

NOTES ON *PIERIS VIRGINIENSIS* AND *ERORA LÆTA*—TWO
BUTTERFLIES HITHERTO UNREPORTED FROM MICHIGAN¹

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Once confused with *P. napi* Linné, *Pieris virginiensis* Edw., the "West Virginia White," is a rather rare and local species, heretofore known over an area extending from Ontario, New England, and New York, southward to North Carolina (cf. Merritt in Chermock, 1953). The butterfly has not previously been reported from the state of Michigan, although our present observations indicate that it occurs abundantly in certain localities in the northern part of the state. Once attention is called to this species and to the habits which distinguish it from the common Cabbage Butterfly, *Pieris rapæ* Linné, and the Gray-veined White, *P. napi*, as these species occur in Michigan, we believe that collectors in the state will discover localities additional to the five herein reported.

The collections of the University of Michigan Museum of Zoology contained only two Michigan specimens of *P. virginiensis*, both having been detected in 1955 in the series of *P. napi*. The earliest specimen taken in the state is apparently the ♀ captured over 40 years ago by T. H. HUBBELL at Benzonia, Benzie Co., May 19, 1914. This remains the southernmost record in the state, being approximately one degree of latitude south of the other known Michigan localities, all of which are in the general vicinity of the Straits of Mackinac. In addition, the Museum collection contains a ♂ taken by SHERMAN MOORE at St. Ignace, in the Upper Peninsula (Mackinac Co.) on May 21, 1922.

Recognition of this species in Michigan was first made on the basis of a specimen taken (VOSS) May 15, 1954, in Emmet Co. The determination was confirmed by A. B. KLOTS, who wrote that he did not know of any authentic Michigan records. This specimen, a ♂, was taken in a very fine stand of mature beech-maple-hemlock woods ("Hastings Woods") on the southwest side of Crooked Lake (sec. 19, T35N, R4W), about six miles northeast of Petoskey. The day was cloudy, with intermittent light rain, and unfortunately no insect net was carried into the woods. However, several of the butterflies were seen, and the single specimen which was captured was taken by hand as it visited a blossom of *Trillium grandiflorum* (Michx.) Salisb., which was abundant in the woods. *Dentaria diphylla* Michx., although not yet in flower, was occasional, and is presumably the foodplant of this species in the region, as *D. laciniata* Muhl. is extremely rare in the county.

After the specimen was determined later in the season, it was naturally planned to return to the woods during the corresponding weekend the following spring. Two weeks earlier, however, on April 30, 1955, *P. virginiensis* was unexpectedly encountered (VOSS) on a sandy woods road in Bliss Township, Emmet Co., about 20 miles north of the previous station. This locality is described in detail below under the discussion of *Erora leta*, which was found here when

¹This paper is a contribution from the Biological Station of the University of Michigan.

both of us visited the spot on May 14 — at which time *virginiensis* continued to be common. Old fields and some young second-growth woods characterize the roadsides here, but *virginiensis* was found to be even more common in the deeper woods about one-half mile to the west of the spring-fed damp spot where the species was first noticed on the open road, particularly in the morning hours before noon. At this locality, no *P. napi* were observed. (We never did return to the Crooked Lake woods in 1955, having found so good a place elsewhere.)

On May 15, 1955, a very large colony of *P. virginiensis* was discovered (WAGNER) in the Upper Peninsula in rich deciduous woods in the limestone region near the Daggett Fire Tower, in Mackinac Co. (about four miles south of the Chippewa Co. line and about 9 miles southwest of Pickford). This colony was of special interest in making possible a comparison between the habits of *P. virginiensis* and of *P. napi*, the two species which were for a long time considered by many to be only varietally distinct. Field observations on their behavior wholly support the present generally accepted view that these are two distinct species.

The area near Daggett Tower is made up of rich woods strewn with dolomite boulders and criss-crossed by old lumbering trails. The dominant tree here is sugar maple, *Acer saccharum* Marsh., and the most conspicuous herbaceous plants in mid-May were *Trillium grandiflorum*, *Viola canadensis* L., and *Dentaria diphylla*. The dissected leaves of *Dicentra* and the large simple leaves of *Allium tricoccum* Ait. were prominent, but the flowers of the former had mostly fallen and those of the latter were not to be expected for another month.

