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ZOOLOGY****UNIVERSITY OF MICHIGAN**

ANN ARBOR, MICHIGAN

**A REVISED ANNOTATED LIST OF THE BUTTERFLIES
OF MICHIGAN***

BY SHERMAN MOORE

[SHERMAN MOORE was Honorary Associate Curator of Lepidoptera in the University of Michigan Museum of Zoology from 1927 until his death on January 7, 1956. An account of his life and a list of his entomological publications may be found in the Annual Report of this Museum for 1950–1951. He had practically completed the manuscript of the present paper some months before his death, and it has been changed as little as possible in editing. In order to make it more useful, however, the arrangement and nomenclature have been altered from those of the Barnes and McDunnough 1917 Checklist to conform with those of the widely used manual by Klots, "*A Field Guide to the Butterflies*" (1951). A considerable number of additional Michigan records have also been included, many of them from the collection of Michigan State University. A committee of the Michigan Entomological Society undertook the task of making these changes; its membership included Ronald W. Hodges, John H. Newman, Edward G. Voss, and Warren H. Wagner, Jr. Their generous help is gratefully acknowledged—T. H. HUBBELL.]

IN 1913, W. W. Newcomb published the first comprehensive list of Michigan butterflies; he recorded 101 species. Twenty-six years later the list was revised (Moore, 1939) and increased to 127 species, of which three were somewhat doubtfully included. Today the Michigan list stands at 139 species and subspecies, and our knowledge of butterfly distribution in the state is far more detailed and accurate than it was in 1939. There are, also, many more Michigan residents interested in the collection and study of Lepidoptera than there were twenty years ago—indeed, this is the main reason why there is so much new information to be incorporated in the list. The collecting of M. C. Nielsen and Ronald Hodges in the central part of the Lower

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Peninsula, in particular, has helped to fill in what was formerly a great gap between the Straits region and the southern tiers of counties. For these reasons the need for a revised checklist has become increasingly urgent.

In addition to the comprehensive lists mentioned above, a few incomplete local lists of Michigan butterflies have been published. Arranged chronologically, these are as follows:

1893. Wolcott: 79 species from the vicinity of Grand Rapids in Kent County.
1901. Pettit: 8 species from Alger County.
1906. Ruthven: 10 species from the Porcupine Mountains and Isle Royale.
1909. Adams: 19 species from Isle Royale.
1915. Welch: 26 species from the Douglas Lake region in Cheboygan and adjoining counties.
1918. McAlpine: 38 species from Whitefish Point in Chippewa County.
1922. Moore: 68 species from northern Michigan.
1929. Andrews: 24 species from the vicinity of the Huron Mountain Club in Marquette County.
1930. Moore: 45 species from the Beaver Islands in northern Lake Michigan.
1945. Detroit Entomological Society: 72 species from Wayne County.
1954. Voss: 74 species from Cheboygan and Emmet counties, and many other records.
1956. Voss and Wagner: bringing the list from Cheboygan and Emmet counties to 81 species, with records from other localities.

The present list is based on previously published records, and on specimens in the collections of the University of Michigan Museum of Zoology^{1,2,3} and Michigan State University,^{3,4,6} and the private collections of R. R. Dreisbach,^{2,3} Ronald W. Hodges,^{3,4} Richard Holzman,⁵ Stephen P. Hubbell,^{3,5} Edward Lohrstorfer,² Wilbur S. McAlpine,^{3,5} P. E. Moody,² John H. Newman,^{2,3,5} Mogens C. Nielsen,^{3,5} Thomas E. Pliske,^{3,5} George W. Rawson,^{2,3} W. C. Stinson,² Jeffrey Tordoff,³ William Van Deurs,² Edward G. Voss,^{3,5} and Warren H. Wagner, Jr.^{3,5}.

¹ Including the collections of W. W. Newcomb, Sherman Moore, and T. H. Hubbell.

² All or most of specimens examined by Moore.

³ Critical identifications made by various specialists, as noted in list.

⁴ Records furnished by Ronald W. Hodges.

⁵ Identifications furnished by owner of collection.

⁶ Including the collection of W. C. Stinson.

An effort has been made to indicate all records which for any reason are doubtful. In a few instances, especially of old published records or those of rare species, credit for the determination or published record is given. References are made to plate and figure numbers in (K) Klots' *Field Guide to the Butterflies* (1951), and (H) Holland's *Butterfly Book*, revised edition (1931), for the species there illustrated. These books are probably those most used by amateur collectors. The plates in both as a rule are good, and with the descriptive notes should enable anyone to name most of the butterflies of Michigan. The nomenclature used in this list is essentially that of McDunnough (1938) and the same as that of Klots, with a single noted exception; where it differs from that of Holland (1931), the name used in the latter work is also given.

In order to enable the user of this list to visualize the distribution of each species more clearly, the accompanying map (Fig. 1) shows the location of all Michigan counties, and the three zones into which the state is divided for convenience in listing records and giving dates of occurrence. UP covers the Upper Peninsula and Isle Royale; the Lower Peninsula is divided into a northern section NLP and a southern section SLP by an irregular line following county boundaries from Saginaw Bay to Muskegon. The counties in which each species has been taken are listed alphabetically under each zone, together with the earliest and latest date of capture in that zone. It has seemed desirable to include, as localities equivalent to counties, the following islands; Isle Royale (Keweenaw Co.) in Lake Superior, the Beaver Islands (Beaver, Garden, Hog, Squaw, Whiskey and Hat, in Charlevoix Co.), the Fox Islands (North and South, in Leelanau Co.) in Lake Michigan, and the Charity Islands (Arenac Co.) in Saginaw Bay, Lake Huron. Records from the Edwin S. George Reserve in Livingston County are indicated by an asterisk preceding the name of that county.

Family SATYRIDAE. The Satyrs and Wood Nymphs

Pearly Eye. *Lethe portlandia* Fabr. UP: Alger, Chippewa, Dickinson, Isle Royale, Mackinac, Marquette, Schoolcraft; June 20–Aug. 5. NLP: Arenac, Cheboygan, Clare, Emmet, Iosco, Lake, Mason, Montmorency, Oscoda, Presque Isle; June 29–Aug. 25. SLP: Barry, Cass, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, Washtenaw, Wayne; June 29–July 30. H. XVIII:20 (*Enodia*). K. 7:8.

Creole Pearly Eye. *Lethe creola* Skin. SLP: One specimen in the National Museum, collected in Michigan by David Bruce (Clark,

1936). No additional data are available, but the specimen probably came from the southwest corner of the state. Badger (1958) states without indication of authority that the species has been recorded from Cass County. H. XVIII: 18, 19 (*Enodia*). K. 7:9.

Eyed Brown. *Lethe eurydice* Joh. UP: Chippewa, Dickinson, Luce, Mackinac, Marquette, Schoolcraft; June 30–Aug. 15. NLP: Alpena, Arenac, Beaver Isls., Benzie, Charity Isl., Cheboygan, Clare, Emmet, Grand Traverse, Iosco, Mason, Mecosta, Midland, Muskegon, Oceana, Osceola, Otsego, Presque Isle; June 23–Aug. 12. SLP: Barry, Clinton, Huron, Ingham, Jackson, Kent, Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; June 13–Aug. 16. XXV:1 (*Satyrodes*). K. 10:4.

Little Wood Satyr. *Euptychia cymela* Cram. UP: Chippewa, Dickinson, Schoolcraft; June 20–July 26. NLP: Alpena, Arenac, Bay, Benzie, Cheboygan, Clare, Crawford, Emmet, Grand Traverse, Lake, Mason, Midland, Montmorency, Muskegon, Oceana, Oscoda, Roscommon; June 6–Aug. 16. SLP: Barry, Berrien, Cass, Clinton, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Saginaw, St. Clair, St. Joseph, Washtenaw, Wayne; May 21–Aug. 15. H. XXV:4 (*euryta*). K. 7:1.

Mitchell's Satyr. *Euptychia mitchellii* French. SLP: Barry, Berrien, Cass (type locality), Kalamazoo, Kent (Wolcott, 1893), St. Joseph, Washtenaw; July 2–24. (Pl. I, Fig. 1). H. XXV:6. K. 7:3.

This species is seldom found, in part because of its restricted distribution and very short flight season, and doubtless also because collectors avoid its uninviting habitat. Although the type specimens were taken in dry upland meadows (French, 1889), *mitchellii* normally lives only in tamarack and poison sumac swamps (Wolcott, 1893; Badger, 1958). Its colonies are strongly localized, but where the species occurs it may be very abundant during its flight period of a week or ten days. The larval foodplants are certain sedges which grow in the open parts of the swamps (McAlpine, Hubbell, and Pliske, in press).

Inornate Ringlet. *Coenonympha tullia inornata* Edw. UP: Alger, Chippewa, Luce, Mackinac, Schoolcraft; June 18–Aug. 2. NLP: Beaver Isls., Cheboygan, Emmet; June 18–July 17. H. XXV:13, 29. K. 10:7.

Wood Nymph. *Cercyonis pegala nephele* Kby. UP: Alger, Chippewa, Delta, Dickinson, Gogebic, Keweenaw, Mackinac, Marquette, Menominee, Schoolcraft; July 8–Aug. 20. NLP: Alpena, Antrim, Arenac, Bay, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Clare,

Emmet, Grand Traverse, Iosco, Kalkaska, Lake, Leelanau, Manistee, Mason, Midland, Montmorency, Muskegon, Newaygo, Osceola, Oscoda, Otsego, Roscommon; June 25–Sept. 1. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Genesee, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; July 4–Sept. 22. H. XXVI:1,2 (*alope*); 3,4 (*nephele*); 5,6 (*ariane*); 9,10 (*olympa*). K. 7:5 (*pegala alope*).

Macoun's Arctic. *Oeneis macounii* Edw. UP: Isle Royale, June 29. H. XXVII:3; LXII:5. K. 7:11.

The only Michigan specimens were collected by R. N. Rysgaard (Newcomb, 1941). One of these is in the collection of the Museum of Zoology, University of Michigan.

Chryxus Arctic. *Oeneis chryxus strigulosus* Edw. UP: Schoolcraft; May 24–June 12. NLP: Alcona, Cheboygan, Crawford, Emmet, Iosco, Lake, Montmorency, Newaygo, Ogemaw, Oscoda, Otsego, Roscommon, Wexford; May 4–June 21. H. XXVII:10; LXII:9. K. 7:10.

Jutta Arctic. *Oeneis jutta* Hbn. UP: Baraga, Dickinson, Marquette, Schoolcraft; June 4–July 3. (Pl. I, Fig. j). H. XXVII:5. K. 8:11.

While on a Michigan Biological Survey expedition to Dickinson County in 1909, W. W. Newcomb took a female at Wauceda, June 29, and H. Burrington Baker a male in a small tamarack bog near Brown Lake on July 3. For nearly fifty years these two specimens remained the only ones known from Michigan, and Klots listed *O. jutta* as "perhaps" occurring in the northern part of the state. On June 21, 1957, T. H. Hubbell and Warren H. Wagner, Jr. collected seven specimens in a tamarack-leatherleaf-sphagnum bog about six miles north of Manistique in Schoolcraft County—the same one in which *Boloria frigga* was found the previous year. In 1959, additional specimens were taken in this bog by Newman, Nielsen, and Voss; Nielsen also reports specimens from Marquette and Baraga counties.

