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PART I, MACROLEPIDOPTERA

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INTRODUCTION

The Historical Aspect

On May 2, 1864, the first paper dealing exclusively with the lepidopterous fauna of Nova Scotia was read before the Nova Scotian Institute of Natural Science, by Thomas Belt. It was an annotated list of thirty species of butterflies observed by that author in the vicinity of Halifax during 1862 and 1863. This was followed in relatively quick succession by seven other papers, most of them dealing solely with the Lepidoptera of this area. The last of these appeared in 1915—thirty-eight years ago, so ample time has elapsed to justify the writing of another, incorporating the wealth of information since accumulated, together with the inevitable changes in nomenclature that occur during so long a period.

The following are the eight previously published papers, in chronological sequence:

- BELT, THOMAS.** List of Butterflies observed in the Neighbourhood of Halifax, Nova Scotia. *Trans. N. S. Inst. Sc.*, Vol. I, pt. 2, pp. 87-92, 1864. (Thirty species mentioned).
- BETHUNE, REV. CHARLES J. S.** Nova Scotian Lepidoptera, with Additional Notes by J. MATTHEW JONES. *Ib.*, Vol. II, pt. 3, pp. 78-87, 1869 (seventy-nine species mentioned, seven of which are butterflies).
- JONES, J. MATTHEW.** Review of Nova Scotian Diurnal Lepidoptera. *Ib.*, Vol. III, pp. 18-27, 100-103, 1871-72 (thirty-five species mentioned).

- SILVER, ARTHUR P. List of Nova Scotian Butterflies. *Ib.*, Vol. VII, pp. 86-88, 1888 (forty-six species listed, without further data).
- BETHUNE, REV. CHARLES J. S. Butterflies of the Eastern Provinces of Canada. 25th Annual Report of the Entomological Society of Ontario, pp. 29-44, 1894 (about forty species mentioned as occurring in N. S.).
- EATON, MISS LUCY C. The Butterflies of Truro, N. S., with Remarks by HARRY PIERS Regarding a Few of the Species Mentioned. *Trans. N. S. Inst. Sc.*, Vol. IX, pp. XVII-XXI, 1895 (twenty-six species mentioned).
- PERRIN, JOSEPH and RUSSELL, JOHN. Catalogue of Butterflies and Moths Collected in the Neighbourhood of Halifax and Digby, Nova Scotia. *Ib.*, Vol. XII, pt. 3, pp. 258-290, 1909 (fifty-three species of butterflies and four hundred and eighty moths, including *Microlepidoptera*, mentioned).
- PERRIN, JOSEPH. Additions to the above catalogue. *Ib.*, Vol. XIV, pt. I, pp. 49-56, 1915 (about sixty two additional species mentioned, including *Microlepidoptera*).

Little is known about the work of most of these earlier collectors apart from what their published papers disclose.

Miss Lucy C. Eaton made a general collection of insects at Truro sometime during the final decade of the last century. This collection gathered dust and was largely destroyed by *Dermestes* beetles before the author had the opportunity of going over it several years ago. It contained little in the way of interesting records.

A Lieut. Redman evidently collected in Nova Scotia sometime before 1862, and from his material Francis Walker, of the British Museum, described a number of new species, the types of which were deposited in the collections of that institution. The exact locality where these specimens originated is not known, but they might have come from the vicinity of Halifax.

Andrew Downs (1811-1892), probably the most eminent Nova Scotian naturalist of his day, made a small collection of insects near Halifax, but like the Eaton collection, this was largely destroyed. The specimens had no data labels. Mention is made, however, of a few interesting Downs records that seemed likely to be authentic.

Some interesting captures were made at Sydney, N. S. around 1900 by Miss Margaret Brown, a botanist and specialist in mosses, now of Halifax. These records are acknowledged in the text.

The late Mr. E. Chesley Allen, another well known Nova Scotian naturalist, specialized in Crambinae, but also collected a few Macrolepidoptera at Deerfield, Yarmouth Co. almost 40 years ago.

The numerous references to MacNab's Island, at the mouth of Halifax Harbour, are based on the small but neatly kept collection made there by the late Mr. Joseph Perrin, chiefly between 1900 and 1933. His material is now incorporated in the collection of the Nova Scotia Museum of Science. A perhaps even greater contribution in number of interesting records has been made by Mr. John Russell of Digby, who is responsible for nearly all the records from that locality. A good part of his material is now in the Nova Scotia Museum of Science and the Canadian National Collection, and has been examined by the author.

Another amateur lepidopterist of importance was the late Mr. H. G. Payne, former Provincial Apiarist, who collected most of the specimens recorded from Truro and part of those from Granville Ferry, Annapolis County, over a long period during the first half of the century.

An extensive survey of Lepidoptera was carried out in Nova Scotia from 1934 to 1946 by Dr. J. McDunnough, accompanied some seasons by Dr. T. N. Freeman of Ottawa. The main collecting stations were at White Point Beach, Queen's County, Petite Riviere, Lunenburg County, South Milford, Annapolis County, Parrsboro, Cumberland County and Baddeck, Victoria County. A list of the species of Lepidoptera from Nova Scotia in the Canadian National Collection, Dominion Department of Agriculture, Ottawa, with accompanying data, was kindly furnished the author several years ago, and it proved immensely valuable in extending the known ranges of numerous species within the Province.

Mr. T. Keilor Bentley of Halifax, friend and companion of the author's earliest collecting years, studied Lepidoptera enthusiastically around Halifax and Springhill from about 1941 to 1945, and a few of his records have been used.

Others whose work has contributed to the compilation of data are: the late Mr. C. B. Hills, who collected in the early twenties (all Stellarton records); Mr. Harold T. Stultz and the late Mr. F. C. Gilliatt, both entomologists of the Dominion Department of Agriculture (nearly all Round Hill and Annapolis Royal records prior to 1941); the late Mr. G. E. Sanders, who collected most of the Bridgetown records; the late Mr. J. Reddin (collected at Armdale from about 1918 to 1923); and the late Mr. Arthur D. Hall (collected moths at Chignecto and Fenwick, Cumberland County and Great Village, Colchester County between 1938 and 1949).

The present writer has collected very extensively in Halifax County during the past eleven years, and in addition has made numerous and often repeated collecting trips to localities elsewhere in the province, the most important of these being: Mount Uniacke (border of Hants and Halifax counties), Wolfville, Aldershot, Centreville, Coldbrook, Aylesford and Auburn, King's County, Lawrencetown, Lequille and Annapolis Royal, Annapolis County, Acaciaville, in the Acacia Valley, Digby County, Lake Kejimukujik, Queen's County, Parrsboro and Glenville (near Springhill), Cumberland County, Bass River and Londonderry Mines, Colchester County, Three Brooks (six miles west of Pictou on Route 6), Pictou County, and Baddeck, Victoria County. Much additional collecting, particularly of diurnals, has of course been carried on to a lesser extent in numerous other localities. It can now safely be said that the fauna of certain portions of Nova Scotia is reasonably well known. Central Halifax County to Mount Uniacke, and thence through the Cornwallis and Annapolis Valleys to Digby is one section relatively well worked. Much material has also been collected in Colchester County between Truro and Great Village, in central Cumber-

land County, Pictou County and central Cape Breton. The working up of other areas has been rather sketchy. Four outstanding areas still relatively uninvestigated are: (1) The extreme southern end of the province between White Point Beach and Yarmouth, (2) The triangular peninsula that juts southwestward between Chignecto Bay and Minas Channel, (3) Guysborough County, (4) The barren plateaus of Cape Breton Highlands National Park.

Geography

Nova Scotia, occupying about the same extremities of latitude as the states of Maine and Oregon, is the most easterly portion of North America in which the lepidopterous fauna has been extensively studied. It is, at the present time, the eastern-most state or province in which there lives a resident lepidopterist.

In no part of Nova Scotia is it possible to get much farther than thirty miles from salt water, or one thousand four hundred feet above sea level, a situation that has an influential bearing on climatic conditions. The climate is truly temperate. In the coastal areas especially, the temperature rarely exceeds 90° F. or goes below 0° F. In the Halifax area the temperature rests between 20° and 30° during most of the winter, and frequently climbs well above freezing point, especially during the day. Normally it drops to sub-zero values on only two or three occasions during the winter. In July and August the normal daytime temperature is in the seventies, dropping at night to the fifties. Spring frosts rarely cease before May, or autumn ones begin before mid-October. Inland temperatures, in the areas not immediately adjacent to salt water, tend to be slightly more extreme.

The province receives a generous amount of precipitation, mostly in the form of rain, and normally eighteen to twenty-four inches fall between April and September inclusive. The

summers vary greatly, however, in the periods of continued drought or rainy weather that may occur. Fog is another important aspect of the Nova Scotian climate. The southern coastal area is most heavily affected, with up to ninety foggy days per year. This decreases inland and northward to the Northumberland Straight region, which gets by with as few as ten foggy days annually.

The peninsula is all but cut off from neighbouring New Brunswick by Northumberland Straight to the north, and the Bay of Fundy to the south. It is joined only by the narrow Isthmus of Chignecto which, as a bridge with the mainland, is probably not highly functional as far as many insect species are concerned, since it is essentially an open, marshy prairie, cut by numerous muddy, tidal creeks.

Geological and Botanical Influences

Nova Scotia is about equally divided between hard and soft rock areas. The southern half, excluding the Annapolis Valley region, is mainly granite, slate and quartzite. Northward, from the Isthmus of Chignecto to Cape Breton, it is essentially a confusing picture of jumbled sedimentary and metamorphic formations, with only scattered granitic intrusions. The bulk of this northern strip is composed of Carboniferous sandstone, conglomerate and shale. The Annapolis Valley is a fifty mile trough, carved from a bed of much eroded and broken down Triassic sandstone. It is shielded from the Bay of Fundy by a long ridge of Triassic basalt and diabase, Cape Split and Digby Neck forming opposite extremities of this ridge. This same Annapolis Valley sandstone reappears on the north shore of Minas Basin and Cobequid Bay, between Truro and Economy.

Nova Scotia lies within that zone where the northern hardwood forest of eastern North America and the southern edge of the northern coniferous forest meet and intermingle.



Figure 1. Typical Canadian Zone forest near Centerville, Kings Co. The numerous species recorded from Centerville were taken at light and bait along this old wood road.

This is the so-called Acadian Forest Region. The dominant trees are white and red pine, hemlock, balsam fir, larch, white, red and black spruce, yellow, white and gray birch, poplar, red maple, sugar maple, beech, red oak, *Amelanchier*, and white and black ash. Elm is conspicuous in the fertile river valleys. In effect, Nova Scotia provides a mixture of Alleghenian, Canadian and Hudsonian flora growing in close association. It is a curious contrast to spend an evening on a fog-enshrouded headland, with the crashing of surf continuously in the background, collecting a variety of species that enables one to imagine that the locale is really somewhere in Labrador, and then on the following night journey to another collecting site, perhaps but a few miles distant, and, under a canopy of tall pines, encounter an entirely different moth fauna. Basswood, butternut and hickory have not penetrated the Acadian

forest region as far as Nova Scotia and white cedar, although common in New Brunswick, is all but absent.

The character of the lepidopterous fauna changes noticeably from one part of the province to another, and there is a temptation to sub-divide the area into several crudely defined zones. These zones coincide well with the geological divisions described above.

The southern region of granite and quartzite is a mixed zone of northern hardwoods and conifers. In general the forest is mixed, but almost pure stands of spruce, hemlock, pine, beech or oak may occur in suitable situations. The soil tends towards acidity, and there are abundant bogs and black spruce-larch swamps. Ericaceae grow in profusion wherever the forest has been cut or burned. Wherever the underlying rock is slate, rather than granite or quartzite, the deciduous portion of the forest tends to be somewhat more varied, with the appearance of *Corylus*, *Cornus*, *Crataegus* and ironwood. That part of Halifax County where extensive collecting has been carried on lies partly on granite and quartzite, and partly on slate.

The Annapolis Valley changes very little throughout the fifty miles of its length from Kentville to Annapolis Royal. The red sand provides excellent soil for red and white pine, but the magnificent forest that must once have filled much of the valley has been reduced to a few scattered second growth stands. With relation to the other areas, the vegetation of the Annapolis Valley is southern in character. Oak, ash, elm, hawthorn, witch hazel and sumach grow more commonly than in most other parts of Nova Scotia. In the central part of the valley there are miles of open sandy plain, carpeted with broom crowberry (*Corema conradii*) and sweet fern, and interrupted here and there by groves of pine, oak or scrubby *Betula populifolia*, aspen or willow. The main concentrations of oak and ash feeding species seem to occur in the Annapolis Valley region, especially in Annapolis County.

Pine feeders are also very prevalent there but in general these may occur about groves of white pine anywhere, whereas a few of the oak and ash feeding species actually seem limited to the lower Annapolis Valley.

The moth fauna in that portion of Colchester County between Truro and Great Village, occupying an extension of the Annapolis Valley Triassic sandstone, shows a decided affinity with the valley fauna, but also has conspicuous elements of its own rarely, if ever, occurring elsewhere in the province. *Acronicta vinnula*, *Homohadena badistriga*, *Fishea enthea*, *Abrostola urentis*, *Peridea basitriens*, *Heterocampa bilineata* and *Oporophtera bruceata* are characteristic species of that district (Truro, Debert, Glenholme, Great Village). Just what special relationship these species may have to the flora there is not well understood, although at least two of them feed on the elm.

The fauna occupying the Carboniferous areas of Cumberland and Pictou counties also shows noticeable differences from that occurring in other parts of the province, but whether this is due to a characteristic vegetation, or merely to position relative to the adjacent and similarly Carboniferous areas of New Brunswick, is still something that can only be guessed at. Both factors are probably involved. The presence in this area of *Boloria titania grandis*, *Semiothisa perplexa*, *Semiothisa bicolorata* and *Itame loricaria* does suggest the fauna of northern and eastern New Brunswick.

Cape Breton Island, by its separation from the rest of Nova Scotia by the Strait of Canso, is doubly isolated, and in some aspects the lepidopterous fauna differs accordingly. In its flora, much of the island closely resembles the rest of northern Nova Scotia, with spruce, fir and larch as the dominant conifers, and deciduous forests composed of birch, maple, aspen, beech and balsam poplar (not on the mainland). The mountains and plateaus of Cape Breton Highlands National Park support many distinctly northern plants rarely found



Figure 2. South side of Cape Smoky, Victoria Co., showing the characteristic ruggedness of the northern Cape Breton Island terrain.

elsewhere in this province, and this may indicate the presence of more truly boreal Lepidoptera than have so far been recorded; perhaps such species as *Anomogyna homogena*, *A. speciosa*, *A. sincera*, *Diarsia pseudorosaria*, *Syngrapha montana*, *Dysstroma truncata* and *Xanthorhoe algidata* will be found inhabiting the spruce forest atop French Mountain or North Mountain. Since the development of the National Park these localities have become somewhat more accessible than formerly, but have not yet received the entomological attention they deserve.