Pieris virginiensis was extremely abundant in these woods and at all times during a period between 11:30 a.m. and 12:30 p.m. — even when the sky was somewhat overcast — there were several individuals in sight, flying through the understory vegetation. Along the main dirt road only rare individuals of *virginiensis* were seen, and these usually would alight in the damp spots. Practically all of the specimens were flying entirely within the deep woods — a habit conspicuously different from the imported *P. rapæ*. And when the occasional roadside specimen was frightened, it would fly straight into the woods, in contrast to the habit of *P. rapæ* of staying in the open. The minor lumbering trails in the woods were ideal collecting places, for they possessed muddy spots where individuals would land, in addition to providing access to the dense woods. However, the butterflies proved to be much less attracted to muddy spots here than to the flowers of *Viola canadensis*.

Pieris napi was observed at this locality particularly along the main open roads, usually gathered at wet spots. The differences between this species and *P. virginiensis* were obvious and conspicuous: *P. napi* has a bolder, swifter flight than *P. virginiensis*; in the latter the flight is slow and weak. The color of *P. napi* is much more chalky white; in *P. virginiensis* the appearance of the flying insect is grayish. At this time, the specimens of *P. virginiensis* were more or less worn and included both ♂♂ and ♀♀, while those of *P. napi* were fresh and nearly all ♂♂, suggesting that the first appearance of *napi* follows

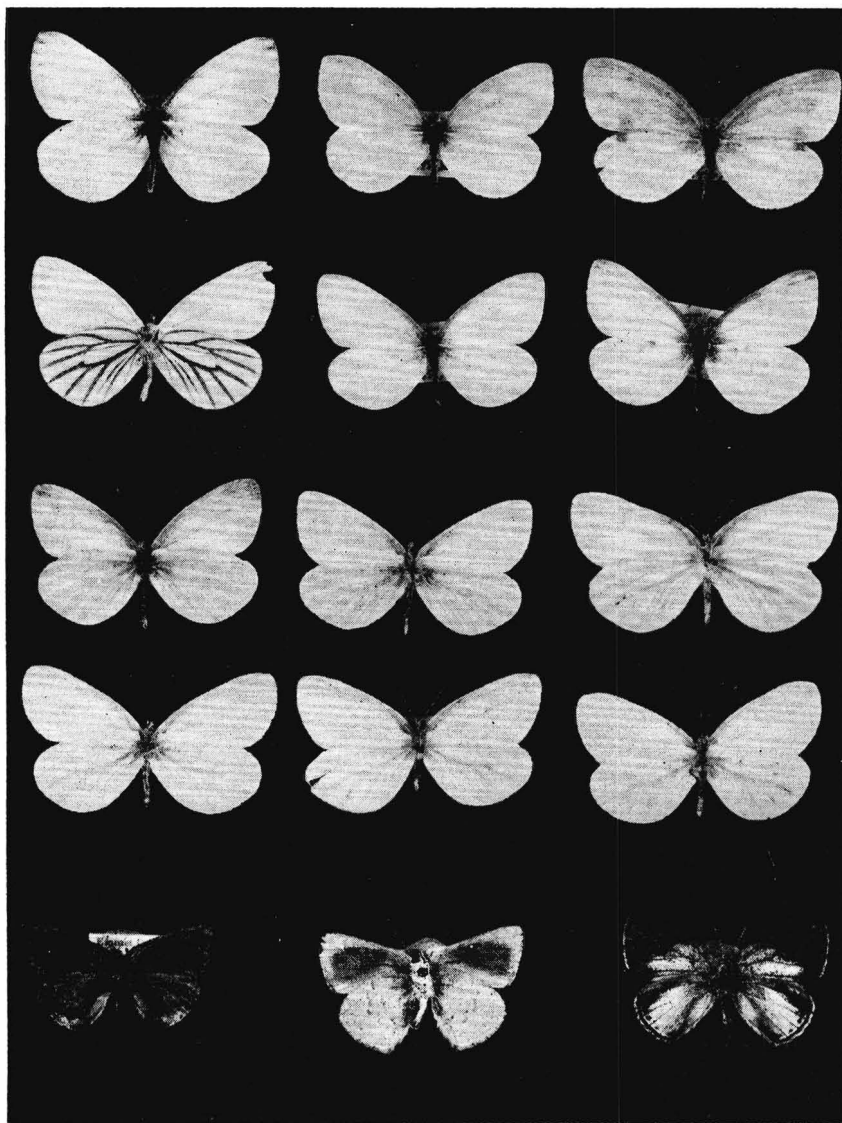


Fig. 1. Northern Michigan *Pieris* and *Erora* taken in 1955. All specimens show the upper surface except as specified.

TOP: left, *P. napi* ♂, Emmet Co., May 14; center & right, *P. virginiensis* ♀, Mackinac Co., May 15.

SECOND: left, *P. napi* ♂, under side, Mackinac Co., May 15; center & right, *P. virginiensis* ♂, Mackinac Co., May 15.

