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A LIST OF NORTHERN MICHIGAN LEPIDOPTERA.

By SHERMAN MOORE

The list of Lepidoptera herein presented represents the results of five seasons of collecting, 1917 to 1921 inclusive, along the shores of the north end of Lake Michigan and of the Straits of Mackinac, covering parts of the counties of Schoolcraft, Mackinac, Charlevoix, Emmet, and Cheboygan. Collecting usually has been continuous from some time in May until about the first of November, and an average of two to three days per week has been devoted to the work. While some of the earliest forms may have been missed, the collecting period has covered the greater part of the insect season.

Collecting has been confined largely to the immediate vicinity of the lake shores, and at no point have specimens been taken more than three miles inland. The collection therefore does not represent fairly the lepidopterous fauna of the various counties, but only that of a narrow strip along the shores.

of the lake. Certain habitats have been entirely missing, notably low grassy meads and open upland woods. Such habitats are found, however, farther inland. As a matter of fact, the whole of the northern shores of Lake Michigan are of a singularly monotonous character.

Collecting was done in Schoolcraft County in 1917, from Pt. aux Barques, about twelve miles south of Manistique, to the eastern boundary of the county at Hughes Point. The shore over this stretch is generally sandy, the sandy beach being broken at intervals by rocky points. Back of the beach there are ridges of sand dunes, rising at some places to considerable heights, covered largely with a scattering growth of scrubby birch and poplar. At Pt. aux Barques a hardwood ridge approaches closely to the shore, and along the Manistique River there are some patches of hardwoods.

Collecting in Mackinac County has covered the entire shore from Hughes Point to Les Cheneaux Islands, and the years 1918 to 1921, inclusive. There is much less sand beach along this portion of the shore, the beach being rather flat and rocky with short stretches of sand. Back of the beach the country is low and flat, covered with a dense growth of balsam, spruce, and cedar, intermixed with some scattering birch and poplar. The greater part of the collecting was done near Naubinway, around St. Ignace, and in St. Martin Bay.

In Cheboygan County only two or three days were spent along the beach in the immediate vicinity of Cheboygan. In Emmet County the collecting was confined to the beach from Mackinaw City to Waugoshance Island. The beach here is generally sandy, followed by ridges of sand, between which are wet swamps.

The only collecting in Charlevoix County was on the islands known as the Beaver Island group. These islands, lying in the northern end of Lake Michigan, twelve to twenty miles

from the mainland, are geographically a part of Emmet County, being a continuation of Waugoshance Point, but for political reasons they are attached to Charlevoix County. Beaver Island, the largest of the group, was scarcely touched, a little collecting having been done near St. James only. Garden Island, the second in size, about five miles long by two miles wide, was thoroughly covered in 1919. The beaches of this island are for the most part rocky, and behind them is the usual growth of conifers. The interior of the island, however, is high, and covered with a heavy growth of maple, beech, and birch. There are several old clearings and some small lakes. This island affords the most diversified habitat of any territory along this portion of the lake, and is an excellent collecting ground.

Hog Island, somewhat smaller than Garden Island, is low and flat, and covered with a dense growth of mixed timber. There are a few sand ridges near the northern end and a black ash swamp of considerable size in the interior. It was thoroughly covered during the season of 1920, but offers little to the collector. The other islands of the group, Squaw, Whiskey, and Hat, are all small, low, and rocky, with a scanty growth of mixed trees. Hat Island, the smallest of the three, is a breeding place of the herring gull and the great blue heron.

Combined in this list with the results of the writer's collecting along the Straits of Mackinac are two small lists of Lepidoptera from different localities. In July, 1919, T. H. Hubbell was sent to Gogebic County to collect Orthoptera for the Museum of Zoology of the University of Michigan. In the course of his work there he took 13 species of Lepidoptera. Ten of these species were butterflies and included one specimen of *Nathalis iole* Bdv., which is a record for the state. All of the other species have been taken along the Straits. Of

the three species of moths, two were not found in the vicinity of the Straits.

The other list is from Huron Mountains, Marquette County. In 1919 A. W. Andrews collected some Lepidoptera there early in July, and Bryant Walker added some specimens later in the season. In 1921 T. H. Hubbell collected some specimens. The compiled list contains 19 species of Rhopalocera and 22 species of Heterocera. Five species of moths in this list have not been taken in the vicinity of the Straits.

Considerable care has been taken in the determination of the specimens. For much valuable assistance in this work I am deeply indebted to Dr. W. W. Newcomb, of Detroit. He has checked practically all of the determinations and has devoted considerable time and the use of his extensive library to the work. Where there exists any doubt in regard to the identity of a species, it has either been omitted from the list or a note of explanation has been made. The list includes but 20 species of the super-family Tineoidea. A number of other species have been taken, but the literature and the time necessary for their determination has been lacking. In addition to 32 undetermined species of this group, the collection contains 10 species of Noctuidae and 7 species of Geometridae which have not been determined satisfactorily.

The nomenclature of the Check List by Barnes and McDunnough, published in 1917, has been followed in the list, with one or two changes in conformity with later publications by the same authors. The list indicates the counties in which specimens of each species have been taken and gives the earliest and latest dates on which each species has been taken in any of the counties.

