*.

Underside streaked with black lines. .... *G. progne*.

Underside marked with olive green on the outer parts. .... *G. faunus*.

Hind wings above with a large white spot on the costa. .... *G. j-album*.

**Vanessa.**

Wings velvety brown, with yellow borders. .... *V. antiopa*.

Smaller in size, with a broad fulvous transverse band on each wing. *V. milberti*.



**Pyrameis.**

Wings velvety brown, with an oblique red band. . . . . *P. atalanta*.  
 Wings fulvous with black markings.  
 With two large eye-like spots on underside of hind wings. . . . . *P. huntea*.  
 With five small eye-like spots " " " " . . . . . *P. cardui*.

**Junonia.**

Wings sepia brown, with large eye-like spots above . . . . . *J. cania*.

**Limenitis.**

Reddish brown with black borders and veins, and a transverse band  
 across the middle of the hind wings. . . . . *L. disippus*.  
 Velvety black, with metallic blue shades and spots. . . . . *L. astyanax*.

Subfamily SATYRINÆ.

**Neonympha eurytris (Fabr.).**

PLATE V, FIG. I.

*Butterfly*.—Upperside of both wings wood-brown, with two black eye-like spots with yellow rings on the fore wings near the outer border, and two eye-like spots on the hind wings, one large and one small spot near the anal angle. In the female there is only one spot on the hind wings. Underside very much paler than above, with two narrow transverse lines on both wings, with the spots on the fore wings repeated. Hind wings with four eye-like spots, two near the apex and two near the anal angle; between these are two small silvery spots. Expands  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Body flat at base, the dorsum rounded, much arched on middle of segments, the sides flat and sloping; over the feet a fleshy ridge; the second segment constricted, much as in the larvæ of *Hesperia*; the last segment bifurcate, each fork short, pointed, divergent. Color of dorsum yellow brown; of sides, darker; a mediodorsal band dark brown, and on either side of this, on each segment from the fourth to the eleventh, is an indistinct patch; the lateral area separated from the dorsal by two wavy parallel lines, the upper one dark, the other yellowish. On the side of each segment, from the fifth to the eleventh, is a dark oblique stripe; the basal ridge yellowish, the tails tipped with red; the whole surface covered with sharp tubercles of irregular sizes, and colored as the ground, each emitting a very short brown hair; feet and legs yellow-brown; head subpyriform, flattened in front, truncated at summit and slightly depressed. The vertices a little produced, pointed and compressed. Color yellow brown, finely tuberculated; the face crossed by three rows of rounded brown patches. Length, 1 inch.

[November, 1893.]

*Chrysalis*.—Cylindrical ; body stout, and larger than the anterior portion ; thorax rounded ; head-case truncated. Color pale yellow brown, the wing-cases and interior parts streaked with fine, abbreviated, brown lines ; body beneath with two brown stripes, and on the middle of each side a row of brown points. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Various species of Grasses.

Common from the latter part of May until August, in woods and in fields near by, especially if these last are more or less overgrown with shrubs. Single brooded.

### ***Neonympha canthus* (Linn.).**

*Butterfly*.—Paler brown than the preceding species, with a row of black spots in a lighter field before the outer border of the fore wing. Hind wings with five larger, black, eye-like spots before the outer border ; the three lower spots are in pale yellow rings. Underside much paler than above, with two narrow, wavy transverse lines ; the black eye-like spots from above are repeated ; those on the fore wings are surrounded with a yellow circle, and enclosed in a whitish ring. The six spots on the hind wings are quite conspicuous, and are in rings of yellow, brown and white. All the spots have a white dot in the centre. Expands  $1\frac{3}{4}$  to 2 inches.

*Caterpillar*.—Slender, tapering into two long tails on the last segment, with rough tubercles ; each segment is creased transversely. The whole surface is covered with fine tubercles, each with a fine, very short hair. Body green, with narrow yellow longitudinal stripes. Head with two long conical processes on top ; yellowish green, with a brown stripe running down the sides. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Bright green, with the outer wing-cases margined with yellow, and three stripes on upper side of the body and one at the sides. Length,  $\frac{3}{8}$  inch.

*Food-plants*.—Grasses.

Not common in this vicinity. It has been taken near Newark, N. J., Staten Island, near Mount Vernon, N. Y., West Farms, N. Y., and various other localities. Found from the latter part of June, through July and August, flying in swampy places. Its flight is low, with a slow, jerking motion, and settles here and there among the tall grasses, and by beating these they may often be startled forth in numbers. The larva over-winters.

**Debis portlandia (Fabr.).**

PLATE IV, FIG. 9.

*Butterfly*.—Much the same in general appearance as *Neonympha canthus*, in color and markings on the upperside, but the black spots are larger. The wings are more elongate and are regularly scalloped on the outer borders, by which it may be readily distinguished from *N. canthus*, which has the wings rounded. The underside of both wings have the transverse bands much darker, broader, and the outer ones angulated, the angle pointing outward. The black spots from above are repeated and have a yellow ring; all the spots have a small white dot in the middle, and are also encircled by a pale violet ring, which is disconnected between the spots. Outer margins with a narrow pale violet and a dull yellow border. Expands about  $2\frac{1}{4}$  inches.

*Caterpillar*.—Resembles that of *N. canthus*, but is stouter and the head is larger. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Also similar to that of *N. canthus*. It is bright green, and lacks the yellow stripes on the body. Length,  $\frac{3}{8}$  inch.

*Food-plants*.—Grasses.

Generally distributed in this vicinity, but is local. The flight is like that of *N. canthus*. It often rests on the trunks of trees, and sallies forth at any other passing butterfly, and retires again to its chosen post of observation. It also flies near the ground, along the edges of woods, or in the forests among bushes and trees. Found from the latter part of June to the first of August, and is single brooded.

**Satyrus alope (Fabr.).**

PLATE IV, FIG. 10.

*Butterfly*.—Upperside dark brown with a large yellow patch on the fore wings enclosing two black spots, and very much resembles the figure eight. Hind wing with only a small black spot near the anal angle. Underside with the yellow patch repeated on the fore wing, and towards the base are numerous short transverse brown streaks. Hind wings with six small eye-like spots with a light blue dot in the centre, and each surrounded with a yellow circle. These spots are more or less distinct. Across the wings are also short, dark brown streaks, and a narrow, transverse, irregular, wavy band across the middle. The female differs by being larger, somewhat paler in color, and the yellow 8-like patch larger and paler. The underside of the hind wings lacks the small eye-like spots. Expands 2 to  $2\frac{1}{2}$  inches.

*Form maritima* Edw.—Smaller in size, and dark brown, with the yellow patch deeper in color, and smaller.

*Form nephele Kirby*.—Differs from *alope* by the absence of the yellow patch on the fore wings, but the two black spots are present, and on the under-side are conspicuous, with a narrow yellow circle, and are much larger in the female. Otherwise much the same as *alope*.

*Caterpillar*.—Body green, ending in two sharp conical tails; covered with fine papillæ, each of which emit a very short fine hair. On the dorsum a dark green line and along the extreme side a yellow stripe, and sometimes one of the same color along the sub-dorsum. Head globose, green, with fine white papillæ and short hairs. Length,  $1\frac{1}{4}$  inches.

*Chrysalis*.—Green or yellowish green, with a cream-colored line along the inner margin of the wing-cases, another on the keel of the thorax, and one across the top of the head-case. Length,  $\frac{3}{8}$  inch.

*Food-plants*.—Grasses.

Found plentifully through July and August in grassy fields or in open woods, especially along the borders of woods, where the large trees have been felled and a young growth appearing. They fly low, but for a short distance, and rest upon the leaves of bushes or trunks and twigs of dead trees. The form *maritima* has been taken at Jamesburg, N. J. *Nephele* is a northern form, and very rarely occurs here.

### *Synopsis of the Species of Satyrinæ.*

- |   |                       |
|---|-----------------------|
| Outer borders rounded.  | <b>Neonympha.</b>     |
| Wood brown, with two eye-like spots in yellow rings on each wing..... | <i>N. eurytris.</i>   |
| With a row of black spots in a light shade on each wing..             | <i>N. canthus.</i>    |
| Outer borders scalloped.  | <b>Debis.</b>         |
| With a row of black spots in a light shade on each wing....           | <i>D. portlandia.</i> |
|   | <b>Satyrus.</b>       |
| Wood brown, with yellow figure 8-like patch on the fore wings.....    | <i>S. alope.</i>      |
| With yellow patch reduced and darker.....                             | form <i>maritima.</i> |
| With yellow patch absent.....   | form <i>nephele.</i>  |

### Subfamily LIBYTHEINÆ.

#### **Libythea bachmanii** *Hüb.*

#### PLATE V, FIG. 2.

*Butterfly*.—Fore wings blackish, with a large fulvous patch in the lower part of the cell, and a large patch beneath it near the base of the wing. In the

black field at the apex are two white spots, and an oblique white patch on the costa before the spots. Hind wings with a large fulvous patch in the middle. Underside of fore wings with the markings as above; apex grayish. Hind wings grayish or finely speckled with brown, and if held in certain light have a metallic reflection. Expands  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Color dark green, with the extreme sides and beneath pale green. The segments are creased transversely, and have pale whitish points. Along the side is a yellow stripe and an indistinct dorsal line. Length, 1 inch.

*Chrysalis*.—Subtriangular, compressed laterally; head-case square; thoracic process rounded. Color blue green, with a faint yellow dorsal line from the last joint to middle of the body, where it is forked, sending a branch along each wing-cover to the top of the head-case and meeting. At the sides, from the end of the wing-cases to the end of the last segments, a narrow yellow line. The body is also marked with a number of small, whitish tubercles. Length, about  $\frac{1}{8}$  inch.

*Food-plant*.—Hackberry (*Celtis occidentalis*).

This species may be easily recognized by its long beak-like palpi, which are about twice as long as the head. It is quite rare here, but sometimes appears in numbers. In August, 1886, the butterfly was quite common at Sandy Hook, N. J.

### *Synopsis of Species.*

With long beak-like palpi, black, with fulvous patches.....*L. bachmanii*.

## LYCÆNIDÆ.

### *Thecla melinus* (Hüb.).

PLATE V, FIG. 3.

*Butterfly*.—Upper wings slate-color, with a darker, indistinct patch at the end of the cell, in the male. Hind wings with a few blue scales along the outer border, interrupted by a large orange crescent enclosing a black spot, and at the anal angle is a small orange spot. The fringes of both wings are white, and the hind wings have one long slender tail and a short one, both black, tipped with white. Underside of both wings gray; fore wings with a brown and white spot-like band. Hind wings with a similar band, but running across the wing. The orange and black spot from above repeated; anal angle black and orange. Expands about  $1\frac{1}{4}$  inches.

*Caterpillar*.—Slug-shaped. Pale green, with a dorsal yellow stripe, and a white stripe along each side. Length,  $\frac{3}{8}$  inch.

*Chrysalis*.—Testaceous, discolored and flecked with dark brown; abdomen wider than thorax, with long hairs. Length,  $\frac{1}{3}$  inch.

Not common during May, June, July and August. The larva lives on the heads of the common Hop vine, and also on the Bean. Double brooded.

### ***Thecla calanus* (Hüb.).**

PLATE V, FIG. 4.

*Butterfly*.—Upper surface of both wings wholly sepia brown, with a brassy green reflection. Underside paler than above; beyond the middle is a double, broken, white transverse stripe, with the space between sepia brown; beyond this band is a single narrow white band edged outside with brown. In the disc are two short white lines. Hind wings with similar bands, but are more curved. Before the outer border, towards the anal angle, is an oval crescent enclosing a black spot; then comes a patch of blue scales, and on the anal angle a black spot sometimes marked above with a little white and orange. Expands 1 to  $1\frac{1}{4}$  inches.

*Caterpillar*.—Body yellowish green, deep green or pale brown, thickly covered with minute white hairs; along the dorsum a green or dark brown stripe; sides of body with five or six oblique lines. Length,  $\frac{1}{2}$  inch.

*Chrysalis*.—Light or dark brown sprinkled with dots of a darker shade, and is thickly covered with short yellowish hairs. Length,  $\frac{3}{8}$  inch.

*Food-plants*.—Oak, Chestnut, Hickory and Walnut.

Not common in this vicinity during June and July, in woods and about shrubbery. Single brooded.

### ***Thecla strigosa* (Harris).**

*Butterfly*.—Upperside like that of *Thecla calanus*, sometimes with an orange spot near the anal angle of the hind wings, which have a long slender and a short tail tipped with white. Underside paler than above, with a very short white line at the end of the cell; beyond which are four fine, irregular, wavy, white lines, the first almost reaching across the wing, the second shorter, and the third still shorter, while the fourth almost reaches across the wing. Hind wings with the first line nearly extending across, then bending at a small angle and running some way up the abdominal margin, preceded in this last part by another short line, almost parallel to it. The outer lines are shorter. Before

the anal angle is a large orange spot followed by a patch of blue scales with an orange patch above, which is connected with the patch of the same color at the anal angle. Expands 1 to  $1\frac{1}{8}$  inches.