THIRD: darker form of *P. virginiensis* ♂, under side: left, Emmet Co., May 14; center, Mackinac Co., May 15; right, Emmet Co., April 30.

FOURTH: *P. virginiensis* ♂, under side: left & right, Mackinac Co., May 15; center, Emmet Co., April 30.

FIFTH: *Erora leta*, Emmet Co., May 14: left, ♂; center, ♂ under; right, ♀.

that of *virginiensis*, at least in this area, by perhaps one or two weeks. When taken, the specimens of the spring form of *napi* are strikingly differentiated by the bright blackish-green shading along the veins of the under side of the hind wings; in *virginiensis*, this shading is a diffuse gray. In some very dark specimens of *P. virginiensis*, the diffuse gray bands which follow the veins are nearly confluent, practically covering the entire wing surface with shading. (See fig. 1, third row.) At the time of these observations, the sky was intermittently cloudy and clear, and there had evidently been rain in the region during the previous night. The only other butterflies which were seen were a few specimens of *Lycænopsis pseudargiolus* Bdv. & Lec. and *Papilio glaucus* Linné.

As noted above, it was on a return to the Bliss Township, Emmet Co., station for *Pieris virginiensis* that we joined the fraternity of *Erora læta* Edw. collectors on May 14, 1955. Previously unknown from Michigan — or, for that matter, anywhere in the northern Great Lakes region — this exceedingly rare butterfly had been reported, often from only one or two specimens per locality, at scattered places from London, Ontario (type locality, 2 ♂♂ taken by SAUNDERS in 1861), Quebec, and Nova Scotia, southward to Virginia, Tennessee, and Kentucky (cf. Clark & Clark, Field, and Klots). It seems to have been most often taken in Vermont, and has recently (Hessel, 1952) been reported above timber line on Mount Washington, New Hampshire.

How many individuals we may have scared away in pursuit of *Pieris virginiensis* we do not care to contemplate; suffice it to say that VOSS, having taken adequate *virginiensis* at this locality two weeks before, was gathering small butterflies from a moist spot in the road — hardly consciously thinking of what they could be — *Erynnis*, perhaps. Indeed, the net included, among other things, an *Erynnis lucilius* Scud. & Burg. — and two ♂♂ of *Erora læta*. When it was recognized that *læta* had been found, WAGNER'S interest in *Pieris* a few yards down the road quickly waned, and within 30 minutes he netted a ♀ *læta*. Another ♂ was seen (and pursued) but not captured. The specimens were taken between 11:15 and 11:45 a.m. on a clear sunny day; no more were seen in the course of the next hour.

Our locality (see fig. 2) is scarcely the sort of "shaded trail" in beech woods where one is supposed to expect — if he ever dare expect — to find *læta*. A sandy "dirt" road faithfully follows a section line due east and west over the north-facing slope of a morainic hill the crest of which is slightly to the south (to the left in the figure). Therefore, although the road itself, as figured, rises to the west, the general slope of the land is north-facing. A moist spot along the south side of the road (toward which WAGNER is pointing his net in the figure) is kept damp until late summer by a small, apparently spring-fed pool in the shrubbery to the side of the road. In the valley to the north of the road (off the right edge of the figure) are scattered shrubs, small trees, and brush — evidently an abandoned field. On the slight rise to the southwest of the moist spot (behind the trees showing in the figure) is an abandoned apple orchard; presumably there was once a dwelling here, for there are small lilac bushes (not in flower) and plants of a cultivated species of *Phlox* (in full bloom). Directly south of the moist area, and also on the opposite (north) side of the road several

yards to the east, the vegetation is a very young deciduous woods, apparently arising in large part from vegetative re-growth after cutting. Immediately along both sides of the road itself are young sprouts and suckers of assorted deciduous trees and shrubs, among which the following predominate: Sugar Maple, Basswood, American Elm, White Ash, Pin Cherry, Willows, and Blackberries. Several of the common introduced grasses and other weeds are included in the herbaceous vegetation along the roadsides. Although there is no Beech in the immediate vicinity of the moist spot, this species does occur in the woods not far away. No Hazelnut (*Corylus*) was noted anywhere near (either in the spring or on a later July visit to the site with A. B. KLOTS and F. H. RINDGE), and conifers are conspicuously absent.



Fig. 2. The roadside habitat in Bliss Township, Emmet Co., Michigan, at which both *Pieris virginienensis* and *Erora lata* were taken, May 14, 1955. Looking somewhat south of west (the road goes due west).