A comparison of this list with others previously published may be of interest. In the Fourteenth Report of the Michigan

Academy of Science, 1912, Dr. W. W. Newcomb published a list of the butterflies of Michigan, based on all earlier lists and upon the results of his own collecting. This list contains the names of 101 species. In Entomological News, March, 1915, Paul S. Welch published a list of Lepidoptera taken in the vicinity of Douglas Lake, Cheboygan County. This list includes but 26 species of butterflies, and adds no new species to Dr. Newcomb's list. In May, 1918, the University of Michigan published a list of Lepidoptera from Whitefish Point, by W. S. McAlpine, the results of the Shiras Expedition of 1914. (Occasional Papers of the Museum of Zoology, No. 54.) This list includes 42 species of butterflies and adds two species to Dr. Newcomb's list. In the present list there are 68 species of butterflies, seven of which are not included in any previously published list. Two additional species have been taken during the past season by Dr. Newcomb at Detroit. This makes the total number of species of Rhopalocera known to occur in Michigan 112. Of the total number of species recorded from the state, 67, or about 60 per cent, occur in the territory bordering the Straits of Mackinac.

The species in the present list which have been included in no previously published list are as follows:

Zegris olympia rosa Edw. The only ^{other} specimens known to have been taken in Michigan were secured by N. A. Wood, in Berrien County, in the spring of 1920.

Coenonympha inornata Edw. Probably taken in Schoolcraft County in 1915 by W. S. McAlpine, although I have not seen his specimens.

Nathalis iole Bdv. One female was taken by T. H. Hubbell in Gogebic County. The occurrence of this southern form in the Northern Peninsula is remarkable.

Oeneis chryxus Dbdy. & Hew. Taken in only one locality.

in Schoolcraft County in 1917 by the writer. It appeared to be quite common.

Strymon melinus Hbn. The writer took one specimen on Squaw Island, Charlevoix County, in 1919.

Incisalia polios C. & W. Taken in Schoolcraft and Mackinac counties. This butterfly has been taken near the Michigan boundary in Indiana, but its discovery in the Northern Peninsula was a surprise.

Carterocephalus palaemon Pall. Found in considerable abundance in Mackinac County.

In addition to the published records for Douglas Lake by Welch and for Whitefish Point by McAlpine, the only other list of Michigan Heterocera known to the writer is of Sphingidae by W. W. Newcomb in the Report of the Michigan Academy of Science, 1913, which includes 29 species. Only three species are noted by Welch from Douglas Lake, and five by McAlpine from Whitefish Point, all of which occur in Dr. Newcomb's report. The present list includes eight species of Sphingidae, two of which, *Smerinthus cerisyi* Kirby and *Haemorrhagia gracilis* G. & R., represent records for Michigan.

In comparing the present list of moths with those for Douglas Lake and Whitefish Point, surprise is occasioned by the comparatively few species that are common to the three regions. From Douglas Lake there are 127 species, of which 35 belong to the Tineoidea. From Whitefish Point there are 129 species, of which 32 are Tineoidea. In the present list are 211 species, of which 21 are Tineoidea. Combining the three lists, there are 357 species, of which 72 are Tineoidea.

Because of the great difficulty in the determination of species of the Tineoidea for the average student, the number of species of this group included in any list is a relatively small percentage of the species collected, unless it is possible to

have them determined by a specialist. In the present list somewhat less than 40 per cent of the species collected have been determined, and largely because of the difficulty of determination no particular effort has been made to collect members of this group. It would appear to be proper, therefore, to omit them in the comparison of lists by different collectors.

Of the 285 species of moths, exclusive of the Tineoidea, in the three lists, 38 have been taken only at Douglas Lake, 52 only at Whitefish Point, one only in Gogebic County, one only in Marquette County, and 117 only in the vicinity of the Straits. Out of 283 species, only 74 have been taken in more than one of the three localities for which there are extended lists, and only 18 have been taken in all of the three. The list for the Straits of Mackinac includes 49 species that were recorded from Douglas Lake and 40 species that were noted from Whitefish Point. Only five species are listed from both Douglas Lake and Whitefish Point that were not taken at the Straits.

The same phenomenon will be noted if the distribution of species from the different counties included in the Straits list is studied, although not to quite such a degree. The majority of the species have been taken in but one county. A further fact bearing on the subject is to be found in the great number of species that are represented by only one or two individuals. Furthermore, each year of collecting adds twenty to thirty new species from the same localities. In view of these facts, any further comparison between lists of this nature would lead only to what probably would be erroneous conclusions.

Two explanations are possible. First, that the distribution of the species of Heterocera is not at all uniform, species being confined to certain localities with very narrow limits, although such localities may be rather widely scattered over

a given region. Second, that none of these collections is fully representative of the Heterocerous fauna of its locality. The latter appears to be the more reasonable assumption. In the check list are given 661 species of Rhopalocera. Of these, 73 are known to occur in the region under consideration. Using the same proportion, there should be about 450 species of Heterocera in the same region, excluding the Tineoidea, whereas there are but 285. One thing at least is apparent: a great deal of field work remains to be done before a representative list of Michigan Heterocera can be compiled.

PAPILIONIDAE

1. *Papilio polyxenes* Fabr.—Schoolcraft; June 12. One male. Rare.
2. *Papilio glaucus* Linn.—Schoolcraft, Mackinac, Charlevoix; May 20-July 16. Abundant.

PIERIDAE

3. *Pieris protodice* Bdv. & Lec.—Mackinac; August 21-October 14. Rare. All specimens taken have been females.
4. *Pieris napi* Linn., form *oleracea* Harris.—Mackinac, Charlevoix, Emmet, Cheboygan; May 26-July 5. Common, especially in heavy woods.
Form *cruciferarum* Bdv.—Mackinac, Charlevoix, Emmet; June 26-September 8. Common in open fields.
5. *Pieris rapae* Linn.—Schoolcraft, Mackinac, Charlevoix, Marquette; May 20-September 3. Two specimens of the form *immaculata* Ckll. were taken at St. Ignace, June 1.
6. *Nathalis iole* Bdv.—Gogebic; July 29. One female, taken by sweeping roadside bushes.
7. *Zegris olympia rosa* Edw.—Cheboygan; May 12. Two specimens, a male and a female, taken near Cheboygan, and a second male seen.