*Caterpillar*.—Body rich velvety green, with a yellowish tinge, and a darker colored dorsal stripe. Anterior edge of the second segment brownish. Body thickly covered with minute brown hairs, hardly visible without a lens. Sides with faint oblique yellowish stripes and an indistinct basal line from the fifth to last segment. Length,  $\frac{1}{2}$  inch.

*Chrysalis*.—Resembles that of *T. calanus*. Reddish brown with very short, fine, whitish hairs, and with black markings and a dark ventral line on the body. Length,  $\frac{1}{3}$  inch.

*Food-plants*.—Oak, Holly, Thorn, Plum and Apple.

Very rare in this neighborhood. Taken by Dr. R. Kunze near Woodhaven, L. I.; also recorded from Newark, N. J., by Prof. Smith; an example taken in this vicinity is also in the collection of the late S. L. Elliot. It is closely allied to *Thecla calanus*, but differs in the position and number of white lines on the under-side.

### ***Thecla damon* (Cram.).**

PLATE V, FIG. 5.

*Butterfly*.—Wings above dark brown, with the middle area ochraceous. Hind wing with two tails, one long and the other short. Underside of fore wings thickly scaled with green, and a transverse band of white and brown before the outer border. Hind wings with the green covering the entire surface, and a wavy transverse white and brown band a little beyond the middle, and a short white and brown band near the base of the wing. Expands 1 inch.

*Caterpillar*.—Green with two rows of small red spots along the back, and on each side a row of somewhat larger and deeper red spots. Head and feet blackish. Length,  $\frac{1}{2}$  inch.

*Chrysalis*.—Grayish brown, marked with dark brown, and covered with hair; body more clear and reddish. Length,  $\frac{1}{3}$  inch.

*Food-plant*.—Red Cedar.

Found on the wing in May and June, and again in August. It occurs only in localities where cedar trees grow. The butterfly, when disturbed, flies for a short distance and suddenly drops to the ground, folding its wings, and owing to the green color

on the underside, it is quite difficult to detect the insect in the grass. In this vicinity it has been taken at West Farms, Rye, Nepperhan and Staten Island, N. Y.; Plainfield, Newark and Passaic Valley region, N. J., and also in different places on Long Island and in New Jersey.

### ***Thecla irus* (Godt.).**

PLATE V, FIG. 6.

*Butterfly*.—Upper surface dark brown, with a slight greenish reflection, and sometimes with a ferruginous patch on the hind wings near the anal angle. The border of the hind wings is toothed, the teeth becoming longer as they reach the anal angle. Underside of fore wings paler than above, with a narrow transverse white line, followed by a row of indistinct dark spots. Basal half of hind wings blackish brown, limited by an irregular zig-zag line, outer half overlaid with whitish scales. Expands 1 inch.

*Caterpillar*.—Slug-shaped. Yellowish green along the dorsum and reddish brown along the sides, with a fine green lateral line along the fold. Head minute, yellowish green. Length,  $\frac{1}{2}$  inch.

*Chrysalis*.—Black or blackish brown, with dull red bands and a narrow black stripe on each side in the middle of the body, not extending to the thorax. Length,  $\frac{8}{10}$  inch.

*Food-plants*.—Wild Plum and Huckleberry.

Not common, occurring in April and May, especially in pine woods and open places.

### ***Thecla augustus* (Kirby).**

*Butterfly*.—In color on the upper surface and in shape this insect is like *Thecla irus*, but differs greatly on the underside of the hind wings, which have the basal half deep brown with the outer half of a ferruginous tint, with a row of minute dark spots. Fore wing somewhat lighter. The wings have a decided brassy reflection. Expands  $\frac{3}{4}$  to 1 inch.

Taken in pine woods on Staten Island, in April and May. The early stages are unknown.

### ***Thecla nippon* (Hüb.).**

PLATE V, FIG. 7.

*Butterfly*.—Upperside sepia brown with a small ochraceous spot at the anal angle of the hind wings in the male, and a large ochraceous space in the middle



of each wing of the female. Underside of fore wings paler than above, and washed with ferruginous. Beyond the middle is a zig-zag white line not reaching the inner border. Beyond this is a submarginal row of dark brown spots, shaded outside with brown and whitish rays. Hind wings with basal half ferruginous, with blackish transverse shades limited by a white zig-zag band shaded outside with grayish brown; beyond this the color is ferruginous with pale grayish scales along the outer margin. Expands  $1\frac{1}{2}$  inches.

*Caterpillar*.—Slug-shaped. Deep green, with a light yellow stripe along the middle of the back, and a white one on each side. Head brown. Length,  $\frac{3}{4}$  inch.

*Chrysalis*.—Short, thick, brown, with two rows of small blackish spots, and outside of these a row of more conspicuous, rust-red spots.

*Food-plant*.—Pine.

Very rare in this vicinity, and found only in pine woods in April and early in May. Single brooded.

### ***Thecla titus* (Fabr.).**

PLATE V, FIG. 8.

*Butterfly*.—Upper surface wholly sepia brown, with a distinct grayish-brown spot at the end of the cell in the male. Underside paler than above, fore wings with two rows of black spots, the outer row touched with orange. Hind wings somewhat produced at the anal angle with a row of black spots, and an outer row of large orange-red spots, touched with black and white on the inside; in the cell are two black spots. The female has the wings more rounded than the male. Upperside sepia brown, with two, three or four orange-red spots along the outer border of the hind wings. Underside like the male, only the spots are larger. Expands  $1\frac{1}{8}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Slug-shaped. Dull green, with a yellowish tint, especially on the anterior segments, thickly covered with very minute brown hairs. On the back is a streak of dark green and a patch of dull pink or rose color on the anterior segments; on the posterior segments a larger rosy patch, extending from ninth segment to the end of the body. Head small, bilobed, black and shining, with a streak of dull white across the front above the middle. Length,  $\frac{3}{4}$  inch.

*Chrysalis*.—Body pale brown and glossy, with many small dark brown or blackish dots over the whole surface, thicker along the middle above, and appearing as a faint imperfect stripe beneath; also thickly covered with very short, minute hairs. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Plum and Wild Cherry.

Rare. Taken at Pelhamville, N. Y.; Jamesburg, Snake Hill, and near Newark, N. J., and probably also occurs on Long Island and other localities. Single brooded. July.

**Feniseca tarquinius** (*Fabr.*).

PLATE V, FIG. 9.

*Butterfly*.—Upperside orange ochraceous. Fore wings with a broad blackish brown outer border, which is narrowly continued along the inner margin and on the costa, where it forms an angular patch. At the base beneath the middle of the wings is a blackish brown dash, beyond which is a round spot of the same color. Hind wings have the anterior half blackish brown, and a series of spots of the same color near the outer border. Underside pale orange yellow, with three rusty-brown spots beneath the costa at the base of the wing, and the blackish basal dash and spot beyond it repeated. Outer border rusty brown, with a whitish patch before the apex on the costa, and rusty brown patches before it. Hind wings rusty brown with numerous white circles, and washed with white. Exands  $1\frac{1}{2}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Head small, pale green. Body largest in the middle, tapering in each direction, with short hairs arranged in transverse patches across each segment, and smoky brown with smoky stripes. Length, about  $\frac{1}{2}$  inch.

*Chrysalis*.—Plump with swollen body, which is covered with slight bosses, and the hinder extremity flattened and laterally expanded. Pale on the thorax, flecked with brown; dark greenish brown on the abdomen, flecked or blotched with cream yellow. Length,  $\frac{1}{3}$  inch.

*Food*.—Plant-lice living on Alder.

Very rare and local in this neighborhood, and only occurs where alders grow. The caterpillar feeds on the lice (*Schizoneura tessellata*) which infest this tree, and probably also feeds on other lice, which exude a waxy secretion and live in colonies. It is three brooded; the first brood appearing from the latter part of May to the middle of June; the second early in July and flies into August; the third from the middle of August to the end of September.

**Chrysophanus hypophlæas** (*Bdv.*).

PLATE V, FIG. 11.

*Butterfly*.—Upperside of fore wings deep orange red, with a satiny gloss; a rather broad brown outer border, before which is a row of black spots and two spots in the cell. Hind wings dark brown with a short orange-red terminal

border. At the end of the cell is an indistinct dark bar. Underside of fore wings orange, with the spots from above repeated, and an additional spot at the base of the wing. Outer border pale brownish gray. Hind wings pale brownish gray with the red outer band from above reduced to a narrow wavy line. Beyond the middle is a transverse row of black spots and a few spots in the basal area. Expands 1 inch.

*Caterpillar*.—Slug-shaped. Body with minute hairs, grass green, with a faint dusky dorsal line and darker, sometimes roseate, along the sides. Length, about  $\frac{3}{8}$  inch.

*Chrysalis*.—Light brown tinged with yellowish green, dotted with blackish, the dots on the body arranged longitudinally in a dorsal series and on either side, above and including the spiracles, five series, sometimes faint. Length, about  $\frac{3}{8}$  inch.

*Food-plant*.—Sorrel.

Very common in open, sunny fields and meadows, from May to October, and in this vicinity it is two or three brooded.

### ***Chrysophanus thoë* (Bd.-Lec.).**

PLATE V, FIG. 10.

*Butterfly*.—Upperside of the male coppery brown, with a purplish reflection and a narrow black outer border. Hind wings darker, with a broad orange-red border. Both wings show traces of the spots on the underside. The female has the fore wings orange ochraceous with a number of black spots and a broad, deep brown outer border. Underside of fore wings light orange ochraceous; hind wings grayish white, with the terminal border as above, orange-red. Both wings with three rows of black spots and a few spots at the basal half. Expands about  $1\frac{1}{2}$  inches.

*Caterpillar*.—Slug-shaped. Head minute, pale. Body bright transparent green, having a velvety appearance, with a dark green dorsal stripe edged with yellow, the whole profusely dotted with minute white mushroom-shaped appendages. Length, about 1 inch.

*Chrysalis*.—Light yellowish brown, the body with six longitudinal series of obscure fuscous dots on each side (including those beneath) and a few dots on the thorax. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Smart-weed (*Polygonum*) and *Rumex*.

This butterfly is double brooded, and is not common in this vicinity. It is found in swampy places. The first brood appears in June and early in July, and the second in the middle of August to the middle of September.

***Lycæna comyntas* (Godt.).**

PLATE V, FIG. 13.

*Butterfly*.—Upper surface in the males wholly violet-blue, with very narrow black outer border; fringes white. The hind wings are provided with a fine thread-like tail near the anal angle, and sometimes with a row of more or less distinct black spots along the outer margin. The spot before the tail sometimes orange. Underside whitish gray, with a double row of gray spots along the outer margin of both wings and another row of black spots encircled with white, between the cell and the outer rows of spots. At the end of the cell is a short gray bar. The hind wings have also two black spots near the base, and near the anal angle are two orange crescents enclosing a black spot surrounded with silvery scales. The female is blackish brown, sometimes bluish at the base. Expands  $\frac{3}{4}$  to 1 inch.

*Caterpillar*.—Slug-shaped. Head black; body greenish or brownish, with darker green lines and oblique lines on the sides. Length,  $\frac{1}{3}$  inch.

*Chrysalis*.—Color greenish brown or dull whitish, with three rows of black dots, and covered with a few whitish hairs. Length,  $\frac{1}{4}$  inch.

*Food-plants*.—*Lespedeza*, *Desmodium* and Clover.

Common in meadows, clover fields and roadsides from May to September. Three brooded. The caterpillar feeds on the flower heads and tender leaves of the plants.

***Lycæna scudderii* Edw.**

PLATE V, FIG. 12.

*Butterfly*.—Allied to the preceding species, but is larger and wants the thread-like tail on the hind wings. The color on the upperside is the same. Underside deeper gray than in *L. comyntas*, with the spots much heavier and larger, and a distinct row of orange crescents on the hind wings before the outer margin, each enclosing a black spot, with silvery scales. The female is blackish brown above, with bluish scales at the base. Hind wings with a row of orange crescents along the outer border and each enclosing a black spot. Expands  $1\frac{1}{8}$  inches.

*Caterpillar*.—Slug-shaped. Dull green, with a velvety appearance, caused by the presence of many short fine hairs and minute brownish dots, hardly visible without a lens. Along the back is a deeper green stripe, margined faintly with a blue shade. Along the sides is a series of oblique lighter stripes and a cream-colored stripe along the extreme sides. Underside similar in color to the above, with a blackish tinge along the middle. Length, over  $\frac{1}{3}$  inch.

*Chrysalis*.—Pea-green, body tinged with yellow, except dorsal line, pea-green. Body covered with delicate tracery, forming a broken, irregular, reticulation of raised lines, and with short fine hairs. Length,  $\frac{2}{3}$  inch.

*Food-plants*.—Lupines.