Habitats and Their Indigenous Species

These varied conditions provide a diversity of habitats for the insect fauna. Species like *Incisalia nippon*, *Panthea pallascens*, *Lapara bombycoides*, *Caripeta piniata* and *Lambdina*

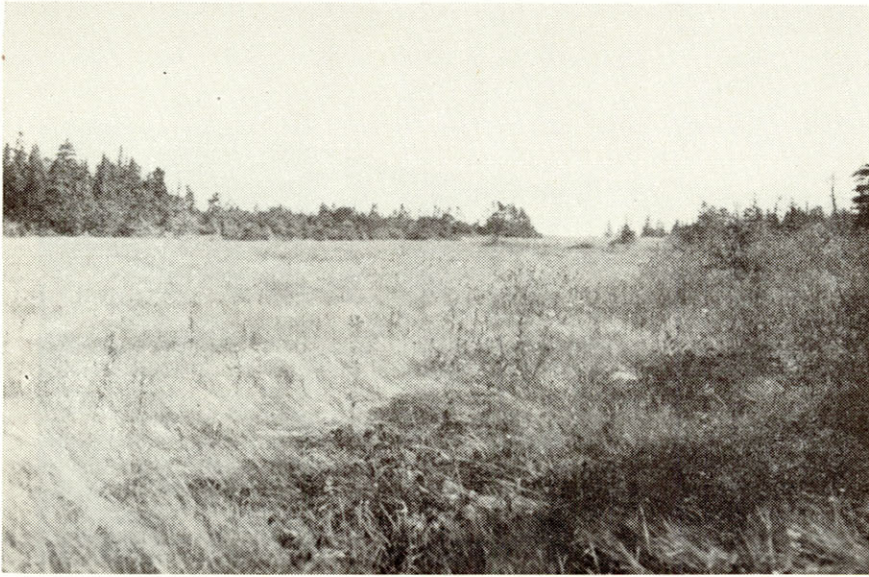


Figure 3. A grassy bog-meadow at 1400 feet, on the top of North Mountain, Inverness County.

athasaria, which inhabit the southern type of coniferous forest of pine and hemlock, do not normally extend northward into the forests of spruce and fir, except perhaps for a few which can transfer their attentions to *Pinus banksiana* in places where it grows. The spruce and fir woods have their own fauna that includes such species as *Panthea acronyctoides*, *Aplectoides condita*, *Anaplectoides pressus*, *Anomogyna perquiritata*, *Xanthorhoe abrasaria* and *Hydriomena frigidata*.

Oak woods, most noticeably around Annapolis, support a very characteristic group of species not quite duplicated under any other conditions. There are found *Erynnis juvenalis*, *Acronicta lithospila*, *Acronicta lobeliae*, *Lophodonta angulosa*, *Heterocampa umbrata* and *obliqua*, *Catocala ilia*, *connubialis* and *praeclara*.



Figure 4. Looking across the barrens between West Dover and Peggy's Cove, Halifax County. This area yielded many interesting species.

Nova Scotia has no truly alpine conditions, but the presence of many cold, damp sphagnum bogs, as well as exposed, barren headlands along the coast, partly compensates for this deficiency. This close to sea level it is only in such locations as these that one may still see the last straggling remnants of a Pleistocene fauna that at one time flourished over much of the continent. On the Mount Uniacke bogs, in association with reindeer moss, crowberry, cloudberry, Labrador tea and other plants of an Arctic-alpine nature, there exists a very local but seemingly strong colony of *Anomogyna imperita*, which otherwise occurs in the east only in Labrador, northern Quebec and the high mountains of the Appalachians, around timber line. On these and other bogs fly *Anarta cordigera*, a *Lastionycta* sp., *Syngrapha microgramma*, *Carsia paludata*, *Eulype subhastata*, *Eupithecia gelidata*, *Oeneis jutta*, *Lycæides argyrognomon*, and other distinctly northern

species. A stretch of boggy black spruce forest near Parrsboro constitutes the southern-most locality for *Boloria titania* east of the Rocky Mountains.



Figure 5. The bog habitat, near Mount Uniacke, of *Lycaeides empetri*, *Hemipachnobia Monochromatea*, *Carsia paludata* and many other species



Figure 6. Haunt of *Oeneis jutta* in the tangle of half dead black spruces, at the edge of the same bog shown above.

It is not at all likely that all species indigenous to bogs and barrens have been derived from an arctic or subarctic fauna. Some are typical Canadian zone species that feed upon larch, cranberry, *Vaccinium*, *Myrica gale*, or some other bog or swamp plant. Among these would fall *Incisalia augustus*, *Hemipachnobia monochromatea*, *Oligia minuscula*, *Graphiphora oblata* and *opacifrons*, *Papaipema appassionata*, *Catocala coelebs*, *Epiglaea apiata*, *Itame sulphurea*, *Semiothisa oweni* and *sexmaculata*, *Glena cognataria*, *Metarranthis obfirmaria*, *Isturgia truncataria* and *Eufidonia discospilata*.

Some of the distinctly northern species are not confined to the bogs and barrens at all, but rather to the spruce and fir forests. These include *Anomogyna perquiritata*, *Xanthorhoe abrasaria* and *munitata*, and possibly *Caradrina quadrangula* and *Entephria aurata*.

The sea-shore and salt marshes harbour species rarely or never straying very far inland, such as *Ommatostola lintneri*, *Hypocoena orphnina*, *Spartiniphaga inops*, *Doryodes bistrialis* and *Papilio brevicauda*. Fresh water marshes and cat-tail swamps provide habitats for many other specialized species like *Ancyloxypha numitor*, *Bombycia algens*, *Hillia iris*, *Macronoctua onusta*, *Oligia diversicolor*, *Archanara oblonga* and *Hypocoena inquinata*.

The most completely isolated locality within our area is Sable Island, a twenty mile strip of sand over one hundred miles south-east of Cape Canso. It is treeless and covered only with coarse grasses, *Juniperus*, beach pea and other sea-shore plants. I have seen specimens of only one species from there—*Ommatostola lintneri*.

Although availability of a certain food plant seems to be the usual environmental factor responsible for the presence of a species, there are a few conspicuous cases where this reasoning does not hold. *Papilio brevicauda bretonensis*, our own endemic representative of the perplexing *machaon*



Figure 7. Marsh habitat of *Bombycia algens*, *Hillia iris*, *Oligia diversicolor* and *Macronoctua onusta*, near Aylesford, Kings County

complex, feeds upon Scotch lovage (*Ligusticum scothicum*) and occasionally on certain other coarse Umbelliferae. These plants are widely distributed, the lovage all around the coast from Cape North to the Bay of Fundy, yet *brevicauda* seems entirely restricted to Cape Breton Island, and even there is known only from the northern half. The species is not isolated geographically, since the adults are strong flyers that could readily cross the narrow Strait of Canso. So here may be detected the action of an environmental factor apart from food plant requirements or isolation. If it is climate influencing the organisms directly, then *brevicauda* must require a set of conditions held between relatively narrow limits, since the climate of Cape Breton Island, especially in the coastal zone where *brevicauda* occurs, does not differ too greatly from that of the adjacent mainland where the species is missing.

It is not a local butterfly in the sense that its colonies occupy the same locations year after year, but is continually shifting. It tends to die out completely in certain localities after flourishing there for several years, and then reappear elsewhere. This may perhaps be attributed to a depletion of the food supply, which is usually quite limited anyway, and also to a local build-up of the parasite population, *brevicauda* being subjected in that area to the depredations of a large parasitic wasp, *Trogus vulpinus* Grav.

On the salt marshes near Bathurst, N. B. occur *Lycaena dorcas dos Passosi* and *Coenonympha inornata nipisiquit*, and although the same marsh conditions prevail in Nova Scotia, the butterflies are absent. *Incisalia lanoraiensis* feeds on black spruce in the bogs of Quebec, Maine and New Brunswick, yet under identical conditions in Nova Scotia it too seems absent.

In a fully glaciated peninsular area like Nova Scotia, one might theoretically expect a rather full complement of northern species, and any gaps in the fauna to be mainly among species of a more southern character that had just not managed to push their way in during the long postglacial period. In reality, the northern species *are* many, but just as many more that might readily occupy this region have failed to appear. Southern species are surprisingly well represented, and since these are chiefly confined to the southern section between the Atlantic and the Bay of Fundy, it looks as though their ancestors must have crossed many miles of open water to get there. Many species, of course, would readily do this, and therefore their presence is not quite as perplexing as the existence in the same area of various similarly southern plants. Perhaps at some period a variation in climate allowed an infiltration of these more southern forms through the Isthmus of Chignecto. Then, in succeeding generations, these populations may have found the extreme south-western corner of the peninsula most to their liking, taken up their abode there, and abandoned the northern isthmus and adjacent areas through which they entered. Evidence so far points out the following as members of a group that followed some such pattern:

<i>Celama triquetrana</i>	<i>Paectes oculatrix</i>
<i>Acronicta afflicta</i>	<i>Marathyssa inficita</i>
<i>Acronicta lobeliae</i>	<i>Pseudeva purpurigera</i>
<i>Leucania pseudargyria</i>	<i>Catocala coccinata</i>
<i>Adita chionanthi</i>	<i>Catocala connubialis</i>
<i>Morrisonia confusa</i>	<i>Catocala subnata</i>
<i>Psaphida grotei</i>	<i>Epizeuxis laurenti</i>
<i>Fagitana littera</i>	<i>Scopula cacuminaria</i>
<i>Cerma cora</i>	<i>Hydriomena transfigurata</i>
<i>Amoleta fessa</i>	<i>Semiothisa gnophosaria</i>
<i>Schinia nundina</i>	<i>Metarranthis lateritiaria</i>
<i>Cryphia pervertens</i>	<i>Plagodis kuetzingi</i>

Some of the more southern species that have turned up are, of course, those known to have strong migratory or at least wandering tendencies, like *Colias eurytheme*, *Eurema lisa*, *Herse cingulata*, *Pholus fasciatus*, *Pholus satellitia pandorus*, *Feltia annexa*, *Alabama argillacea* and *Camptogramma stellata*. Of these, only *pandorus* is known to have survived the winter here.

A few species are suggestive of the fauna of western North America, and in general are much more common and widespread there than in the east. These are mostly species of the northern spruce belt stretching from the Atlantic to the Pacific, and here in the east tend to extend their range southward near the coast in the Acadian forest region. I would refer the following species to this group:

<i>Boloria titania</i>	<i>Lygris destinata</i>
<i>Polygonia satyrus</i>	<i>Plemyria georgii</i>
<i>Plebeius saepiolus</i>	<i>Eupithecia nimbicolor</i>
<i>Euxoa tristicula</i>	<i>Eupithecia ravocostaliata</i>
<i>Diarsia pseudorosaria</i>	<i>Hydriomena furcata</i>
<i>Graphiphora oblata</i>	<i>Semiothisa perplexa</i>
<i>Polia ingravis</i>	<i>Itame andersoni</i>
<i>Septis plutonia</i>	<i>Hesperumia sulphuraria</i>
<i>Autographa flagellum</i>	<i>Selenia alciphearia</i>

A few, like *Apantesis williamsii* and *Dysstroma truncata*, are present in New Brunswick, but there is yet no evidence of their presence in Nova Scotia.

Europe has not contributed quite as much in Lepidoptera as in Coleoptera (For the Coleoptera, see W. J. Brown, Can. Ent., Vol. 82, pp. 197-205). *Oporophtera brumata* and *Thera juniperata*, both probably introduced accidentally, have become abundant. *Stilpnotia salicis* is also plentiful but seems to feed only on *Populus alba*. *Euproctis phaeorrhoea*, once a pest in the Annapolis Valley, is now very rare. *Lymantria dispar*, a serious pest introduced into New England, has not been reported from Nova Scotia.

A Note on Collecting Methods

A few comments on the various techniques found most useful for collecting moths in this region might prove interesting to the reader.

Bait. A variety of bait mixtures have been tried, all of them giving good results under the right conditions. The chief ingredients used were molasses, preferably blackstrap molasses, crude sugar, cooked apples, over-ripe bananas, fermented or otherwise spoiled jams and jellies. A mixture of molasses and mashed bananas, apples or other fruit, left to ferment in the sun for a day or so, has proven a highly satisfactory bait. The addition of ethyl alcohol, rum, stale beer or amyl acetate might help, but these do not seem to improve greatly upon the naturally fermented fruit. Patches of the bait mixture three or four inches square are applied with a small paint brush to tree trunks at dusk, and the moths collected with flashlight and cyanide jar after dark. Frequently moths just refuse to come to bait for no apparent reason. This situation varies with locality, and so far the underlying causes have defied comprehension. Certain areas nearly always provide good bait collecting, while others, differing in no obvious way, yield little or nothing.

Lights. The Coleman gasoline lantern is the standard light source used for the nocturnal collecting. These lanterns give brilliant illumination of up to five hundred candlepower

and, unlike electric lights, may be conveniently carried into the woods and set up at suitable collecting sites anywhere. The lantern is supported at a height of four or five feet on a specially made iron rod support driven into the ground. About two feet behind the lantern hangs a white sheet from a rope tied horizontally between two trees. On barrens where there are no trees, the sheet is simply spread on the ground and the lantern supported about two feet above it. Many of the moths eventually come to rest on the sheet after flying about the light for a while, and are then easily bottled. It is often practical to operate three or four sheets and lanterns simultaneously by setting them up at intervals along an old wood road or on a bog, and tramping back and forth from light to light during the course of the evening.

Moths are strongly influenced by changes in temperature. Many species, especially early spring and late fall ones, will fly freely on cool nights when the temperature is in the forties, but should it drop even four or five degrees below where the mercury stood when they began flying, they may cease activity entirely. In warmer weather it takes a drop of about ten degrees to influence them noticeably. A drop from 65° to 55° F. will result in most species disappearing for the remainder of the night. Many mid-summer species will not fly at all at temperatures below 50°F. if they are accustomed to warmer weather.

Humidity also has some bearing on their activity. Summer nights in this region tending to be cool, periods of drought frequently provide the best collecting. Moths seem able to sustain their activity during a greater drop in temperature if the atmosphere is dry. They fly actively all night in very dry weather. Very damp nights, even with fog or heavy rain, may provide excellent collecting if it remains warm, perhaps about 60° or 65°F., but a combination of extreme dampness, even locally, such as ground fog, and a lowering temperature, constitutes a condition that few species will

endure. Several lights differently situated can give striking evidence of this. A lantern placed in a bog on a still, cool night may attract absolutely nothing, while another situated on an adjacent hillside, perhaps forty or fifty feet higher, just above the layer of low lying damp air, provides very good collecting.

Moths do not come readily to light when there is a bright moon, and on a clear night when the moon is about full most of them will ignore a lantern altogether. During that part of the month when the moon is not visible in the evening, moths come to light commonly, sometimes even in swarms. It is probably just a matter of competition between the light of the moon and that of the Coleman lanterns.

The Net. Some species of moths have diurnal habits, and are best taken with a butterfly net. Such species as *Mesothea incertata*, *Eufidonia discospilata*, *Isturgia truncataria*, *Metarranthis obfirmaria*, *Bapta semiclarata*, *Eubaphe lamae* and *Syngrapha microgramma* are in this class. Many bog species are diurnal, perhaps because the cold, damp conditions prevailing at night inhibit nocturnal activity. This is one of the major ways in which bogs approximate arctic or alpine conditions.

Collecting larvae. In addition to the usual methods of sweeping and beating for larvae, another highly successful method was found, rather accidentally. This consists of searching the leaves and branches at night with a strong light. Many larvae hide during the day and feed at night; they are then conspicuous. This seems particularly true of the *Catocaline* species. At Lequille, Annapolis County it was possible, by nocturnal searching, to find scores of *Synedoida grandirena* caterpillars feeding on and crawling over *Hamamelis* bushes, where not one could be found during daylight hours. A similar situation was also found later at Lake Rossignol. Many species of larvae have been collected in this way.

Statistics

The present catalogue is based on over fifty thousand collected specimens of Macrolepidoptera. Of these, perhaps seventy-five per cent have been taken during the past eleven years by the author. It records the occurrence of sixty-eight species of butterflies, and about seven hundred and sixty-four species of moths, or a total of eight hundred and thirty-two distinct species, approximately sixteen per cent of the total number of species occurring in Canada and the United States. The Perrin and Russell catalogue, together with the additions, listed five hundred and three separate species, so the present work mentions the occurrence of three hundred and twenty-nine species not hitherto reported from Nova Scotia in a list of this kind, although scattered references to a very few of them have been made in descriptive and revisional papers of other authors. Of the species listed, there are fifty-seven, or less than seven per cent, that the writer has not personally encountered, but in most cases he has seen the specimens upon which the records are based, and can safely vouch for their authenticity.

SUMMARY

This is the ninth list or catalogue dealing entirely or in large part with the Lepidoptera of Nova Scotia, although the last one appeared thirty-eight years ago. Lepidopterists who have already made important contributions to a knowledge of the area are or were: J. H. McDunnough, Joseph Perrin, John Russell, H. G. Payne, and Arthur D. Hall.

The more central portions of Nova Scotia have received more attention from lepidopterists. A few extensive districts, more difficult of access, still remain relatively unexplored.