8. *Eurymus eurytheme* Bdv., form *amphidusa* Bdv.—Schoolcraft, Mackinac; July 4-October 15. Not common.

9. *Eurymus philodice* Godt.—Schoolcraft, Mackinac, Charlevoix, Emmet; May 29-October 14.

Form *luteitincta* Wollc.—Schoolcraft, Mackinac; August 21-September 22. This form appears to be not uncommon, as six or seven specimens have been taken.

10. *Eurymus interior* Scud.—Schoolcraft, Mackinac, Charlevoix, Emmet, Marquette; May 28-August 5. Fairly common.

11. *Eurema lisa* Bdv.—Mackinac, Charlevoix, Emmet, Marquette; June 18-September 14. Rather rare until 1921, during which season it was quite abundant, even as far north as the Huron Mountains.

DANAIDAE

12. *Danaus archippus* Fabr.—Schoolcraft, Mackinac, Emmet, Charlevoix; May 20-September 26. Very abundant in 1917 and 1918, migrating by thousands. During 1919 and 1920 it was very scarce, only a few individuals having been seen. During 1921 it appeared to be increasing in numbers again.

SATYRIDAE

13. *Enodia portlandia* Fairb.—Mackinac; June 30, July 8. Only two specimens taken.

14. *Satyroides canthus* Linn.—Schoolcraft, Mackinac, Charlevoix; June 30-August 15. Common.

15. *Coenonympha inornata* Edw.—Schoolcraft, Mackinac; June 18-August 2. Quite common among low bushes along rocky shores.

16. *Cercyonis alope* Fabr., form *nephele* Kirby.—Schoolcraft, Mackinac, Charlevoix, Marquette, Gogebic; July 8-August 20. Abundant.

17. *Oeneis chryxus* Dbldy. & Hew.—^{Schoolcraft}~~Mackinac~~; May 27-June 12. Occurs in considerable numbers on the sand dunes near Manistique in early spring.

NYMPHALIDAE

18. *Argynnis cybele* Fabr.—Schoolcraft, Mackinac, Emmet, Charlevoix, Marquette; June 24-August 11. Common. The females show great variation in color, running from very dark specimens to those as light as the specimens taken in the Porcupine Mountains.
19. *Argynnis aphrodite* Fabr.—Schoolcraft, Mackinac, Emmet, Charlevoix, Marquette; July 8-August 11. Normally not quite so common as *cybele*, but in 1921 it was almost the only Argynnid seen. All of the specimens approach the form *cypris* Edw.
20. *Argynnis atlantis* Edw.—Schoolcraft, Mackinac, Marquette, Gogebic; June 20-September 10. Common, at times very abundant. I have seen bushes actually bending beneath the weight of thousands of these butterflies.
21. *Brenthis myrina* Cram.—Schoolcraft, Mackinac, Charlevoix, Cheboygan, Gogebic; May 28-August 20. Common.
22. *Brenthis bellona* Fabr.—Schoolcraft, Mackinac, Charlevoix, Gogebic; May 28-August 20. Not so common as *myrina*.
23. *Euphydryas phaeton* Dru.—Mackinac; June 20-30. Taken only in one locality, where four specimens were found in each of two years.
24. *Phyciodes nycteis* Dbldy. & Hew.—Schoolcraft, Mackinac; June 8-July 16. Common.
25. *Phyciodes tharos* Dru.—Schoolcraft, Mackinac, Emmet, Charlevoix; June 7-September 8. Abundant. Both the form *morpheus* Fabr. and the form *marcia* Edw. occur, apparently simultaneously, and every gradation between these forms may be found.

26. *Polygonia comma* Harris, form *dryas* Edw.—Charlevoix, Marquette; July 8-13. Not at all common.
27. *Polygonia satyrus* Edw.—Mackinac, Schoolcraft, Marquette; July 6-September 18. Rather uncommon.
28. *Polygonia faunus* Edw.—Schoolcraft, Mackinac, Charlevoix, Marquette; July 10-September 12. Common.
29. *Polygonia progne* Cram.—Schoolcraft, Mackinac, Charlevoix, Emmet, Marquette, Gogebic; May 12-October 3. Common.
30. *Aglaïs j-album* Bdv. & Lec.—Schoolcraft, Mackinac, Charlevoix, Marquette; July 13-October 21. Common. In 1919 the most plentiful butterfly in this region.
31. *Aglaïs milberti* Godt.—Schoolcraft, Mackinac, Charlevoix, Marquette, Gogebic; June 26-October 2. Common, but in rather restricted localities.
32. *Aglaïs antiopa* Linn.—Schoolcraft, Mackinac, Charlevoix, Emmet, Marquette, Gogebic; May 26-October 13.
33. *Vanessa atalanta* Linn.—Mackinac, Charlevoix, Marquette; May 25-October 13. Normally rather scarce, but in 1919 it was very abundant.
34. *Vanessa virginiana* Dru.—Schoolcraft, Mackinac, Marquette; June 2-October 12. Common.
35. *Vanessa cardui* Linn.—Schoolcraft, Mackinac, Charlevoix; August 20-September 17. Only four specimens taken.
36. *Junonia coenia* Hbn.—Schoolcraft, Mackinac, Marquette; June 10-September 7. Not common. One specimen was taken at Manistique in 1917, and no other specimens were seen until September, 1921, when for a few days they appeared to be quite numerous.
37. *Basilarchia arthemis* Dru.—Schoolcraft, Mackinac, Charlevoix, Marquette, Gogebic; June 15-August 15.
- Λ ^{Form} ~~Var.~~ *proserpina* Edw.—This form was not at all uncommon

in 1919. All of the specimens seen were of the form in which the white bands on the wings are entirely suppressed.