Very rare in this vicinity. A number from this neighborhood are in the collection of the late S. L. Elliot, now in the American Museum of Natural History. Double brooded. May–June and July–August.

### *Lycæna pseudargiolus* (Bd.-Lec.).

PLATE V, FIG. 14.

*Butterfly*.—Upperside wholly azure blue, with a narrow black outer border. The female is paler blue and has a very broad black outer border extending along the costa in some specimens. Hind wings with a terminal row of blackish spots; costa also washed with black. Underside whitish; a row of spots along the outer margin and another row before it, and several small blackish spots on the basal area. Expands 1 to 1 $\frac{2}{3}$  inches.

This species is subject to great variation, and the following forms are also found in the vicinity of New York City:

*Form lucia* Kirby.—Upper surface violet blue. Underside gray, with the two rows of terminal spots running together and forming a distinct band on both wings, preceded by a row of rather large blackish spots. The spots on the basal part of the hind wing run together and form a distinct patch.

*Form marginata* Edw.—Much the same as the form *lucia*, but the spots in the basal area of the hind wings beneath do not run together.

*Form violacea* Edw.—The rows of spots along the outer borders of both wings do not run together as in the two preceding forms, and the spots in the basal area are also distinct.

*Form neglecta* Edw.—Resembles *pseudargiolus*, but is smaller, not expanding more than a little over an inch.

*Caterpillar*.—Very variable in color and markings. In spring it is whitish often stained with red, or brown, light or dark; sides olive green, with a darker green or dull red patch along the posterior edge of each joint. Beneath it is pale green. In summer it is white or pale green, second joint brown, or has the sides dark, often with patches over it, or is pale green with a broken dark green band along the back, and another one along the base. Sometimes the entire surface is wine red or chocolate brown. Color in fall, green, with more or less brown, irregular patches. Head, dark brown. Length of spring larva,  $\frac{2}{3}$  inch; of summer larva,  $\frac{1}{2}$  inch.

*Chrysalis*.—Dark brown or yellow, also varying; the wing-cases dark, and sometimes greenish. On the body are two subdorsal rows of blackish dots and sometimes a dark dorsal line. Length, about  $\frac{1}{8}$  inch.

A very common insect here, and is found in open sunny places, especially in woods. The forms *lucia*, *marginata* and *violacea* are found in April and early in May. The forms *neglecta* and *pseudargiolus* are found in the summer until September. The winter forms lay their eggs in the flower buds of the Dogwood (*Cornus florida*), and the following brood deposit their eggs on the flower stem of the black snake-root (*Cimicifuga racemosa*), and the fall brood are found on *Actinomeris*. The following food-plants have also been given: Wild bean (*Apios tuberosa*), *Spiraea salicifolia*, *Ceanothus americanus*, and Ilex.

### *Synopsis of the Species of Lycæninae.*

Hind wings with tails.

#### **Thecla.**

- Slate gray, with an orange spot at the anal angle of hind wing. *T. melinus*.  
 Sepia brown, with a double, broken, white transverse band on both wings beneath. .... *T. calanus*.  
 Sepia brown, with four irregular, wavy white lines across the upper wing beneath. .... *T. strigosa*.  
 Thickly scaled with green on the underside, with wavy white and brown transverse bands. .... *T. damon*.

Hind wings strongly toothed.

- Outer half of hind wing beneath heavily overlaid with whitish scales. *T. irus*.  
 Hind wings beneath ferruginous with zig-zag transverse lines. . *T. niphon*.

Hind wings not toothed.

- Underside of hind wings with outer half ferruginous. .... *T. augustus*.

Hind wings with outline evenly rounded, ♀; hind angle produced, ♂.

- Underside of hind wing with an outer row of large orange spots. *T. titus*.

#### **Feniseca.**

Wings ochraceous, with black border.

- Underside of hind wings with many whitish rings. .... *F. tarquinius*.

#### **Chrysophanus.**

Small size, glossy orange red.

- Hind wing beneath brownish gray with black spots . . . . . *C. hypophleas*.

Large size with black spots.

- Underside of wings whitish, with black spots. .... *C. thoë*.

#### **Lycæna.**

Hind wings with a thread-like tail.

- Underside of hind wings with two orange spots . . . . . *L. comyntas*.

Without thread-like tail on hind wings.

- With terminal row of orange spots on underside of hind wings. *L. scudderii*.  
 Without orange spots on hind wings beneath . . . . . *L. pseudargiolus*.  
 Smaller than *pseudargiolus* . . . . . form *neglecta*.  
 Spots on underside running together . . . . . form *lucia*.  
 Spots on basal area of hind wings not running together. . . form *marginata*.  
 Terminal rows and basal spots on hind wing prominent, not running together. .... form *violacea*.

## HESPERIDÆ.

### *Ancyloxypha numitor* (Fabr.).

PLATE VI, FIG. 20.

*Butterfly*.—Upperside of fore wings blackish, washed with orange ochraceous. Hind wings orange ochraceous bordered with black. Underside of fore wings blackish bordered, orange ochraceous along the costa and outer margin. Hind wings wholly orange-ochraceous. Body white beneath; at the side orange, above blackish brown. Expands about 1 inch.

Common in grassy places in June, July, August and September, and is three brooded. The early stages are only imperfectly known.

### *Pamphila massasoit* Scudder.

PLATE VI, FIG. 2.

*Butterfly*.—Upperside of male wholly blackish brown, sometimes with a row of three small spots below the costa before apex on the fore wing. Underside of fore wings blackish brown, with the costa and outer margin scaled with yellowish brown. The three spots on the costa from above are repeated, and there are sometimes one or two minute yellow spots in the middle of the wing. Hind wings with a very large bright yellow patch in the middle, the borders of the wing dull orange ochraceous, becoming lighter toward the anal angle. The female has three small yellow spots on the costa beyond the middle, and two larger yellow spots in the middle of the wings, and in the middle of the hind wings a row of two to seven yellow spots. Underside similar to the male. Expands about  $1\frac{1}{8}$  inches.

Not common in this vicinity. Found in July and August. The caterpillar feeds on grasses.

### *Pamphila zabulon* (Bd.-Lec.).

PLATE VI, FIG. 1.

*Butterfly*.—Upperside of male orange ochraceous, with outer border blackish brown, dentate within; the same extending along the hind margin. At the end of the cell is a narrow oblique bar and a patch beyond touching the apical portion of the border. Hind wings bordered all around with blackish brown. Underside of fore wings paler yellow than above, with the outer border also paler, and at the base a large dark brown patch. Hind wing bright yellow with a faint, broken, brownish outer border; base of the wing brown, containing a yellow patch. Expands  $1\frac{1}{8}$  inches.

Var. **hobomok** *Harris*.—Differs from the preceding by having the markings above heavier. Hind wings beneath have the yellow reduced to a band; basal part of wings brown tinged with yellow, and a broad brown continuous outer and inner border with grayish scales. The female has the veins brown, and is suffused with this color over the basal half of the fore wings above, otherwise it resembles the male.

Dimorphic female **pocahontas** *Scud*.—Upperside brown with three small spots on the costa and a few indistinct whitish spots in the middle of the fore wing. Hind wings entirely brown. Underside similar to the above, with the pale yellowish spots in the middle of the wing forming an irregular patch. Hind wings with the yellow band as in *hobomok*, but entirely covered with brown or gray scales.

*Caterpillar*.—Head dark reddish brown, rough. Body naked, yellowish brown, with a dark line along the middle of the back, two lateral lines and dotted with brown. First segment green, with a brown, narrow, interrupted thoracic shield. Length,  $\frac{3}{8}$  inch.

*Chrysalis*.—Uniformly livid, somewhat infuscated on head and thorax, the appendages with a whitish bloom; tongue-case extending to the eighth abdominal segment. Length, about  $\frac{3}{8}$  inch.

*Food-plants*.—Different species of Grasses.

The form *hobomok* is common in this neighborhood along the edges of woods and sunny wood paths during the latter part of May, through June, and disappears early in July. The butterfly flies close to the ground, and settles on leaves of plants when at rest. Single brooded. The form *zabulon* is rare, and the dimorphic female *pocahontas* is occasionally common, especially in the mountainous district in New Jersey.

### **Pamphila sassacus** (*Harris*).

PLATE VI, FIG. 3.

*Butterfly*.—Upperside of fore wings dull orange ochraceous, with a broad blackish-brown outer border crenate within; base of wings dusky. On the wings beneath the cell is a velvety black, oblique dash; beyond this black dash is a brownish patch. Hind wings with the yellow surrounded by a broad blackish-brown border. Underside ochre yellow, blackish at the base; near the apex on the costa are traces of a short row of spots. Hind wings ochre yellow with an indistinct curved row of paler spots in the middle. The female differs by the absence of the black dash on the fore wing above, and on the



underside the spots near the apex and middle of hind wing are more distinct and more black at the base of the fore wings beneath. Expands  $1\frac{1}{8}$  to  $1\frac{1}{6}$  inches.

Not common in this vicinity in May and June. Taken at West Farms and Staten Island, N.Y., Caldwell and Newark, N.J., and different places on Long Island. The caterpillar feeds on grasses.

### ***Pamphila logan* (Edw.).**

PLATE VI, FIG. 4.

*Butterfly*.—Upperside orange yellow with the veins dark brown, as also is the narrow outer border. Hind wings also orange yellow surrounded with a brown border. Underside somewhat paler than above, without brown veins, only the basal part of the fore wings is blackish brown. Hind wings wholly clear orange yellow. The female has the basal portion above blackish brown, and also the inner and outer borders. Hind wings have the borders broader. Underside similar to the male, clear orange yellow. Expands  $1\frac{1}{8}$  inches.

*Caterpillar*.—Head oval, oblique, white, smooth, slightly bilobed. A black band about the top and sides; a black vertical streak on the middle of the face, and a short streak on either side of this last. Body bluish white, with a small black band on the last segment and anal plates. Surface thickly dotted with white and black tubercles. Shield on first segment black, including a dot on either side. Length, about 1 inch.

*Chrysalis*.—Narrow, greenish white; head-case blunt, black, with tubercles and bristles. Last segment black. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Grasses.

Exceedingly rare in this vicinity, but is common in the Southern States. Found from June to the middle of August. Single brooded.

### ***Pamphila leonardus* (Harris).**

PLATE VI, FIG. 5.

*Butterfly*.—Upperside dark brown, thickly overlaid with dark orange ochraceous scales from the base to beyond the middle of the fore wings. Below the costa in the brown outer field is a row of three small spots and two spots beneath it, and a larger spot at the end of the cell, beneath which is a slightly curved black dash or stigma. Hind wings with a curved central band, composed of spots, and not reaching either margin; towards the body the wings are more or less covered with orange ochraceous hairs. Underside blackish, washed with dark orange ochraceous along the costa and outer margin. The light spots from above are repeated, with the addition of a yellow patch

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beneath the spot at the end of the cell. Hind wings inclined to be ferruginous, with a pale yellow or white spot near the middle; beyond which is a curved row of rather large, distinct, yellow or whitish spots. The females lack the black stigma beneath the cell on the fore wing, and in addition have three large yellow spots from the end of the cell running towards the inner margin. Underside like the male. Expands  $1\frac{1}{2}$  inches.

Rare in this vicinity. Taken in August and early in September, in open fields. The caterpillar feeds on grasses, and is only imperfectly known.

### ***Pamphila huron* (Edw.).**

PLATE VI, FIG. 6.

*Butterfly*.—Upperside of fore wings orange ochraceous, the outer border blackish brown, dentate within. Beneath the cell is a curved velvety black dash or stigma, below which is a rounded patch of raised brownish scales. Before the apex, touching the outer border, is a small blackish brown patch. Hind wings with the middle portion dull orange ochraceous, sending rays in the blackish brown outer border around the wing. Underside of wings ochre yellow, sometimes tinged with pale blackish around the borders; fore wings blackish at the base and indications of a few subterminal spots. The female is blackish brown, and lacks the stigma and raised scaly patch. The fore wings are washed with orange ochraceous along the costa and inner margin from the base to about the middle of the wing, with a blackish patch between, at the end of which is a quadrate, semitranslucent spot and a smaller one a little beyond. Near the apex beneath the costa is a row of three small spots and two a little beyond and beneath. Hind wings with a curved band of orange ochraceous spots in the middle. Underside of fore wings ochre yellow, with base along costa orange and blackish below at the base; the spots from above are repeated. Hind wings ochre yellow with two paler rows of curved spots. Expands  $1\frac{1}{8}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Pale green, more or less clouded with darker green and sprinkled profusely with very minute blackish papillæ, each with an exceedingly short hair. Thoracic shield black, edged in front by a light band. Thoracic feet blackish. Length,  $1\frac{1}{8}$  inches.

*Chrysalis*.—Dark reddish brown. Head with three large, round, light-brown spots, arranged triangularly. Abdomen testaceous mottled with blackish brown spots. Length,  $\frac{3}{8}$  inch.

*Food-plants*.—Different species of Grasses.