Family DANAIDAE. The Monarchs

Monarch Butterfly. *Danaus plexippus* L. UP: Alger, Chippewa, Delta, Dickinson, Isle Royale, Mackinac, Marquette, Menominee, Schoolcraft; May 26–Sept. 26. NLP: Antrim, Arenac, Bay, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Iosco, Lake, Leelanau, Mason, Midland, Oceana, Ogemaw, Otsego, Presque Isle, Roscommon; May 10–Oct. 1. SLP: Barry, Ber-

rien, Calhoun, Cass, Clinton, Huron, Ingham, Kent, Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Washtenaw, Wayne; May 18–Oct. 13. H. VII:1 (*Danais*). K. 10:1.

In Michigan this common butterfly is a summer resident only, working up into the state from the south in May, and returning southward in great swarms in early fall. On Aug. 16, 1917, I found thousands of individuals on Seul Choix Point on the north shore of Lake Michigan. They were resting on the small cedars, their weight bending the branches, and could be picked off with one's fingers. Males seemed to outnumber females six to one. The next day there was not one left.

Family NYMPHALIDAE. The Brush-footed Butterflies

Variegated Fritillary. *Euptoieta claudia* Cram. UP: Chippewa, Schoolcraft; July. NLP: Emmet, July 4. SLP: Berrien, Kent (Wolcott, 1893), Lenawee, Livingston, Oakland, St. Clair, Washtenaw, Wayne; July 14–Oct. 8. H. VIII:9. K. 11:1:

Regal Fritillary. *Speyeria idalia* Dru. NLP: Newaygo; July 11–Sept. 3. SLP: Berrien, Calhoun, Jackson, Kalamazoo, Kent (Wolcott, 1893), Lenawee, *Livingston, Oakland, St. Clair, Washtenaw, Wayne; June 28–Sept. 7. H. X:3 (*Argynnis*). K. 11:3.

Atlantis Fritillary or Mountain Silverspot. *Speyeria atlantis* Edw. UP: Alger, Baraga, Chippewa, Dickinson, Gogebic, Isle Royale, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; June 30–Sept. 10. NLP: Alcona, Alpena, Beaver Isls., Benzie, Charity Isl., Cheboygan, Crawford, Emmet, Iosco, Midland, Osceola, Oscoda, Otsego, Presque Isle; July 1–Aug. 17. SLP: Washtenaw; Aug. (identification verified by Klots). H. X:9 (*Argynnis*). K. 8:8.

Great Spangled Fritillary. *Speyeria cybele* Fabr. UP: Alger, Baraga, Chippewa, Dickinson, Isle Royale, Keweenaw, Mackinac, Marquette, Ontonagon, Schoolcraft: June 24–Aug. 26. NLP: Alcona, Alpena, Antrim, Arenac, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Emmet, Iosco, Lake, Leelanau, Mason, Midland, Montmorency, Muskegon, Osceola, Otsego, Presque Isle; June 23–Sept 5. SLP: Allegan, Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Huron, Ingham, Jackson, Kalamazoo, Kent, Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne; June 10–Sept. 17. H. IX:3, 4; XIII:1 (*Argynnis*); LVI:2 (*A. c. krautwurmi*). K. 8:4.

Holland described subspecies *krautwurmi* from Les Cheneaux Islands in Mackinac County, on the basis of four female specimens in which the ground color of the upper surface of the wings is pale buff instead of the usual orange. Most females from the Upper Peninsula and the northernmost part of the Lower Peninsula are buffy, but the males are orange.

Aphrodite or Silverspot Fritillary. *Speyeria aphrodite* Fabr. UP: Alger, Chippewa, Dickinson, Isle Royale, Keweenaw, Luce, Mackinac, Marquette (Andrews, 1929), Menominee, Schoolcraft; July 4–Aug. 30. NLP: Alcona, Antrim, Arenac, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Clare, Crawford, Emmet, Iosco, Kalkaska, Lake, Leelanau, Mason, Midland, Missaukee, Montmorency, Muskegon, Newaygo, Osceola, Otsego, Presque Isle; June 24–Sept. 4. SLP: Berrien, Calhoun, Cass, Clinton, Huron, Ingham, Jackson, Kalamazoo, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Van Buren, Washtenaw, Wayne; June 20–Sept. 22. H. XIV:11 (*Argynnis*); X:6 (*Argynnis alcestis*). K. 8:6.

The race *alcestis* occurs frequently.

Silver Bordered Fritillary. *Boloria selene* Schiff. UP: Alger, Chippewa, Dickinson, Gogebic, Isle Royale, Keweenaw, Luce, Mackinac, Marquette, Menominee, Schoolcraft; June 6–Aug. 30. NLP: Antrim, Beaver Isls., Benzie, Charlevoix, Cheyboygan, Emmet, Lake, Leelanau, Manistee, Mason, Midland, Missaukee, Muskegon, Oceana, Osceola, Oscoda, Otsego; May 15–Sept. 14. SLP: Cass, Clinton, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), *Livingston, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; June 4–Sept. 29. H. XV:1, 2 (*Brenthis myrina*). K. 13:4.

Meadow Fritillary. *Boloria toddi* Holl. UP: Alger, Chippewa, Dickinson, Gogebic, Isle Royale, Luce, Mackinac, Marquette, Menominee, Schoolcraft; May 30–Aug. 20. NLP: Alcona, Arenac, Cheboygan, Crawford, Emmet, Gladwin, Iosco, Lake, Midland, Montmorency, Oceana, Oscoda, Otsego; May 10–Sept. 14. SLP: Barry, Calhoun, Cass, Clinton, Eaton, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne; Apr. 30–Sept. 10. H. XV:16 (*Brenthis bellona*); LV:14, 15 (*B. b.* var. *toddi*). K. 13:1.

Frigga Fritillary. *Boloria frigga* Thunb. UP: Schoolcraft: June 4–25. (Pl. I, Fig. k). H. XV:13, 14 (*Brenthis frigga*, var. *saga*). K. 13:2 (*f. saga*).

A single male in fresh condition was taken in a bog about six miles north of Manistique June 25, 1956, by S. P. Hubbell (1957). This is the only known locality for the species in the eastern United States. A. B. Klots, who examined the specimen, reports that it differs somewhat from the northeastern race *saga*, as well as from the Ontario race. Other specimens were taken in the same bog by Nielsen and Newman in 1959.

The Baltimore. *Euphydryas phaëton* Dru. UP: Dickinson, Mackinac, Marquette, Menominee, Schoolcraft; June 20–July 26. NLP: Arenac, Cheboygan, Clare, Mason, Muskegon, Newaygo, Osceola, Otsego; June 19–July 20. SLP: Barry, Calhoun, Cass, Clinton, Eaton, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Joseph, Washtenaw, Wayne; June 11–July 24. H. XVI:1 (*Melitaea phaëtona*). K. 11:4.

The larva is said to feed on snake-head (*Chelone glabra*), a member of the family Scrophulariaceae. I found larvae in the next to the last instar on another plant of that family, lousewort (*Pedicularis canadensis*), and reared them to maturity on it.

Harris' Checkerspot. *Melitaea harrisii* Scud. UP: Chippewa, Dickinson, Mackinac, Schoolcraft; June 27–July 30. NLP: Arenac, Iosco, Lake, Mason, Midland, Missaukee, Newaygo, Oscoda, Roscommon; May 31–June 26. SLP: Jackson, Kent (Wolcott, 1893), *Livingston, Montcalm, St. Clair, Washtenaw, Wayne; June 10–July 27. H. XVII:5, 6. K. 12:1.

Gorgone Checkerspot. *Melitaea gorgone* Hbn. UP: Dickinson, July 24–Aug. 7. NLP: Iosco, Newaygo, Oscoda; May 26–July 20. SLP: Kent (Wolcott, 1893). H. XVII:24, 25 (*Phyciodes*). K. 8:5.

Silver Crescent. *Melitaea nycteis* Dbldy. UP: Chippewa, Dickinson, Mackinac, Schoolcraft; June 8–July 25. NLP: Beaver Isls., Benzie, Charity Isl., Cheboygan, Crawford, Emmet, Fox Isls., Grand Traverse, Iosco, Leelanau, Mecosta, Midland, Oscoda; June 7–July 20. SLP: Barry, Cass, Clinton, Eaton, Ingham, Jackson, Kalamazoo, Kent (Wolcott, 1893), *Livingston, Macomb, Monroe, Montcalm, Oakland, Saginaw, St. Clair, Shiawassee, Washtenaw, Wayne; June 8–July 20. H. XVII:28, 29, 30 (*Phyciodes*). K. 12:2.

Tawny Crescent. *Phyciodes batesii* Reak. UP: Dickinson, Mackinac; June 10–July 7. NLP: Benzie, Cheboygan, Emmet, Mason, Montmorancy, Oscoda, Presque Isle, Roscommon; May 3–July 23. SLP: Huron, Oakland; May 10–June 26. (Pl. I, Fig. e). H. XVII:35, 36. K. 13:12.

According to Klots, *P. batesii*, although very similar to *P. tharos*, is a distinct species, northern, single-brooded, and co-existing with *tharos*. In my opinion its status is not yet certain; what I consider to be intermediates between *batesii* and *tharos* are not uncommon.

Pearl Crescent. *Phyciodes tharos* Dru. UP: Alger, Chippewa, Delta, Dickinson, Isle Royale, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; June 7–Aug. 26. NLP: Alcona, Alpena, Antrim, Arenac, Bay, Beaver Isls., Benzie, Charlevoix, Charity Isl., Cheboygan, Clare, Crawford, Emmet, Fox Isls., Iosco, Kalkaska, Lake, Leelanau, Mason, Midland, Missaukee, Montmorency, Muskegon, Oceana, Oscoda, Otsego, Presque Isle, Roscommon; May 31–Sept. 8. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Gratiot, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; May 17–Sept. 21. H. XVIII:1–4. K. 13:14.

Question Mark. *Polygonia interrogationis* Febr. UP: Alger, Dickinson, Marquette, Menominee, Schoolcraft; July 13–Aug. 8. NLP: Benzie, Cheboygan, Emmet, Lake, Missaukee, Oceana, Oscoda, Presque Isle; May 16–Sept. 8. SLP: Berrien, Cass, Clinton, Eaton, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, Saginaw, St. Clair, Shiawassee, Van Buren, Washtenaw, Wayne; May 3–Oct. 13. H. I:3; XIX:1, 2. K. 14:4; 17:5, 6.

Hop Merchant or Comma. *Polygonia comma* Harris. UP: Alger, Chippewa, Dickinson, Gogebic, Mackinac, Menominee, Schoolcraft; July 6–Aug. 28. NLP: Arenac, Beaver Isls., Benzie, Cheboygan, Clare, Emmet, Iosco, Lake, Mecosta, Midland, Oceana, Oscoda, Otsego; Apr. 13–Sept. 18. SLP: Barry, Berrien, Calhoun, Huron, Ingham, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne; Apr. 2–Oct. 25. H. XIX:3, 4. K. 14:1; 17:1.

Satyr Angle Wing. *Polygonia satyrus* Edw. UP: Alger, Dickinson, Mackinac, Marquette, Schoolcraft; July 6–Sept. 18. H. XIX:14, 15; XX:1, 2. K. 17:4

Green Comma. *Polygonia faunus* Edw. UP: Alger, Chippewa, Dickinson, Iron, Isle Royale, Keweenaw, Mackinac, Marquette, Ontonagon, Schoolcraft; July 10–Sept. 12. NLP: Beaver Isls., Cheboygan, Crawford, Emmet, Osceola, Presque Isle, Roscommon; Apr. 26–Aug. 23. H. XIX:12, 13. K. 14:2; 17:3.