38. *Basilarchia archippus* Cram.—Schoolcraft, Mackinac, Emmet; June 26-September 2. Fairly common.

LYCAENIDAE

39. *Strymon melinus* Hbn.—Charlevoix; July 29. One specimen taken on Squaw Island.

40. *Strymon titus* Fabr.—Mackinac; August 1-15. Two specimens only.

41. *Strymon calanus* Hbn.—Charlevoix, Marquette; July 10-12. Two specimens.

42. *Strymon liparops* Bdv. & Lec.—Mackinac; August 5. Only one specimen.

43. *Incisalia augustus* Kirby.—Schoolcraft, Mackinac, Charlevoix, Cheboygan; May 19-July 16. Common on dry, sandy upper beaches.

44. *Incisalia polios* C. & W.—Schoolcraft, Mackinac; May 27-30. Rather rare. Appears somewhat earlier than *augustus* in the same localities.

45. *Incisalia niphon* Hbn.—Mackinac; May 18-30. Two specimens.

46. *Feniseca tarquinius* Fabr.—Mackinac; June 18-23. Appears to be rare.

47. *Heodes thoe* Bdv.—Schoolcraft; August 1-September 16. Two specimens only.

48. *Heodes helloides* Bdv.—Schoolcraft, Mackinac; June 17-September 16. Not common.

49. *Heodes dorcas* Kirby.—Mackinac; July 2-August 18. Common.

50. *Heodes epixanthe* Bdv. & Lec.—Schoolcraft; August 21. One pair taken near Manistique.

51. *Heodes hypophlaeas* Bdv.—Schoolcraft, Mackinac; June 4-October 1. Quite common.

52. *Everes comyntas* Godt.—Schoolcraft, Mackinac; May 31-October 2. The specimens vary greatly in size and color. A very small, dark form was common at Manistique in September, 1917.

53. *Plebeius saepiolus* Bdv.—Schoolcraft, Mackinac, Charlevoix; June 5-July 24. Common.

54. *Glaucopsyche lygdamus* Dbldy.—Mackinac; May 25-June 28. Not nearly so common as *saepiolus*, and is more closely restricted to certain localities.

55. *Lycaenopsis pseudargiolus* Bdv. & Lec.—Schoolcraft, Mackinac, Charlevoix, Cheboygan, Emmet; May 23-July 1. The common form is *marginata* Edw. Form *lucia* Kirby is somewhat less common, and form *violacea* Edw. still less so. The butterfly appears to be single brooded in this region, but one specimen of the summer form *neglecta* Edw. having been taken, August 16, near St. Ignace.

HESPERIIDAE

56. *Cocceius pylades* Scud.—Mackinac; May 29-June 26. Common.

57. *Thanaos icelus* Lint.—Schoolcraft, Mackinac, Charlevoix; May 18-July 4. Common.

58. *Thanaos brizo* Bdv. & Lec.—Mackinac; July 4. One specimen only.

59. *Thanaos juvenalis* Fabr.—Schoolcraft; June 21. One only.

60. *Carterocephalus palaemon* Pall.—Mackinac; June 4-28. Quite common.

62. *Pamphila comma* Linn., var. *manitoba* Scud.—School-

61. *Ancyloxypha numitor* Fabr.—Mackinac.
Charlevoix, Emmet; June 20-August 23. Common.

craft, Mackinac, Charlevoix, Emmet, Gogebic; July 19-August 23. Very common.

63. *Polites cernes* Bdv. & Lec.—Schoolcraft, Mackinac, Charlevoix, Marquette; June 8-August 2. Common.

64. *Polites mystic* Scud.—Schoolcraft, Mackinac; June 15-July 24. Common.

65. *Polites peckius* Kirby.—Mackinac; June 30-July 7. Not common.

66. *Poanes hobomok* Harris.—Schoolcraft, Mackinac, Charlevoix; June 1-July 13. Common.

67. *Euphyes vestris* Bdv.—Schoolcraft, Mackinac, Charlevoix; June 30-August 3. Quite common.

68. *Amblycirtes vialis* Edw.—Mackinac, Charlevoix; May 30-July 27. Very common.

SPHINGIDAE

69. *Ceratonia undulosa* Wlk.—Charlevoix; June 22-August 3. Two specimens.

70. *Sphinx chersis* Hbn.—Mackinac, Charlevoix; July 2-21. Two specimens.

71. *Smerinthus jamaicensis* Dru., normal form *gemminatus* Say.—Mackinac; June 21. A single specimen.

72. *Smerinthus cerisyi* Kirby.—Mackinac; June 20-July 4. Only two specimens.

73. *Pachysphinx modesta* Harris.—Mackinac; July 3-10. Four specimens, one taken in each of four years.

74. *Haemorrhagia gracilis* G. & R.—Mackinac; June 5. A single specimen.

75. *Haemorrhagia diffinis* Bdv.—Mackinac, Cheboygan; May 26-July 1. Common.

76. *Celerio gallii* Rott., var. *intermedia* Kirby.—Mackinac; June 1-30. Not uncommon.

77. *Celerio lineata* Fabr.—Gogebic; August 21. One only.

SATURNIIDAE

78. *Tropaea luna* Linn.—Mackinac; June 6. One specimen taken at night at St. Ignace.
79. *Telea polyphemus* Cram.—Schoolcraft, Mackinac; July 12. One specimen taken at Seul Choix Lighthouse, and one reared from larva.