Very rare in this vicinity. Has been taken in Van Courtland Park, N. Y., and Newark, N. J. Single brooded.

***Pamphila phylæus Drury.***

PLATE VI, FIG. 7.

*Butterfly*.—Upperside bright orange ochraceous, outer border blackish brown, and is broken into short lines running inwards. Beneath the cell is an oblique dash, to which is connected an elongated, velvety patch of elevated, brown scales. At the base of the wings are three black streaks, the lower one touching the black dash. At the end of the cell are two short blackish brown dashes. Hind wings light orange ochraceous with the outer brown border dentate within. Underside paler than above. Fore wings blackish at the base and along the hind margin; a black spot beneath the cell, one at the end, and a row of subterminal spots. Hind wings with a blackish streak running from the base, within the inner margin to nearly the anal angle, and a number of blackish spots. The female differs from the male by being brown, with the basal portion slightly washed with yellow; at the end of the cell is a small yellow spot, an oblique broken row beyond, and three small spots in a row beneath the costa near the apex. Hind wings with a row of broken spots in the middle. Underside dirty yellow, blackish brown at the base; the oblique row of spots from above paler yellow and forming a broken patch. Hind wings dirty yellow, somewhat tinged with brownish, with the spots as in the male. Expands  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Spindle-shaped. Dull green and thickly granulated with pale points; thoracic plate on first segment dark brown; head small, punctured, dark brown. Length,  $\frac{3}{4}$  inch.

*Chrysalis*.—Nearly cylindrical; head, thorax and abdomen pubescent. Pale green with a black, broken line extending from back of the head-case to the end of the body, a lateral black streak and a row of black dots on the body; wing-cases paler, contracted behind into a point; anal hook stout, spine-like. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Various species of Grasses.

Exceedingly rare in this vicinity, but is a common insect in the Southern States. Taken late in October in Bayonne, N. J., and Astoria, L. I., by Dr. R. Kunze; also taken at Clifton, N. J., by Prof. J. B. Smith.

***Pamphila otho (Abb. & Sm.).***

PLATE VI, FIG. 8.

*Butterfly*.—Upperside dark brown washed with orange ochraceous on the costa at the base. Beneath the cell is a short velvety black dash or stigma, with a patch of raised scales beneath it towards the base of the wing, con-

taining a small black spot ; at the end of the black stigma is an orange spot and three small ones in a row below the costa near the apex. Hind wings with yellowish hairs over the basal and inner part. Underside of fore wings brown, costa and apex rusty brown ; the yellow spots from above repeated. Hind wings rusty brown, with an indistinct band in the middle. The female wants the orange ochraceous scales along the costa at the base, and the stigma beneath the cell, at the end of which are two spots instead of one, and one beneath these. Underside like that of the male. Expands  $1\frac{1}{2}$  to  $1\frac{1}{4}$  inches.

Var. *egeremet* *Scud.*—Differs from *otho* in having the yellow tinge on the upperside somewhat olivaceous, as also the underside of both wings. The markings above and below are similar.

*Caterpillar.*—Body light green mottled with dark green, and becoming hoary in the middle of the upper surface. A dark green dorsal line ; a dull yellow stigmatal band, broader so as to occupy the whole dorsal part of the body (except the dorsal stripe) beyond the seventh segment and tinged with pinkish on the posterior third of body. A slender, indistinct, greenish line, followed by a yellowish green band. First segment crossed by a narrow black band. Length, about 1 inch.

*Chrysalis.*—Head brownish green ; tongue pink ; thorax dull grass green ; suture pinkish brown ; abdomen dull yellowish green ; spiracles and cremasters pink. Length,  $\frac{3}{8}$  inch.

*Food-plants.*—Different kinds of Grasses.

Rather scarce in June and July. The variety *egeremet* is more common than *otho*, which is abundant southward. Single brooded.

### ***Pamphila peckius* (Kirby).**

PLATE VI, FIG. 9.

*Butterfly.*—Upperside brown ; basal half of fore wings yellow ; beneath the cell is an oblique black dash, and below this an opaque, brown patch. Before the apex is a row of three yellow spots below the costa, two a little beyond and beneath and one at the end of the velvety black stigma. Hind wings with a band of four spots in the middle and with orange ochraceous hairs. Underside of fore wings washed with orange ochraceous along costal area and outer portion ; spots from above repeated, there being eight of them instead of six. Hind wings dull orange ochraceous with a broad ochre yellow band composed of six oblong spots, the third spot from the costa being longest ; at the base is also a row of spots connected with the large spot of the other band. The female differs by the absence of the black stigma and having at the basal part dashes of yellow, and beyond the middle an oblique row of irregular spots. Hind wings and underside like the male. Expands 1 inch.

Found everywhere in meadows, and is one of the most common species of Hesperians in this vicinity. It is double brooded, the first brood appearing in the latter part of May to the middle of July, and the second brood in August and September. The caterpillar feeds on grasses, and is only imperfectly known.

### ***Pamphila mystic* (Edw.).**

PLATE VI, FIG. 10.

*Butterfly*.—Upperside orange ochraceous; outer border dark brown; beneath the cell is a velvety black, oblique stigma, limited beneath with a deep brown patch of raised scales and a spot of the same color at the end. Beyond and attached to the stigma is an irregular, yellow band. Hind wings with a band-like patch in the middle, outer borders deep brown, of which color are also the veins in the yellow part. Underside ochre yellow, with the black stigma and spot from above faintly indicated. Hind wings ochre yellow with a lighter curved band in the middle and a spot in the cell. This band and spot are more or less distinct. The female is deep brown with a yellow patch in the cell and an oblique row of spots beyond. Hind wings somewhat like those of the male, but not shaded with as much yellow, the band being smaller. Underside same as in the male. Expands  $1\frac{1}{8}$  inches.

*Caterpillar*.—Dull brownish green, with a dorsal line and sprinkled with darker dots. Second segment whitish, with a blackish band across. Head dull reddish brown with very minute whitish hairs, which also cover the body. Length, 1 inch.

*Food-plants*.—Grasses.

Rare in this vicinity, and is found in open grassy meadows late in May and through June, and again in August and September. The chrysalis is unknown.

### ***Pamphila cernes* (Bd.-Lec.).**

PLATE VI, FIG. 11.

*Butterfly*.—Upperside brown with a slight olivaceous tint. Beneath the cell is an oblique velvety black stigma, above which is an orange ochraceous patch on the costa, beneath the stigma and at base of wings washed with yellow. At the end of the stigma is a small yellow spot, and three in a row below the costa before the apex. Hind wings with olivaceous hairs towards the base. Underside with the yellow patch on the costa reproduced, and traces of two spots beneath the cell; outer part of wings olivaceous, basal part blackish. Hind wings

olivaceous. The female differs in having less yellow on the costa; by the absence of the black stigma, and in having a row of three spots at the end of the cell, running towards the hind margin. Expands 1 inch.

*Caterpillar*.—Rich purplish brown with a green tinge, finely mottled with gray and dark purplish brown; first segment milk-white above with a piceous shield. Length, about 1 inch.

*Chrysalis*.—Light brown with slight and delicate infuscations, the thorax darker, the head black, the whole dotted sparsely with reddish brown. Tongue-case reaching to the eighth segment. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Various species of Grasses.

Very common from May to September inclusive in grassy meadows. Double brooded.

### ***Pamphila manataaqua* (Scud.).**

*Butterfly*.—Upperside with light orange ochraceous; beneath the cell is an oblique velvety black stigma, which is connected with a narrow basal streak; before the apex beneath the costa are three spots, which seem to be a continuation of the yellow streaks on the costa. Outside of the black stigma are two or three spot-like marks. Outer part of wings dark brown. Hind wings have an ochraceous shade on the inner half. Underside, along the costal half, orange; other half brown. The spots from above repeated. Hind wing ochre yellow with an obsolete curved row of paler spots in the middle. The female lacks the black stigma and has the spots beyond larger. Expands 1 to  $1\frac{1}{4}$  inches.

Not rare in this vicinity. Found in June and July, and is single brooded. The larva feeds on grasses. The fully-grown larva and chrysalis are unknown.

### ***Pamphila verna* Edw.**

PLATE VI, FIG. 12.

*Butterfly*.—Upperside deep brown with a slight olivaceous tint, especially the hair on the hind wings and body. Below the cell in the fore wings is an oblique, velvety black stigma, with three semitranslucent, pale yellowish spots beyond, the middle one being largest; before the apex below the costa are three small spots in a row of similar color. Underside paler, with spots repeated. Hind wings with an indistinct curved row of minute light spots in the middle. The female similarly colored as the male, but lacks the oblique velvety black stigma, and has an additional whitish spot. Underside with the spots repeated, otherwise like the male. Expands  $1\frac{1}{2}$  inches.

*Caterpillar*.—Body yellowish or wood-brown with a russet tinge along the upper half, flecked uniformly and profusely with minute dark brown spots and covered by pale brown short hairs; a slender dorsal stripe of blue black and two similar stripes along the sides, fading away at either extremity beyond the third thoracic and seventh abdominal segments, and a faint similar stripe below the spiracles, scarcely perceptible. Underside paler than above, with a greenish tinge. Head castaneous, edged with black behind, covered with minute points and with pale brown hairs. Length,  $\frac{4}{5}$  inch.

*Food-plants*.—Grasses.

Not common in June and July, in grassy meadows. Single brooded.

### ***Pamphila metacomet* (Harr.).**

PLATE VI, FIG. 13.

*Butterfly*.—Upperside wholly dark brown, with a slight olivaceous gloss. Beneath the cell is the oblique velvety black stigma in the male. Underside paler than above and not glossy. Hind wings have sometimes a few minute spots in the middle. The female lacks the oblique stigma, and has two pale yellow dots in the wing a little beyond the middle, and one or two more below the costa near the apex. Underside with the spots reproduced. Expands  $1\frac{1}{2}$  inches.

Not common in June and July. The butterfly may be easily recognized by its dark color without pale marking in the male. It is found in fields and open grounds. Single brooded. The earlier stages are unknown.

### ***Pamphila accius* (Abb. & Sm.).**

*Butterfly*.—Upperside deep brown, with a very slight olivaceous tint. Male with an indistinct velvety black oblique stigma, at the end of which is a minute white dot and a row of three above it beneath the costa. Underside deep rusty brown along the costal area, and the outer margin beneath the apex tinged with violet. Spots from above reproduced. Hind wings are deep rusty brown with a violet patch near the base and one on outer margin. The female lacks the black stigma, and has a row of three white spots beyond the middle, and the three beneath the costa also present a small dot about the middle of the wing immediately below the costa. Underside with spots repeated, otherwise like the male. Expands  $1\frac{1}{2}$  to  $1\frac{3}{8}$  inches.

*Caterpillar*.—Slender; nearly white, but under a lens mottled and dotted with darker lines and points; collar black; head small, oblique, oval, flattened

frontally, white with a black band around the top and sides, a black streak down the middle of the face and a short black streak on either side of this last, and not reaching the band at top. Length,  $1\frac{1}{3}$  inches.

*Chrysalis*.—Slender, smooth, white; head-case tapering into a slender pointed beak. Length, 1 inch.

*Food-plants*.—Grasses.

Very rare in this vicinity, but a common insect in the Southern States. Recorded by Prof. Smith from Salem, N. J. Readily known by the violet shades on the underside. June–July.

### ***Pamphila ocola* (Edw.).**

*Butterfly*.—Upperside deep brown, with a slight bronzy lustre with a semi-translucent spot at the end of the cell and a small dot a little beyond, sometimes traces of a third spot beneath the large one. Underside paler than above, with the spots repeated. Hind wings above and below without markings. Expands  $1\frac{1}{2}$  inches.

Very rare. Recorded by Prof. Smith from Salem, N. J. An example taken in this vicinity is also in the collection of the late S. L. Elliot. The early stages are unknown. The caterpillar probably feeds on grasses.

### ***Pamphila pontiac* (Edw.).**

PLATE VI, FIG. 14.

*Butterfly*.—Upperside deep brown, basal portion deep orange ochraceous, with a broad velvety black stigma, pinched at the middle; attached to the stigma is an orange ochraceous band; some distance above are three spots below the costa. Hind wings with an orange ochraceous, streak-like patch in the middle. Underside orange brown, with the band beyond the stigma broken into spots. Hind wings orange brown with the patch from above repeated. The female is wholly dark brown, with a curved band of spots beyond the middle. Hind wings like the male, also the underside of the wings, only somewhat darker. Expands  $1\frac{3}{4}$  to  $1\frac{1}{2}$  inches.

Not common in June and July. Taken on Staten Island, Lake Hopatcong, N. J., Snake Hill, N. J., West Farms, N. Y. City, and other places. Single brooded. The early stages are unknown.