Gray Comma. *Polygonia progne* Cram. UP: Alger, Baraga, Chippewa, Dickinson, Gogebic, Houghton, Iron, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; June 30–Oct. 11. NLP: Alpena, Beaver Isls., Benzie, Cheboygan, Clare, Emmet, Iosco, Lake, Muskegon, Ogemaw, Oscoda, Otsego; Apr. 17–Sept. 25. SLP: Eaton, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lapeer, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; May 12–Oct. 11. H. XX:3, 4. K. 14:3; 17:3.

Hoary Comma. *Polygonia gracilis* G. and R. UP: Chippewa, July 23–31. H. XIX:10, 11. K. 14:5.

Specimens listed as this species by Ruthven (1906) from Isle Royale are all *faunus*. *P. gracilis* seems to be a very rare butterfly in Michigan, only two specimens being known, one taken by McAlpine in 1914, the other by Newcomb in 1915.

Compton Tortoise Shell. *Nymphalis j-album* Bdv. and Lec. UP: Alger, Baraga, Chippewa, Dickinson, Iron, Isle Royale, Keweenaw, Mackinac, Marquette, Ontonagon, Schoolcraft; July 21–Oct. 21. NLP: Alpena, Arenac, Beaver Isls., Benzie, Charlevoix, Cheboygan, Crawford, Emmet, Iosco, Lake, Leelanau, Manistee, Mason, Mecosta, Midland, Newaygo, Oscoda, Otsego, Presque Isle; Apr. 13–Sept. 20. SLP: Huron, Ingham, Kent (Wolcott, 1893), Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; Mar. 19–Nov. 20. H. XIX:9 (*Aglais*). K. 11:7; 14:6.

Milbert's Tortoise Shell. *Nymphalis milberti* Latr. UP: Alger, Chippewa, Dickinson, Gogebic, Iron, Isle Royale, Keweenaw, Mackinac, Marquette, Menominee, Schoolcraft; June 26–Oct. 2. NLP: Beaver Isls., Benzie, Charity Isl., Cheboygan, Emmet, Iosco, Midland, Montmorency, Osceola, Otsego, Presque Isle; Apr. 18–Sept. 8. SLP: Berrien, Calhoun, Cass, Clinton, Genesee, Huron, Ingham, Kent (Wolcott, 1893), *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; Mar. 22–Nov. 17. H. XX:10 (*Aglais*). K. 14:7.

Mourning Cloak. *Nymphalis antiopa* Linn. UP: Alger (Pettit, 1901), Chippewa, Dickinson, Gogebic, Houghton, Iron, Isle Royale, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; May 12–Oct. 13. NLP: Antrim, Arenac, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Emmet, Fox Isls., Grand Traverse, Iosco, Lake, Leelanau, Mason, Mecosta, Midland, Montmorency, Newaygo, Ogemaw, Oscoda, Otsego; Apr. 13–Oct. 20. SLP: Berrien, Cass, Eaton, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb,

Montcalm, Oakland, Saginaw, St. Clair, Shiawassee, Van Buren, Washtenaw, Wayne; Mar. 26–Nov. 1. H. I:6 (*Aglais*). K. 11:8; 14:8.

California Tortoise Shell. *Nymphalis californica* Bdv. NLP: Emmet (Voss, 1954), Mason (Boram, 1945); Sept. 4–6. H. XX:11 (*Aglais*).

Four specimens of this western species (determined by W. J. Gerhard) were found by Boram in wash-up on the Lake Michigan beach in Mason County, Sept. 4, 1945, and one fresh specimen was taken by Voss in Emmet County two days later.

Red Admiral. *Vanessa atalanta* Linn. UP: Alger, Chippewa, Iron, Isle Royale, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; May 25–Oct. 13. NLP: Alpena, Arenac, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Crawford, Emmet, Fox Isls., Iosco, Kalkaska, Lake, Missaukee, Oceana, Osceola, Oscoda, Otsego; May 16–Sept. 18. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; Apr. 23–Oct. 29. H. XLIII:4. K. 14:9; 17:2.

Painted Lady. *Vanessa cardui* Linn. UP: Chippewa, Isle Royale, Keweenaw, Mackinac, Marquette, Menominee, Schoolcraft; June 4–Oct. 15. NLP: Beaver Isls., Cheyboygan, Emmet, Leelanau, Mason, Oscoda; May 24–Sept. 17. SLP: Barry, Clinton, Ingham, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; July 2–Oct. 16. H. I:1. K. 14:10.

Although *V. cardui* breeds in Michigan (I have reared it from larvae on burdock), there is reason to think that it may be only a summer visitor to the state. Austin H. Clark wrote me (1940) that *cardui* "is a recurrent visitor from the southwest, but is not known as a permanent resident anywhere in the United States;" and that "so far as can be seen, on the basis of admittedly meagre data, conditions in North America are parallel to those in Europe, where the *cardui* population, continually dying out, is constantly replenished by immense migrations from Africa." According to Klots (1951), "at times it is strongly migratory during periods of abundance that may be followed by periods of great scarcity."

American Painted Lady. *Vanessa virginiensis* Dru. UP: Alger (Pettit, 1901), Chippewa, Isle Royale, Keweenaw, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; May 24–Oct. 13. NLP: Antrim,

Beaver Isls., Benzie, Cheboygan, Crawford, Emmet, Iosco, Lake, Midland, Montmorency; May 14–Sept. 5. SLP: Berrien, Calhoun, Clinton, Eaton, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; May 3–Oct. 26. H. I:2; XXXIII:6. K. 14:11.

Buckeye. *Precis lavinia coenia* Hbn. UP: Chippewa, Delta, Isle Royale, Keweenaw, Mackinac, Marquette, Menominee, Schoolcraft; June 10–Sept. 6. NLP: Beaver Isls., Cheboygan, Emmet, Iosco, Leelanau, Mason, Montmorency; June 22–Sept. 11. SLP: Barry, Cass, Clinton, Eaton, Ingham, Lenawee, *Livingston, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; June 7–Oct. 16. H. XX:7 (*Junonia coenia*). K. 14:12.

Viceroy. *Limenitis archippus* Cram. UP: Chippewa, Dickinson, Luce, Mackinac, Marquette (Andrews, 1929), Menominee, Schoolcraft; June 26–Sept. 16. NLP: Alcona, Alpena, Antrim, Arenac, Beaver Isls., Benzie, Charlevoix, Cheboygan, Crawford, Emmet, Iosco, Lake, Mason, Midland, Missaukee, Montmorency, Oceana, Otsego, Roscommon; June 22–Sept. 8. SLP: Barry, Berrien, Calhoun, Clinton, Huron, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, Saginaw, St. Clair, Shiawassee, Van Buren, Washtenaw, Wayne; May 24–Sept. 26. H. VII:4 (*Basilarchia*). K. 17:8.

White Admiral. *Limenitis arthemis* Dru. UP: Alger, Chippewa, Dickinson, Gogebic, Houghton, Iron, Isle Royale, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; June 15–Sept. 20. NLP: Antrim, Beaver Isls., Benzie, Cheboygan, Emmet, Iosco, Manistee, Montmorency, Oscoda, Presque Isle; June 25–Sept. 4. SLP: Allegan (Hovanitz, 1949). H. XXII:4 (*Basilarchia*). K. 15:2.

Under this name I have listed all specimens with a white medial band crossing both wings, although they show considerable variation. The wingspread ranges from 60 to 75 mm. The series of submarginal red spots on the upper side of the secondaries is complete in some specimens, but is accompanied or replaced by green spots in others. The larger individuals agree with the description of form *albofasciata* Newc., but, except for size, there seems to be no constant difference between them and typical *arthemis*.

Red Spotted Purple. *Limenitis arthemis astyanax* Fabr. NLP: Antrim, Bay, Charity Isl., Charlevoix, Cheboygan, Clare, Iosco, Kalkaska, Lake,

Mason, Midland, Mecosta, Newaygo, Oscoda, Otsego, Roscommon; June 16–Sept. 3. SLP: Barry, Berrien, Cass, Eaton, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; June 1–Sept. 14. H. XXII:1 (*Basilarchia astyanax*). K. 15:1.

Klots (1951) follows Nakahara (1924) in considering this a southern race of *arthemis*. Although there are said to be differences between their larvae, adult *astyanax* shows complete intergradation with typical *arthemis*. The specimens that I have listed under this name average larger than *arthemis*, have no red spots on the upper surface of the hind wings, and have the postmedial area suffused with bright green. They show no trace of the white band characteristic of *arthemis*.

Atlantic Red Spotted Purple. *Limenitis arthemis astyanax* Fabr., form *atlantis* Nakahara. UP: Mackinac; July 9. NLP: Beaver Isls. (Hovanitz, 1949), Iosco, Montmorency, Oscoda, Otsego, Presque Isle, Wexford (Edwards, 1879); June 7–Sept. 8. SLP: Genesee, Ingham, Wayne; Aug. 2–26.

Under this name I have listed the intermediate forms that Michigan collectors have called *proserpina*, and which were included under *arthemis* in my list of 1939. They certainly are not form *proserpina*, but I am not certain that Nakahara's name will apply. It fits better, however, than any other. There is but little variation among these specimens. They are about the size of *astyanax*. The upper surface of the hind wings has a submarginal row of red spots which vary in number, and at least traces of a row of postmedian greenish spots. The position of the white band of *arthemis* is usually marked in these specimens by a short white bar on the costal edge of the forewing.

[NOTE: It has long been known that the more northern *L. arthemis* and the more southern *L. astyanax* hybridize freely in the zone of overlap, which extends from New England to Nebraska and includes the Lower Peninsula of Michigan. The intergrades form an almost complete transitional series from typical *arthemis* to typical *astyanax*; they have commonly been recorded under the name *proserpina* Edwards, but many varietal or form names have been given to particular conditions. Hovanitz (1949) who regards the two as distinct species, has reviewed the situation and proposed a genetic hypothesis to explain it. The differences between the two species (contact between which is presumed to be so recent that reproductive isolation has not yet developed) are probably multifactorial; the hybrid between typical *arthemis* and typical *astyanax* is "half-banded" and intermediate in

other characteristics. Hovanitz would use the name *proserpina* to bracket the spectrum produced by backcrossing of the hybrids with *arthemis* in the northern part of the zone of intergradation, the name *albofasciata* Newcomb for the corresponding products of backcrossing with *astyanax* along the southern part of the zone. Although this hypothesis seems reasonable, the proposed use of the names *proserpina* and *albofasciata* (especially the latter) seems open to question.—T. H. Hubbell].

Goatweed Butterfly. *Anaea andria* Scud. SLP: Washtenaw; May 8, 1932. H. XXIV:1. K. 11:11.

Two taken, and several others seen.

Tawny Emperor. *Asterocampa clyton* Bdv. and Lec. SLP: Cass? (Mitchell, 1891), Ingham, Kent (Wolcott, 1893), Lenawee, Shiawassee, Washtenaw, Wayne; July 6–late August. H XXIII:5, 6. K. 14:14.

Mitchell (1891) records having taken a female in good condition in "southern Michigan" the last of August, 1890, "on ground I had worked over for several years," presumably near Wakelee in Cass County.

Hackberry Butterfly. *Asterocampa celtis* Bdv. and Lec. SLP: Eaton, Ingham, Lenawee, Washtenaw (Clench, 1950), Wayne; June 17–Sept. 4. H. XXIII:3, 4, 13. K. 14:15.