CERATOCAMPIDAE

80. *Anisota rubicunda* Fabr.—Charlevoix; July 29. One specimen taken on Squaw Island.

SYNTOMIDAE

81. *Scopsis fulvicollis* Hbn.—Mackinac, Charlevoix; June 30-September 24. Common.
82. *Lycomorpha pholus* Dru.—Mackinac, Marquette; July 10-20. Two specimens.
83. *Ctenucha virginica* Charp.—Schoolcraft, Mackinac, Charlevoix; June 11-July 20. Common.

ARCTIIDAE

84. *Hypoprepia miniata* Kirby.—Charlevoix; July 26. One taken on Hog Island.
85. *Halisidota maculata* Harr.—Schoolcraft, Mackinac; June 7-July 26. Several specimens.
86. *Eubaphe aurantiaca* Hbn., ^{Var.} ~~form~~ *ferruginosa* Wlk.—Schoolcraft, Mackinac, Emmet; June 20-September 9.
87. ^{Var.} ~~Form~~ *brevicornis* Wlk.—Mackinac, Emmet; July 14-30. Two specimens.
87. *Diacrisia virginica* Fabr.—Schoolcraft, Mackinac, Charlevoix; June 17-July 26. Common.
88. *Isia isabella* A. & S.—Mackinac; June 18-30. Two specimens.

89. *Hyphantria textor* Harr.—Schoolcraft, Mackinac, Charlevoix; June 7-August 10. Four specimens.

90. *Estigmene acraea* Dru.—Mackinac; July 4. One specimen, taken at light.

91. *Estigmene prima* Slosson.—Mackinac; June 22. One specimen.

92. *Apantesis parthenice* Kirby.—Mackinac, Emmet; July 16-August 18. Four specimens.

93. *Arctia caja* Linn.—Marquette; July. One large yellow female.

94. *Utetheisa bella* Linn.—Mackinac, Charlevoix; July 27-September 6. Quite common.

95. *Haploa confusa* Lyman.—Mackinac; June 20-July 24. Three specimens taken at the same locality.

AGARISTIDAE

96. *Alypia octomaculata* Fabr.—Schoolcraft, Charlevoix; June 11-July 16. One specimen from Manistique. Quite common on Garden Island, the only locality in this region where the wild grape grows.

97. *Alypia langtoni* Couper.—Schoolcraft, Mackinac, Charlevoix; June 23-August 1. Quite common.

NOCTUIDAE

98. *Heliothis obsoleta* Fabr.—Mackinac; July 16-October 13. Abundant.

99. *Euxoa detersa* Wlk.—Schoolcraft, Mackinac, Emmet, Charlevoix; September 8-18. Common at light.

100. *Feltia venerabilis* Wlk.—Mackinac; August 29-September 7. Common at light.

101. *Feltia subgothica* Haw.—Mackinac; August 6-22. Quite common, especially at light.

102. *Feltia herilis* Grt.—Mackinac; August 9-10. Several specimens at light.

103. *Agrotis geniculata* G. & R.—Mackinac; August 8. One specimen at light.

104. *Agrotis ypsilon* Rott.—Mackinac; July 7-23. Several at sugar.

105. *Agrotis c-nigrum* Linn.—Schoolcraft, Mackinac; September 1-October 3. Common.

106. *Agrotis* ~~*bicaudata* Gn.~~ ^{*trialis* Grt.}—Mackinac; July 19. One at light.

107. *Agrotis baja* Fabr.—Schoolcraft; August 19. One at light.

108. *Agrotis unimacula* Morr.—Mackinac; July 23. Two specimens at sugar.

109. *Agrotis unicolor* Wlk.—Marquette; July 10. One only.

110. *Epipsilia littoralis* Pack.—Mackinac; June 22. One specimen at light.

111. *Lycophotia nigra* Sm.—Mackinac; July 23. Four females at sugar.

112. *Lycophotia occulta* Linn.—Mackinac; June 30-August 16. Three specimens.

113. *Lycophotia margaritosa* Haw.—Mackinac; July 9-October 5. Several specimens of both the typical form and the form *saucia* Hbn. taken at light and reared from larvae.

114. *Rynchagrotis alternata* Grt.—Mackinac; July 18. One specimen taken at light.

115. *Rynchagrotis anchocelioides* Gn.—Schoolcraft; August 18. One specimen at light.

116. *Euretagrotis sigmoides* Grt.—Mackinac; July 23. One specimen taken at sugar.

117. *Euretagrotis perattenta* Grt.—Mackinac, Marquette; June 28-July 23. Several taken at sugar and at light.

118. *Polia purpurissata* Grt.—Mackinac; August 14. One taken at sugar.
119. *Polia adjuncta* Bdv.—Mackinac. One specimen reared from larva.
120. *Polia renigera* Steph.—Mackinac; July 19-August 16. Quite common at light.
121. *Chabuata signata* Wlk.—Mackinac; June 28-August 16. Not uncommon at light.
122. *Nephelodes emmedonia* Cram.—Schoolcraft, Mackinac; August 25-September 11. Quite common at light.
123. *Cirphis commoides* Gn.—Mackinac; July 2-12. Two only.
124. *Cirphis phragmatidicola* Gn.—Mackinac; May 22-July 23. Two specimens, one taken at sugar.
125. *Cirphis unipuncta* Haw.—Mackinac; May 24-October 3. Very common.
126. *Leucania luteopallens* Sm.—Mackinac; June 28-August 4. Quite common at light.
127. *Cucullia intermedia* Speyer.—Mackinac; June 11. One only.
128. *Oncocnemis riparia* Morr.—Schoolcraft; October 13. One at light.
129. *Graptolitha amanda* Sm.—Mackinac; September 10. Only one specimen.
130. *Graptolitha georgii* Grt., var. *holocinerea* Sm.—Mackinac; September 9-October 21. Two only.
131. *Xylena nupera* Lint.—Mackinac. One reared from larva.
132. *Xylena curvimacula* Morr.—Mackinac; September 18. Only one specimen.
133. *Parastichtis bicolorago* Gn., ^{form} var. *ferrugineoides* Gn.—Mackinac; August 27-September 25. Two only.