### ***Pamphila hianna* (Scud.).**

*Butterfly*.—Upperside wholly dark brown, somewhat paler outwardly, with one minute whitish dot beyond the end of the cell and a row of three ante-



apical spots below the costa above it. Underside with spots from above repeated, and along the outer margin is washed with grayish. Hind wings with the outer half scaled with gray. The female differs in having two spots at the end of the cell and one above the cell, and the three anteapical spots more distinct and whiter. The outer part of the fore wings with pale scales. Underside have the spots from above reproduced and the gray scales on both wings thicker and paler. Expands  $1\frac{1}{8}$  to  $1\frac{3}{8}$  inches.

A single specimen of this species has been taken by the late S. L. Elliot in the vicinity, of New York City; also taken on Long Island. It appears in May and June, and is single brooded. The early stages are unknown.

### ***Pamphila viator* (Edw.).**

PLATE V, FIG. 19.

*Butterfly*.—Upperside dark brown with an orange spot in the cell at the end, and a row of three rather large spots beyond and below, and two small spots below the costa before the apex. Hind wings with the brown margin broad, and the orange patch in the middle is broken by the veins. Underside of fore wings orange brown, blackish along the base to the hind angle. Spots from above repeated. Hind wings orange brown with the patch from above indistinct. Female similar to the male, but the spots are larger. Expands  $1\frac{1}{4}$  to  $1\frac{3}{8}$  inches.

Scarce in this neighborhood. Taken in July on Snake Hill, N. J., Newark, N. J., and near Brooklyn, Long Island. Single brooded. The early stages are unknown.

### ***Pyrgus montivagus* Reak.**

PLATE VI, FIG. 15.

*Butterfly*.—Upperside black with transverse rows of white spots of different sizes. Hind wings also with white spots. Underside whitish with the black from above partly repeated. Hind wings also whitish, with the bands more or less distinct and greenish. In the female the black markings are heavier. Expands  $1\frac{1}{8}$  inches.

*Caterpillar*.—Body naked, briefly pilose, green with a dark broken dorsal line, dark lateral band and a light band below the spiracles; thoracic shield black. Head piceous, summits rounded. Length,  $\frac{2}{3}$  inch.

*Chrysalis*.—Body slender, the abdomen longer than the rest of the body; posterior lip of thoracic spiracle elevated, flaring; yellowish white dotted above with black. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Mallow, *Althæa*, *Abutilon* and *Sida*.

Taken on Staten Island in September, and recorded by Prof. Smith as being common throughout the State of New Jersey. To my knowledge it is very rare everywhere in this vicinity. Probably double brooded.

### ***Pyrgus centaureæ* (Ramb.).**

*Butterfly*.—Differs from the preceding species by having only one row of white spots on the black fore wings; a spot at the end of the cell and one a little beyond. Hind wings with the two rows of white spots, not as large and distinct as in *P. montivagus*. Underside of fore wings greenish, with the greenish-white markings from above repeated and more distinct. Hind wings olivaceous with three rows of whitish spots across. Expands about  $1\frac{1}{4}$  inches.

Exceedingly rare in this vicinity, and has been reported from Long Island. The caterpillar and chrysalis are unknown.

### ***Pholisora catullus* (Fabr.).**

PLATE VI, FIG. 16.

*Butterfly*.—Upperside deep brownish black with an irregularly curved row of small white spots, and sometimes with traces of another row before the outer border, and one or two spots in the cell. Hind wings without markings, sometimes traces of an indistinct row of spots. Underside brown, but somewhat paler than above, with part of the white spots on the fore wings repeated. Expands 1 inch.

*Caterpillar*.—Body dull green, briefly pilose; thoracic shield velvety black, pale at the edges. Head black, summits rounded. Length,  $\frac{4}{5}$  inch.

*Chrysalis*.—Yellowish green with brownish dorsal line and similar ventral line on abdomen. Body slender, abdomen slender, longer than the rest of the body. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—*Chenopodium* and *Amarantus*.

Very common everywhere in open fields and meadows. Double brooded. May to September.

### ***Nisoniades brizo* (Bd.-Lec.).**

PLATE VI, FIG. 17.

*Butterfly*.—Upperside deep brown, darker towards the base, with an indistinct oblique, double, broken band before the middle of the wings, and another band, also broken, beyond the middle. The space between the first band con-

tains a few grayish scales, and the space in the outer band thickly scaled with gray; also scaled with gray at the costa between the two bands and at the outer margin. Hind wings with two rows of indistinct pale spots near the outer border. Underside paler than above, with two rows of pale spots near the outer border. The two rows of spots on the hind wings distinct. Expands  $1\frac{1}{8}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Head dark brown, paler above, with an orange spot at base of mandibles. Body naked, briefly pilose, pale green with an indistinct paler lateral stripe and dotted with darker green. Length, over 1 inch.

*Chrysalis*.—Green, the appendages infuscated. Slender; abdomen longer than the rest of the body. Length,  $\frac{1}{2}$  inch.

*Food-plant*.—Oak.

Found in May and June in moist shady woods and along wood paths. The butterfly flies swiftly and near the ground. Single brooded.

### ***Nisoniades icelus* Lintner.**

*Butterfly*.—Similar to *N. brizo* but smaller, and has the grayish scales more regularly distributed over the wings, but most distinct at the costa between the two transverse bands. The markings are like those of *brizo*, but with an additional more or less distinct line before the outer border. Underside similar to *N. brizo*. Expands 1 to  $1\frac{1}{8}$  inches.

*Caterpillar*.—Head light reddish brown, with slightly raised summits. Body naked, pilose, pale green dotted with white, giving a grayish green appearance, and with a pallid lateral stripe. Length, about  $\frac{3}{4}$  inch.

*Chrysalis*.—Fore part of body reddish or yellowish brown, the abdomen pale flesh-color, the rest as in the other species. Length,  $\frac{1}{2}$  inch.

*Food-plants*.—Aspen, Willow and Witch-hazel.

Not rare in this vicinity in May and June in open woods, and especially along wood roads. Taken at West Farms, N. Y. City, Tuckahoe and Staten Island, N. Y.; Plainfield and Fort Lee, N. J., and other places. Single brooded.

### ***Nisoniades lucilius* Lintner.**

*Butterfly*.—Upperside deep brown, becoming lighter towards the outer border; before the middle is an indistinct oblique transverse band almost obscured by the ground color, and another spot-like band beyond the middle, which contains a row of four minute semitranslucent spots beneath the costa and one or two spots about the middle. Sometimes there is a similar spot at the end of the

cell. Over the outer part of the wing are scattered a few grayish scales. Hind wings with two rows of indistinct spots. Underside paler than above, with the spots repeated, and two rows of whitish spots before the outer border. Hind wings with the spots more distinct than above. Expands 1 to  $1\frac{1}{4}$  inches.

*Caterpillar*.—Body naked, sparsely pilose, green, with a narrow pale yellowish lateral line. Head with the summits much elevated, black, with three reddish spots and streaks at the sides. Length,  $\frac{4}{5}$  inch.

*Chrysalis*.—Pale green. Slender, the abdomen longer than the rest of the body; the posterior lip of the thoracic spiracle scarcely raised, not flaring; the tongue-case scarcely extending beyond the wings. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Wild Columbine (*Aquilegia*) and *Chenopodium*.

Rare in this neighborhood. Taken at West Farms, N. Y. City, by Mr. J. Angus, and in the Orange Mountains, N. J., by Dr. R. E. Kunze. May–June.

### ***Nisoniades persius* Scudder.**

*Butterfly*.—Allied to *N. lucilius*, but larger and deeper in color, with the markings less distinct; in some specimens the markings are almost obscured by the ground color. The white spots smaller than in *N. lucilius*. The female is almost identical, and is not readily separated except in size. Expands  $1\frac{1}{2}$  inches.

*Caterpillar*.—Body naked, scarcely pilose, pale green with pale yellowish lateral lines and sprinkled profusely with white dots. Head ferruginous, with pale vertical streaks or piceous marked with ferruginous. Length, about 1 inch.

*Chrysalis*.—Dull olivaceous green, much infuscated, abdomen pinkish brown, mottled faintly with pale dots. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Willow and Poplar.

Not rare in this neighborhood, being found in different places in New Jersey, Westchester Co., Long Island and Staten Island. May–June. It occurs in woods and along shady road-sides. Single brooded.

### ***Nisoniades martialis* Scudder.**

PLATE VI, FIG. 18.

*Butterfly*.—Upperside dark brown with a darker brown spot near the base of the cell; then a distinct curved spot-like band, and another beyond the middle of the wing, followed by lilac-gray scales. Some specimens have more or less gray scales between the bands. On the outer band are four white

spots in a row below the costa, and one about the middle of the band. Hind wings with traces of spots. Underside lighter with the white spots repeated, and two indistinct rows of pale spots near the outer margin. Hind wings with two rows of light spots. The female differs in having the bands more distinct and the ground color paler. Expands  $1\frac{1}{8}$  inches.

*Caterpillar*.—Body pale pea green with probably a darker dorsal stripe, greenish yellow lateral band and a stigmatal band; between the bands are white blotches. Head dark brown, each side with an upper and lower dull yellow, oval spot. Length, about 1 inch.

*Chrysalis*.—Pea green with obscure whitish dashes, paler on the abdomen. Cremasters orange yellow; thoracic spiracle black. Length, about  $\frac{1}{2}$  inch.

Rare in this vicinity, and found in similar localities as the other species of *Nisoniades*, in May and June, and again in July and August. Double brooded. It may be easily recognized by its conspicuous bands and spot at the base of the cell on the fore wings, especially in the female. The food-plants are said to be 'Red-shank' or 'Red-root' and Wild Indigo (*Indigofera carolina*).

### ***Nisoniades juvenalis* (Bd.-Lec.).**

PLATE VI, FIG. 19.

*Butterfly*.—Allied to *N. martialis*, but is a much larger insect. The blackish bands are similar to those of *martialis*. The outer band contains a row of four spots below the costa, and one or two more about the middle, and one at the end of the cell. These spots are semitransparent, and are larger and more conspicuous than in any of the other species of *Nisoniades*. Underside with the spots repeated; otherwise much the same as *martialis*. Expands  $1\frac{3}{8}$  to  $1\frac{1}{2}$  inches.

*Caterpillar*.—Body naked, sparsely pilose, light or dark green, with narrow pale yellow lateral lines, and much dotted with pale yellow. Head varying from greenish brown to fawn color, and heavily marked with pale orange at the sides. Length, 1 inch.

*Chrysalis*.—Pale or livid above, the abdomen faintly tinged with salmon above and below; metathorax slightly infuscated; all the appendages black or blackish brown; disc of wings dark olivaceous brown. Length, about  $\frac{1}{2}$  inch.

*Food-plants*.—Oak, Wild Bean (*Apios*) and other Leguminous plants.

Found from May to September, in woods, and is double brooded.

**Eudamus tityrus (Fabr.).**

PLATE V, FIG. 17.

*Butterfly*.—Upperside dark chocolate brown with a broad, oblique amber-yellow patch composed of four spots, running from the costa before the middle towards the hind angle, with a small spot outside of this band and three minute dots before the apex. Hind wings without markings. Underside with a gray bloom before the outer margins, and the markings of the fore wings repeated. Hind wings with a silvery white patch in the middle. Expands 2 to  $2\frac{1}{2}$  inches.

*Caterpillar*.—Naked, sparsely pilose, yellowish green, with green transverse lines encircling the body above, and blotches of the same color. First segment orange with a brown shield. Head ferruginous with an orange spot at the base of the mandibles. Length, about  $1\frac{1}{2}$  inches.

*Chrysalis*.—Dark brown. Stout and plump; abdomen about as long as the rest of the body; prothoracic spiracle with posterior lip flat; tongue-case not extending beyond the wings. Length, about 1 inch.

*Food-plants*.—Locust, *Acacia*, *Amorpha fruticosa*, *Wistaria*, *Lespedeza*, *Desmodium*, Wild Bean, etc.

Common everywhere in this district, and is found in gardens and copses. The caterpillar lives in a nest made of a few leaves spun together with silken threads. Double brooded. May to August inclusive.

**Eudamus pylades Scud.**

*Butterfly*.—Upperside dark glistening brown, with a few very small white spots on the fore wings; two or three on the costa at the middle; three in a triangle beyond the middle of the wing, and three in a row on the costa before the apex. Hind wings without markings. Underside as above, but with grayish clouds before the outer margin, and the spots repeated. Hind wings beneath with two obscure bands, and also with grayish scales before the outer margin. Expands  $1\frac{1}{4}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Dark green, with a narrow dorsal stripe, a dull salmon lateral stripe, and the fold beneath the spiracles pale salmon. First segment black, edged with orange or red in front. Over the body are also minute black points and salmon-colored warts. Head black, covered with short whitish hairs. Length, about  $1\frac{1}{4}$  inches.

*Chrysalis*.—Rather slender-bodied, the abdomen shorter than the rest of the body; the prothoracic spiracle with elevated posterior lip; tongue-case not

extending beyond the wings; light brown, speckled with blackish brown, becoming blackish transverse broken bands on the abdomen. Length,  $\frac{3}{4}$  inch.