Peninsular and insular Nova Scotia has a truly temperate climate, with mild winters and abundant rainfall. The southern half of the province is mostly granite, quartzite and

slate, the northern half sandstone, shale and conglomerate. The flora is that of the Acadian forest region, a mingling of Alleghenian, Canadian and Hudsonian elements. The Annapolis Valley, parts of Colchester, Cumberland and Pictou counties and Cape Breton Island each have special combinations of lepidopterous species differing from those of the large hard rock area to the south. These local differences at least partly agree with the geological pattern.

Nova Scotia provides a variety of habitats; viz., southern oak-pine-hemlock woods, northern hardwood forest, northern spruce forest, sandy pine barrens, bogs, sea-shore barrens, salt marshes. As well as the expected Canadian zone species, a few surprisingly northern and southern ones are also present, also some reminiscent of the west.

Collecting moths with baits, lights (especially gasoline lanterns), nets and as larvae have all been successful under local conditions.

This catalogue, based on over fifty thousand specimens, reports eight hundred and thirty-two species, three hundred and twenty-nine more than were recorded in the last published list.

EXPLANATIONS

In general, the nomenclature and arrangement employed follows Dr. McDunnough's Check List of 1938. Important changes since brought about by revisions of groups and by various other taxonomic papers that have since appeared are, however, incorporated. In a few instances changes have been made to conform with my own views, more or less in anticipation of such changes being inevitable in the light of information not previously available. The individual species that have, since 1938, been described, resurrected or discovered but not yet described are inserted, on the basis of relationship, in what would seem to be their appropriate positions.

When a species has been taken repeatedly in many different localities, a generalized statement is made explaining its distribution, such as, "generally distributed". Otherwise the localities are separately listed. When a number of specimens have been taken, the earliest and latest dates of capture are given, and if a species has more than one generation a season, the earliest and latest dates are given for each brood.

All readily available information on larval food plants has been included, with the hope that this might make the work more useful to other lepidopterists. In cases where I have personally bred a species from the egg or larva, on a known plant, and can therefore fully vouch for the reliability of the information, this is clearly indicated. When the host plant information is based on the experience of others due acknowledgement is made or, if the early stages are more generally known, such expressions as "larva on spruce" are commonly employed. Definite statements are made only when there is virtually no doubt as to their reliability. Wherever there is even slight reason for doubt, it is clearly suggested by the wording.

Much time and effort has been spent on the determination of the species, and I feel that a fair degree of accuracy has been achieved. Nova Scotian material in some of the more difficult groups has been the subject of exhaustive study, which necessitated the making of numerous genitalic slides, repeated reference to what literature has been available, and the rearing of larvae when this has been possible. The work of identification, though satisfactorily terminated for the bulk of the species listed, still shows many points of weakness. This is inevitable in a group as large as the Lepidoptera, and especially so in an area as little known entomologically as the Maritimes. Those cases of the species being given only tentative determinations are usually due to one or more of the following factors:

- (1) The species being rare and poorly known, often involved in a difficult group, and insufficient material available for the ascertainment of its proper status (e.g., *Fishea*, *Mniotype*).

- (2) Species, although sometimes common enough, belonging to a very confusing genus. In many cases the larvae must be seen to make determination positive (e.g., *Datana*, *Cerura*, *Dasychira*).
- (3) Published literature unsatisfactory for determination purposes and the types unavailable.

ACKNOWLEDGEMENTS

To Dr. James H. McDunnough, who personally worked up, with painstaking thoroughness, the *Eupithecias*, *Hydriomenas* and *Euxoas* upon which my records are based, who has verified or refuted many of my own determinations and who has, during the past nine years, answered innumerable questions involving almost every group, I am profoundly grateful.

Sincere thanks are also due Drs. George P. Holland, T. N. Freeman and Eugene G. Munroe of the Unit of Systematic Entomology, Department of Agriculture, Ottawa for lending material from the Canadian National Collection and supplying photographs of the McDunnough and Freeman types collected in this area. I owe similar indebtedness to Mr. John G. Franclemont, formerly of the United States National Museum but now of the Department of Entomology, Cornell University, for his kindness in lending material for study, answering questions and rendering opinions on various problems in the *Phalaenidae*. Special acknowledgement must also go to Dr. Frederick H. Rindge of the American Museum of Natural History for the loan of material from that institution, thus also aiding the process of determination in certain Phalaenid genera, and to Mr. Laurence R. Rupert of Sardinia, New York, my congenial companion of several collecting trips in New England and the Maritimes, who has been a reliable source of much information, especially on taxonomy and larval habits of the Geometrid sub-family *Ennominae*. I must also thank Mr. Otto Buchholz, Roselle Park, New Jersey, who rendered valuable aid by straightening out our material in the very difficult *clarescens* group of the genus *Acrionicta* and assisted with the determinations in *Datana*, and Dr.

A. E. Brower, Augusta, Maine, whose knowledge of the fauna of Maine has been placed willingly at my disposal.

Without the valuable assistance provided, directly and indirectly, by these and other lepidopterists, my catalogue would surely have fallen far short of the mark in completeness and reliability.

Superfamily PAPILIONOIDEA

PAPILIONIDAE

Papilio L.

4 *P. ajax* L. (*P. polyzenes asterius* Cram.) Black Swallowtail.

The present distribution of the black swallowtail probably includes all of Nova Scotia. The species has been taken from Cape North, Ingonish and Baddeck, south to Digby, and in most of the intervening counties. In the north-west it occurs in Cumberland County, and flies very commonly just across the border near Sackville, N. B. June 17-August 31. Stragglers of the first brood are still flying when the second brood begins to appear about July 23 (Halifax and Kings counties). On Cape Breton Island only a small percentage of the pupae seem to emerge as a second brood, but on the mainland farther south late summer individuals are so numerous in some localities as to indicate that a full second brood appears. *Ajax* is apparently a very general feeder on Umbelliferae; larvae on *Ligusticum*, *Heracleum*, *Daucus*, Carroway and Parsley.

There is evidence suggesting that *P. ajax* is a relatively recent arrival in this area. The earliest known record was a specimen taken on MacNab's Island, August 15, 1925 (Perrin). The intensive collecting of diurnals carried on earlier in the century should certainly have yielded as conspicuous a butterfly as *ajax* had it been present. Since this is a butterfly of open field and meadows, it seems logical to think that it was originally confined to more southern or central portions of the continent, before the heavily timbered north-east was opened up by man.

5b *P. brevicauda bretonensis* McD. Plate I, Figure 1.

McDunnough, Can. Ent., Vol. 71, p. 153.

Ferguson, Lepidopterist's News, Vol. IV, p. 11.

This race of *brevicauda*, described from Kidston Island in the Bras d'Or Lakes opposite Baddeck, seems confined to the northern half of

Cape Breton Island. Quantities of larvae have been collected and reared from the type locality and several other spots on the shores of Baddeck Bay, Terre Noire, Inverness County, Dingwall and at Eel Cove on St. Ann Bay, Victoria County. Adults were found flying at Terre Noire, July 2 and 6, 1949, and near Cheticamp and Cap Rouge, July 3, 1949. Dr. McDunnough took a female on Kidston Island July 12, 1936. Of the several hundred larvae of *bretonensis* that have been collected, all were feeding on *Ligusticum scothicum* except a few from Dingwall, which were on another coarse Umbel, possibly *Coelopleurum*. Nearly all the larvae pupated by the first week of August, and none emerged as a second brood. Of over two hundred and fifteen larvae that I collected, all but two or three were of a pale green form with yellow spots, not so broadly banded with black nor bearing orange spots like most *ajax* larvae in this region. Apparently dark *brevicauda* larvae do occasionally appear. Although the ranges of the two species overlap in Cape Breton, and in some instances larvae of both have been found on the same clump of plants, there is no evidence of interbreeding.

This butterfly is to be looked for on Cape Breton Island wherever *Ligusticum* grows, but the populations fluctuate greatly from one season to another. It was evidently common in the Baddeck area in 1936 and 1938, yet repeated efforts to find it there between 1943 and 1948 failed entirely. Not till 1949 was its reoccurrence on Baddeck Bay noticed.

12 *P. cresphontes* Cram. Giant Swallowtail.

There is a single record of the occurrence of *cresphontes* in Nova Scotia, at Lakeview, near Windsor Junction, Halifax County, probably in August, 1901 (Miss Helen King). The specimen, in the collection of the Nova Scotia Museum of Science, is a very tattered male. Although its condition implies that it might actually have strayed here, the presence of railway sidings at Windsor Junction suggests another possibility. The larvae prefer Rutaceae, especially orange trees but are reported from many other plants, including prickly ash and Lombardy poplar.

15a *P. glaucus canadensis* R. & J. Northern Tiger Swallowtail.

This forest dwelling species occurs throughout Nova Scotia. It is our commonest *Papilio*. I have taken or observed it in numerous localities in almost every county from Digby north-eastward to Baddeck. Strictly single brooded, *canadensis* flies from May 24 to mid-July, with a peak of abundance around the middle of June. At Three Brooks, Pictou County and Lequille, Annapolis County I have seen it feeding in enormous numbers, mostly males, on lilac blossoms in country gardens. Bred from Larvae on cherry, apple, ash, poplar, willow and alder.

PIERIDAE

Colias Fabr.41 *C. eurytheme* Bdv. Orange Sulphur.

Sporadic in its occurrence and apparently unable to survive the winter. The population of *eurytheme* seems to depend for its annual replenishment on migrant females arriving from farther south in June and July, and some years these do not appear at all. Occasional large, and usually badly worn, females are seen in spring and early summer, and ova secured from one of these at Armdale, July 13, 1943 were reared and produced adults in August. Most captures of *eurytheme* have been made in Halifax County, where it has been seen northward to the Musquodoboit Valley. A few were seen around Annapolis Royal in 1946 and one was taken there September 12. Dates for late summer range from August 19 to October 16, suggesting more than one native generation. Larvae feed on clover and alfalfa.

As with *P. ajax*, there is evidence that *eurytheme* made its first appearance in Nova Scotia during this century. It remained unreported until September 4, 1910, when Joseph Perrin took a female on MacNab's Island. On September 12, 1913 he captured a male. Since then it has reoccurred many times about Halifax, sometimes outnumbering *C. philodice*.

42 *C. philodice* Godt. Clouded Sulphur.

Generally distributed, including Cape Breton, and very common. Two and possibly a partial third brood, May 15 - October 16 without a noticeable break, although steadily increasing in abundance towards the end of the summer. Stragglers seen some seasons as late as the first week of November. Only one or two white females of the spring brood taken, but up to twenty-five per cent of the late summer females may be of this form. The chief larval food is probably clover.

45a *C. interior laurentina* Scud. Pink-edged Sulphur.

Common in numerous localities from Barrington Passage to northern Cape Breton; no doubt present on suitable bogs and blueberry barrens throughout the area. June 11 - August 18. Single brooded. Host plant supposed to be *Vaccinium*. A few of the females, probably not more than ten per cent, are of the white form, and a higher percentage are intermediate between the white and yellow forms.

Laurentina, described from Cape Breton Island. (Scudder, Proc. Bost. Soc. Nat. Hist., XVIII, 189-190, 1876), differs from typical *interior* from north and west of the Great Lakes in its slightly smaller size and broader black border. The types, collected by Thaxter, were deposited in the Museum of Comparative Zoology, Cambridge, Mass.

Eurema Hbn.72 *E. lisa* Bvd. & LeC.

A rare migrant. MacNab's Island, August 24, 1904, September 1, 1912; Digby, August, 1904; Little Narrows, Baddeck, July 14, 1938 (T. N. Freeman); one seen in downtown Halifax, August, 1945 (Ferguson). Nearly all were of the pale form. Food plants; *Cassia*, *Amphicarpa*, clover.

Pieris Schrank83d *P. napi oleracea* Harr.

Seemingly diminishing in numbers and occupying only a part of its former range. Halifax, Fall River, Truro and Baddeck, June 2 - July 18; second generation "*cruciferarum*", July 21 - September. Not found in Halifax County since 1933, except for one worn male I took within the city limits near Armdale, September 12, 1942. Still common in the vicinity of Baddeck, especially along the road up Beinn Breagh. The only second brood specimens from there were taken August 4, 1950. Plentiful along the main road at Mount Thom, Pictou Co., June 16, 1953.

Mention is made of *napi* in all the earlier lists, indicating that it must have been quite common during the latter half of the last century. For example, in 1864, Thomas Belt wrote of the species, in listing the butterflies of the Halifax area: "Common. The first brood appears at the end of May; the second in July".

Larvae probably on *Dentaria* and other woodland Cruciferae.

86 *P. rapae* L. Cabbage Butterfly.

The earliest papers on Nova Scotian Lepidoptera, by Belt (1864) and Bethune (1869) make no mention of *Pieris rapae*. In 1870 J. M. Jones wrote of the species: "It was observed in Canada Proper some years ago, and has been making its way eastward rapidly, until about three years ago it first became known about Halifax." The Butterfly is now only too well known throughout Nova Scotia, and its feeding habits scarcely necessitate further mention. There are several broods flying from May 4 until October.

The Nova Scotia Museum of Science has three males of the rare yellow aberration "*novangliae*" of Scudder, all from MacNab's Island, June 7, 1923, June 7, 1924, June 24, 1927. Dr. J. A. Comstock figures a specimen on Plate 9 of the *Butterflies of California* from Smith's Cove, Digby County.

DANAIDAE

*Danaus Kluk*89 *D. plexippus* L. The Monarch

Halifax area, May 27—June 19, and August 18—October 24. Also seen in early November. Parrsboro, Truro, Gay's River, Vogler's Cove, White Point Beach, Digby, Annapolis, May 26 into June, and July 28—September 30. Normally only a scattering of individuals appear, even in late summer, when they are seen feeding on blooms of *Centaurea* or *Solidago*; but the following note on a relatively large flight was given me by Mr. J. Lynton Martin, now of the Nova Scotia Museum of Science staff, regarding the appearance of the species at Vogler's Cove, Lunenburg County, in 1949:

"A few specimens of *Anosia plexippus* L. appeared in the Vogler's Cove area in late August and early September. In the course of a day's collecting one would capture one to three specimens, seldom more. No noticeable increase in numbers was noted until September 25th when twenty-five specimens were taken from a small clump of fall flowering weeds (Goldenrod, Aster, etc.) within a few yards of the door of the laboratory. Thirty-two specimens were taken in the same place on the 26th, sixty specimens on the 27th, seventy-five specimens on the 28th, thirty-five specimens on the 29th and nine specimens on the 30th. We considered this an odd occurrence for Lunenburg County, since, as a rule, this species is fairly rare, the average collector seldom expecting to capture more than a half dozen specimens during the season".

Although there is no record of *plexippus* breeding here, larvae should be looked for on *Apocynum*. The common milkweed, *Asclepias syriaca*, is not indigenous to Nova Scotia.

SATYRIDAE

Lethe Hbn.96 *L. portlandia borealis* Clark. Pearly Eye.

Fall River and Miller's Lake, Hfx. County, Three Brooks, Pictou County Lake LaRose and South Milford, Annapolis County, Digby, Mount Uniacke. July 8-25. At Dorchester, N. B., as late as August 11. Never common. Usually occurs near moist, grassy places in woods and rests head downward on tree trunks. Larva on grasses.

106 *L. eurydice* Joh. Common Grass Nymph.

Common among the coarse grasses in marshy spots at Baddeck, near Pictou, East Hansford, Cumberland County, and other northern localities; scarcer southward. Occurs sparingly in suitable locations

in Halifax County to the border of Hants County. No records for farther south and only one for the Annapolis Valley region at Aylesford. July 6 - August 7. Larva probably on coarse marsh grasses.

Euptychia Hbn.

(103) *E. cymela* Cram. Little Wood Satyr.

Several taken at Dartmouth, probably in June, 1946 (David Gray). Apparently very local.

Minois Hbn.

117 *M. alope* Fabr. Wood Nymph, Grayling.