134. *Xanthia lutea* Strom.—Mackinac, Charlevoix; September 14-October 18. Three specimens.
135. *Septis arctica* Bdv.—Schoolcraft, Mackinac; July 12-31. Four specimens.
136. *Trachea mactata* Gn.—Mackinac; September 24. Only one specimen.
137. *Trachea modica* Gn.—Mackinac; July 16. One only.
138. *Euplexia lucipara* Linn.—Mackinac; July 12. One taken at sugar.
139. *Agroperina dubitans* Wlk.—Mackinac; July 19-August 30. Very common at light.
140. *Agroperina lateritia* Hufn.—Mackinac; June 27-July 24. Several specimens.
141. *Sidema devastator* Brace.—Mackinac, Charlevoix; July 12-August 21. Common at both light and sugar.
142. *Chutapha periculosa* Gn., form *v-brunneum* Grt.—Mackinac; July 12. One at sugar.
143. *Acronycta superans* Gn.—Mackinac; June 15. Only one specimen.
144. *Acronycta grisea* Wlk.—Mackinac; June 16. One only.
145. *Acronycta spinigera* Gn.—Mackinac. One specimen reared from larva.
146. *Acronycta innotata* Gn.—Mackinac, Marquette; June 16-July 23. Four specimens.
147. *Acronycta dactylina* Grt.—Mackinac; August 15. Only one specimen.
148. *Hyppa xylinoides* Gn.—Mackinac; September 22. One specimen taken at sugar.
149. *Balsa malana* Fitch.—Cheboygan; August 19. One specimen taken at light.
150. *Apamea nictitans* Linn., var. *americana* Speyer.—Mackinac; August 6-16. Three at light.

151. *Pyrrhia umbra* Hufn.—Mackinac, Charlevoix, Marquette; July 11-12. Three specimens.
152. *Papaipema cataphracta* Grt.—Mackinac; September 21. One specimen taken at light.
153. *Ogdoconta cinereola* Gn.—Mackinac; July 12. One specimen taken at sugar.
154. *Lithacodia carneola* Gn.—Mackinac; July 14-August 10. Several specimens taken at light.
155. *Catocala antinympha* Hbn.—Charlevoix; July 31. One specimen taken at light.
156. *Catocala coelebs* Grt.—Mackinac. One reared from larva. Believed to be the first record of this species for Michigan.
157. *Catocala relictta* Wlk.—Mackinac, Emmet; August 14-September 9. Both the typical form and the form *clara* Beut. are common.
158. *Catocala parta* Gn.—Emmet; August 15. One only.
159. *Catocala briseis* Edw.—Mackinac, Gogebic, Charlevoix, Marquette; July 15-September 22. Common.
160. *Catocala unijuga* Wlk.—Schoolcraft, Mackinac, Charlevoix; July 19-September 18. Common.
161. *Catocala semirelictta* Grt.—Mackinac; August 14-19. Three specimens. No previous record for Michigan.
162. *Catocala concumbens* Wlk.—Mackinac; August 14-19. Three specimens taken at sugar.
163. *Catocala ultronia* Hbn.—Mackinac; August 9. One specimen taken at light.
164. *Parallelia bistriaris* Hbn.—Schoolcraft, Mackinac; June 10-July 21. Two specimens.
165. *Euclidia cuspidata* Hbn.—Mackinac, Charlevoix; May 27-June 27. Very common.
166. *Caenurgia crassiuscula* Haw.—See next species.

167. *Caenurgia erechtea* Cram.—Schoolcraft, Mackinac, Charlevoix, Emmet, Cheboygan; May 12-September 28. Both this and the preceding species are common and occur together. The difference between them is so slight that their separation is very unsatisfactory. There is no doubt, however, that both species have been taken.

168. *Zale minerea* Gn.—Mackinac; June 13. One only.

169. *Autographa falcifera* Kirby, form *simplex* Gn.—Schoolcraft, Mackinac, Charlevoix, Emmet, Cheboygan; May 26-October 1. Very common. Some of the specimens approach closely to the typical form.

170. *Autographa brassicae* Riley.—Mackinac; June 29-October 3. Not common.

171. *Autographa precatationis* Gn.—Mackinac; August 3-9. Only two specimens.

172. *Autographa bimaculata* Steph.—Mackinac, Marquette; July 1-10. One specimen reared from larva.

173. *Autographa mappa* G. & R.—Mackinac; June 18. Only one specimen.

174. *Autographa ou* Gn.—Mackinac; June 29. One only.

175. *Plusia aereoides* Grt.—Mackinac; July 19. One specimen taken at light.

176. *Drasteria graphica* Hbn.—Schoolcraft, Mackinac; May 30-June 18. Common in restricted localities.

177. *Syneda adumbrata* Behr. (?).—Mackinac; June 15-27. Two specimens. The determination of this species is not satisfactory, being based wholly upon Holland's plate. The specimen is very different from *graphica*.

178. *Scoliopteryx libatrix* Linn.—Mackinac, Emmet, Marquette; July 19-September 3. Three specimens.