*Food-plants*.—Clover and *Lespedeza*.

Common in open woods, fields and meadows; it flies rapidly, close to the ground, and is single brooded. Found from the latter part of May to the middle of August.

### **Eudamus bathyllus** (*Abb. & Sm.*).

PLATE V, FIG. 15.

*Butterfly*.—Closely allied to the preceding species, but differs from it in having the spots on the fore wings much larger and very conspicuous; otherwise much the same as *E. pylades*. Expands  $1\frac{1}{4}$  to  $1\frac{3}{4}$  inches.

*Caterpillar*.—Dull mahogany brown, tinged with olivaceous and thickly sprinkled with dirty, pallid wartlets, each giving rise to a minute hair. There is a very faint, narrow dorsal line and an indistinct line beneath the spiracles. On the first segment is a dull black shield, and the soft integument before and behind it, pale, with no traces of any bright tint. Head black, minutely scabrous, covered with a dense pile of golden brown hair; neck black. Length, about 1 inch.

*Chrysalis*.—Dull greenish brown; the eyes and appendages with the posterior edges of the abdominal segments and the veins of the wings marked with fuscous brown; a few dots of the same color along the posterior margin of the wing-cases. Length, about  $\frac{3}{4}$  inch.

*Food-plants*.—*Lespedeza*, Wild Bean, Butterfly-pea (*Centrosema virginianum*) and *Tephrosia*.

Found during June and July in the same places as *E. pylades*, in various localities in this vicinity, but is less common. Single brooded. It is more common southward. The caterpillar differs from *E. pylades* in the generally darker color and in the color of the soft integument of the first segment, and appears more scabrous.

### **Eudamus lycidas** (*Abb. & Sm.*).

PLATE V, FIG. 16.

*Butterfly*.—Upperside very similar to *E. tityrus*, but there is an additional spot attached to the outside of the amber-yellow patch. The anal angle of the hind wings is also less produced. Underside of fore wings smeared with

lighter brown, with the markings from above repeated. Hind wings with the outer portion smeared with white, and about the middle of the wing a large blackish patch containing a lighter spot; other parts chocolate brown with darker streaks. Expands about  $1\frac{3}{4}$  inches.

*Caterpillar*.—Body dark green, with a bluish green broad dorsal line, and heavily sprinkled with orange-yellow dots and black specks; sides with two lateral yellow stripes; thoracic shield black; front edge of first segment blood red. Length, about  $1\frac{1}{2}$  inches.

*Chrysalis*.—Anterior part whitish brown, darker towards the head. Abdomen sordid yellow brown. Head with minute papillæ clustered into black patches; similar papillæ are scattered over the thorax and abdomen, where they are in regular transverse lines. Length, nearly 1 inch.

*Food-plants*.—*Desmodium* and other Leguminosæ.

Not common in June and July in open places and edges of woods. The flight of the butterfly is swift, and it darts off very rapidly when disturbed. Besides alighting on flowers, it has the habit of sitting on the tips of dead branches of bushes and young trees. Single brooded.

### **Eudamus cellus (*Bd.-Lec.*)**

PLATE V, FIG. 18.

*Butterfly*.—Blackish brown, with a broad, continuous, amber-yellow band running obliquely across the fore wings, from about the middle of the costa to nearly the hind angle; before the apex is a row of three or four small, connected spots, and a minute one beneath this row. Hind wings blackish brown, with apex marked with a little yellow. Underside of fore wings marked with lighter brown, the band and spots from above repeated, and before the outer border a grayish line. Hind wings with three very indistinct dark brown transverse bands, and broadly overlaid with bluish scales along the outer border. Expands  $1\frac{3}{4}$  to 2 inches.

*Caterpillar*.—Head black, with an orange spot at the base of the mandibles, and a large lavender spot in front. Body green, with a narrow darker dorsal line and a pale, broad stigmatal stripe, above which the sides are obscured with darker green; thoracic shield black, and the anterior edge of the segment yellow. Length,  $1\frac{1}{2}$  inches.

*Chrysalis*.—Uniformly pale yellowish brown, with the incisures dusky. Length, 1 inch.

*Food-plants*.—*Convolvulacæ*.



Exceedingly rare in this neighborhood ; it has been taken in the vicinity of Newark, N. J., as is recorded by Prof. Smith. It is more common in the Southern States, and is also found in Mexico.

### **Eudamus proteus (Linn.).**

*Butterfly*.—Easily recognized by the long tail-like appendage on each of the hind wings. The wings and body are thickly covered with green hairs ; the fore wings have an oblique row of whitish spots, one spot beyond this row and a short row of smaller spots before the apex. Underside of fore wings paler brown, with the spots repeated. Hind wings with two transverse darker brown bands and two blackish spots below the costa about the middle of the wing ; tails deep brown. Expands about 2 inches.

*Caterpillar*.—Head large, round, brown, pubescent, with a yellow spot on each side of the mouth narrowing upwards and fading into the light brown of the upper part of the face. Body with a fine, dark dorsal line, a bright yellow subdorsal band and a pale green line along the base of the body ; dorsal space between the bands gray, dotted with black and yellow arranged in transverse lines ; sides gray, with the upper half dotted with black ; collar black, shining ; anal plate yellow, greenish in the middle. Underside of body pale green ; legs black ; prolegs yellow. Length,  $1\frac{1}{2}$  inches.

*Chrysalis*.—Dark brown when dried, fusco-luteous beneath, above mahogany colored, more or less tinged with luteo-olivaceous, shining throughout ; hairs of head as well as the scant hairs of the rest of the body luteous, the bristles of the prothoracic spiracles luteo-fuliginous ; the posterior lip of spiracle itself piceous ; mesothorax faintly striated in irregular, transverse wavy lines. Abdominal segments sparsely, irregularly and finely punctate, fuscous ; cremasters dark fusco-castaneous. Length, nearly 1 inch.

*Food-plants*.—Wild Bean (*Phaseolus*), Butterfly Pea (*Clitoria*), *Wisteria*, *Desmodium* and other allied plants.

Exceedingly rare in this neighborhood, but very common in the Southern States. It was taken by the late S. L. Elliot in Central Park, New York City, and is recorded by Prof. J. B. Smith as being taken at Newark and Cape May, N. J.

*Synopsis of the Species of Hesperidae.<sup>1</sup>*

**Ancyloxypha.**

- Fore wings blackish washed with orange ochraceous.  
Hind wings beneath clear orange ochraceous. .... *A. numitor.*

**Pamphila.**

- With a short black bar at end of discal cell in fore wings.  
Hind wings beneath with a large yellow patch in the middle. ... *P. zabulon.*  
Hind wings beneath clear yellow. .... *P. logan.*  
With an oblique velvety black stigma on fore wings (male).  
Hind wings beneath yellowish, with an indistinct spot-like band  
in the middle. .... *P. sassacus.*  
Hind wings beneath rusty brown, with a conspicuous row of white  
or pale yellow spots . . . . . *P. leonardus.*  
Hind wings beneath yellowish, with black spots. .... *P. phylæus.*  
Hind wings beneath with a distinct, yellow, large spot-like band  
across the middle connected with a patch at the base. .... *P. peckius.*  
Hind wings beneath with a more or less distinct, yellow, spot-like  
band in middle, not connected with the patch near base . . . *P. mystic.*  
Hind wings beneath thickly scaled with olivaceous. .... *P. cernes.*  
Fore wings with stigma indistinct.  
Hind wings beneath vinous, with a few very indistinct, paler spots  
in the middle. .... *P. verna.*  
Hind wings lighter brown beneath than above. .... *P. metacomet.*  
Hind wings beneath rusty brown, with violet patches. .... *P. accius.*  
With stigma on the fore wings curved.  
Hind wings beneath dirty yellowish, with a lighter shade in the  
middle . . . . . *P. huron.*  
Stigma and fore wings pinched in the middle.  
Hind wings beneath orange brown, with a few yellow spots in  
the middle . . . . . *P. pontiac.*  
With stigma connected with an indistinct, narrow basal streak.  
Hind wings beneath ochraceous, with a row of lighter spots in the  
middle. .... *P. manataqua.*  
Stigma broken in the middle.  
Hind wings beneath rusty brown, with a row of lighter spots in  
the middle, or olive brown (var. *egeremet*). .... *P. otho.*  
Stigma absent.  
Hind wings beneath with a large, bright yellow patch in the  
middle. .... *P. massasoit.*  
Both sexes similar; hind wings beneath dirty yellowish brown,  
with a lighter spot-like patch in the middle. .... *P. viator.*  
Stigma minute, almost invisible.  
Hind wings beneath washed with gray . . . . . *P. hianna.*  
Fore wings deep brown, with bronzy lustre and two semitransparent  
spots in the middle.  
Hind wings beneath paler than above, with a lighter reflection. ... *P. ocola.*

**Pyrgus.**

- Black, with transverse rows of white spots on the fore wings. ... *P. montivagus.*  
Black, with one row of transverse, white spots. .... *P. centaureæ.*

<sup>1</sup> It is very difficult to give a satisfactory synopsis of the genus *Pamphila*, as the sexes of each species differ in markings on the upperside, especially on the fore wings. The males of some species are provided with a stigma, which is more or less distinct or wanting entirely; while in the females it is always absent. The markings and coloration of the underside of the hind wings, however, are constant in both sexes, and by means of this they may be readily united, or the species separated.

### Pholisora.

Sooty black, with an irregular curved row of small white dots.....*P. catullus*.

### Nisoniades.

Deep brown, fore wings thickly scaled with gray between the outer bands.....*N. brizo*.

Smaller, with the scales more regularly distributed over the fore wings.....*N. icelus*.

Small, with white spots on the outer band.....*N. lucilius*.

Larger, marked like *lucilius* but less distinctly.....*N. persius*.

With bands on fore wings heavy and very conspicuous, white spots very indistinct.....*N. martialis*.

Large species, allied to *martialis*, but with heavy white spots.....*N. juvenalis*.

### Eudamus.

Chocolate brown, with an amber-yellow patch on fore wing.

Hind wings with a large silvery-white spot in the middle....*E. tityrus*.

Hind wings beneath broadly smeared with white along the outer border.....*E. lycidas*.

Hind wings beneath with two transverse bands.

Fore wings with small white spots.....*E. pylades*.

Fore wings with large white spots.....*E. bathyllus*.

Fore wings with a broad, oblique, amber-yellow band.

Outer border of hind wings scaled with gray.....*E. cellus*.

Hind wings with long, tail-like appendages.

Wings and body above with long green hairs.....*E. proteus*.

The following list of species may possibly occur within fifty miles of New York City; but at present we have no record of their capture.

*Phyciodes batesii* Reak.—Recorded from Long Island and New Jersey.

*Thecla læta* Edw.—Taken at Atlantic City, N. J.

*Thecla halesus* Cram.—Taken at Cape May and Gloucester, near Westville, N. J. Common in the South.

*Thecla m-album* Bd.-Lec.—Recorded from Cape May, N. J. Common in the Southern States.

*Calephelis borealis* G. & R.—Recorded from New York and New Jersey.

*Pamphila metea* Scud.—Recorded from Farmington, New Britain, Conn., and the Schooley Mountains, N. J.

*Pamphila seminole* Scud.—Recorded from New Jersey, but without definite locality.

*Pamphila maculata* Edw.—Recorded from New York. Common in the Gulf States.

*Pamphila panoquin* Scud.—Has been taken in abundance at Atlantic City, N. J., in June and July. Common in the South.

*Pamphila bimaculata* G. & R.—Recorded from Albany, N. Y., and doubtfully from New Jersey.

*Pamphila ethlius* Cram.—Dr. S. H. Scudder records this insect as having once been taken at West Farms, New York City, by Mr. J. Angus. It has also been taken near Albany, N. Y., and its occurrence here is probably only accidental.

*Pamphila fusca* G. & R.—A single example of this southern species was taken by me at Sandy Hook, N. J.

*Amblyscirtes vialis* Edw.—Recorded as being locally common throughout the State of New Jersey, but without definite locality.

## EXPLANATION OF PLATES.

### PLATE II.

[The detached figures on the right hand side represent the undersides of the wings.]

- Fig. 1.—*Papilio asterias* Fabr. Male.
- Fig. 2.— “ *turnus* Linn. Male.
- Fig. 3.—*Pieris rapa* (Linn.). Male.
- Fig. 4.— “ *protodice* (Bd.-Lec.). Female.
- Fig. 5.—*Anthocharis genutia* (Fabr.). Male.
- Fig. 6.—*Colias philodice* (Godt.). Female.
- Fig. 7.—*Terias lisa* (Bd.-Lec.). Male.
- Fig. 8.— “ *nicippi* (Cram.). Male.

### PLATE III.

The detached figures on the right hand side represent the undersides of the wings.]

- Fig. 1.—*Danaus archippus* (Fabr.). Male.
- Fig. 2.—*Argynnis idalia* (Dru.). Male.
- Fig. 3.— “ *cybele* (Fabr.). Female.
- Fig. 4.—*Euptoieta claudia* (Cram.). Male.
- Fig. 5.—*Limenitis disippus* (Godt.). Male.