Family LIBYTHEIDAE. The Snout Butterflies

Snout Butterfly. *Libytheana bachmannii* Kirt. SLP: Ingham, Kent (Wolcott, 1893), Lenawee, Monroe, Wayne; June 10–Sept. 10. H. XXVIII:1, 2 (*Libythea*). K. 17:9.

Family RIODINIDAE. The Metalmarks

Swamp Metalmark. *Calephelis muticum* McAlpine. SLP: Cass, Clinton, Kent, *Livingston, Montcalm, Oakland, St. Joseph, Washtenaw (type locality Willis); June 30–Aug. 12. (Pl. I, Fig. q). K. 15:4 (*Lephelisca*).

This bog- and swamp-loving species was first distinguished from *borealis* G. and R. and described by McAlpine in 1937. Its larvae feed upon the swamp thistle (*Cirsium muticum*). All published records of *borealis* (including that from Kent County by Wolcott, 1893) are undoubtedly based upon *muticum*. Nevertheless, *borealis* may possibly occur in the state; F. S. Badger has found it in abundance west of

Kokomo, Indiana. Unlike *muticum*, it frequents high ground and open woods, and its larvae feed on ragwort (*Senecio obovatus*).

Family LYCAENIDAE. The Gossamer Winged Butterflies

Red Banded Hairstreak. *Strymon cecrops* Fabr. SLP: Berrien. H. XXIX:18; XXX:7 (*Thecla*). K. 15:12.

A single specimen of this southern species, taken Aug. 5, 1906, by Emil Liljeblad, near Pawpaw Lake, is in the University of Michigan collection.

Coral Hairstreak. *Strymon titus* Fabr. UP: Dickinson, Keweenaw, Mackinac; July 24–Aug. 23. NLP: Charity Isl., Cheboygan, Crawford, Emmet, Iosco, Kalkaska, Lake, Mason, Midland, Muskegon, Oceana, Osceola, Oscoda; July 15–Aug. 26. SLP: Berrien, Cass, Clinton, Hillsdale, Huron, Ingham, Jackson, Kent, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; June 26–Aug. 23. H. XXX:10, 14 (*Thecla*). K. 16:6.

Gray Hairstreak. *Strymon melinus* Hbn. NLP: Antrim, Beaver Isls., Charlevoix, Iosco, Lake, Montmorency, Muskegon, Newaygo, Oscoda; May 11–Aug. 26. SLP: Allegan, Barry, Berrien, Ingham, Kent, *Livingston, Montcalm, St. Clair, St. Joseph, Washtenaw; April 23–Oct. 8. H. XXIX:31, XXXII:20 (*Thecla*). K. 16:1.

Acadian Hairstreak. *Strymon acadica* Edw. UP: Dickinson; July 24–Aug. 6. NLP: Benzie, Charlevoix, Cheboygan, Clare, Emmet, Iosco, Mason, Midland, Muskegon, Osceola, Oscoda, Otsego; July 10–Aug. 14. SLP: Berrien, Cass, Clinton, Ingham, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; June 26–Aug. 8. H. XXIX:15, 16 (*Thecla*). K. 16:7.

Edwards' Hairstreak. *Strymon edwardsii* G. and R. NLP: Charity Isl., Iosco, Midland, Muskegon, Newaygo; June 20–July 20. SLP: Allegan, Huron, Ingham, Jackson, Kent (Wolcott, 1983), Lenawee, *Livingston, Montcalm, Oakland, Washtenaw; June 26–July 24. H. XXIX:27 (*Thecla*). K. 16:11.

Specimens listed under this name by McAlpine (1918), from Chipewewa County, and by Andrews (1929), from Marquette County, are *S. falacer*. In 1948 Clench examined the material of *S. edwardsii* and *S. falacer* in the collection of the University of Michigan Museum of Zoology, and noted that some specimens from Huron County and from the Porcupine Mountains in Ontonagon County appear to be hybrids between the two species.

Banded Hairstreak. *Strymon falacer* Gdt. UP: Chippewa, Dickinson, Keweenaw, Luce, Marquette, Ontonagon; July 6–Aug. 20. NLR: Beaver Isls., Charity Isl., Cheboygan, Iosco, Lake, Mason, Midland, Oceana, Roscommon; June 20–July 26. SLP: Cass, Clinton, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Montcalm, Oakland, Ottawa, St. Clair, Shiawassee, Washtenaw, Wayne; June 11–Aug. 4. H. XXIX:26 (*Thecla calanus*). K. 16:10.

This species was long known under the name *calanus* Hbn., which actually applies to the Florida insect later described by Edwards as *wittfeldii*.

Hickory Hairstreak. *Strymon caryaevorus* McDun. SLP: Ingham (records from Nielsen and Wagner), Oakland (det. T. H. Hubbell), Shiawassee (det. Hodges), Washtenaw (Clench, 1950, and Jeffrey Tordoff, det. Hubbell); June 29–July 13. K. 16:12.

Genitalic examination is necessary to distinguish this species with certainty from the very similar and much commoner *S. falacer*. Since the distribution of *caryaevorus* is still poorly known, it is worth noting that the University of Michigan collection has a male and a female from Decorah, Iowa, taken July 12, 1909, by A. F. Porter.

Striped Hairstreak. *Strymon liparops strigosus* Harris. UP: Chippewa, Dickinson, Mackinac, Marquette, Schoolcraft; July 6–Aug. 6. NLP: Alpena, Beaver Isls., Charity Isl., Charlevoix, Cheboygan, Emmet, Iosco, Mason, Mecosta, Montmorency, Oscoda, Otsego; July 6–Aug. 25. SLP: Calhoun, Clinton, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, Saginaw, St. Clair, Washtenaw; June 26–Aug. 4. H. XXIX:28 (*Thecla*). K. 16:8.

Early Hairstreak. *Erora laeta* Edw. NLP: Emmet; May 14. (Pl. I, Figs. c,d). H. XXIX: 23, 24 (*Thecla*). K. 16:14.

This very rare species was taken for the first time in Michigan in 1955 by Voss and Wagner; they have published details of the discovery, with figures (1956). Two males and one female were collected and one additional male seen at a damp spot near a spring, along the side of a sandy road near woods, in Bliss Township, Emmet County.

Brown Elfin. *Incisalia augustinus* Westw. UP: Mackinac, Schoolcraft; May 19–July 16. NLP: Beaver Isls., Cheboygan, Crawford, Emmet, Iosco, Kalkaska, Lake, Mason, Midland, Montmorency, Newaygo, Ogemaw, Oscoda, Presque Isle, Roscommon; April 26–June 23. SLP: Huron, Ingham, *Livingston, Montcalm, Oakland, Washtenaw; Apr. 18–June 5. H. XXX:15 (*Thecla*). K. 16:15.

Hoary Elfin. *Incisalia polios* C. and W. UP: Chippewa, Mackinac, Schoolcraft; May 15–30. NLP: Cheboygan, Clare, Crawford, Emmet, Iosco, Lake, Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon; May 6–31. SLP: Huron, Monroe; Apr. 18–May 28. H. LXIV:9 (*Thecla*). K. 16:16.

Henry's Elfin. *Incisalia henrici* G. and R. NLP: Arenac, Crawford, Montmorency, Newaygo, Oscoda; May 4–28. SLP: Montcalm, May 7–23. H. XXX:21 (*Thecla*). K. 16:17.

Frosted Elfin. *Incisalia irus* Godt. NLP: Iosco, Lake, Muskegon, Newaygo, Oceana; May 6–June 1. SLP: Monroe, Montcalm, Oakland; May 2–June 5. H. XXX:12 (*Thecla*). K. 16:18.

Clench would call all Michigan specimens *irus arsace* Bdv. and Lec.

Western Banded Elfin. *Incisalia eryphon* Bdv. UP: Mackinac; May 18–30. H. XXX:17 (*Thecla*).

This western species is included with some doubt. The two specimens here referred to it, one taken near Naubinway and the other near St. Ignace, are in reasonably good condition and superficially agree with specimens from the west. They were sent to A. B. Klots for verification; in a letter, he states his opinion that *eryphon* is not certainly distinct from *niphon*, and that he would prefer to call these *I. niphon clarki* T. N. Freeman. In the 1939 list these specimens were recorded as *niphon*, and another specimen (now lost) from Schoolcraft County also so recorded should probably be placed here.

Pine Elfin. *Incisalia niphon* Hbn. NLP: Cheboygan, Crawford, Emmet, Iosco, Lake, Midland, Montmorency, Newaygo, Ogemaw, Oscoda, Otsego, Wexford; May 9–June 20. SLP: Montcalm, Oakland; Apr. 26–May 17. H. XXX:11, 22 (*Thecla*). K. 16:19.

In Crawford and adjacent counties *niphon* is at times very abundant in stands of jack pine, upon which the larvae apparently feed. Specimens from this area differ from eastern ones in no significant way. I have seen five individuals taken near Orion in Oakland County between 1913 and 1925, probably from an isolated colony. They are slightly smaller than specimens from farther north; one of them, with a wing expanse of only 22 mm., looks quite different from typical *niphon*, but is probably only an aberrant form. Neither W. S. McAlpine nor I can recall seeing any pine, except for a few small white pines, in the vicinity of Orion. As no collecting has been done in that locality since 1925, it is not known whether the colony still exists. Wolcott (1893) listed *niphon* from Kent County, but as this was based on

a sight record of a "*Thecla*" seen flying in a pine region, it has been omitted.

In the 1939 list I noted under *niphon* that there might be two species in Michigan and that neither might be true *niphon*. The Mackinac County specimens are now recorded as *eryphon* (see above), and the Schoolcraft County specimen probably belongs with them. Clench and Klots would place all Michigan specimens under *niphon clarki* T. H. Freeman.

The Harvester. *Feniseca tarquinius* Fabr. UP: Chippewa, Dickinson, Mackinac, Schoolcraft; June 10–Aug. 13. NLP: Alpena, Antrim, Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Iosco, Kalkaska, Lake, Midland, Montmorency, Oceana, Osceola, Oscoda; May 15–Sept. 14. SLP: Barry, Ingham, Lapeer, Lenawee, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; May 30–Aug. 27. H. XXVIII: 21. K. 18:8.

American Copper. *Lycaena phlaeas americana* Harr. UP: Alger, Chippewa, Dickinson, Isle Royale, Luce, Mackinac, Marquette, Schoolcraft; June 3–Oct. 1. NLP: Alpena, Antrim, Beaver Isls., Benzie, Cheboygan, Crawford, Oceana, Osceola, Otsego; Apr. 22–Sept. 30. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Gratiot, Huron, Ingham, Ionia, Kalamazoo, Kent, Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Van Buren, Washtenaw, Wayne; May 15–Sept. 26. H. XXVIII:25 (*Chrysophanus hypophlaeus*). K. 21:2.

Bronze Copper. *Lycaena thoë* Guer. UP: Alger, Dickinson, Mackinac, Schoolcraft; July 3–Sept. 16. NLP: Arenac, Beaver Isls., Charlevoix, Cheboygan, Emmet, Leelanau, Midland, Oscoda, Otsego; June 22–Sept. 5. SLP: Clinton, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne; June 9–Oct. 23. H. XXVIII:31, 32 (*Chrysophanus*). K. 21:1.