179. *Alabama argillacea* Hbn.—Mackinac; September 5-October 2. Very common. This moth was especially abun-

dant in the vicinity of Naubinway, Mackinac County, in September, 1920. Hundreds were attracted to the lights, and on one morning thousands were seen on the surface of Lake Michigan. They appeared to lie in patches, often covering more than one hundred square yards in extent, and occurred as far as four miles from the shore.

180. *Epizeuxis aemula* Hbn.—Marquette; July 10.

181. *Epizeuxis lubricalis* Geyer.—Marquette; July 10.

182. *Zanclognatha lituralis* Hbn.—Mackinac; June 15.

183. *Zanclognatha theralis* Wlk.—Charlevoix; August 3.

184. *Zanclognatha inconspicualis* Grt.—Mackinac; June 21.

185. *Zanclognatha laevigata* Grt. (?).—Charlevoix; August 3. Specimen badly worn, so determination is somewhat doubtful.

186. *Renia flavipunctalis* Geyer.—Mackinac; August 6. One specimen taken at light.

187. *Phalaenophana pyramusalis* Wlk.—Charlevoix; June 22. Three specimens.

188. *Palthis angulalis* Hbn.—Mackinac, Charlevoix; June 8-July 28. Three specimens.

189. *Bomolocha deceptalis* Wlk.—Mackinac; July 12. One taken at sugar.

190. *Plathypena scabra* Fabr.—Mackinac, Charlevoix, Gogebic; June 15-August 29. Common.

NOTODONTIDAE

191. *Datana ministra* Dru.—Mackinac; June 30. One specimen taken at light. Larvae which appear to be those of this moth are quite common, but adults are seldom seen.

192. *Heterocampa manteo* Dbldy.—Mackinac, Charlevoix; July 21-August 12. Three specimens.

193. *Schizura unicornis* A. & S.—Mackinac; June 16. Only one specimen.

194. *Gluphisia septentrionalis* Wlk.—Mackinac; July 2-August 10. Several at light.

THYATIRIDAE

195. *Habrosyne scripta* Gosse.—Mackinac; July 23. Several at sugar.

196. *Habrosyne rectangulata* Ottol.—Charlevoix. One specimen from pupa. Determined only by comparison with plate of Barnes and McDunnough.

197. *Pseudothyatira cymatophoroides* Gn.—Mackinac; June 18-July 12. Two specimens of the typical form and one of the form *expultrix* Grt. taken at sugar.

LYMANTRIDAE

198. *Notolophus antiqua* Linn.—Mackinac, Emmet; July 16-September 24. Common. Most of the specimens at hand were reared from larvae.

LASIOCAMPIDAE

199. *Malacosoma americana* Fabr.—Mackinac; July 12-18. Common. Two specimens reared from larvae, others from pupae.

200. *Epicnaptera americana* Harris.—Mackinac; June 5. One only.

DREPANIDAE

201. *Drepana arcuata* Wlk.—Mackinac; June 19-August 15. Several specimens.

202. *Drepana bilineata* Pack.—Cheboygan; May 10. One taken at light.

GEOMETRIDAE

203. *Alsophila pometaria* Harris.—Mackinac; November 2. Several males taken flying in a snow storm.
204. *Nemoria mimosaria* Gn.—Schoolcraft; June 10. One male.
205. *Synchlora aerata* Fabr.—Mackinac; August 9-16. Several specimens taken at light.
206. *Mesothea incertata* Wlk.—Schoolcraft, Charlevoix; May 30-June 10.
207. *Acidalia emuleata* Gn.—Mackinac; June 23-July 19.
208. *Haematopis grataria* Fabr.—Mackinac, Cheboygan; August 19-September 6. Common.
209. *Trichodesia albovittata* Gn.—Charlevoix, Marquette; May 26-July 12. Quite common on Garden Island in heavy maple woods.
210. *Lobophora montanata* Pack.—Schoolcraft, Mackinac; May 30-June 18. Two specimens.
211. *Triphosa affirmaria* Wlk.—Mackinac; September 14. Three specimens.
212. *Calocalpe undulata* Linn.—Mackinac; June 10. Four specimens.
213. *Lygris diversilineata* Hbn.—Schoolcraft, Mackinac; July 25-September 1. Frequent at light.
214. *Lygris testata* Linn.—Mackinac; July 19. One only.
215. *Dystroma hersiliata* Gn.—Charlevoix; July 28.
216. *Hydriomena coeruleata* Fabr.—Mackinac, Charlevoix; June 25-July 8. Common.
217. *Xanthorhoe lacustrata* Gn.—Mackinac; July 19. Taken at light.
218. *Xanthorhoe designata* Hufn.—Charlevoix; June 1.
219. *Xanthorhoe ferrugata* Clerk. — Mackinac, Emmet, June 9-20. Two specimens.

220. *Orthonama obstipata* Fabr.—Mackinac; June 17-September 20. Several taken at light.
221. *Spargania magnoliata* Gn.—Mackinac, Marquette; July 1-15. Two specimens.
222. *Euphyia centrostrigaria* Woll.—Mackinac, Charlevoix; June 4-22. Two specimens.
223. *Mesoleuca ruficillata* Gn.—Mackinac, Charlevoix; June 11-24.
224. *Eulype hastata* Linn.—Mackinac, Charlevoix, Marquette; May 17-July 29. Very common.
225. *Hydrelia lucata* Gn.—Mackinac; June 15. One only.
226. *Eudule mendica* Wlk.—Mackinac, Charlevoix, Marquette; June 16-July 28. Quite common.
227. *Eupithecia miserulata* Grt. (?).—Mackinac; May 25-September 26. Determination not certain.
228. *Isturgia truncataria* Wlk.—Schoolcraft, Mackinac; May 19-June 10. Quite common in dry, sandy woods.
229. *Isturgia amitaria* Gn.—Emmet; May 28. Two specimens.
230. *Bapta semiclarata* Wlk.—Mackinac, Charlevoix; May 26-June 23. Common.
231. *Physostegania pustularia* Gn.—Schoolcraft, Mackinac, Marquette; August 1-25. Quite common.
232. *Cabera variolaria* Gn.—Schoolcraft, Mackinac, Charlevoix; June 10-September 24. Common.
233. *Philobia aemulataria* Wlk.—Mackinac, Charlevoix; June 11-28.
234. *Macaria granitata* Gn.—Mackinac, Charlevoix; May 27-July 30. Common.
235. *Phasiane neptaria* Gn., var. *trifasciata* Pack.—Charlevoix; June 8-July 29. Two specimens.
236. *Phasiane atrofasciata* Pack.—Mackinac; June 27. Only