All of Nova Scotia seems to lie within a zone of transition between *alope*, or perhaps the coastal New England race *maritima* Edw., and race *nephele* Kby. This zone continues up the north-eastern coast of New Brunswick at least to Bathurst. The species is common about hay fields and grassy locations everywhere. At Annapolis, almost fifty per cent have the yellow band of *alope*, the rest are very dark *nephele*, or intermediate. In Pietou and Cumberland counties yellow banded specimens still form a conspicuous, though smaller, percentage of the population, but at Baddeck scarcely one in ten has a well defined yellow band. The assumption that this tendency towards yellow banded individuals decreases northward does not entirely hold, since they seemed plentiful at Bathurst, N. B., August 2, 3, 1949. Dates for Nova Scotia—July 9 - August 24, with a peak of abundance in late July. A few very worn specimens survive into September. Larva on grasses.

Oeneis Hbn.

130 *O. jutta ridingiana* Cherm. & Cherm. *Jutta* Arctic.

I first took *jutta* in 1946 on two bogs near Mount Uniacke, where it has since been observed annually. Otherwise seen only on French Mountain, Inverness County, despite extensive searching of other bogs. June 3-23. *Jutta* prefers little open sunny glades among the black spruces in wet locations bordering the bogs, and is exceedingly difficult to capture, alighting on lichen covered tree trunks, stumps, or on tangles of dead spruce branches. The best time to collect it is early morning when the butterflies are sunning themselves, but it is still too cool for much activity. The species is extremely local, by no means occurring in all suitable looking locations along the bog margins where one would expect it. Scudder reared it on lawn grass, but certain bog sedges or grasses constitute its favoured food under normal environmental conditions. Mr. D. J. Lennox successfully reared *jutta* on a species of cotton grass (*Eriophorum*) in New Hampshire.

The source and disposition of the material employed by Holland as a basis for his common name, the "Nova Scotian Arctic", remains a mystery.

NYMPHALIDAE

Speyeria Scud.

166a *S. cybele novascotiae* McD. Great Spangled Fritillary. Plate I, Figure 2.

McDunnough, Can. Ent., Vol. 67, pp. 18-19, 1935. Type locality: White Point Beach, Queens County.

This race is characterized by "a distinct encroachment of red-brown into the yellow submarginal band of the underside of the secondaries". In size it averages rather small. The earlier lepidopterists invariably confused it with *aphrodite*.

Generally distributed, but scarcer in Cape Breton, being greatly outnumbered there by *atlantis*. Very plentiful on the mainland and especially so in the southern countries, usually, like others of the genus, on flowers of *Centaurea*, *Aralia* and thistle. June 24 - September 10. *Speyeria* larvae are thought to feed on violets, but are notoriously hard to find. A full grown one found crawling on a sandy road at Aldershot, June 3, 1951, pupated without further feeding on June 7, and produced a male of this species on June 25.

167e *S. aphrodite winni* Gunder.

Generally scarcer and more local than the preceding species, but common around Parrsboro, Bridgewater, New Germany and Cherryfield, Lunenburg County, and Centreville, Kings County. Also from other localities in these counties, as well as Digby, Annapolis, Halifax, Colechester, Pietou, Antigonish, and at Baddeck, Victoria County and Lake Ainslie, Inverness County. Always commonest in rich, moist meadows of river valleys and intervals. July 17 - August 20.

171 *S. atlantis* Edw. Mountain Silver-spot

Usually the most plentiful *Speyeria* everywhere, even more general than *novascotiae* and similarly unrestricted in habitat. June 7 - September 7.

Boloria Moore

200a *B. selene atrocotalis* Huard. Pearl-bordered Fritillary.

Present in moist meadows and sheltered marshy areas throughout. Two broods: June 2 - July 25, and July 27 - September 4.

Two unusual variants were taken at Fall River, Halifax County by Perrin, June 14, 1904 and June 2, 1921. One of these has most of the spots in the median area and near the base fused together, forming a

broad black median band; the other is the reverse, with the marginal and submarginal spots fused forming a broad black border on the outer margin, and the median row of spots greatly exaggerated on the secondaries. Larva supposedly feeds on violets.

206b *B. tilania grandis* B. & McD. Plate I, Figures 3 and 4.

A small colony of this northern species still survives in a tract of boggy spruce forest near Parrsboro, on highway Route 9 to Advocate Harbour. Dr. McDunnough took a female on the West Bay Road, Parrsboro, August 23, 1943, and for a time it remained a mystery where this specimen came from. In early August, 1949, I located a flourishing colony in a belt of black spruce and jack pine forest between Dorchester and Sackville, N. B., and on August 12 of the same season took two males in a somewhat similar environment in the above mentioned area near Parrsboro. In New Brunswick the species flies at its best during the first week of August, feeding on blooms of *Solidago* and *Spiraea*. At Nordegg, Alta., Dr. McDunnough found a larva on willow, and also a pupa attached to a willow twig.

Euphydryas Scud.

217a *E. phaeton borealis* Cherm. Baltimore Checker-spot.

Rare and very local. Truro, Onslow and Londonderry Mines, Colchester County, Bedford, Fall River and Preston, Halifax County, Baddeck, Victoria County June 20 - August 12, mostly in mid-July. I took six in a meadow along a watercourse at Londonderry Mines, July 18, 1948, and one other specimen there July 18, 1950. It occurs along a narrow secondary road a mile or so in back of Baddeck (McDunnough and Freeman). Larva on *Chelone glabra*.

Melitea Fabr.

256a *M. harrisii albimontana* Avin. Harris' Checker-spot.

Local in suitable locations, never abundant. Taken from Digby and Queens counties northward and eastward to Baddeck. One brood, June 14 - July 19. Bred from hibernated larvae found on *Aster umbellatus* in late May and early June.

263 *M. nycteis* Dbldy. & Hew. The Silver Crescent.

Between June 22 and 28, 1934, Dr. McDunnough captured five specimens of *nycteis* along a roadside at South Milford, Annapolis County. I took four others at the very same place, June 27 and 28, 1951. Apparently no other records. Food plants: *Helianthus*, *Aster*.

Phyciodes Hbn.

265a *P. tharos arctica* dosP. The Pearl Crescent.

The description of this race from Newfoundland fits most of the Nova Scotian population almost equally well (see McDunnough, Can. Ent. Vol. 67, p. 211, 1935). Common everywhere, including Cheticamp, Cape North and Ingonish, Cape Breton, where they perhaps most closely approach typical *arctica*. June 12 - August 11, with sometimes a partial second generation in the fall; Three Brooks, Pictou County, Sept. 7; Wolfville, fresh specimens plentiful September 2, 1951. Colonies of the young larvae conspicuous on *Aster umbellatus* in late summer.

Polygonia Hbn.

285 *P. interrogationis* Fabr. Question Mark, Violet Tip.

MacNab's Island, Halifax, Armdale and Miller's Lake, Halifax County, Debert, Colchester County, Three Brooks, Pictou County, Baddeck, Digby. July 1 - August 22. Not common. A dwarfed second brood specimen (evidently) of this form with dark secondaries on September 10, 1945 at Halifax.

The autumn, hibernating form "*fabricii*" Edw., at Halifax, MacNab's Island, Armdale and Ragged Lake, Halifax County, Debert and Great Village, Colchester County, Digby, Wolfville. August 12 - September 26. Commoner than the summer form. Bred from larvae on *Humulus* at Wolfville, where they were almost in sufficient numbers to defoliate the vines, and on elm at Great Village.

287 *P. satyrus* Edw. Satyr Angle Wing.

Very rare, though like the other *Polygonias*, once considerably commoner than now. Digby, August 6-25, 1905-06, a good series; Armdale, April 20, 1920, May 18, 1943; Ragged Lake, Halifax County, July 24, 1922; Sydney, three specimens taken about 1900 (Miss M. Brown). Old specimens without date also seen from Windsor. Larvae on nettle in British Columbia.

288 *P. faunus* Edw. Green Comma.

Digby, Armdale, MacNab's Island, Fall River, Truro, Stellarton, Springhill Junction, August 9 - September 3, and April 4 - May 9. Most recently at Springhill Junction, Cumberland County, August 10, 1949. Food plants; birch, alder, willow, *Ribes*.

292 *P. gracilis* G. & R. Hoary Comma.

Truro, August 26, 1927 (in the Canadian National Collection), and Stellarton, no date (C. B. Hills). Rarest of the recorded *Polygonias*. It is moderately common near Bartibog, north-eastern New Brunswick in early August, where the butterflies may be found on flowers of *Solidago*, pearl everlasting, or sunning themselves on bare ground, in company with *faunus* and *progne*.

294 *P. progne* Cram. Gray Comma.

Certainly no longer common, as recorded by earlier collectors, but still the most generally distributed of our *Polygonias*, occurring in the counties of Digby, Annapolis, Halifax, Colchester, Cumberland and Victoria. July 12 - August 25, and April 14; also a specimen from Ragged Lake, near Halifax, dated February 8, 1918 (J. Redden). Food plants: *Ribes*, elm.

Nymphalis Kluk295 *N. j-album* Bdv. & LeC. Compton Tortoise Shell.

Halifax, MacNab's Island, Fall River, Yarmouth, Digby, Annapolis, Truro, Stellarton. August 10 - October 5, and April 18. In September, 1944 a specimen was seen hovering about an alder thicket at Armdale; the following April I saw a number flying in the woods in the same vicinity, and on September 5 of the same year a fine specimen flew in an open window at the Nova Scotia Museum of Science and now rests in the collection there. I have not seen *j-album* in Nova Scotia since. Food plants: white birch, willow.

297 *N. milberti* Godt. Milbert's Tortoise Shell.

Armdale and Preston, Halifax County, Truro, Debert, Glenholme, Annapolis Royal, Stellarton, Sydney. August 16 - October 18, and April 19 - May 14. Generally rare, though when encountered, a number are usually found together. J. Redden collected five at Armdale between August 22 and 27, 1923, and I took a series of five at Annapolis on roadside flowers, September 11, 1946, after having found a single specimen there almost a month earlier on August 16. In 1952 it occurred in abundance at Debert and Glenholme, Colchester County. Larva on nettle and possibly elm.

298 *N. antiopa* L. Mourning Cloak.

Scarce as an adult, although I have found the larval colonies on willow at Smith's Cove, Annapolis, Lake LaRose, Annapolis County, and Oxford, Cumberland County. Adults from the vicinity of Halifax, Fall River, Digby, Annapolis, Grand Pré and Truro. July 31 October 10, and hibernated specimens April 11 - June 3.

Vanessa Fabr.299 *V. atalanta* L. Red Admiral.

Halifax and vicinity, Digby, Annapolis, Truro, Parrsboro, Isle Haute, Southampton, Stellarton, Baddeck. May 15 - June 17, and July 18 - September 12. Scarcest of the three *Vanessas*. Larva on Urticaceae

300 *V. virginiensis* Dru. American Painted Lady.

Digby, White Point Beach, Stellarton, Halifax and vicinity. May 15, and July 27 - October 6. Common some seasons, though never in

such abundance as *cardui*. Like the latter, this species is very fond of the blossoms of knapweed (*Centaurea*) and thistle. Bred from a larva on cudweed (*Gnaphalium*), although the preferred food is supposed to be pearl everlasting (*Anaphalis*).

301 *V. cardui* L. Painted Lady.

Present some seasons in enormous numbers everywhere, and in other years absent. Tends to be absent, or very nearly so, for two or three successive years before reappearing. Worn specimens apparently arrive as migrants in the spring, and in such seasons as these appear, a large summer brood follows. May 24 - July 12, and the summer generation from July 31 - September 10. Larvae commonly on thistle, burdock and hollyhock, and in 1952 I found larvae in great numbers feeding on beach wormwood (*Artemisia stelleriana*), near Tabusintac, N. B.

Limenitis Fabr.

321 *L. arthemis* Dru. Banded Purple, White Admiral.

Generally distributed, including Cape Breton. June 18 - August 11. Single brooded. Frequently taken, but never in the enormous numbers encountered in the White Mountains or the Adirondacks. Most commonly as single individuals resting on the road, through wooded areas. Bred at Halifax from larvae on *Amelanchier* and *Populus*. At Jefferson, N. H. the hibernacula may be found quite commonly late in the fall on yellow birch, usually on branches overhanging streams.

325 *L. archippus* Cram. Viceroy.

Locally common in old fields, meadows and open, scrubby woods throughout, including Cape Breton Island. Two broods, June 24 - July 27, and August 12 - September 5. At Three Brooks, Pietou County, larvae were common on willow, scarcer on aspen.

LYCAENIDAE

Strymon Hbn.

373 *S. melinus* Hbn. Gray Hairstreak.

Digby, June 20, 1907; South Milford, Annapolis County, June 27, 1951; Coldbrook, Kings County, May 24, 1952; Armdale, July 23, 1923 (J. Redden); bred from a larva feeding on *Comptonia* at Petite Riviere, Lunenburg County in August, 1948. Both the South Milford and Coldbrook specimens were taken hovering over, or alighting upon, sweet fern. Rare. Larval food plants farther south include *Malva*, *Humulus*, *Polygonum*, *Cynoglossum*, *Crataegus*, *Hypericum* and garden beans. The name *humuli* Harris may be used in a racial sense for north-eastern specimens.

381 *S. acadica* Edw. Acadian Hairstreak.

Taken not uncommonly in and near a wet, shrubby meadow at Three Brooks, Pictou County. July 12 - August 22, 1942-47. Most were taken resting on the coarse marsh grasses or the low willows, although a few were found some distance from this spot, about shrubbery in old fields. Once seen feeding on thistles. Two more taken in a similar meadow near Southampton, Cumberland County, August 1, 1952. The larval food is willow.

387 *S. falacer* Godt. Banded Hairstreak.

South Milford, Annapolis County, July 10, 1938, a small female (McDunnough). The food plant in this region would probably be oak.

389a *S. liparops strigosa* Harr. Striped Hairstreak.

Four specimens only. Armdale, July, 1941 (on a bean plant in the garden); Yankeetown Road, Halifax County, July 24, 1952; Petite Riviere, August 13, 1936 (McDunnough); Three Brooks, Pictou County, July 27, 1943 (resting on willow). Recorded food plants include oak, willow, blueberry, *Amelanchier*, *Prunus* and *Rubus*.

Incisalia Scud.403 *I. augustinus* Westwood. Brown Elfin.

Locally common on bogs and heathy barrens throughout southern Nova Scotia north to Pictou County and a bog near Baddeck. Scarcity of more northern records doubtless due only to lack of early spring collecting in those areas. May 7 - June 14. The larvae will eat the flowers and fruit of leatherleaf (*Chamaedaphne*), and are reported on *Vaccinium* and *Kalmia angustifolia*. *Augustinus* is the commonest *Incisalia* in Nova Scotia.

407 *I. henrici* G. & R. Plate II, Figures 1 and 2.

Fall River, Halifax County, June 4, 1919; Digby, May 24, 1905, May 26, 1908; Armdale, May 24, 1943, June 6, 1943; Halifax watershed area, June 1, 1951 (McDunnough). Rare. Found in a habitat similar to *augustinus* and *polios*. Food plants: *Prunus*, *Vaccinium*.

409 *I. polios* Cook and Watson. Hoary Elfin.

Halifax and vicinity, Mount Uniacke, Aldershot, Lake Kejimukujik, Caledonia, Bangs' Falls, Queens County, Digby. May 2 - June 1. Like *augustinus*, *polios* tends to frequent small, sunny, sheltered bogs, or the sheltered margins of larger bogs where there is a thick growth of *Chamaedaphne*, the flowers of which attract the butterflies. *Polios* is not always confined to such locations, often turning up in dry, sandy areas about

patches of *Vaccinium* and *Kalmia*, sometimes in company with *niphon*, as well as *augustinus*.

413a *I. niphon clarkii* Frmn. Banded Elfin.

Armdale, Waverley and Sackville, Halifax County, Aldershot and Coldbrook, Kings County, Lake Kejimukujik, Annapolis, Stellarton. May 9-June 14. Uncommon, but tends to be less local than the other species. Larva on pine, probably including *Pinus strobus*, that being the only pine growing in some of the localities where it occurs.

Erora Scud.

418 *E. laeta* Edw. Early Hairstreak. Plate II, Figures 3 and 4.