Bog Copper. *Lycaena epixanthe michiganensis* Rawson. UP: Alger, Chippewa, Dickinson, Schoolcraft; July 10–Aug. 21. NLP: Beaver Isls., Cheboygan, Emmet; June 29–July 28. SLP: Jackson, Oakland (type locality Proud Lake), Washtenaw; July 1–29. (Pl. I, Figs. f, g). H. LXVIII:10, 11, 12 (*Chrysophanus*). K. 21:4. The figures in Holland and Klots are of typical *L. e. epixanthe*, not of *e. michiganensis*.

Newcomb (1910) noted that Michigan specimens of *epixanthe* differ from eastern Ontario and New Jersey specimens in lacking the yellow

coloration on the lower side of the hind wings; Rawson (1948) described the Michigan form as subspecies *michiganensis*. The record of *epixanthe* from Isle Royale by Adams (1909) was shown by Newcomb to apply to *L. dorcas*.

Purplish Copper. *Lycaena helloides* Bdv. UP: Alger, Chippewa, Dickinson, Mackinac, Schoolcraft; June 17–Sept. 16. NLP: Beaver Isls., Cheboygan, Kalkaska, Leelanau, Muskegon, Newaygo, Oscoda, Otsego; June 14–Oct. 17. SLP: Allegan, Barry, Calhoun, Cass, Clinton, Lenawee, *Livingston, Monroe, Montcalm, Oakland, Washtenaw; June 10–Oct. 12. H. XXVIII:33, 34 (*Chrysophanus*). K. 21:3.

Dorcas Copper. *Lycaena dorcas* Kirby. UP: Alger, Chippewa, Dickinson, Isle Royale, Mackinac, Schoolcraft; July 2–Aug. 30. NLP: Cheboygan, Emmet, Gladwin, Oscoda; July 19–Sept. 21. SLP: Clinton, Jackson, Kent (Wolcott, 1893, as *epixanthe*; Newcomb, 1910), *Livingston, Montcalm, Oakland, Washtenaw; June 19–Aug. 15. H. LXIV:43 (*Chrysophanus*). K. 18:6.

Klots, who examined a part of the Michigan material here recorded, writes that the specimens agree well with Alaskan ones, but that the specific distinctness of *dorcas* and *helloides* is questionable.

Reakirt's Blue. *Hemiargus isolus* Reak. SLP: Allegan, Washtenaw (Clench, 1948:105, *Echinargus isola alce*); July 8–18. H. XXX:33, 38 (*Lycaena isola*). K. 19:2.

Only two specimens of this western species are known from Michigan. The worn female taken in a clover field near Ypsilanti on July 8, 1948, by Clench may have been a stray, but the specimen in the University of Michigan Museum of Zoology collected by F. M. Case at Round Lake in Allegan County on July 18, 1938, is perfect and unworn, suggesting the existence of a colony there. Remington (1942: 6–8) has reported other isolated occurrences in northern Illinois, Indiana, and Ohio.

Eastern Tailed Blue. *Everes comyntas* Godt. UP: Alger, Dickinson, Keweenaw, Mackinac, Marquette, Schoolcraft; May 21–Oct. 2. NLP: Arenac, Beaver Isls., Charlevoix, Cheboygan, Emmet, Iosco, Lake, Leelanau, Midland, Montmorency, Oceana, Osceola, Oscoda, Presque Isle, Roscommon; May 14–Sept. 5. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Gratiot, Ingham, Kent, Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Saginaw, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; Apr. 30–Oct. 16. H. XXXI:29, 30; (*Lycaena*). K. 19:4; 21:5.

Eastern Melissa Blue. *Lycaeides melissa samuelis* Nabokov. NLP: Lake, Muskegon, Newaygo (47 males, 19 females), Oceana; June 4–Aug. 26. SLP: Allegan, Monroe, Montcalm; May 24–July 20. (Pl. I, Figs. o, p). H. XXX:48, 49; LXVI:12 (*Lycaena scudderi*). K. 21:10.

Greenish Blue. *Plebeius saepiolus* Bdv. UP: Alger, Chippewa, Delta, Dickinson, Houghton, Isle Royale, Keweenaw, Luce, Mackinac, Menominee, Schoolcraft; June 5–July 24. NLP: Alpena, Beaver Isls., Cheboygan, Emmet, Fox Isls., Iosco, Leelanau, Oscoda, Presque Isle; May 31–July 26. H. XXXI:15, 16 (*Lycaena*). K. 21:8.

Silvery Blue. *Glaucopsyche lygdamus* Dbldy. UP: Chippewa, Mackinac, Marquette; May 2–June 28. NLP: Antrim, Cheboygan, Emmet, Iosco, Newaygo, Otsego, Presque Isle; May 2–June 9. SLP: Barry, Ionia, Kent, *Livingston, Montcalm, Oakland, St. Joseph, Washtenaw; Apr. 27–June 5. H. XXX:34; XXX:50; XXXI:17, 18 (*Lycaena*); LXVI:7, 8 (*Lycaena couperi*). K. 21:9 (*G. l. couperi*).

Spring Azure. *Lycaenopsis argiolus* L. UP: Chippewa, Mackinac, Schoolcraft; May 11–Oct. 2. NLP: Arenac, Beaver Isls., Benzie, Cheboygan, Crawford, Emmet, Fox Isls., Gladwin, Iosco, Kalkaska, Lake, Midland, Montmorency, Muskegon, Oceana, Oscoda, Roscommon; Apr. 26–Aug. 2. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Hillsdale, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Ottawa, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; Apr. 20–Aug. 8. H. XXX:19, 20, 32; XXXI:1–10 (*Lycaena pseudargiolus*). K. 18:5; 21:6, 7.

Family PAPILIONIDAE. The Swallowtails

Black Swallowtail. *Papilio polyxenes asterius* Stoll. UP: Schoolcraft; June 12. NLP: Bay, Benzie, Charity Isl., Cheboygan, Emmet, Iosco, Midland, Oceana, Osceola, Otsego; May 14–Sept. 8. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Hillsdale, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, St. Joseph, Tuscola, Washtenaw, Wayne; Apr. 10–Sept. 27. H. XL:1. K. 24:2.

Giant Swallowtail. *Papilio cresphontes* Cram. SLP: Berrien, Calhoun, Eaton, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Van Buren, Washtenaw, Wayne; May 19–Sept. 6. H. XLII:3. K. 24:3.

Tiger Swallowtail. *Papilio glaucus* Linn. UP: Chippewa, Dickinson, Isle Royale, Mackinac, Marquette, Schoolcraft; May 15–Aug. 8. NLP:

Alcona, Alpena, Antrim, Beaver Isls., Benzie, Charlevoix, Cheboygan, Clare, Crawford, Emmet, Fox Isls., Iosco, Lake, Leelanau, Mason, Midland, Montmorency, Oceana, Oscoda, Otsego, Presque Isle, Roscommon; May 16–Aug. 25. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Saginaw, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; May 13–Aug. 30. H. XLIII:1 (*turnus*), 2 (*turnus* form *glaucus*); LXX:6, 7 (*turnus* var. *canadensis*). K. 20:3, 6.

Spicebush Swallowtail. *Papilio troilus* Linn. UP: Gogebic; July 30. NLP: Clare, Lake, Mason, Midland, Muskegon, Oceana; June 9–Sept. 3. SLP: Barry, Berrien, Cass, Clinton, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; May 5–Sept. 23. H. XLI:5. K. 24:4.

Zebra Swallowtail. *Papilio marcellus* Cram. NLP: Charity Isl.; July 20. SLP: Allegan, Berrien, Branch, Ingham, Kent (Wolcott, 1893), Lenawee, St. Clair, St. Joseph, Washtenaw, Wayne; Apr. 23–Aug. 31. H. XLIV:1–4 (*ajax*). K. 24:7, 8.

For many years this butterfly was known as *ajax* Linn. That name has been applied to insects as different as *glaucus* and *p. asterius*, on account of the inadequacy of the original description.

Pipevine Swallowtail. *Papilio philenor* Linn. SLP: Ingham, Lenawee, Washtenaw, Wayne; May 1–Sept. 30. H. XLII:2. K. 24:1.

Family PIERIDAE. The Whites and Sulphurs

Olympia. *Euchloë olympia* Edw. UP: Schoolcraft; May 24–June 25. NLP: Arenac, Cheboygan, Crawford, Emmet, Iosco, Lake, Montmorency, Newaygo, Oceana, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon, Wexford; May 7–31. SLP: Berrien, Huron, Montcalm; Apr. 23–May 14. H. XXXII:39 (*Euchloë rosa*); LXVII:28. K. 25:6.

Alfalfa Butterfly or Orange Sulphur. *Colias eurytheme* Bdv. UP: Alger, Baraga, Chippewa, Dickinson, Houghton, Iron, Keweenaw, Mackinac, Marquette, Schoolcraft; July 2–Oct. 15. NLP: Antrim, Charlevoix, Cheboygan, Emmet, Iosco, Lake, Mason, Midland, Roscommon; June 12–Sept. 30. SLP: Barry, Clinton, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; May 15–Oct. 25. H. XXXIII:5; XXXII:7, 8 (*ariadne*), 9, 10 (*keewaydin*); XLVIII:18. K. 23:1, 2, 3.

The white females of this species cannot always be separated with certainty from those of *philodice*, although their wings usually have wider dark borders than do those of the latter species. *Eurytheme* and *philodice* hybridize, and there is reason to believe that what have been considered "cold weather forms" of early spring and late autumn, with the ground color largely yellow and the orange reduced to discal patches (*ariadne*), are mostly hybrids. According to Hovanitz (1949) about ten per cent of all individuals of populations studied in the field in the regions of overlap are intermediates of one sort or another. The genetic difference between the two species is multifactorial; in experimental crosses the F_1 generation is intermediate, the F_2 giving a swarm of variations ranging from one species to the other. Despite their frequent crossing the identity of the two species is not being eliminated by the blending; although *eurytheme* is a relatively recent immigrant into the eastern United States, it has been hybridizing with *philodice* in some places for more than 60 years without other effect than to make the eastern forms of the latter somewhat more like the western ones, which show a closer resemblance to *eurytheme*. Klots (1951) has recommended that for the present all clear yellow specimens be assigned to *philodice*, all truly orange ones to *eurytheme*, and that all intermediates be regarded as "hybrids." In this paper, however, all specimens having any orange on the upper surfaces of the wings are recorded as *eurytheme*.

Common or Clouded Sulphur. *Colias philodice* Latr. UP: Alger, Chippewa, Dickinson, Houghton, Isle Royale, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft; May 29–Oct. 14. NLP: Antrim, Beaver Isls., Benzie, Charlevoix, Charity Isl., Cheboygan, Emmet, Fox Isls., Iosco, Lake, Midland, Montmorency, Oceana, Ogemaw, Oscoda, Otsego, Roscommon; May 23–Oct. 1. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Eaton, Gratiot, Huron, Ingham, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Van Buren, Washtenaw, Wayne; May 10–Nov. 17. H. I:4, 5; LXXIII:29. K. 23:4, 5.

In Michigan, *philodice* is especially abundant where the larval food plants, species of *Trifolium*, grow, while *eurytheme* shows a similar prevalence where its foodplants, species of *Medicago*, are cultivated.