The specimens are shown at the bottom of figure 1: two ♂♂, slightly worn at the tips of the primaries, and a perfect ♀. Although on the upper side the ♂♂ are an excellent match for published figures (*e.g.*, Holland, pl. 29, fig. 23; Klots, pl. 16, fig. 14), on the underside of the primaries the smoky or fuscous clouding is distinctly more extensive than in previously published figures. (This is absent in our ♀.) There is apparently no evidence of such clouding shown in HOLLAND's ♂ (pl. 29, fig. 24), CLARK & CLARK's ♀ (frontis. fig. 8; pl. 12, fig. b, the latter also as fig. 71 right, on p. 65 of CLARK, 1940), or FERGUSON's ♀ (pl. 2, fig. 4, p. 331). There is a suggestion of this clouding in the ♂ figures of KLOTS (pl. 16, fig. 14, p. 129), EDWARDS (Thecla I, fig. 1), and CLARK, 1932 (pl. 25, fig. 6 [stated to be from Prescott, Ariz., and therefore referable to

E. quaderna]). EDWARDS' figure of the under side of a ♀ (fig. 4) indicates less clouding than in the ♂, and such a sex difference is implied in his text. The original description (Edwards, 1862, pp. 55-56) is unaccompanied by an illustration, but does describe the disc of the primaries beneath as "smoke color" obscuring the latter two red spots. It is of interest to recall that the type locality, London, Ontario, is the previous northwesternmost record. The under side of a ♂ figured by FIELD (pl. 1, fig. 7) comes closest to resembling our darkest specimen in this respect (see under side in fig. 1).

For the sake of a more complete evaluation of published figures of this rare species, reference may be also made to SCUDDER, whose unsatisfactory, uncolored figure (pl. 14, fig. 9) of the under side of a ♀ indicates none of this gray clouding; and to SEITZ, whose very poor depiction (pl. 155) of the under surface shows no clouding but indicates a decidedly pink, rather than greenish, ground color.

The two counties, Emmet and Cheboygan, which share the northernmost tip of the Lower Peninsula of Michigan constitute the area under special consideration by the University of Michigan Biological Station (located on Douglas Lake, in Cheboygan Co.). A recently published enumeration (Voss, 1954) of the butterflies found in these two counties cited 74 species for the two-county region, of which 66 were known from Emmet County and 70 from Cheboygan County (as of the 1952 season). During the past three years, a number of new county records have been obtained. The 1953 season added three species to the Cheboygan Co. list: *Euphydryas phaeton* Drury, *Lycæna dorcas* Kirby, and *Polites manataaquæ* Scud. The 1954 season added *Pieris virginiensis* to the Emmet Co. list. The 1955 season added *Euptoieta claudia* Cramer, *Erora læta*, *Glaucopsyche lygdamus* Dbldy., *Euchloe olympia* Edw., and *Erynnis lucilius* to the Emmet Co. list; and *Poanes viator* Edw., *Carterocephalus palemon* Pallas, and *Atrytonopsis bianna* Scud. to the Cheboygan Co. list. (We are indebted to M. C. NIELSEN and J. H. NEWMAN for the latter two records.) Of these, the new records for the entire two-county area are *Euptoieta claudia*, *Euphydryas phaeton*, *Erora læta*, *Pieris virginiensis*, *Polites manataaquæ*, *Poanes viator*, and *Atrytonopsis bianna*.

All of these records have been made available for inclusion in SHERMAN MOORE's new annotated list of the butterflies of Michigan, now in press. The revised totals for the University of Michigan Biological Station region are now as follows: For the two-county region, 81 species; for Emmet Co., 72 species; for Cheboygan Co., 76 species.

We believe that for a long time to come, Emmet County will remain the only county in Michigan — or in the nation — in which have been taken fresh specimens of such diverse elements as *Cœonympha tullia* Müller, *Euptoieta claudia*, *Nymphalis californica* Bdv., *Erora læta*, *Lycæna thoe* Guérin, *Eurema lisa* Bdv. & Lec., *Pieris virginiensis*, and *Hesperia laurentina* Lyman.

After completion of the present manuscript, our attention was called to the list of Lepidoptera in the Los Angeles County Museum by Martin & Truxal, published in

September, 1955. *P. virginiensis* is cited for Michigan in June and July. Believing that these late records may have been based on specimens of *P. napi*, we sent an inquiry, accompanied by a copy of the photograph reproduced as figure 1, to LLOYD M. MARTIN, who kindly checked the material carefully. He writes (Nov. 2, 1955): "I find we have one pair which agrees with the photograph . . . taken at Petoskey, Michigan, June 19, 1915 . . . by J. J. LICHTER."

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