This species, one of the rarest of North American butterflies, is known from two localities in Nova Scotia. Mr. John Russell informs me that in the early days of his collecting around Digby, he actually took *laeta* in some numbers at blackberry blossoms in sunny clearings on the beech covered slopes of Mount Beaman, near Digby. Available data: June 2, 1908, June 7, 1906, June 19, 1905, June 16, 1931. One of these is in the collection of the Nova Scotia Museum of Science, and I saw another in the collection of the late Mr. H. G. Payne. During the past decade I have twice tried to relocate *laeta* on Mount Beaman, accompanied once by Mr. Russell, but both attempts failed. The old clearings near the top where the blackberry vines grew have been engulfed by the surrounding forest, and no longer offer good collecting.

The second locality is at Armdale where, on May 14, 1944., I took a fresh female at rest on a clump of *Corema* (Broom crowberry) on the barren summit of a hill, actually a granite outcrop, lying between Ashburn golf course and the Chain Lakes. This seemed an unusual habitat but since it was a windy day, the butterfly could readily have blown up from the surrounding forest of birch, maple, beech and aspen. Larvae have been reared on beaked hazelnut (*Corylus*).

Feniseca Grt.

419a *F. tarquinius nova-scotiae* McD. The Harvester. Plate II, Figure 7.

McDunnough, Can. Ent., Vol. 67, pp. 211-212, 1935.
Type locality: South Milford, Annapolis County.

In this race the marginal row of dark spots on the secondaries has a tendency to become obsolete, or wholly wanting. All the Nova Scotian specimens taken as adults that I have seen lack the marginal spots entirely, yet of well over one hundred specimens reared, about fifty

percent possessed them, though in most cases more reduced than in normal *tarquinius*. Armdale, Spryfield, Oldham, French Village, Fall River, Petite Riviere, South Milford, Digby, Truro, Stellarton, Three Brooks. June 22-September 7, mostly in July. Bred from larvae found in colonies of woolly alder aphids at Armdale, Waverley, Fall River, Auburn and Annapolis.

Lycaena Fabr.

434a *L. epixanthe phaedra* Hall. Bog Copper. Plate II, Figures 5 & 6
Common in cranberry bogs throughout the province. The most southerly records are from White Point Beach, and from Karsdale (near Granville Ferry); the most northerly ones from Pleasant Bay and Terre Noire, Inverness County. One brood, June 14-August 1. The larvae feed on cranberry (Cook and Watson, Can. Ent., Vol. 40, pp. 85-88).

I follow Klots's usage of the name *phaedra* Hall, rather than Benjamin's resurrection of *amicetus*, a Boisduval manuscript name never published, but listed as a synonym by Scudder. The latter name, whether attributed to Boisduval or Scudder, may be regarded as a *nomen nudum*.

435 *L. phlaeas americana* Harris. American Copper.

Common in fields and pastures wherever the larval food, sheep sorrel (*Rumex acetosella*) grows. Records from many localities from White Point Beach to Ingonish. It is one of the few butterflies that can still be found in large numbers within the city limits of Halifax. Two broods, June 4 - July 7, and August 1 - September 29.

Lycaeides Seud.

449d *L. argyrognomon empetri* Freeman. Plate II, Figures 8 and 9.

Freeman, Can. Ent., Vol. 70, p. 62, 1938.

Type locality: Baddeck, Cape Breton Island.

Present on many acid bogs, coastal barrens and headlands south to Halifax County. It is abundant about *Empetrum* on the coastal cliffs at Grand Etang and Cap Rouge and on the mountains above Cheticamp and Pleasant Bay. Farther south it occurs in great numbers on the barren areas of eastern Guysborough County near Cape Canso, and in Halifax County is common at times on several bogs not far from the city, and about patches of *Empetrum* on the coast at Herring Cove and near Ketch Harbour. *Empetri* also occurs plentifully on the two bogs near Mount Uniacke, one of which lies five miles within Hants County. June 30 - August 9, but at its best in early July. It is doubtful if *empetri* occurs much farther south, but should be sought in suitable locations along the south coast, and on the cliffs bordering the Bay of Fundy. Observed

ovipositing on *Kalmia*, *Empetrum* and *Ledum* (Freeman), though its invariable association with *Empetrum*, even when the others are absent, constitutes strong evidence that this is the true host plant.

Material from the eastern end of Prince Edward Island (Canadian National Collection) matches *empetri*, but specimens taken along the south shore of the Bay of Chaleur and near Pokemouche, N. B. have smaller spots, and resemble *aster* Edw.

Plebeius Kluk

453 *P. saepiolus amica* Edw. Greenish Blue.

The Payne collection contained a single female from Digby, June 2, 1908, presumably taken by Russell. It is abundant in New Brunswick from the Miramichi River northward in early July, though perhaps somewhat past its best at that time, and occurs also in northern Maine. Food plant: clover. Two larvae on sweet clover (*Melilotus alba*), Bartibog, New Brunswick, 1952 are probably this species. They are hibernating as pupae.

Glaucopsyche Scud.

473a *G. lygdamus couperi* Grt. Silvery Blue.

A series of specimens taken about beach pea in Point Pleasant Park, Halifax, June 13-15, 1950, June 21, 1951 and June 9, 1953 appear closer to this race than to *mildredae* Cherm. On the Tantramar Marshes just over the boundary near Sackville, New Brunswick, I found *couperi* common around patches of wild vetch (*Vicia*), on July 8, 1950 and June 25, 1952. It seems likely that further collecting in that vicinity will reveal its presence also on the Nova Scotian side of the marshes.

473g *G. lygdamus mildredae* Cherm. Plate II, Figures 10 and 11.

F. H. Chermock, Can. Ent., Vol. 76, p. 216, 1945.

Type locality: Baddeck, Cape Breton Island.

Described from Kidston Island, opposite Baddeck. Common everywhere along the shore of Baddeck Bay where beach pea (*Lathyrus japonicus*) grows. Also taken on a sand bar at Eel Cove, St. Ann Bay, and in back of a beach near Cap Rouge. June 17 - July 20. Many reared from larvae on beach pea at Baddeck and Eel Cove. Hibernates as a pupa.

Lycaenopsis F. and F.

475a *L. argiolus lucia* Kby. Spring Azure, Jenny Lind.

Including a high proportion of form *marginata* Edw., (almost fifty per cent), and a few of form *violacea*, emerging late, usually about the

end of June or the beginning of July. *Lucia* and form *marginata* abundant throughout, characteristic of open woods and bog margins before the leaves are out in the spring. Form *violacea* seems localized, occurring in certain areas only. Probably all one extended brood, from April 22 to July 19, except for a few rare instances of second generation individuals. One of these on MacNab's Island, October 4, 1917, and another near Annapolis, August 9, 1946, both of the *violacea* type. Larvae frequently in flower heads of *Aralia hispida* and *Viburnum cassinoides*, though reported on many other plants elsewhere.

Superfamily HESPERIOIDEA

HESPERIIDAE

Not a great deal is known about the early stages of our Skippers, yet it seems likely that all of them, except *Erynnis* and *Thorybes*, feed upon grasses. I have found the larvae of *E. icelus* repeatedly on aspen and willow, and *E. juvenalis* on oak. Judging from the vegetation in areas where it occurs, I should guess that the latter feeds on beech also. They go into hibernation as partly grown larvae. *T. pylades* is reported on clover and other Fabaceae.

Thorybes Scud.

505 *T. pylades* Scud. Northern Dusky Wing.

Three Brooks, Pictou County, July 2, 1944 (2), July 12, 1942; Great Village, Colchester County, no date (Hall).

Erynnis Schrank

541 *E. icelus* Scud. and Burg. Dreamy Dusky Wing.

Generally distributed in or near woodland in Digby, Annapolis, Queens, Kings, Halifax, Cumberland, and Pictou counties. May 16 - July 16. Presumably present everywhere, though overlooked through insufficient spring collecting.

551 *E. juvenalis* Fabr. Juvenal's Dusky Wing.

Halifax, Armdale, Coldbrook, Lake Kejimukujik, and along the Liverpool Road between Lequille and Greywood, Annapolis County. May 24 - July 15. At Lake Kejimukujik *juvenalis* occurred quite commonly in beech woods, May 30 - 31, 1950. There was no oak in the vicinity.

Carterocephalus Led.

563a *C. palaemon mesapano* Scud. Arctic Skipper.

Various localities in Halifax County, and at South Milford, Point Prim (near Digby), Stellarton, Three Brooks, Pictou County and Bad-

deck. June 12 - July 25. Very local; in marshy places where it frequents the coarse grasses.

Ancyloxypha Feld.

567 *A. numitor* Fabr. Least Skipper.

The first record was netted by Dr. McDunnough in a grassy roadside bog near South Milford, July 5, 1946. Careful search of that vicinity by Dr. McDunnough and the author failed to produce any others. Since then I have seen one female taken by an Agricultural College student at Canard, Kings County, July, 1950, and I took another male in a grassy marsh near Aylesford, July 1, 1951. Seen at Green Bay, Lunenburg County, July 17, 1953.

Hesperia Fabr.

——— *H. laurentina* Lyman. Laurentian Skipper. Plate II Figures 12 and 13.

Records from only four counties. Parrsboro and vicinity, August 8-17, 1944; Blue Mountain, Pictou County, August 13, 1933 (Perrin); Three Brooks, Pictou County, August 1 - 22, 1942 - 47, and seen once in early September; James River, Antigonish County, August 4, 1948; Sackville, Halifax County, August 24, 1950. Frequents dry, open fields and grassy hillsides. The butterfly would seem to be invading the province from the west.

591 *H. leonardus* Harr. Leonard's Skipper.

One old specimen from Digby in the Canadian National Collection. Like the preceding, *leonardus* flies in late summer.

Polites Scud.

611 *P. themistocles* Latr. Tawny-edged Skipper.

Occurs nearly everywhere from Digby to Cape Canso, and at Baddeck in Cape Breton. June 17 - July 27. Common in grassy situations such as poor hay fields.

614 *P. peckius* Kby. Peek's Skipper.

A little commoner than *themistocles* and in similar locations, Digby to Baddeck. Undoubtedly general. June 23 - July 31. Second brood specimens rare; one taken at Coldbrook, August 28, 1952.

618 *P. mystic* Scud. The Long Dash.

Numerous localities from the southern counties north to Cumberland and Pictou, and eastward to Cape Canso and Baddeck. June 23 - July 31. Also occurring in open, grassy places.

Poanes Seud.624 *P. hobomok* Harr. Hobomok Skipper.

Digby and Annapolis to Pictou, and north-eastward to Ingonish, June 2 - August 1. An early species and one of the commonest skippers. *hobomok* prefers sunny, sheltered places in or bordering the woods. Dimorphic female *pocahontas* Seud. does not occur.

Atrytone Seud.642a *A. ruricola metacomet* Harris. Dun Skipper.

Three Brooks, Blue Mountain and Groveland, Pictou County, Londonderry, Colechester County, Loch Lomond, Richmond County, Baddeck, Mount Uniacke, Armdale, Centreville. July 1 - August 13. Usually occurring together with the species of *Polites* but less commonly, tending to show a distribution pattern similar to *Hesperia laurentina*.

Amblyscirtes Seud.660 *A. vialis* Edw. Roadside Skipper.

Fall River, Halifax County, June 2, 1921, June 12, 1906. 6 specimens (Perrin). White Point Beach, June 23 - 26, 1953, 7 specimens (Mc.D.).

661 *A. hegon* Seud. Pepper and Salt Skipper. Plate II, Figures 14 and 15.

Armdale, Waverley and Fall River, Halifax County, Three Brooks, Pictou County, Annapolis. May 31 - July 2. About twenty specimens examined. Scarce and very local; in moist, grassy spots in the woods and along roadside ditches.

 Superfamily SPHINGOIDEA

SPHINGIDAE

Sphinginae

Herse Oken693 *H. cingulata* Fabr.

Five specimens taken. Crawfalls, near Musquodoboit, Halifax County, July, 1908 (A. P. Silver); Canning, Kings County, August 10, 1924 (H. G. Payne); Halifax, October, 1944, (at rest on the side of a building); Halifax, October 8, 1952, a very battered specimen; Cow Bay, Halifax County, October, 1952, a rather fresh specimen. Three of these

are in the collection of the Nova Scotia Museum of Science. Larvae on Convolvulaceae in the southern United States.

Phlegethontius Hbn.

697 *P. quinquemaculata* Haw.

South Gut, Cape Breton, September 6, 1935, Rod McLeod (H. G. Payne collection); Halifax, August 9, 1949. The larva is the well known tomato worm of the eastern United States, but there is no evidence that it breeds here.

Ceratonia Harr.

706 *C. amyntor* Hbn

Annapolis Royal, Bridgetown, Lawrencetown, Kentville, Truro, Wilmot, Chignecto Mines, Baddeck. June 16 - July 23. Not nearly as common as the following species. Larvae on elm in the Annapolis Valley.

707 *C. undulosa* Wlk.

Various localities in Annapolis, Digby, Queens, Halifax and Pictou counties. In the vicinity of Annapolis this is about the commonest Sphingid. June 9 - July 28; once on September 4. Have found larvae on ash.

Sphinx L.

719 *S. chersis* Hbn.

Digby, Annapolis, Granville Ferry, Bridgetown, Lawrencetown, Berwick, Bedford, Truro, Stellarton, and "Cumberland County". June 16 - August 1, with the peak of emergence about mid-July. I found it common only in Annapolis County, where the moths came to light, and to blossoms of dogbane and evening primrose. A larva on ash at Waverley.

727 *S. kalmiae* A. & S.

Frequent records from Barton, Digby County and White Point Beach north to Pictou County and Baddeck. June 16-August 5. One of the few Sphingids that comes to bait. The food plants commonly given for *kalmiae* are ash, lilac and privet, but its general occurrence here suggests an association with some commoner indigenous plant. The presence of white and black ash, native though scattered and local, hardly explains the frequent occurrence of the moth everywhere.

728 *S. gordius* Cram.

The most abundant of our Sphingidae. Taken in numerous localities from Barrington Passage, near Cape Sable, to Baddeck. Single brooded; May 24 - July 29. Up to two dozen examples at light in one evening, and I have seen it hovering at dusk in countless numbers over dogbane

blossoms near Digby. *Gordius* is also very fond of the flowers of evening primrose, lilac, honeysuckle, sweet-scented summer phlox (rocket) and other garden plants. Evidently breeds abundantly on bogs, blueberry barrens and coastal barrens, and is one of the commonest moths at light in such locations. Larvae reared on blueberry, *Comptonia* and *Myrica gale*. Only one of the striking, wine-colored larvae seen—on *Myrica*. Other writers report larvae on apple, ash and other plants.

729 *S. luscitiosa* Clem. Plate II, Figure 16.

Dartmouth, June 12, 1910 (Perrin); Armdale, July 19, 1945, a female at light; Digby and vicinity, June 17, 1907 and others without date. Decidedly rare. Mr. John Russell informs me that he bred it *ex ovo* and from larvae on a shiny-leaved species of willow at Digby.

730 *S. drupiferarum* A. & S.

Amherst, Cumberland County, June 20, 1941 (H. G. Payne). Glenholme, Colchester Co., June 26, 1952 (W. Harrington). Food plants: apple, plum, cherry, lilac.

Lapara Wlk.

736 *L. bombycoides* Wlk.

Widely distributed from Digby and Queens counties to Baddeck, but never common. Probably present wherever pine grows. June 8 - July 30. Larva without a caudal horn, green, striped with white, yellow and violet, twice on *Pinus strobus* near Mount Uniacke.

Smerinthinae

Smerinthus Latr.

739 *S. jamaicensis* form norm. *geminatus* Say

Digby and White Point Beach to Northumberland Strait, and in Cape Breton at Baddeck. Common throughout. May 22 - August 16, one brood. The name *jamaicensis* is supposed to have been based on the rare form with one blue spot, undivided by a black bar. This form turned up once at Annapolis, July 29, 1946. Food plants: birch, poplar, willow, wild cherry.

740 *S. cerisyi* Kby.

Acaciaville, Digby north to Glenville, Cumberland County (common), Great Village, Stellarton, Baddeck. Widely distributed, though not usually as plentiful as *geminatus*. May 29 - July 29, mostly in June. Larvae not uncommon on willow.