## PLATE IV.

[The detached figures on the right hand side represent the undersides of the wings.]

- Fig. 1.—*Argynnis myrina* (Cram.). Male.  
 Fig. 2.—*Melitæa phaëton* (Dru.). Male.  
 Fig. 3.—*Phyciodes tharos* (Dru.). Male.  
 Fig. 4.— “ *nycteis* (Db.-Hew.). Female.  
 Fig. 5.—*Vanessa milbertii* (Godt.). Male.  
 Fig. 6.—*Grapta comma* (Harr.). Male.  
 Fig. 7.—*Pyrameis cardui* (Linn.).  
 Fig. 8.—*Junonia cania* (Hüb.). Male.  
 Fig. 9.—*Debis portlandia* (Fabr.). Female.  
 Fig. 10.—*Satyrus alope* (Fabr.). Female.

## PLATE V.

[The detached figures on the right hand side represent the undersides of the wings.]

- Fig. 1.—*Neonympha eurytris* (Fabr.). Female.  
 Fig. 2.—*Libythea bachmani* (Kirtl.). Female.  
 Fig. 3.—*Thecla melinus* (Hüb.). Male.  
 Fig. 4.— “ *calanus* (Hüb.). Male.  
 Fig. 5.— “ *damon* (Cram.). Female.  
 Fig. 6.— “ *irus* (Godt.). Female.  
 Fig. 7.— “ *niphon* (Bd.-Lec.). Female.  
 Fig. 8.— “ *titus* (Fabr.). Male.  
 Fig. 9.—*Feniseca tarquinius* (Fabr.). Female.  
 Fig. 10.—*Chrysophanus thoë* (Bd.-Lec.). Male.  
 Fig. 11.— “ *hypophlæas* (Bd.). Female.  
 Fig. 12.—*Lycæna scudderii* Edw. Female.  
 Fig. 13.— “ *comyntas* (Godt.). Male.  
 Fig. 14.— “ *pseudargiolus* (Bd.-Lec.). Female.  
 Fig. 15.—*Eudamus pylades* (Scud.). Male.  
 Fig. 16.— “ *lycidas* (Abb. & Sm.). Female.  
 Fig. 17.— “ *tityrus* (Fabr.). Female.  
 Fig. 18.— “ *cellus* (Bd.-Lec.). Male.  
 Fig. 19.—*Pamphila viator* Edw. Female.

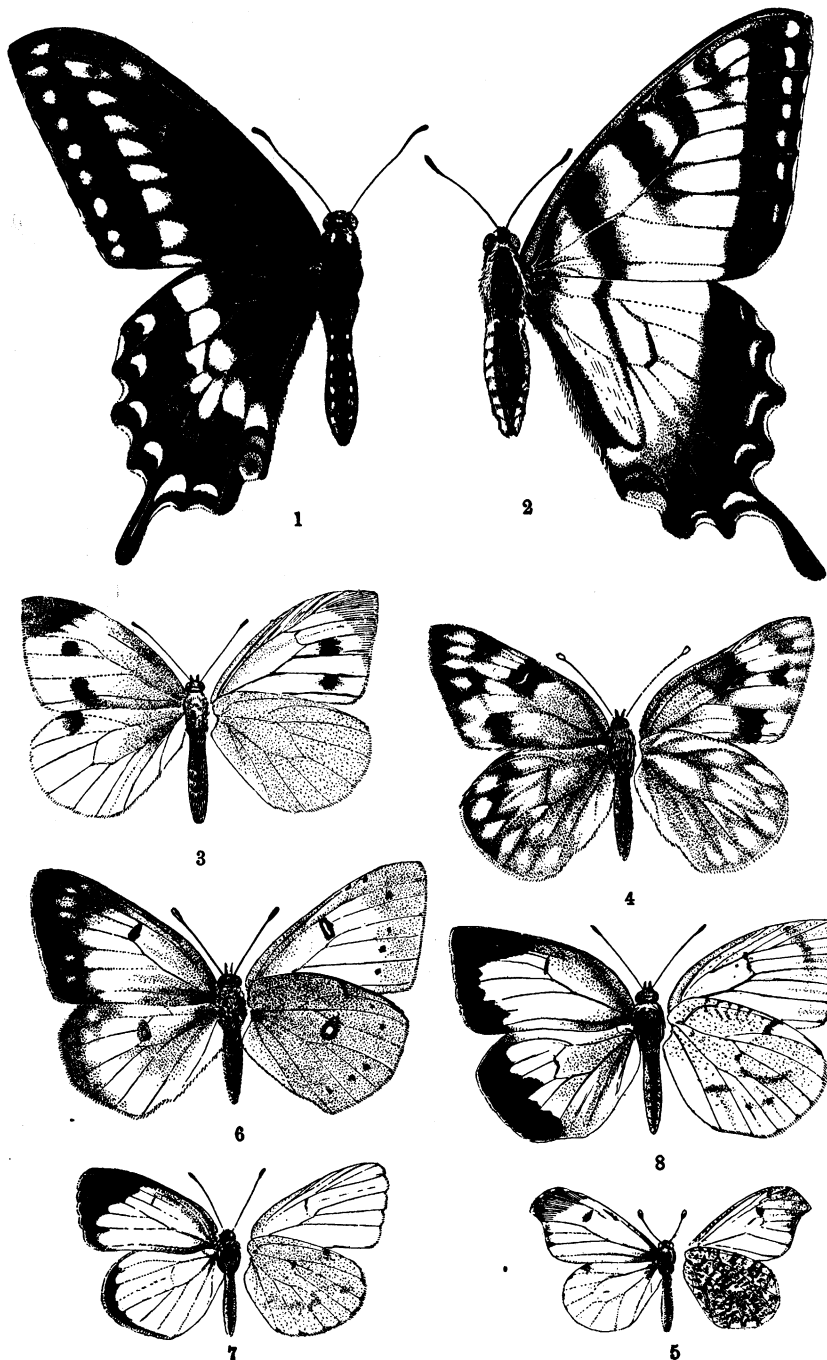
## PLATE VI.

[The detached figures on the right hand side represent the undersides of the wings. Those marked “a” are the uppersides of the females.]

- Fig. 1. —*Pamphila zabulon*, var. *hobomok* (Harr.). Male.  
 Fig. 1a.— “ “ “ Female.  
 Fig. 2. — “ *massasoit* (Harr.). Female.  
 Fig. 3. — “ *sassacus* (Harr.). Male.  
 Fig. 3a.— “ “ “ Female.

## PLATE VI—Continued.

- Fig. 4. — *Pamphila logan* (Edw.). Male.  
 Fig. 5. — " *leonardus* (Harr.). Male.  
 Fig. 6. — " *huron* (Edw.). Male.  
 Fig. 6a. — " " Female.  
 Fig. 7. — " *phylæus* (Dru.). Male.  
 Fig. 8. — " *otho* (Abb. & Sm.). Male.  
 Fig. 8a. — " " Female.  
 Fig. 9. — " *peckius* (Kby.). Male.  
 Fig. 9a. — " " Female.  
 Fig. 10. — " *mystic* (Edw.). Male.  
 Fig. 10a. — " " Female.  
 Fig. 11. — " *cernes* (Bd.-Lec.). Male.  
 Fig. 11a. — " " Female.  
 Fig. 12. — " *verna* Edw. Male.  
 Fig. 13. — " *metacomet* (Harr.). Male.  
 Fig. 14. — " *pontiac* (Edw.). Male.  
 Fig. 14a. — " " Female.  
 Fig. 15. — *Pyrgus montivagus* Reak. Male.  
 Fig. 16. — *Pholisora catullus* (Fabr.). Male.  
 Fig. 17. — *Nisoniades brizo* (Bd.-Lec.). Female.  
 Fig. 18. — " *martialis* Scud. Female.  
 Fig. 19. — " *juvenalis* (Fabr.). Female.  
 Fig. 20. — *Ancyloxypha numitor* (Fabr.).



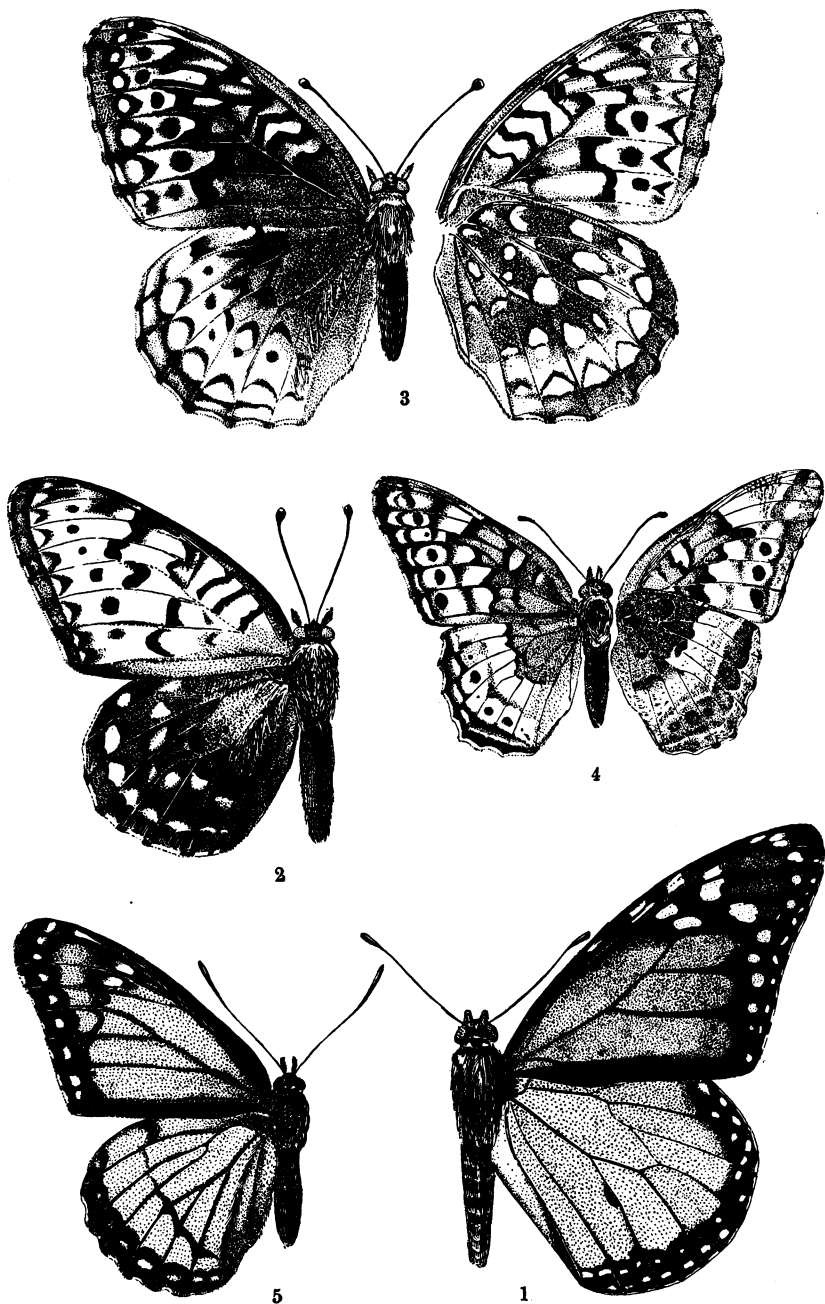
L. JOUTEL DEL.

1. *Papilio asterias* Fabr.
2. " *turnus* Linn.
3. *Pieris rapae* (Linn.).
4. " *protodice* (Bd. Lec.).

5. *Anthocharis genutia* (Fabr.).
6. *Colias philodice* (Godt.).
7. *Terias lisa* (Bd. Lec.).
8. " *nicippi* (Cram.).