Pink Edged Sulphur. *Colias interior* Scud. UP: Alger, Chippewa, Dickinson, Isle Royale, Keweenaw, Luce, Mackinac, Marquette (Andrews, 1929), Schoolcraft; June 21–Aug. 21. NLP: Alpena, Antrim, Benzie, Charlevoix, Cheboygan, Clare, Crawford, Emmet, Iosco, Kalkaska,

Montmorency, Newaygo, Oscoda, Otsego, Presque Isle, Roscommon; June 22–Aug. 9. SLP: Ingham, Oakland, Washtenaw; May 2–July 30. H. XXXV:10, 11. K. 23:6, 7.

Dog Face. *Colias cesonia* Stoll. SLP: Berrien, Kent (Wolcott, 1893), *Livingston, Oakland, St. Clair; May 23–Aug. H. XXXVI:3, 4 (*Zerene caesonia*). K. 23:9.

Cloudless Sulphur. *Phoebis sennae eubule* Linn. UP: Chippewa; July 24. SLP: Kalamazoo, *Livingston; Oct. 13. H. XXXIII:2, 3 (*Callidryas eubule*). K. 20:8.

A straggler from the south, chiefly in autumn migrations.

Orange Barred Sulphur. *Phoebis philea* L. SLP: Wayne; Aug. 25, 1951. H. XXXIII:4 (*Callidryas*). K. 24:10.

Ralph Beebe reports seeing very distinctly a specimen of this species struggling in wet grass at Ecorse. It arose quickly and flew away before it could be captured.

Mexican Sulphur. *Eurema mexicana* Bdv. SLP: Wayne; Oct., 1931. H. XXXVII:7, 8. K. 19:9.

A specimen taken by Ralph Beebe in Lincoln Park near Detroit, determined by Klots and now in the American Museum of Natural History, is the basis for including Michigan in the range as given by Klots (1951: 197).

Little Sulphur. *Eurema lisa* Bdv. and Lec. UP: Alger, Chippewa, Delta, Mackinac, Marquette, Schoolcraft; June 19–Sept. 14. NLP: Alcona, Alpena, Beaver Isls., Cheboygan, Emmet, Leelanau, Oceana, Presque Isle; June 20–Aug. 25. SLP: Barry, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Oakland, St. Joseph, Washtenaw, Wayne; June 6–Oct. 16. H. XXXVII:13. K. 22:1, 2.

Dainty Sulphur. *Nathalis iole* Bdv. UP: Gogebic, July 29. SLP: Ottawa, Wayne; July 20–Oct. 13. H. XXXII:21, 22. K. 21:13.

Iole probably does not breed in Michigan, but strays find their way up from farther south, where the species is common.

Cabbage Butterfly. *Pieris rapae* Linn. UP: Alger, Chippewa, Delta, Dickinson, Houghton, Mackinac, Marquette, Ontonagon, Schoolcraft; May 20–Sept. 5. NLP: Alpena, Antrim, Bay, Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Clare, Crawford, Emmet, Grand Traverse, Kalkaska, Lake, Leelanau, Midland, Montmorency, Oceana, Oscoda, Otsego, Presque Isle, Roscommon; May 14–Sept. 30.

SLP: Berrien, Branch, Calhoun, Cass, Clinton, Eaton, Genessee, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Shiawassee, Van Buren, Washtenaw, Wayne; Mar. 25–Dec. 24. H. XXXV:3. K. 25:10.

This European species was first noticed near Quebec about 1860, and since has spread over most of the continent.

Checkered White. *Pieris protodice* Bdv. and Lec. UP: Alger, Chippewa, Dickinson, Mackinac, Marquette; July 23–Oct. 14. NLP: Bay, Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Kalkaska, Midland, Newaygo, Oceana, Osceola, Oscoda, Otsego; May 12–Oct. 14. SLP: Barry, Berrien, Cass, Clinton, Hillsdale, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; Apr. 23–Nov. 30. H. XXXIV:10, 11. K. 25:8, 9.

Form *vernalis* Edw. (H. XXXIV:18) is a dwarf form with heavy markings along the veins on the under side of the hind wings. It flies in April and May. Another form, which apparently has not been named, flies in October in the southern part of the state. It is as large as the summer form, but has the lower side of the hind wings heavily marked, as in *vernalis*, and closely resembles the western subspecies *occidentalis* Reak. (Rawson, 1945:51).

Eastern Mustard White. *Pieris napi oleracea* Harris. UP: Alger, Chippewa, Dickinson, Gogebic, Isle Royale, Mackinac, Marquette, Schoolcraft; May 12–Sept. 8. NLP: Arenac, Beaver Isls., Benzie, Charlevoix, Cheboygan, Crawford, Emmet, Kalkaska, Lake, Mecosta, Missaukee, Montmorency, Oscoda, Otsego, Roscommon; May 10–Aug. 23. SLP: Cass, Clinton, Ingham, Jackson, Kent (Wolcott, 1893), *Livingston, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; Apr. 23–Aug. 17. H. XXXIV:16 (var. *oleracea-hiemalis*). K. 25:4.

The spring form, *marginalis* Sc., with heavy markings on the under side of the hind wings, is a characteristic insect of the northern open maple woods, flying when the white Trillium is in blossom. The summer form, *cruciferarum* Bdv., with immaculate hind wings, prefers open fields. This species seems to be everywhere in retreat before *P. rapae*, and is much more restricted to patches of woodland than in earlier years.

West Virginia White. *Pieris virginiensis* Edw. UP: Mackinac; May 15–21. NLP: Antrim, Benzie, Emmet; Apr. 26–May 30. (Pl. I, Fig. h). H. XXXIV: 14. K. 25:5.

First recognized in Michigan in 1954, although some specimens

collected earlier and recorded by Moore (1922, 1939) as *napi* are also this species (Voss and Wagner, 1956).

Family HESPERIIDAE. The Skippers

Silver Spotted Skipper. *Epargyreus clarus* Cram. UP: Dickinson, July 6. NLP: Charity Isl., Leelanau, Mason, Midland; July 18–26. SLP: Barry, Berrien, Cass, Clinton, Ingham, Kalamazoo, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; May 20–Sept. 23. H. XLIII:5 (*tityrus*). K. 26:3; 33:1.

Long Tailed Skipper. *Urbanus proteus* Linn. SLP: Wayne. H. XLV:6 (*Eudamus*). K. 26:6; 33:3.

W. W. Newcomb (1913) saw the specimens on which this record is based; they have since been lost. They were taken on Belle Isle, and were undoubtedly strays from the south.

Hoary Edge. *Achalarus lyciades* Gey. SLP: Barry, Berrien, Calhoun, Cass, Clinton, Genesee, Ingham, Kent, Montcalm, St. Joseph, Washtenaw; June 2–Aug. 15. H. XLV:10 (*A. lycidas*). K. 27:1; 33:2.

Southern Cloudy Wing. *Thorybes bathyllus* A. and S. NLP: Lake, Midland; July 6–13. SLP: Barry, Clinton, Ingham, *Livingston, Macomb, Monroe, Montcalm, Oakland, Ottawa, St. Joseph, Washtenaw, Wayne; May 5–July 13. H. XLVIII:5. K. 27:3.

Specimens from southern Michigan, which from their markings were thought possibly to represent the very similar *T. confusis* Bell, were sent for identification to A. B. Klots, who pronounced them all *bathyllus* on the basis of genitalic examination.

Northern Cloudy Wing. *Thorybes pylades* Scud. UP: Chippewa, Dickinson, Mackinac; May 29–July 9. NLP: Bay, Benzie, Charity Isl., Charlevoix, Cheboygan, Emmet, Midland, Montmorency, Newaygo; May 20–July 18. SLP: Cass, Ingham, Kent (Wolcott, 1893), *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; May 30–July 31. H. XLVIII:6. K. 27:5.

Grizzled Skipper. *Pyrgus centaureae* Ramb. NLP: Cheboygan, Crawford, Emmet, Lake, Montmorency, Oscoda, Otsego, Wexford; May 13–31. (Pl. I, Fig. s). H. XLVII:13 (*Hesperia*). K. 27:11; 33:5.

Checkered Skipper. *Pyrgus communis* Grt. SLP: Berrien, Ingham, Lenawee, *Livingston, Montcalm, Oakland, Ottawa, Washtenaw, Wayne; June 30–Oct. 15. H. L:19–23 (*Hesperia*). K. 28:2, 33:6.

Common Sooty Wing. *Pholisora catullus* Fabr. NLP: Crawford, Midland, Newaygo, Oceana; May 29–July 25. SLP: Berrien, Eaton, Hillsdale, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; May 2–Oct. 8. H. XLV:4. K. 28:6.

Dreamy Dusky Wing. *Erynnis icelus* Scud. and Burg. UP: Chippewa, Dickinson, Mackinac, Schoolcraft; May 18–July 6. NLP: Antrim, Beaver Isls., Cheboygan, Clare, Crawford, Emmet, Iosco, Isabella, Lake, Montmorency, Oscoda, Roscommon; May 15–July 12. SLP: Clinton, Kent (Wolcott, 1893), *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; May 4–June 21. H. XLVIII:17 (*Thanaos*). K. 29:1, 33:7.

Sleepy Dusky Wing. *Erynnis brizo* Bdv. and Lec. UP: Mackinac; July 4. NLP: Cheboygan, Crawford, Iosco, Lake, Midland, Montmorency, Newaygo, Oscoda, Roscommon; May 10–June 15. SLP: Berrien, Kent (Wolcott, 1893), *Livingston, Monroe, Montcalm, Oakland, St. Joseph, Washtenaw, Wayne; Apr. 9–June 7. H. XLV:7 (*Thanaos*). K. 29:2; 33:8.

Mottled Dusky Wing. *Erynnis martialis* Scud. NLP: Alcona, Crawford, Iosco, Lake, Newaygo, Oscoda; May 26–Aug. 3. SLP: Barry, Jackson, Kent, Montcalm, Oakland, St. Clair, Washtenaw; May 24–July 21. H. XLVIII:4 (*Thanaos*). K. 29:6.

Horace's Dusky Wing. *Erynnis horatius* Scud. and Burg. SLP: Allegan, Berrien, Lenawee, *Livingston, Washtenaw; Apr. 30–Aug. 10. H. XLVIII:7, 15 (*Thanaos*). K. 29:9.

Juvenal's Dusky Wing. *Erynnis juvenalis* Fabr. UP: Mackinac, Schoolcraft; June 21. NLP: Cheboygan, Crawford, Emmet, Iosco, Lake, Mason, Midland, Montmorency, Newaygo, Oscoda, Roscommon; May 11–June 6. SLP: Barry, Clinton, Ingham, Ionia, Kent (Wolcott, 1893), *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; Apr. 26–June 11. H. XLVIII:11 (*Thanaos*). K. 29:7.

Persius Dusky Wing. *Erynnis persius* Scud. UP: Chippewa, Dickinson, Menominee; July 12–Aug. 13. NLP: Crawford, Iosco, Lake, Newaygo, Oceana, Oscoda; May 23–Aug. 15. SLP: Kent (Wolcott, 1893), *Livingston, Montcalm, Oakland, Washtenaw, Wayne; May 3–Aug. 23. H. XLVIII:1 (*Thanaos*). K. 29:3.

The food plants are willows and poplars.

Wild Indigo Dusky Wing. *Erynnis baptisiae* Forbes. SLP: Oakland, Washtenaw; July 18–24. K. 29:4.

Rared by McAlpine on *Baptisia tinctoria* in Michigan. While most of the species of this difficult genus can be separated by the male genitalia, these structures are so similar in *persius*, *baptisiae*, and *lucilius* that association with the respective food plants is necessary for safe diagnosis.