Paonias Hbn.741 *P. excaecata* A. & S.

Queens and Digby counties to Baddeck. Another of the commoner Sphingids. June 15 - August 11. Bred from larvae on birch at Parrsboro (McDunnough). Probably a rather general feeder on deciduous trees.

742 *P. myops* A. & S.

Scarcer than *excaecata* and more local. Truro, Glenholme, Great Village, Chignecto Mines, Stellarton, Baddeck, Bedford, Armdale, Lawrencetown, Annapolis County, Annapolis Royal. June 13 - July 28, at light. Females rarely taken. The probable food plants here are *Prunus virginiana* and *P. serotina*, and the distribution of *myops* seems to coincide well with areas where these grow commonly.

Cressonia G. & R.744 *C. juglandis* A. & S.

Fenwick, Cumberland County, 1938 (A. D. Hall); Stellarton, Pictou County, no date; Lequille, Annapolis County, June 22, 1946, June 13, 14, 1949; Acaciaville, Digby County, June 15, 1949 (2). Seemingly rare, except possibly in the beech and oak woods of Annapolis and Digby counties. A larva on introduced copper beech at Armdale was probably *juglandis*, but failed to yield an adult.

Pachysphinx R. & J.745 *P. modesta* Harr.

Numerous recent records from most counties north to Baddeck, Victoria County. June 13 - July 28, at light. Like most of the larger Sphingidae, it may be found in greatest numbers about street lamps in small town and villages. A number of larvae found together on aspen, Waverley Game Sanctuary.

There is evidence that *modesta* reached its present abundance in relatively recent years. Up to the time of their catalogue of 1909, and the additions of 1915), neither Perrin nor Russell appeared to have taken the species, although they reported earlier records from Halifax (Andrew Downs) and Truro, (June, 1901, Lucy Eaton).

Macroglossinae*Aellopos* Hbn.964-5 *Aellopos* sp.

A representative of this genus was supposed to have been taken at Sydney in the late eighteen-nineties by Miss Margaret Brown, one of Nova Scotia's best known amateur botanists. Miss Brown informs me

that she sent the specimen to James Fletcher, then Dominion Entomologist, and it was determined by him as *A. tantalus* L. The specimen was retained for the National Collection, although there is no specimen of *Aellopos* bearing a Nova Scotia label there now.

Hemaris Dalm.

767 *H. thysbe* form *cimbiciformis* Steph.

All specimens seen from the Maritimes have been of this form. Generally distributed. Taken from Barrington Passage to Baddeck and Cape Smoky, Victoria County. One brood, June 12 - August 11. Bred from Larvae on *Viburnum cassinoides* at Halifax, Petite Riviere and White Point Beach.

768 *H. gracilis* G. & R. Plate III, Figure 5.

South Milford, Annapolis County, June 28, 1951; South Eastern Passage, Halifax County, June 9, 1921 (Perrin); Southamptton, Cumberland County, August 5, 1949, two seen and one taken; Fenwick, Cumberland County, 1938 (A. D. Hall); and another specimen without data but undoubtedly Nova Scotian. Rare. The dates suggest two broods, especially so since the August specimens appeared fresh. The Southamptton specimens were visiting Joe Pye Weed. Larval food plant unknown.

770a *H. diffinis aethra* Stkr.

Very common locally, but not so inclined to occur everywhere, like *thysbe*. Lequille, South Milford and Lake Kejimukujik north to Truro, and at Stellarton and Three Brooks, Pictou County. May 9 - August 1, probably all one brood. Very common at lilac blossoms at Lequille, Annapolis County in early June, and visiting flowers of blueberry and wild bush honeysuckle in similar numbers along a railway embankment near Halifax. Ova and larvae on *Diervilla lonicera* at Armdale.

Philampelinae

Pholus Hbn.

772a *P. satellitia pandorus* Hbn.

Armdale; bred a fine, large specimen July 20, 1952 from a pupa found on the ground under an *Ampelopsis* vine in the garden. There are no other records.

776 *P. fasciatus* Sulz. Plate III, Figure 1.

Crawfalls, near Musquodoboit, July 1902, one female (A. P. Silver); MacNab's Island, August 29, 1907, one male (Perrin); Granville Ferry, Annapolis County, August 19, 1910 (H. G. Payne). It is a curious

thing that most specimens of *Pholus* taken here should have been of this subtropical species, rather than the more northern *achemon* or *pandorus*, but the records are authentic. Two of the *fasciatus* are in the Nova Scotia Museum of Science collection, and the one from MacNab's Island is in remarkably fresh condition. Dr. Forbes gives *Jussieua* as the larval food.

Darapsa Wlk.

780 *D. pholus* Cram.

Acaciaville and White Point Beach to Baddeck. Apparently general. June 13 - August 6. At times abundant, coming more commonly to baited trees than any other Sphingid. Bred from larvae on *Viburnum cassinoides*.

Amphion Hbn.

785 *A. nessus* Cram.

Chignecto, 1939 (A. D. Hall); Lequille, Annapolis County, June 12, 1946 (in the Canadian National Collection). At the latter locality a specimen was taken at lilac blooms in the bright sunshine of mid-morning. On the same day a second was seen visiting the same bush just before sunset, but was not captured. Another specimen seen from Windsor, without date. Larva probably on *Ampelopsis*.

Proserpinus Hbn.

790 *P. flavofasciata* Wlk.

Digby, May 24, 1906 (J. Russell). Mr. Russell tells me that the moth was hovering over dandelion flowers when taken. The specimen is apparently lost. The western race, *ulalume*, feeds on *Epilobium*.

Choerocampinae

Celerio Oken.

798a *C. gallii intermedia* Kby.

MacNab's Island, Digby, Round Hill, Truro, Great Village, Stellarton, Three Brooks, Springhill, Baddeck and Sydney. June 21-July 10. Generally scarce. In Pictou County I once saw the moths coming in numbers to lilac at dusk and in early morning. Larvae found on *Oenothera* at Great Village were probably this. *Epilobium* is another food plant.

799 *C. lineata* Fabr.

Although this is at times the commonest of North American Sphingidae, records for Nova Scotia are rare. In the Nova Scotia Museum of Science collection, there is one specimen taken on MacNab's Island in 1900 (Perrin). I have seen a number of specimens from the vicinity

of Digby, mostly taken by Russell, indicating that *lineata* may, some seasons, invade that corner of the province as a migrant. Larval food plants most commonly given are purslane and evening primrose.

Superfamily SATURNIOIDEA

SATURNIIDAE

Platysamia Grt.

(*Hyalophora* Duncan)

804 *P. cecropia* L.

Armdale, MacNab's Island, Lower Sackville, Halifax County, Mount Uniacke, Stellarton, Annapolis and Digby. June 4 - July 11. Not as common near Halifax as it used to be, though plentiful in recent years in Digby and Annapolis counties. Cocoons on choke cherry, pin cherry, *Amelanchier*, hawthorn, *Spiraea*, *Viburnum*, birch, alder, poplar and red maple.

806 *P. columbia* Sm.

Bridgetown, Annapolis County, June 16, 1914 (G. E. Sanders). One male, rather worn. On June 25, 1952 I took a fresh female at light in boggy, black spruce - jack pine forest at Dorchester, N. B., not far from the Nova Scotia boundary, and it should be looked for in similar locations in this province. Larvae, from eggs laid by this female, were reared on larch, the usual food plant of *columbia*. As with *cecropia*, the cocoons remain on the trees all winter, but are smaller and often compressed against the rough and gnarled branches of the tamaracks.

There has since been taken an additional record at White Point Beach, July 4, 1953, one male at light (McDunnough).

Actias Leach

811 *A. luna* L.

Halifax and vicinity, St. Margaret's Bay, Bridgewater, Annapolis Royal, Digby, Acaciaville. May 31 - July 24. The data suggests that *luna* is commonest in the southern part of Nova Scotia. Where found, it is not especially rare, and at Annapolis came to light in about the same numbers as *polyphemus*. The chief food in this area possibly birch. Young larvae, newly hatched, refused oak.

Telea Hbn.

812 *T. polyphemus* Cram.

Halifax and vicinity, Digby, Annapolis, Truro, Stellarton, Baddeck, June 7 - Aug. 4. Very common. Bred a number of times from larvae on birch and willow.

CITHERONIIDAE

Anisota Hbn.846 *A. virginiensis* Dru.

Armdale, Halifax, Dartmouth, Mason's Point, Halifax County, Stellarton, Lawrencetown, Annapolis County. June 10 - July 15. Females moderately frequent at light in the vicinity of Halifax; very rare elsewhere. Some seasons not seen at all. Have never taken a male, although the Perrin collection contained two. Reared from eggs and larvae on red oak at Armdale.

848 *A. rubicunda* Fabr.

Many localities from Digby and White Point Beach to Springhill, and in Cape Breton at Whycoomagh and Baddeck. Seems to be generally distributed and common. May 28 - August 16, probably all one brood. In contrast to *virginensis*, it is the males of *rubicunda* that commonly come to light. Reared from eggs and larvae on *Acer rubrum*.

Superfamily NOCTUOIDEA

EUCHROMIIDAE

Cisseps Franclemont871 *C. fulvicollis* Hbn.

Numerous specimens taken through the Annapolis Valley from Annapolis Royal to Grand Pré, and at Great Village, Colchester County mostly at light. Scarcer elsewhere; Bass River, Colchester County, Hubbards, Lunenburg County, and scattered individuals in Halifax County, at Armdale, MacNab's Island, Herring Cove and Port Wallis, usually flying about *Solidago* by day. Two broods, June 5-June 29, and August 9 - October 15. Larva not seen but probably on grasses and other low plants.

Lycomorpha Harr.877 *L. pholus* Dru.

During the week of August 17 - 23, 1952, Mr. David Gray of Port Wallis, Halifax County, saw on four or five occasions, but did not capture, specimens that answer the description of this species perfectly. They were observed at several different places in that vicinity feeding by day at flowers of *Solidago*. I since captured two examples at Rocky Bay, Victoria County, July 31, 1953, flying about flowers of *Centaurea*.

Ctenucha Kby.884 *C. virginica* Charp.

Petite Riviere and Digby to Pictou, and in Cape Breton at Baddeck. Generally distributed and abundant; at light and often by day, visiting

flowers of *Solidago* and thistle. June 25 - August 1. Sometimes comes in enormous numbers to light, even on the Mount Uniacke bogs. The black, white and yellow tufted, hairy caterpillar common in spring on grasses.

NOLIDAE

Celama Wlk.

888 *C. cilicoides* Grt.

Debert, Colchester County, July 19, 1952 (W. Harrington). One specimen at light.

890 *C. triquetrana* Fitch. Plate III, Figure 2.

Lequille, Annapolis County, June 13 - 14, 1949; Acaciaville, Digby County, June 15, 1949; Lake Kejimukujik, May 29, 1950; Waverley, May 20, 1951. Scarce.

Sarbena Wlk.

897 *S. minuscula* Zell. Plate III, Figure 3.

Armdale, Waverley, Coldbrook, Auburn, Round Hill, Lequille, South Milford, Caledonia. June 1 - July 29, at light, and occasionally at rest on tree trunks. Much more frequently taken than *triquetrana*. Bred from a larva feeding on beech leaves at Lequille.

ARCTIIDAE

Lithosiinae

Lexis Wallgr.

905 *L. bicolor* Grt.

Great Village, August 7, 1947; Armdale, August 14, 1948. Only two specimens taken. Farther north, in Gloucester and Restigouche counties, New Brunswick, it was in certain localities one of the commonest moths at light in mid-July, 1950. The larvae of *bicolor*, as of all the Lithosiinae, are supposed to feed on lichens.

Crambidia Pack.

906 *C. pallida* Pack.

Acaciaville, Lequille, White Point Beach, Lake Rossignol, Centreville, Coldbrook, Mount Uniacke, Waverley, Sackville, Peggy's Cove, Armdale. July 22 - September 7, with the peak about mid-August. Sometimes abundant at light.

911 *C. casta* Pack.

Auburn, Kings County, August 27, 1952 (nine specimens); Aylesford, August 26, 1952, September 2, 1951. Apparently local.

Clemensia Pack.952 *C. albata* Pack.

MacNab's Island, July 24, 1913; Bog, Prospect Road, August 11, 1951; Shad Bay, July 27, 1952; Digby, August 3, 1905, August 9, 1907 and 1908. Rare.

Hypoprepia Hbn.958 *H. miniata* Kby.

Yarmouth (E. C. Allen), Acaciaville, Lequille, Round Hill, White Point Beach, Wolfville, Centreville, Mount Uniacke, Bedford, Fall River, Halifax County. July 19 - August 22. The specimens recorded by Perrin as *fucosa* belong here.

959 *H. fucosa* Hbn.

Annapolis Royal, Lequille, Round Hill, Mount Uniacke, Debert, Bass River, Prospect Road and Shad Bay, Halifax County. July 17 - August 18, at light. Neither species of *Hypoprepia* is common.

Arctiinae*Halisidota* Hbn.977 *H. caryae* Harr.

Digby, Annapolis, South Milford, and at Bedford, French Village and MacNab's Island in Halifax County. June 16 - July 11. Scarcest of the three *Halisidotas*. The black and white hairy larva on alder at Granville Ferry, on *Vaccinium* and oak at Bangs' Falls, Queens County.

980 *H. maculata* Harr.

Numerous localities from Digby and White Point Beach to Glenville, Cumberland County, Three Brooks, Pictou County and Baddeck. June 17 - August 1. The black and yellow hairy caterpillar is always common on alder and willow in the fall.

984 *H. tessellaris* A. & S.

Digby and Annapolis to Chignecto Mines, Great Village and Baddeck. June 10 - August 25. Commonest in Annapolis County and bred there from larvae on red oak. It seems likely that in localities where there is no oak, such as Baddeck, the larvae have an alternative food, perhaps beech.

Cynia Hbn.991a *C. tenera sciurus* Bdv.

Chignecto, 1940 (A. D. Hall); Lequille, Annapolis County, June 23, 29, 1946; Acaciaville, June 15, 1949. Larvæ probably feeding on dogbane (*Apocynum*).

Euchaetias Lyman1005 *E. oregonensis* Stretch

Much more frequent than the preceding but similarly local. Annapolis, Round Hill, Lawrencetown, Coldbrook. June 5 - July 13, at light. The host plant is dogbane.

Eubaphe Hbn.

Certain species of this genus have long been a source of difficulty for taxonomists. Not only is there considerable doubt about the application of some of the names, but the old question of which is a distinct species and which is not here remains paramount. Also, not only have one or two of the commonest species a tendency to break off into innumerable local strains throughout their range in North America, but the offspring from these reared under laboratory conditions are not always a good match for the parents.

Using the names as they are now most commonly applied, the most perplexing species or races in the east fall naturally into two fairly well defined groups, both represented here. They are what I shall call the *aurantiaca* group, and the *ferruginosa* group. Species of both groups may come with or without a dark border on the hind wing (both sexes) and whitish spots on the forewing (most often in females only). The differences are chiefly in size and shade or intensity of coloring, since there are no constant markings to rely upon. The genitalia show no visible differences, nor are there any food preferences to aid in separating species, since all *Eubaphes* will feed on almost any low, herbaceous plant. Excepting *lamae*, which is a bog dweller of diurnal habits, the *Eubaphes* show no definite environmental preferences that could serve as clues to their identity, and are just as likely to turn up in dense woods as on open blueberry barrens or old pastures.

In the first of the two groups there are *lamae* and *aurantiaca*. In a paper appearing shortly in the *Canadian Entomologist*, I have given a detailed characterization of *lamae*. But to summarize, it has very rich brown primaries, white spotted in many males as well as the females, it has pale orange or pinkish secondaries always heavily bordered with black—never immaculate, it is strictly a bog species and flies by day. *Lamae* appears to be about as good a species as might be expected in *Eubaphe*. What I am calling *aurantiaca* averages a little larger, is also

richly colored (probably due to denser scaling and stronger pigmentation than in the *ferruginosa* complex), though has decidedly rosy or pale red secondaries (orange when faded), and usually a narrower marginal black band on the secondaries.