one specimen. There is some doubt in this determination. The specimen may be *excurvata* Pack.

237. *Phasiane cremiata* Gn.—Charlevoix; July 26. One only.
238. *Itame brunneata* Thun.—Mackinac, Marquette, June 18-July 14. Not uncommon.
239. *Apaecasia subaequaria* Wlk.—Mackinac, Charlevoix; May 27-June 29. Common.
240. *Catopyrrha coloraria* Fabr.—Schoolcraft; July 16.
241. *Caripecta divisata* Wlk.—Mackinac, Charlevoix, Marquette. Four specimens.
242. *Nepytia semiclusaria* Wlk.—Mackinac; September 7.
243. *Cleora larvaria* Gn.—Mackinac; June 15. One only.
244. *Ectropis crepuscularia* D. & S.—Mackinac, Charlevoix; May 29-August 3. Quite common.
245. *Erannis tiliaria* Harris.—Mackinac; October 5-19.
246. *Cingilia catenaria* Dru.—Schoolcraft; September 25.
247. *Anagoga pulveraria* Linn.—Mackinac; July 17.
248. *Ellopiia fiscellaria* Gn.—Schoolcraft, Mackinac, Charlevoix, Emmet; May 27-September 22. Common.
249. *Campaea perlata* Gn.—Schoolcraft, Marquette; July 10-August 20. Several specimens.
250. *Ennomos subsignarius* Hbn.—Schoolcraft, Mackinac, Charlevoix, Marquette; July 13-August 27.
251. *Ennomos magnarius* Gn.—Mackinac; August 29. One only.
252. *Xanthotype crocataria* Fabr.—Schoolcraft, Mackinac, Charlevoix; June 18-July 23. Common.
253. *Hyperetis amicaria* H. S.—Mackinac, Charlevoix; May 26-June 16.
254. *Gonodontis hypocharia* H. S.—Charlevoix; June 24. One female.

255. *Gonodontis duaria* Gn.—Schoolcraft, Mackinac, Charlevoix; June 10-July 5. Not common.
256. *Euchlaena johnsonaria* Fitch.—Mackinac; August 14.
257. *Euchlaena pectinaria* D. & S.—Mackinac; May 31. One specimen, so badly worn that the determination is a little doubtful.
258. *Mctanema inatomaria* Gn.—Mackinac; June 15-24.
259. *Tetracis crocallata* Gn.—Mackinac; May 30-June 23.
260. *Sabulodes lorata* Grt.—Charlevoix; June 22. One only.
261. *Sabulodes transversata* Dru.—Mackinac; August 14-September 24. Several specimens.

LIMACODIDAE

262. *Prolimacodes badia* Hbn.—Mackinac; July 19. One specimen taken at light.

PYRALIDAE

263. *Diaphania hyalinata* Linn.—Mackinac; October 2. One specimen taken at light.
264. *Evergestis straminealis* Hbn.—Schoolcraft, Mackinac; June 12-September 7. Quite common at light.
265. *Loxostege chortalis* Grt.—Mackinac; May 31. One only.
266. *Pyrausta fodinalis* Led.—Mackinac, Charlevoix; June 28-August 30. Several specimens.
267. *Pyrausta ochosalis* Dyar.—Mackinac; June 15-July 25. Two specimens.
268. *Pyrausta funebris* Strom.—Mackinac, Charlevoix; June 10-25. Quite common.
269. *Nymphula badiusalis* Wlk.—Cheboygan; August 19. Very abundant at light on one night.

270. *Pyralis farinalis* Linn.—Mackinac; June 13-30. Two specimens taken at light.

271. *Crambus pascuellus* Linn.—Charlevoix; July 21. One taken at light.

272. *Crambus leachellus* Zinck.—Mackinac; August 21. Only one specimen.

273. *Crambus unistriatellus* Pack.—Mackinac; July 3-19.

274. *Crambus dumetellus* Hbn.—Mackinac; June 8-13.

275. *Crambus hortuellus* Hbn.—Mackinac; June 15.

276. *Crambus vulgivagellus* Clem.—Mackinac; August 30. One specimen taken at light.

277. *Crambus ruricolellus* Zell.—Cheboygan; August 19. Taken only at light.

278. *Crambus trisectus* Wlk.—Cheboygan; August 19.

279. *Crambus inornatellus* Wlk.—Mackinac, Emmet; July 4-August 23. The most common Crambid of the region.

AEGERIIDAE

280. *Bembecia marginata* Harris.—Marquette, Gogebic; July 13-28.

EUCOSMIDAE

281. *Argyroploce bipartitana* Clem.—Mackinac; June 28.

TORTRICIDAE

282. *Sparganothis flavedana* Clem.—Mackinac; June 30. Taken at light.

283. *Cacoecia cerasivorana* Fitch.—Mackinac; July 7-25. Two specimens.