Columbine Dusky Wing. *Erynnis lucilius* Scud. and Burg. NLP: Charlevoix, Cheboygan, Emmet, Gladwin, Grand Traverse, Iosco; May 9–Aug. 18. SLP: Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Montcalm, Oakland, St. Joseph, Washtenaw; May 9–Sept. 5. H. XLVIII:10 (*Thanaos*). K. 29.5.

Food plant columbine (*Aquilegia canadensis*).

Arctic Skipper. *Carterocephalus palaemon* Pall. UP: Chippewa, Mackinac, Schoolcraft; June 4–28. NLP: Beaver Isls., Cheboygan, Crawford, Emmet, Iosco, Mecosta, Midland, Missaukee, Montmorancy, Oscoda, Presque Isle, Roscommon; May 15–July 1. H. XLVII:1 (*Pamphila mandan*). K. 33:9.

Although Klots records it as occurring in "mid-August (Michigan)," the flight season in this state normally ends before mid-July.

Least Skipper. *Ancyloxypha numitor* Fabr. UP: Chippewa, Dickinson, Mackinac, Marquette, Schoolcraft; June 20–Aug. 23. NLP: Bay, Beaver Isls., Cheboygan, Clare, Emmet, Grand Traverse, Lake, Midland, Oceana, Otsego, Roscommon; June 17–Aug. 25. SLP: Berrien, Clinton, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; June 5–Sept. 27. H. XLVII:2. K. 33:10.

Powesheik Skipper. *Oarisma powesheik* Parker. SLP: Kent; July 9–12. H. XLVII:4. K. 30:1.

Recorded from Lamberton Lake by Wolcott (1893), and found there again by Newcomb in 1930.

European Skipper. *Adopaea lineola* Ochs. SLP: Barry, Eaton, Ingham, Lenawee (Clench, 1950), Macomb, Oakland, Washtenaw (Clench, 1948, 1950), Wayne; June 4–July 15. H. LI:37. K. 30:2.

This European species was first reported in America from near London, Ontario, in 1910. It crossed the Detroit River into Michigan (apparently by way of Belle Isle) in 1927, and had become abundant in Wayne County by 1930 (Rawson, 1931); since then it has been

working steadily westward. Among tens of thousands of individuals observed by Clench in 1948 near Ypsilanti in eastern Washtenaw County, nine were of the rare albinistic form *pallida* Tutt.

Leonardus Skipper. *Hesperia leonardus* Harris. UP: Chippewa (Drummond Island); Aug. 21. NLP: Cheboygan, Crawford, Emmet, Iosco, Kalkaska, Lake, Manistee, Newaygo, Osceola, Oscoda, Otsego, Roscommon; July 20–Sept. 3. SLP: Berrien, Clinton, Huron, Ingham, Kent, (Wolcott, 1893), *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; July 7–Sept. 22. H. XLVII:35, 36 (*Erynnis*). K. 34:3.

Indian Skipper. *Hesperia sassacus* Harris. UP: Dickinson, Mackinac, Schoolcraft; June 17–July 6. NLP: Alcona, Alpena, Beaver Isls., Cheboygan, Emmet, Grand Traverse, Lake, Mason, Midland, Missaukee, Muskegon, Oceana, Oscoda, Roscommon, Wexford; June 7–25. SLP: Allegan, Barry, Kent, Montcalm, Shiawassee, Washtenaw; May 26–June 30. H. XLVI:13; LII:23 (*Erynnis*). K. 30:3; 34.4.

Cobweb Skipper. *Hesperia metea* Scud. NLP: Cheboygan, Crawford, Iosco, Lake, Mason, Newaygo, Ogemaw, Oscoda, Otsego, Wexford; May 8–June 14. SLP: Montcalm; May 16. H. XLVII:33, 34 (*Erynnis*). K. 33:12.

Ottoe Skipper. *Hesperia ottoë* Edwards. NLP: Newaygo, July 10–Aug. 9. SLP: Allegan, Barry, Kent, Montcalm; June 19–July 16. (Pl. I, Figs. a,m). H. LXXIII:20, 21 (*Erynnis ogallala*). K. 34:12 (typical form).

This prairie species seems to be well established in the western part of the Lower Peninsula; in Barry and Montcalm counties more than 20 specimens were taken in 1952–1954 and 18 in 1957, and many others were seen. In Michigan, according to Nielsen and Hodges, it occurs in areas of sandy soil where the chief plant cover consists of scattered clumps of grass. Although specimens from Allegan, Barry, Kent, and Montcalm counties were recorded by Nielsen (1958) as *Hesperia pawnee*, genitalic examination shows them to be *ottoë*; all Michigan material is referable to form *ogallala* Leussler, which closely resembles *H. pawnee*. This assignment is supported by the early flight period (June and July, except for the single record on August 9); in the states bordering the Great Plains, according to Klots and Lindsey, *ottoë* flies in June and July, *pawnee* in August and September.

Laurentian Skipper. *Hesperia laurentina* Lyman. UP: Alger, Chippewa, Delta, Gogebic, Isle Royale, Luce, Keweenaw, Mackinac, Marquette, Schoolcraft; July 19–Aug. 27. NLP: Beaver Isls., Cheboygan, Emmet; July 20–Aug. 26. (Pl. I, Fig. r). H. XLVI:2, 3 (*Erynnis manitoba*); LI:48, 49 (*E. laurentina*). K. 34:1, 2.

Fiery Skipper. *Hylephila phyleus* Dru. SLP: Huron, Ingham, Lenawee, Washtenaw, Wayne; July 25–Oct. 26. H. XLVI:18, 19; XLVII:40. K. 24:7.

Southern Michigan is at the northern limit of the range of this species, which extends south to Patagonia.

Sachem. *Atalopedes campestris* Bdv. SLP: Ingham, Wayne; Sept. 5–30. H. XLVI:4, 5. K. 30:4, 35:4.

Little Glassy Wing. *Polites verna* Edw. NLP: Midland; July 9–16. SLP: Berrien, Cass, Eaton, Ingham, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; June 20–Aug. 3. H. XLVI:32. K. 30:5, 6.

Cross Line Skipper. *Polites manataaquua* Scud. NLP: Antrim, Benzie, Charity Isl., Cheboygan, Crawford, Lake, Mason, Mecosta, Midland, Newaygo; June 21–Aug. 9. SLP: Allegan, Barry, Clinton, Huron, Ingham, Jackson, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Washtenaw, Wayne; June 3–July 31. H. LIII:3, 31, 32. K. 34:13, 14.

Tawny Edged Skipper. *Polites themistocles* Latr. UP: Alger, Chippewa, Dickinson, Isle Royale, Luce, Mackinac, Marquette, Schoolcraft; June 8–Aug. 2. NLP: Antrim, Arenac, Beaver Isls., Benzie, Cheboygan, Clare, Emmet, Fox Isls., Gladwin, Iosco, Leelanau, Mason, Midland, Missaukee, Newaygo; June 5–Aug. 6. SLP: Barry, Berrien, Gratiot, Huron, Ingham, Jackson, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; May 21–Sept. 3. H. XLVII:20; LIII:6, 7 (*P. taumus*). K. 35:1, 2.

Peck's Skipper. *Polites peckius* Kirby. UP: Alger, Chippewa, Dickinson, Mackinac, Marquette (Andrews, 1929), Schoolcraft; June 29–July 28. NLP: Arenac, Bay, Cheboygan, Emmet, Grand Traverse, Iosco, Lake, Leelanau, Midland, Muskegon, Oceana, Otsego; June 23–Sept 10. SLP: Berrien, Cass, Clinton, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Shiawassee,

Washtenaw, Wayne; May 21–Oct. 8. H. XLVII:24, 25; LIII:14. K. 30:7.

Long Dash. *Polites mystic* Scud. UP: Alger, Chippewa, Delta, Dickinson, Keweenaw, Luce, Mackinac, Marquette, Menominee, Schoolcraft; June 15–Aug. 3. NLP: Antrim, Arenac, Benzie, Charlevoix, Cheboygan, Emmet, Iosco, Leelanau, Mason, Mecosta, Midland, Missaukee, Oscoda, Otsego, Presque Isle, Wexford; May 29– Aug. 2. SLP: Barry, Cass, Gratiot, Huron, Ingham, Jackson, Kent, Lenawee, *Livingston, Monroe, Montcalm, Oakland, St. Clair, Shiawassee, Washtenaw, Wayne; May 31–Sept. 5. H. XLVI:22, 23; LIII:20. K. 30:8, 35:3.

Northern Broken Dash. *Wallengrenia otho egeremet* Scud. NLP: Charlevoix, Cheboygan, Clare, Lake, Manistee, Mason, Midland, Muskegon, Oceana, Osceola; July 4–Sept. 26. SLP: Allegan, Barry, Berrien, Branch, Cass, Clinton, Huron, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, Ottawa, St. Clair, Shiawassee, Washtenaw, Wayne; June 8–Aug. 13. H. XLVI:28, 29, LIII:29 (*Catia*). K. 34:15.

Broad Winged Skipper. *Poanes viator* Edw. NLP: Cheboygan, Midland; June 30–July 21. SLP: Barry, Cass, Clinton, Ingham, Kent, Lenawee, *Livingston, Montcalm, Oakland, Washtenaw, Wayne; July 3–Aug. 3. H. XLVI:15; LIV:2 (*Phycanassa*). K. 30:10; 35:10.

This species seems to be largely or wholly confined to marshes dominated by the sedge *Carex lacustris*, which may be the foodplant.

Mulberry Wing. *Poanes massasoit* Scud. NLP: Lake, Midland, Roscommon; July 4–Aug. 22. SLP: Barry, Berrien, Cass, Clinton, Ingham, Kent, Lapeer, Lenawee, *Livingston, Montcalm, Oakland, St. Joseph, Washtenaw, Wayne; July 3–Aug. 19. H. XLVII:21 22. K. 31:1, 2; 35:6.

Hobomok Skipper. *Poanes hobomok* Harris. UP: Alger, Chippewa, Dickinson, Mackinac, Marquette, Schoolcraft; June 1–July 26. NLP: Beaver Isls., Benzie, Charity Isl., Charlevoix, Cheboygan, Crawford, Emmet, Iosco, Isabella, Kalkaska, Leelanau, Mason, Midland, Missaukee, Montmorency, Oscoda, Roscommon, Wexford; May 20–July 17. SLP: Cass, Clinton, Huron, Ingham, Kent (Wolcott, 1893), Lapeer, Lenawee, *Livingston, Macomb, Monroe, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; May 21–July 10. H. XLVII:37, 38; LIII:42, 43. K. 30:11; 35:7, 8.

The dark female form, known as *pocohontas* Sc., is apparently rare

in Michigan. Wolcott (1893) reported it from Kent County, Thomas Pliske has taken a single specimen in Washtenaw County, and the seven in the University of Michigan collection are from Charlevoix, Missaukee, Oakland, and Monroe counties.

Zabulon Skipper. *Poanes zabulon* Bdv. and Lec. SLP: Lenawee, Washtenaw; May 30–Sept. 9. H. XLVII:39; LIII:46, 47. K. 30:12; 35:9.

Delaware Skipper. *Atrytone logan* Edw. NLP: Clare, Crawford, Iosco, Kalkaska, Mason, Midland, Muskegon, Newaygo, Otsego, Roscommon; July 2–Aug. 12. SLP: Allegan, Barry, Berrien, Calhoun, Cass, Clinton, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, St. Joseph, Shiawassee, Washtenaw, Wayne; June 1–Sept. 4. H. XLVI:24, 25. K. 31:6; 36:1.