The *ferruginosa* group comprises a host of forms and minor geographical varieties, changing in appearance from north to south, or east to west throughout their range, but the population occupying Nova Scotia is quite constant, and would appear to be homogeneous. Our form is quite large (26 mm.), with deep pink primaries overlaid with brown scales, and paler pinkish-orange secondaries, usually immaculate, but sometimes marked with a weak blackish border or part of one. The same population continues into New Brunswick, but northward in that province it becomes a little larger, darker, and more often with blackish bordered secondaries.

1016a *E. laeta treatii* Grt.

Deerfield, Yarmouth County, Centreville, Mount Uniacke, Armdale, Oxford and Glenville, Cumberland County, Three Brooks, Pictou County, Baddeck. June 15 - July 28. Well distributed but occurs very sparingly. Two larvae under a log in May; these and others *ex ovo* reared on *Plantago*.

1019 *E. aurantiaca* Hbn.

In many localities from the vicinity of Digby, Lequille, South Milford northward to Glenville and eastward to Tory Creek, Guysborough County. Commonly at light, but often flushed from low shrubbery by day along railway embankments (Hubbards, Halifax County and on blueberry barrens (French Village, Halifax County). July 21 - August 27.

E. lamae Freeman. Plate III, Figure 4.

T. N. Freeman, Can. Ent., Vol. 73, p. 123, 1941.

Type locality: Baddeck, Viet. County.

Eastern Passage, Spryfield, Prospect Road, Hubbards, Peggy's Cove, Mount Uniacke, Aylesford, Lundy, Guysborough County, Baddeck. July 2-August 20. Always in bogs and flying by day. Rarely at light, and then probably only disturbed accidentally. The exact type locality is a bog to the right of highway Route 19, about a mile north west of Baddeck. Bred specimens, reared on *Plantago*, emerged in the fall.

1023 *E. ferruginosa* Wlk.

White Point Beach and Annapolis to Lakelands and Glenville, Cumberland County, and at Three Brooks and Stellarton, Pictou County. July 3 - September 4. Locally common, usually at light; occasionally flushed by day. Especially abundant at Great Village, Colechester

County. Most frequently in dry locations such as scrubby woods, cut or burned over areas, but a few present on bogs at Mount Uniacke and Aylesford.

Phragmatobia Steph.

1028a *P. fuliginosa rubricosa* Harr.

Armdale and vicinity, MacNab's Island, Great Village, Three Brooks, Baddeck, Wolfville, Auburn, Round Hill, Lequille, Acaciaville. June 6-August 15, at light. Locally common.

1029 *P. assimilans* Wlk. Plate III, Figure 8.

Granville Centre, Annapolis Royal, Round Hill, Mount Uniacke, Waverley, Armdale, Halifax watershed area, MacNab's Island, Stellarton. May 18 - June 23. Bred twice from larvae, one of which was crawling on the snow on a mild February day in the Waverley Game Sanctuary.

Apantesis Wlk.

1033 *A. virgo* L.

Yarmouth and White Point Beach to Port Howe, Cumberland County and Pictou. June 19 - August 28. Very abundant at light some seasons, especially in the Annapolis Valley and at Great Village. Reared from larvae under logs and flat stones at Armdale in May, always in fields and open, grassy places. A specimen of ab. "*simplex*" Stretch in the Canadian National Collection labelled "Nova Scotia, 1904".

1035 *A. parthenice* Kby.

Digby, Annapolis, Auburn, Kentville, White Point Beach, Miller's Lake, Halifax County, Truro, Great Village, Parrsboro, Stellarton. July 22 - September 4, mostly in mid-August. Scarce.

1037a *A. doris minea* Sloss. Plate III, Figure 6.

Lequille, Annapolis County, June 23, 1946; Greenwood, Kings County, June 12, 1945; near Peggy's Cove, Halifax County, June 8, 1953; Stellarton, no date. Decidedly rare.

1044 *A. virguncula* Kby.

Digby, Annapolis, Round Hill, Kentville, Mount Uniacke, Peggy's Cove, Halifax watershed area, Stellarton, French Mountain, Inverness County. June 12 - July 19, at light. Essentially a bog species in this region, occurring abundantly on the Mount Uniacke bogs, and on the boggy barrens at Peggy's Cove. Larvae reared *ex ovo* on *Plantago* and *Taraxacum*, but did not survive hibernation.

1051 *A. celia* Saund. Plate III, Figure 7.

A male of this species was bred May 18, 1951 from a larva collected April 29 in the sandy pine barrens at Aldershot, Kings County.

1059 *A. vittata* Fabr.

Great Village, no date (A. D. Hall); Granville Ferry (H. G. Payne); Centreville, Kings County, June 3 - 4, 1949 (seventeen males). All have yellow, not pink, hind wings.

Diacrisia Hbn.1065. *D. virginica* Fabr.

Digby to Springhill, Pietou, French Mountain, Inverness County. Generally distributed and common. May 28 - August 8. The orange-brown, or pale yellow, hairy larva is one of the commonest "woolly bears", and may be found feeding on a variety of garden plants, including even *Ampelopsis*.

Isia Wlk.1069 *I. isabella* A. & S.

Digby, Annapolis and St. Margaret's Bay to Stellarton and Baddeck. Frequent and presumably general. June 24 - July 30. The attractive caterpillar, brown in the middle and black at each end, is another very familiar "woolly bear".

Estigmene Hbn.1070 *E. acrea* Dru. Plate IV, Figure 1, dark form.

White Point Beach and Digby to Springhill, Stellarton, Baddeck and Cheticamp. June 12-August 28. Common in most localities but strangely absent in others. Perhaps essentially a species of open agricultural areas or salt marshes, rather than heavily wooded country. Over fifty per cent are of a dark sooty form, approaching the western variety *dubia* Wlk. in appearance. The larva has both brown and blue-gray forms, and feeds freely on garden plants such as turnip and carrot, in addition to many kinds of weeds.

1072 *E. prima* Sloss. Plate IV, Figure 2.

Annapolis, Auburn, Greenwood, Aldershot, Mount Uniacke and various localities in Halifax County, Truro, Great Village, Baddeck. May 5 - July 19. Mostly on bogs and heathy barrens, though not wholly restricted to such locations. Larvae of this and *congrua* were reared together for comparison and were found to be quite differently marked, thus verifying that the two are correctly placed as separate species. The larvae were fed *Plantago*.

1073 *E. congrua* Wlk.

From approximately the same localities as *prima*, though not so inclined to occur on bogs and barrens. June 3 - July 5, often at light together with *Diacrisia virginica*. Locally common. Unrecorded prior to 1945; possibly confused with *virginica* by earlier collectors.

Hyphantria Harr.1074 *H. textor* Harr.

Digby, Smith's Cove, White Point Beach to Baddeck. General. June 8 - August 26. Some specimens have black-spotted primaries, but I think that these are merely forms of *textor*, not *cunea* Dru.

Parasemia Hbn.1092 *P. parthenos* Harr.

Records for many localities from White Point Beach and Annapolis to Glenville, Cumberland County and Stellarton. No Cape Breton specimens seen, but it is certainly to be expected there. June 25 - July 30. Rare or absent some seasons and at other times abundant. In 1952 I took almost one hundred specimens at light in Halifax County. all but one being males. It does not seem limited to any special habitat but when common occurs everywhere. The larva has been described, and is typically Arctian in its omnivorous feeding habits.

Arctia Schrank1098d *A. caja americana* L.

Annapolis Royal, Round Hill, Granville Ferry, Truro, Debert, Chignecto, Stellarton, Mulgrave. July 7 - August 17, about twelve specimens, mostly taken between 1908 and 1940. Most recently at Debert, 1952. Scarce.

Uteltheisa Hbn.1099 *U. bella* L.

MacNab's Island, August 22, 1909, August 23, 1908, September 19, 1906; Halifax, September 8, 1941; Mount Uniacke, August 7, 1949. Last two specimens rather worn, and flying about *Solidago* by day.

Haploa Hbn.1103 *H. lecontei* Guer.

Including form *militaris* Harr. Kentville, Armdale (once only), Glenholme, Great Village, Bass River, Stellarton and Three Brooks, Pictou County, Baddeck. June 20 - July 31. At light and flushed from vegetation by day, usually in low, damp woods or wooded margins of

meadows, perhaps breeding commonly in the sedimentary rock areas only. Food plants might include certain Boraginaceae (such as *Cynoglossum*, *Lappula*, *Symphytum*), and horse gentian (Saunders, Can. Ent., Vol. 1, page 20). I once tried rearing larvae *ex ovo* on willow, but all died when about one third grown.

AGARISTIDAE

Alypia Hbn.

1116 *A. langtoni* Couper

Digby, Hubbards, Todd's Island (St. Margaret's Bay), MacNab's Island, Fall River, Three Brooks, Pietou County, Baddeck. June 28 - July 25. Always scarce. Larvae probably on *Epilobium*.

PHALAEENIDAE

*Pantheinae**Colocasia* Ochs.

1122 *C. flavicornis* Sm. Plate IV, Figure 3.

A pale race with much of the grayish scaling of normal *flavicornis* replaced by pure white. From Annapolis, Digby and Queens Counties only. Acacia Valley, June 15, 1949; Granville Ferry, July 1, 1908, five specimens (H.G. Payne); Lequille, June 11, 1949; Lake Kejimukujik, May 29, 30, 1950, at light. In the last locality the moth seemed commonest in pure stands of beech and elsewhere it occurred where there was beech and also oak, so it may well be that the larvae feed on Fagaceae.

1123 *C. propinquilinea* Grt.

Annapolis Royal, Armdale, MacNab's Island, Stellarton, Baddeck. June 13 - July 27. More widely dispersed than *flavicornis*, and never as plentiful in any one locality. Birch, walnut, maple, oak, beech (Smith and Dyar).

Panthea Hbn.

1125a *P. acronyctoides albosuffusa* McD.

McDunnough, Can. Ent., Vol. 69, p. 153, 1937.

Type locality; White Point Beach, Queens County, N. S.

Well distributed but uncommon. Annapolis County and White Point Beach north to Three Brooks, Pietou County, and in Cape Breton Island to Baddeck and the Valley of the Cheticamp River. June 11 - August 22. Larva on spruce, and probably fir and hemlock.

1130,1 *P. pallescens* McD. Plate IV, Figure 4.

McDunnough, Can. Ent., Vol. 69, p. 153, 1937 and Vol. 74, p. 94.

Type locality: White Point Beach, Queens County.

White Point Beach, Lake Rossignol and Annapolis to Stellarton and Baddeck. June 10 - August 24, at light. An unusually early record at Cole Harbour, May 22, 1951 (W. Harrington). Commoner than *albosuffusa*. Long series taken at Armdale and Lequille. Larvae beaten from White Pine.

Charadra Wlk.

1135 *C. deridens* Gn.

Well distributed from Digby to Baddeck and the Valley of the Cheticamp River. Quite frequent at light, June 1 - July 26, with a straggler, possibly a second brood emergence, on September 16. Bred from larvae on beech at Smith's Cove and Annapolis, in shelters formed by tying two leaves together. Also supposed to feed on oak, birch and elm.

Raphia Hbn.

1141 *R. frater* Grt.

Records from Digby County to Glenville, Pictou and Baddeck. Presumably occurs wherever the food plant, aspen, grows. June 3 - August 2.

Acronictinae

Acronicta Ochs.

1148 *A. americana* Harr.

Occurs with moderate frequency over the whole area north at least to Baddeck. June 19 - September 5, at light and bait. The large yellow, hairy caterpillar with black hair pencils commonly found on maple.

1151 *A. dactylina* Grt.

From White Point Beach and Digby to Northumberland Strait, and in Cape Breton to Baddeck and Cheticamp. Usually commoner than the preceding. June 16 - August 25. The hairy, chocolate-colored caterpillar on alder and willow, but nearly always parasitized.

1153 *A. lepusculina* Gn.

Annapolis, Greenwood, Mason's Point, Halifax County, Armdale, Stellarton, Baddeck. Scarce. More from Baddeck than elsewhere. June 21 - July 21. On willow on Nantucket (Thaxter); *Populus* (Hy. Edw.).

1154a *A. leporina vulpina* Grt.

Digby, Annapolis, Halifax, Armdale, MacNab's Island. June 24 - August 9, at light. Infrequent. On poplar and willow. Thaxter mentions also birch as a food plant.

1155 *A. innotata* Gn.

White Point Beach and Digby to Baddeck and Cheticamp. Often common at both light and bait. June 10 - August 4. On poplar.

1157 *A. radcliffei* Harv.

Digby, Lequille, South Milford, White Point Beach, Armdale. June 20-August 10, mostly at bait. Not common. Bred on Martha's Vineyard from a striped larva feeding on *Amelanchier* (Dr. Frank Morton Jones). Both Dyar and Thaxter bred it on *Prunus serotina*, and Thaxter also mentions apple as a food plant.

1159 *A. tritona* Hbn.

White Point Beach, August 1, 1935; Digby, August 8, 1908; Coldbrook, Kings County, June 5, 1949; MacNab's Island, July 2, 1905; Prospect Road, Halifax County, July 12, 1951; Debert June 13, 1952; Rare. Larva on species of *Vaccinium* (Dyar, *Insect Life*, Vol. 3, p. 391).

1160 *A. grisea* Wlk.

Many localities from White Point Beach and Digby to Baddeck. Often very plentiful at light, June 10 - August 25. Bred several times from larvae on alder, found also on Willow and once on apple. Larva bright translucent green, sparsely hairy, with brown saddle-like markings on dorsum.

1168 *A. funeralis* G. & R. Plate IV, Figure 5.

Round Hill, July 29, 1940; Wolfville, bred from larva on Willow; MacNab's Island, July 29, 1916, and bred June 20, 1907. Rare. The larva presents a very striking appearance, and the following description was made from the Wolfville specimen. Dull coal black, naked of hair, with a vivid orange, transversely elongate dorsal patch on each abdominal segment, similar but smaller markings on the thoracic segments. Within each patch of orange there is a black bar, from the ends of which arise a pair of long, lustrous black, blade-shaped, chitinous tubercles that wave in the air as the larva crawls. The first thoracic segment has two pairs of these compressed, filamentous tubercles. Head shining black; spiracles small, intensely black dots.

1172 *A. vinnula* Grt.

Great Village, Colchester County, no date (A. D. Hall). Specimen sent by Mr. Hall to Dr. T. N. Freeman, who determined it. Elm.

1173 *A. superans* Gn.

Digby, Lequille, Bridgetown, Isle Haute, Armdale, MacNab's Island, June 5 - August 10. Occasionally common at bait. Plum, apple, birch, mountain ash (Smith and Dyar).

1174 *A. laetifica* Sm. Plate IV, Figure 6.

Lequille, Annapolis County, June 14 - July 27; Glenholme, June 5, 1952; Three Brooks, Pictou County, July 20, 1944. Infrequent, and apparently local.

1175 *A. furcifera* Gn. Plate IV, Figure 7.

Chignecto, Waverley, Dartmouth, Lequille, Digby. July 21 - 28. Scarce. Wild cherry.

1181 *A. morula* G. & R.

Digby, Annapolis and Petite Riviere north to Three Brooks, Pictou County, and Baddeck. Local, and commonest in Annapolis County. June 15 - August 10, at light and bait. Elm, apple, linden.

1182 *A. interrupta* Gn.

Lequille, Armdale, MacNab's Island. June 29 - August 12. Locally common at light and bait. Elm, apple, plum, birch.

1183 *A. lobeliae* Gn. Plate IV, Figure 9.

Digby, July 29, 1905; Annapolis Royal, July 27, 1946, at light; Lequille, July 28, 1946, at bait. Rare. Oak.

1185 *A. fragilis* Gn.

White Point Beach, Lequille, Mount Uniacke, Armdale, MacNab's Island, Baddeck. June 20 - August 2. Bred specimens seen from *Betula lutea* and *populifolia*. Also has been reported on apple and mountain ash.

1191 *A. inclara* Sm. Plate V, Figure 3.

Acaciaville, Digby, Annapolis, South Milford, vicinity of Halifax, Baddeck. June 13 - August 10, usually at bait. Commonest in beech woods.