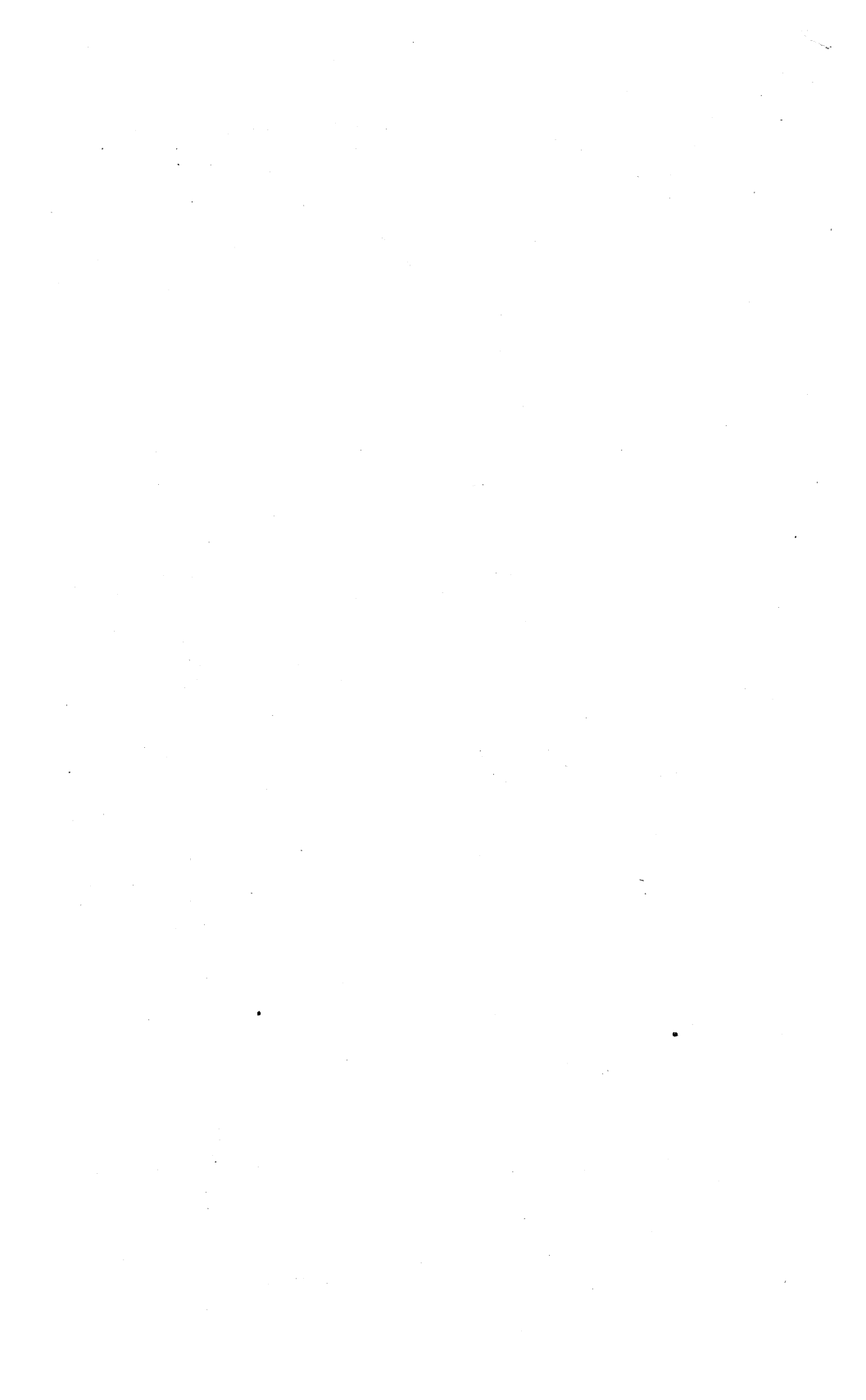


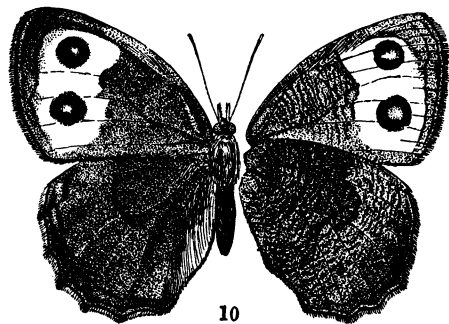
L. JOUTEL DEL.

1. *Danaus archippus* (Fabr.).
2. *Argynnis idalia* (Dru.).

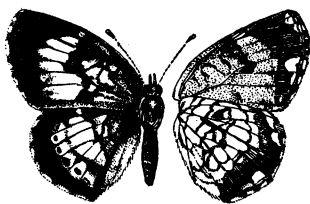
3. *Argynnis cybele* (Fabr.).
4. *Euptoieta claudia* (Cram.).

5. *Limenitis disippus* (Godt.).

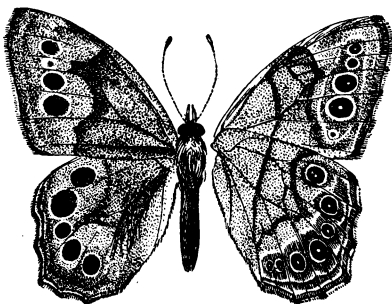




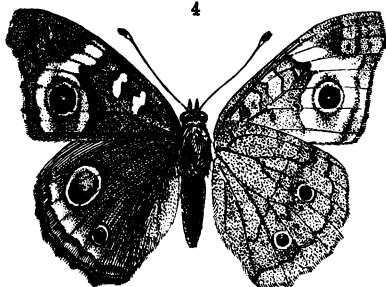
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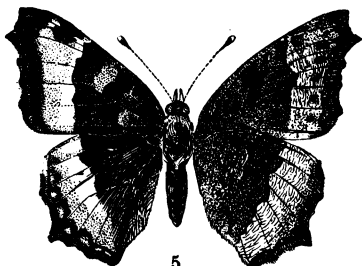
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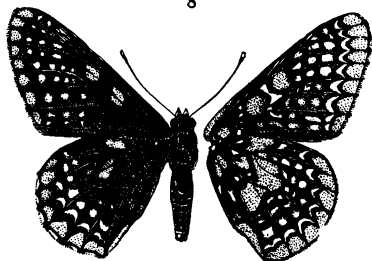
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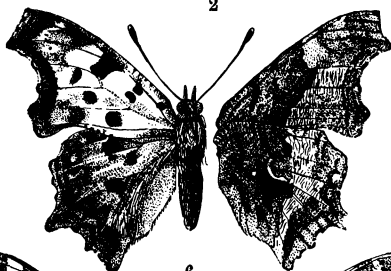
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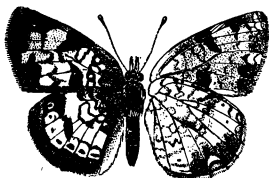
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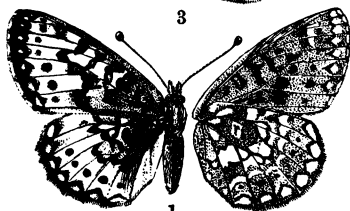
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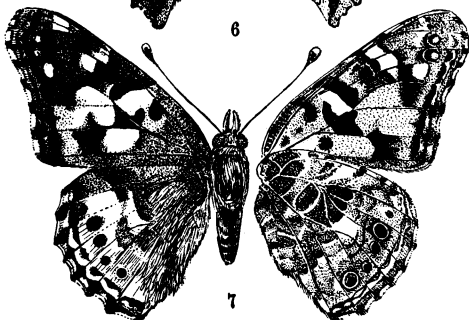
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L. JOUTEL DEL.

1. *Argynnis myrina* (Cram.).
2. *Melitæa phæton* (Dru.).
3. *Phycodes tharos* (Dru.).
4. " *nycteis* (Dbl. & Hew.).
5. *Vanessa milbertii* (Godt.).

6. *Grapta comma* (Harr.).
7. *Pyrameis cardui* (Linn.).
8. *Junonia cœnia* (Hüb.).
9. *Debis portlandia* (Fabr.).
10. *Satyrus alope* (Fabr.).

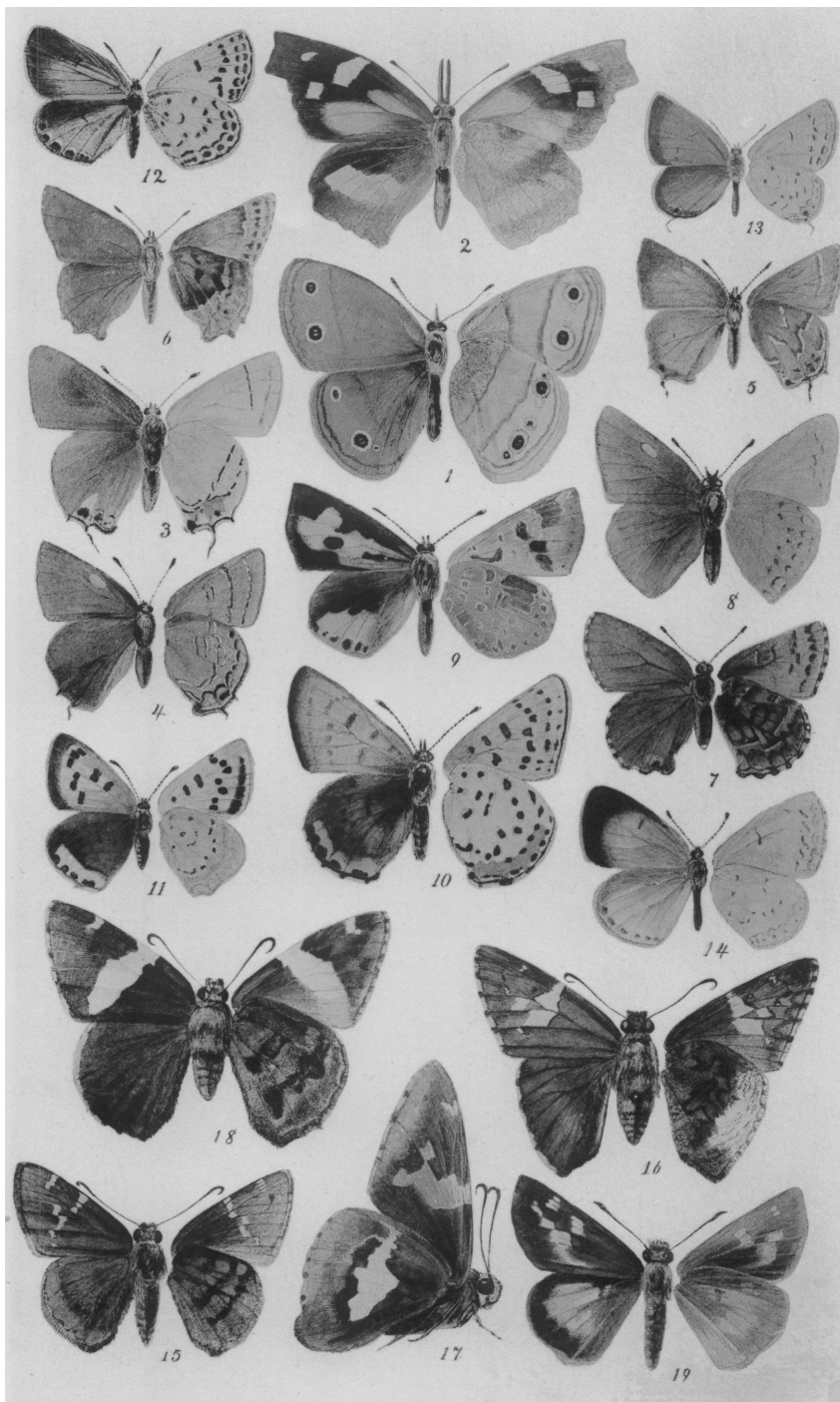




PLATE V.

[The detached figures on the right hand side represent the undersides of the wings.]

- Fig. 1.—*Neonympha eurytris* (Fabr.). Female.  
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Fig. 16.— “ *lycidas* (Abb. & Sm.). Female.  
Fig. 17.— “ *tityrus* (Fabr.). Female.  
Fig. 18.— “ *cellus* (Bd.-Lec.). Male.  
Fig. 19.—*Pamphila viator* Edw. Female.









# PLATE VI.

[The detached figures on the right hand side represent the undersides of the wings. Those marked "a" are the uppersides of the females.]

- Fig. 1. — *Pamphila zabulon*, var. *hobomok* (Harr.). Male.
- Fig. 1a. — " " " " Female.
- Fig. 2. — " *massasoit* (Harr.). Female.
- Fig. 3. — " *sassacus* (Harr.). Male.
- Fig. 3a. — " " " Female.
- Fig. 4. — *Pamphila logan* (Edw.). Male.
- Fig. 5. — " *leonardus* (Harr.). Male.
- Fig. 6. — " *huron* (Edw.). Male.
- Fig. 6a. — " " " Female.
- Fig. 7. — " *phylæus* (Dru.). Male.
- Fig. 8. — " *otho* (Abb. & Sm.). Male.
- Fig. 8a. — " " " Female.
- Fig. 9. — " *peckius* (Kby.). Male.
- Fig. 9a. — " " " Female.
- Fig. 10. — " *mystic* (Edw.). Male.
- Fig. 10a. — " " " Female.
- Fig. 11. — " *cernes* (Bd.-Lec.), Male.
- Fig. 11a. — " " " Female.
- Fig. 12. — " *verna* Edw. Male.
- Fig. 13. — " *metacomet* (Harr.). Male.
- Fig. 14. — " *pontiac* (Edw.). Male.
- Fig. 14a. — " " " Female.
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- Fig. 16. — *Pholisora catullus* (Fabr.). Male.
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- Fig. 18. — " *martialis* Scud. Female.
- Fig. 19. — " *juvenalis* (Fabr.). Female.
- Fig. 20. — *Ancyloxypha numitor* (Fabr.).