Common in various types of marshes and in upland fields where bluegrasses are dominant.

Dion Skipper. *Atrytone dion* Edw. NLP: Lake, Midland; July 12–20. SLP: Barry, Cass, Clinton, Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Joseph, Washtenaw, Wayne; July 3–Aug. 8. H. LIII:36, 37. K. 31:9; 36:7.

This species occurs in the same type of marsh habitat as *Atrytone dukesii* and *Poanes viator*, and the larval foodplant may be *Carex lacustris*.

Dukes' Skipper. *Atrytone dukesii* Lindsey. SLP: Washtenaw, Wayne; July 13–28. (Pl. I, Figs. i,n). H. LIV:26. K. 31:10; 36:5.

As reported by Pliske (1957), this rare and local species was first recognized from Michigan on the basis of four males and one female taken between July 21 and 28, 1956, by Pliske, A. Slater, S. Hubbell, and W. H. Wagner, Jr., in two small marshes on the north bank of the Huron River near Ann Arbor. The following year a female was collected July 13 and a male on July 15 by Wagner in the same situations. These marshes, about one-half mile apart, are wet underfoot and dominated by the lake-margin sedge, *Carex lacustris*, upon leaves of which a female was observed to oviposit. A specimen caught by Moore on July 28, 1942, in Highland Park (Detroit), identified in the University of Michigan collection as *A. dion*, undoubtedly represents a wind-blown stray, as the urbanized area where it was taken is wholly unsuited to the occurrence of the species.

Black Dash. *Atrytone conspicua* Edw. NLP: Muskegon; July 21.

SLP: Barry, Berrien, Cass, Clinton, Ingham, Kent (Wolcott, 1893), Lenawee, *Livingston, Montcalm, Oakland, St. Joseph, Washtenaw, Wayne; July 4–Aug. 10. H. XLVI:16, 17 (*A. pontiac*). K. 32:1; 36:6.

Two Spotted Skipper. *Atrytone bimacula* G. and R. UP: Alger, Luce; July 6. NLP: Cheboygan, Crawford, Lake, Mason, Montmorency, Presque Isle; June 9–July 12. SLP: Ingham, Jackson, Kent (Wolcott, 1893), Lenawee, *Livingston, Montcalm, Oakland, Washtenaw, Wayne; June 24–July 26. (Pl. I, Fig. b). H. Text fig. 187, p. 388. K. 32:2, 36:9.

This species, little known and poorly represented in collections, was found by Pliske, Slater, S. Hubbell, and Wagner to be abundant during June and July, 1956, in localized colonies in Jackson and Washtenaw counties. These colonies are restricted to wet marshes dominated by the sedge *Carex stricta*. In one such marsh, near the juncture of Hanover and Preston roads in southern Jackson County, 15 fresh males and one female were taken on June 24, and many more were seen. The flight period of *A. bimacula* evidently begins before and overlaps those of the more common marsh skippers of this region; the maximum abundance of the species is attained about two weeks earlier than the maxima for *A. logan*, *A. dion*, *A. conspicua*, and *Poanes massasoit*, and about three weeks before the peak abundance of *Poanes viator*.

Eastern Dun Skipper. *Atrytone ruricola metacomet* Harris. UP: Alger, Chippewa, Dickinson, Houghton, Luce, Mackinac, Schoolcraft; June 29–Aug. 3. NLP; Arenac, Beaver Isls., Charity Isl., Charlevoix, Cheboygan, Clare, Crawford, Emmet, Gladwin, Iosco, Kalkaska, Lake, Leelanau, Mason, Midland, Muskegon, Newaygo, Oceana, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon; June 23–Aug. 18. SLP: Barry, Berrien, Cass, Clinton, Huron, Ingham, Kent, Lenawee, *Livingston, Macomb, Montcalm, Oakland, St. Clair, Washtenaw, Wayne; June 28–Aug. 11. H. XLVI:31; LIII:8; LXXIII:12 (*A. ruricola*). K. 32:3, 4; 36:8.

Dusted Skipper. *Atrytonopsis hianna* Scud. NLP: Cheboygan, Crawford, Iosco, Lake, Mason, Montmorency, Newaygo, Oceana, Oscoda; May 24–June 23. SLP: Monroe; May 24–June 9. H. XLVI:9, 10. K. 32:7; 36:13.

Roadside Skipper. *Amblyscirtes vialis* Edw. UP: Alger, Chippewa, Dickinson, Isle Royale, Mackinac, Schoolcraft; May 30–July 27. NLP:

Beaver Isls., Cheboygan, Crawford, Emmet, Iosco, Mason, Montmorency, Newaygo, Ogemaw, Oscoda, Otsego, Presque Isle; May 15–June 25. H. XLVII:5. K. 35:13; 37:1.

Pepper and Salt Skipper. *Amblyscirtes hegon* Scud. UP: Schoolcraft; June 4–12. NLP: Crawford, Oscoda; May 29–June 14. H. XLVII:6 (*samoset*). K. 37:3.

This species seems to be local and rare. It flies with *vialis*, is quite similar, and may have been overlooked by collectors.

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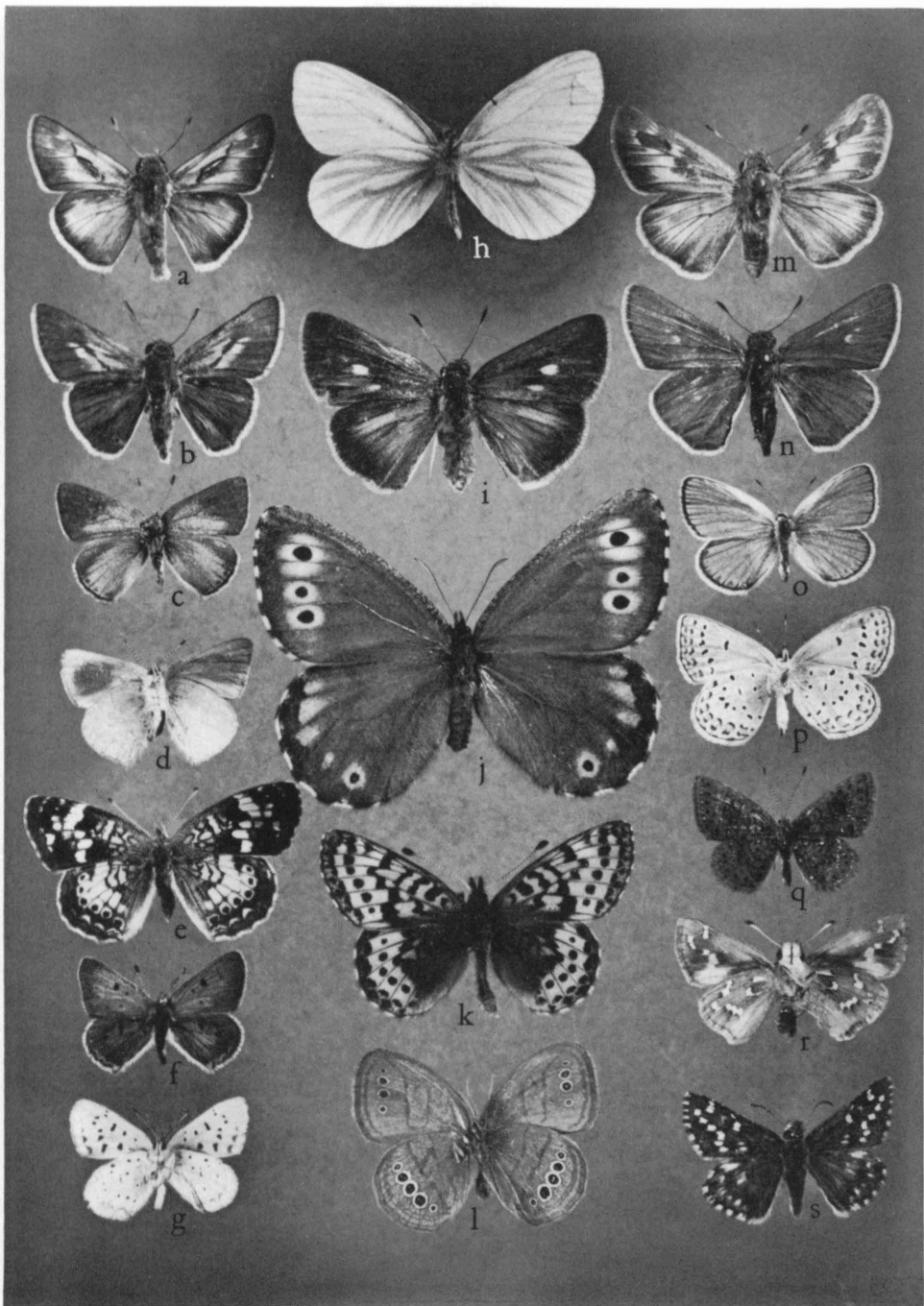
PLATE I

SOME RARE OR SELDOM FIGURED MICHIGAN BUTTERFLIES

- a. *Hesperia ottoë* Edwards, male, Montcalm Co., July 5, 1957 (WHW).
- b. *Atrytone bimacula* Grote & Robinson, male, Jackson Co., June 24, 1956 (WHW).
- c. *Erora laeta* Edwards, female, Emmet Co., May 14, 1955 (WHW).
- d. *Erora laeta* Edwards, male, Emmet Co., May 14, 1955 (EGV).
- e. *Phyciodes batesii* Reakirt, Emmet Co., July 17, 1945 (EGV).
- f. *Lycaena epixanthe michiganensis* Rawson, male, Emmet Co., July 11, 1951 (EGV).
- g. *Lycaena epixanthe michiganensis* Rawson, male, underside, Dickinson Co., July 17, 1909 (UMMZ).
- h. *Pieris virginiensis* Edwards, Emmet Co., May 24, 1959 (EGV).
- i. *Atrytone dukesii* Lindsey, female, Washtenaw Co., July 15, 1957 (WHW).
- j. *Oeneis jutta* Hübner, Schoolcraft Co., June 4, 1959 (MCN).
- k. *Boloria frigga* Thunberg, Schoolcraft Co., June 5, 1959 (MCN).
- l. *Euptychia mitchellii* French, underside, Cass Co. (type locality), July 10, 1917 (UMMZ).
- m. *Hesperia ottoë* Edwards, female, Newaygo Co., August 6, 1957 (MCN).
- n. *Atrytone dukesii* Lindsey, male, Washtenaw Co., July 4, 1956 (WHW).
- o. *Lycaeides melissa samuelis* Nabokov, male, Allegan Co., July 5, 1959 (EGV).
- p. *Lycaeides melissa samuelis* Nabokov, male, underside, Allegan Co., July 5, 1959 (EGV).
- q. *Calephelis muticum* McAlpine, Washtenaw Co., July 21, 1954 (WHW).
- r. *Hesperia laurentina* Lyman, female, underside, Cheboygan Co., August 23, 1951 (EGV).
- s. *Pyrgus centaureae* Rambur, Cheboygan Co., May 15, 1955 (EGV).

The specimens figured are in the collections indicated: (MCN) Mogens C.

Nielsen, (EGV) Edward G. Voss, (WHW) Warren H. Wagner, Jr., (UMMZ) University of Michigan Museum of Zoology. Photo by Thomas R. Detwyler.





Great Spangled Fritillary



Little Sulphur



Bronze Copper



Alfalfa Butterfly