1193 *A. hamamelis* Gn. Plate V, Figure 2.

Annapolis Royal, Lawrencetown, Centreville, vicinity of Halifax, Glenville, Three Brooks. June 11 - August 10, at light and bait. Usually more plentiful than *inclara*. Occasional melanic specimens occur. Bred at Annapolis from red oak, and has been reported also on birch.

1195 *A. retardata* Wlk.

White Point Beach and Digby to Baddeck. June 14 - August 9. Regularly, though sparingly, at light. Maple.

1197 *A. subochrea* Grt. Plate IV, Figure 10.

Digby, June 20, August 2, 1907; Lequille, July 29, August 6, 1946, at light and bait. Rare. Have found larvae on witch-hazel that I presumed to be this species, perhaps erroneously.

1198 *A. afflicta* Grt. Plate V, Figure 1.

Lequille, Annapolis County, June 26, 1946, at bait. One specimen. Petite Riviere, Lunenburg County, July 17, 1953; one specimen at light. Dr. Frank Morton Jones reports the larvae on oak on Martha's Vineyard.

1201 *A. impleta* Wlk.

Various points through the Annapolis Valley from Digby and Annapolis to Centreville, and at White Point Beach, Queens County and Armdale. I have seen it quite common at bait in deciduous woods near Armdale. May 26 - July 21. Bred from larvae on poplar at White Point Beach (McDunnough), and on Willow at Annapolis Royal. Larvae also on white and yellow birch.

1202 *A. sperata* Grt.

Digby, Annapolis, Round Hill, Mason's Point, Halifax County, Truro, Stellarton, Chignecto. June 16 - July 8. Scarce. Poplar, alder.

1203 *A. noctivaga* Grt.

Annapolis Valley region from Digby and South Milford through Mount Uniacke to Halifax, and at Great Village and Baddeck. May 26 - August 16, with a straggler September 3. Sometimes relatively plentiful at bait in June. Poplar.

1204 *A. impressa* Wlk.

Digby and Lequille through the Annapolis Valley region to Halifax, at Caledonia, Queens County and north to Three Brooks and Stellarton, Pictou County. Locally common. May 9 - August 28. Larvae on willow.

1209 *A. lithospila* Grt.

Annapolis Royal, Armdale, Mason's Point, Halifax County. July 7 - August 26. Larva green with brown dorsal markings, sparsely clothed with black hairs; on red oak at Annapolis.

1215 *A. oblinita* A. & S.

White Point Beach and Acaciaville to Baddeck. Generally distributed and common. June 12 - August 7. Larvae conspicuous on willow, alder, *Myrica gale*, *Spiraea* and other meadow vegetation in the fall, always heavily parasitized.

1216 *A. lanceolaria* Grt. Plate IV, Figure 8.

Armdale, July 14, 1948 and Mount Uniacke, June 22, 1951, at light; bred May 7, 1947 from a larva on *Alnus crispa* at Granville Ferry; May 6, 1953 from a larva on *Kalmia polifolia*, Prospect Road area; also bred from a larva on bayberry at Smith's Cove, Digby County, and

on May 28, 1948 from a pupa found under a log near Armdale. Very rare, or else not readily taken as an adult by the usual collecting procedures. Larva thick and chunky with blackish skin, and many large, bright yellow tubercles bearing tufts of stiff yellow hair. The dark skin and yellow tubercles are conspicuous features. Reported on Willow, *Comptonia* and *Gaillardia* by Smith and Dyar.

Simyra Ochs.

1222 *S. henrici* Grt.

Annapolis Royal, Round Hill, Lawrencetown, Auburn, Aylesford, Wolfville, Debert, Great Village, Goodwood, Halifax County. Two broods, June 6 - July 23, and August 10 - 30, including form *fumosa* Morr. in both generations. Seems to have an association with marshes. Smith and Dyar list grass, smartweed and willow as food plants.

Harrisimemma Grt.

1223 *H. trisignata* Wlk.

Taken many times in the southern portion of the province from White Point Beach and Annapolis to Cole Harbour and Truro. None from farther north or east, though probably occurs there. June 15 - August 14, at light. The grotesque larva reported on lilac at Digby (Russell), and at Mount Uniacke in 1950 I found and reared to maturity a larva on *Viburnum cassinoides*. The repeated occurrence of the moth in such situations where *Viburnum* grows abundantly leads me to suspect that this is the natural food plant throughout this region.

Agrontinae

Euxoa Hbn.

1272 *E. detersa* Wlk. Plate V, Figure 4.

Walker, 1856. Cat. Lep. Het. Brit. Mus., pt. 9, p. 212.
Type locality: Nova Scotia.

Cole Harbour, Halifax County, August 31, 1951 (Harrington); Peggy's Cove, September 18, 20, 1952; Aylesford, August 26, 1952; Stellarton, no date. Although described from here, *detersa* seems to be quite rare. In abundance once only, at Petite Riviere, September 4, 1953

1292 *E. perpolita* Morr. Plate V, Figure 5.

Auburn, Aylesford, Coldbrook, Centreville, Great Village, Peggy's Cove, Port Wallis, Bedford, Prospect Road, Halifax County, and White Point Beach. August 11 - September 22. Locally common, most speci-

mens coming from coastal localities or the heath country of the Annapolis Valley. Occasional examples show distinct traces of the brown suffusion that characterizes the variety *criddlei* Sm.

1296 *E. velleripennis* Grt.

From Digby and Lequille through the Annapolis Valley, and at Cole Harbour, Truro, Stellarton and Cape North. August 23 - September 19; July 12 at Cape North. Taken more frequently than *perpolita* but never abundant.

1297 *E. scandens* Riley.

Auburn, White Point Beach, Petite Riviere, Armdale, MacNab's Island, Debert. June 30 - August 20. The records suggest that it may occur only in the southern part of Nova Scotia.

1309 *E. mimallonis* Grt. Plate V, Figure 6.

Digby, September 17, 1907 (in the Nova Scotia Museum of Science collection); Prospect Road, Halifax County, August 29, 1951, and farther out the same road at Shad Bay, July 29, 1952. Rare.

1310 *E. messoria* Harr.

Many records, from White Point Beach and Digby north to Parrsboro, Springhill and Stellarton including, less commonly, form *atrifera* Grt. August 9 - October 3, at light and bait. Often abundant, and probably one of the major cutworms.

1315 *E. scholastica* McD. Plate V, Figure 7.

Lequille, White Point Beach, Shad Bay, Armdale and Stellarton. July 16 - August 27. Local and usually scarce. Taken in series at White Point Beach by Dr. McDunnough, and I had four come to light one evening near Shad Bay.

1321a *E. ontario vestitura* Sm. Plate V, Figure 8.

Digby, Annapolis, White Point Beach, Petite Riviere, north to Parrsboro, Stellarton, Baddeck and Margaree Forks, Victoria County. Almost as common as *messoria*. July 22 - October 3, at light—most of the records in August. Strongly attracted to honeydew from aphids on birch, though seemingly not to the conventional bait mixtures. Described from Saint John, N. B.

1341 *E. tessellata* Harr.

White Point Beach, Centreville, July 23 - August 7. Rare.

1351a *E. declarata decolor* Morr.

Digby, Auburn, Aylesford, Coldbrook, Bridgewater, Armdale, Cole Harbour, Parrsboro, Stellarton. August 10 - September 15. Not common.

1352 *E. campestris* Grt.

Bridgetown (G. E. Sanders). In the Canadian National Collection.

1354 *E. albipennis* Grt. Plate VI, Figure 1.

Auburn, Kings County, September 1, 1951. One male at light.

1366 *E. divergens* Wlk. Plate V, Figure 9.

Walker, 1856. Cat. Lep. Het. Brit. Mus., pt. 10., p. 327.

Type locality: Nova Scotia.

South Milford and Lequille, Annapolis County, Auburn, Kings County, Mason's Point and Bog, Prospect Road, Halifax County, Stelarton, Pictou County, June 27 - July 22, mostly in late June. Locally common. Walker's types, from Lieut. Redman's collection, might have come from the vicinity of Halifax.

1371 *E. redimicula* Morr.

Coldbrook, Kings County, August 31, 1951. Four specimens, examined by Dr. McDunnough. The Nova Scotian record for this species given by Dr. McDunnough in his revision of the Eastern *Euxoas* (Bulletin A.M.N.H., Vol. 95, Article 6, p. 391, 1950) was based on specimens that I had misdetermined, and should have been referred to *novangliae* McD.

1371,la *E. servita novangliae* McD.

Digby, Annapolis, Round Hill, Coldbrook, Centreville, July 11 - August 12. Seems restricted to the Annapolis Valley region, where it is much more prevalent than the closely allied *redimicula*.

1378 *E. ochrogaster* Gn.

White Point Beach, Digby, Annapolis, Bridgetown, MacNab's Island, Cole Harbour, Parrsboro, Glenville, Pictou. July 23-August 28, mostly at bait. The pale form *insignata* Wlk. (Cat. Lep. Het. Brit. Mus., pt. 10, p. 330. 1856. Type locality: Nova Scotia), and the deep reddish-brown form *gularis* Grt. occur occasionally, also an unnamed form similar to *gularis* but lacking the black dash.

1382 *E. tristicula* Morr. Plate V, Figure 10.

Annapolis Royal, June 27, 1930, July 22, 1924; Round Hill, Annapolis County, June 20 - July 9, at light. Includes the form with obsolete black markings (*nesilens* Sm.). *E. tristicula* is one of those species that is very rare in the east, but common in the West.

Agrotis Ochs.

1416 *A. vetusta* Wlk.

Walker, 1856. Cat. Lep. Het. Brit. Mus., pt. 9, p. 78, as

Mythimna vetusta.

Type locality: Nova Scotia.

White Point Beach, MacNab's Island, Stellarton. July 23 - August 28. Scarce.

1419 *A. mollis* Wlk. Plate V, Figure 11.

Lequille, Annapolis County, July 25, 1949. One specimen at light; Stellarton, three specimens without date (Hills collection). Rare.

1422 *A. gladiaria* Morr. Plate V, Figure 12.

Armdale, September 16, 1947, one specimen at light.

1425 *A. venerabilis* Wlk.

Walker, 1856. Cat. Lep. Het. Brit. Mus., pt. 10, p. 328.
Type locality: Nova Scotia.

Lequille and Granville Ferry to Great Village, Truro, Stellarton and the vicinity of Halifax. Often abundant. August 30 - September 22, at light.

1432 *A. volubilis* Harv.

Much less common than the preceding. Digby, Annapolis, Round Hill, Greenwood, Armdale, Peggy's Cove, Stellarton. June 3 - 28, at light.

1435 *A. ypsilon* Rott.

One of the most abundant moths everywhere. April 8 - November 2, most frequently at bait. A notorious cutworm.

Feltia Wlk.

1442 *F. ducens* Wlk. Plate VI, Figure 2.

Common from Digby and Annapolis Royal through the Annapolis Valley to Grand Pré, also at Stellarton and Trenton, Pietou County; Otherwise taken only at Petite Riviere and Cole Harbour. Seems confined essentially to the sedimentary rock areas in the western sections of the Province. August 12 - September 11. This is the type of the genus *Feltia*.

1445 *F. subgothica* Haw.

Armdale, August 15, 1950—the only specimen seen.

1446 *F. herilis* Grt.

Records from Digby and White Point Beach to Cole Harbour and Trenton. July 14 - September 13. By far the commonest *Feltia*, and probably present throughout the area.

1450 *F. annexa* Treit.

Armdale, September 4, 1944; Sackville, Halifax County, August 22, 1950. Rare and possibly a migrant.

1451 *F. geniculata* G. & R.

Deerfield, Yarmouth County, Lake Rossignol and White Point Beach to Debert, Armdale and Herring Cove. July 13 - August 31, at light. Occurs commonly on bogs, but by no means confined to this habitat.

Actebia Steph.1452 *A. fennica* Tausch.

Digby, Armdale, MacNab's Island, Cole Harbour. August 8 - September 14, usually at bait. Rather rare.

Spaelotis Bdv.1472 *S. clandestina* Harr.

Digby and White Point Beach to Cole Harbour, Truro and Parrsboro. Presumably general, since it occurs well to the north in New Brunswick. July 4 - September 12, at light.

Eurois Hbn.1475 *E. occulta* Linn.

Digby, Bridgetown, Mount Uniacke, various points in Halifax County, and Lakelands, Cumberland County. Probably general. July 30 - September 3, at bait.

1476 *E. astrica* Morr.

Digby, Mount Uniacke bogs, Armdale, Debert, Glenville, Baddeck. July 28 - August 29, at light and bait. Local, but often commoner than *occulta*.

Ochropleura Hbn.1480 *O. plecta* L.

Digby and White Point Beach to Truro, Cole Harbour and Baddeck. June 24 - August 5, and one at Grand Pré., August 28. Sometimes quite common at light.

Euagrotis McD.1483,1 *E. forbesi* Franclemont. Plate VI, Figure 10.

Debert, Colchester County, July 15 and 21, 1952 (W. Harrington).

Metalepsis Grt.1493 *M. fishi* Grt. Plate VI, Figure 3.

Halifax watershed area, Armdale, MacNab's Island, Hammond's Plains. Halifax County, Wellington, Mount Uniacke, Aldershot. May 1 -

June 11, mostly in early May. A total of little more than a dozen specimens taken. Usually regarded a rare species wherever it occurs.

1494 *M. salicarum* Wlk.

Round Hill and Middleton through Mount Uniacke to the vicinity of Halifax, at Caledonia, Queens County and northward to Great Village and Stellarton. Locally common at light, bait and willow catkins. April 13 - May 26.

Peridroma Hbn.

1496 *P. margaritosa* Haw.

Generally distributed and always one of the most abundant moths at bait, including form *saucia* Hbn. Throughout the season from April to November, but most plentiful in the fall. Bred August 25 from a larva that fed on grass.

Hemipachnobia McD.

1497 *H. monochromatea* Morr. Plate VII, Figure 3.

South Milford, Annapolis County, Mount Uniacke, Port Wallis, bogs in the Prospect Road area and at Peggy's Cove, and Baddeck. June 8 - July 19, at light. Strictly a bog species, usually common in suitable habitats.

Paradiarsia Pack.

1498 *P. littoralis* Pack.

Lawrencetown, Annapolis County, July 13, 1945. One specimen. Stellarton, Pictou County, series without data (Hills Coll.).

Pseudospaelotis McD.

1499 *P. haruspica* Grt.

Various localities from Digby through the Annapolis Valley, and in Halifax and Pictou Counties. Probably generally distributed. July 18 - August 10. Common at light and bait.

Caradrina Oehs.

1500 *C. quadrangula* Zett. Plate VI, Figure 4.

Shad Bay, Halifax County, July 29, 1952, one female at light. Another specimen, possibly from Stellarton, Pictou County, but lacking data, from the C. B. Hills collection. In the *Catalogue of Noctuidae* (Bulletin 44, U.S.N.M.) J. B. Smith gives Labrador and Nova Scotia as the habitat of *Noctua rava* H.-S. (the name *rava* having fallen to the synonymy of *quadrangula*), so there seems to have existed a previous record of its occurrence here.

Since this was written, there have been added two more records taken at light on the barrens near Peggy's Cove, July 11 and September 8, 1953.

Heptagrotis Mc.D.

1502 *H. phyllophora* Grt.

Barrington Passage, White Point Beach and Digby to Baddeck. June 15 - August 3, at light. Usually abundant, both in bogs and dry woodland.

Diarsia Hbn.

1504 *D. cynica* Sm.

White Point Beach and Digby north to Glenville, Cumberland County, but probably general. July 23 - September 3, at light and bait. Often abundant, varying from deep smoky brown specimens to bright reddish ones, but all are alike genitally. After an extensive study of the group, I am inclined to believe that *cynica* is identical with *rubifera* of Grote, in which case the latter name would have priority, antedating Smith's name by twenty-three years.

1507 *D. jucunda* Wlk.

Digby, Lequille, Coldbrook, Bass River, Pietou, Baddeck and various points in Halifax County. July 9 - August 10, at light. Moderately common. Highly variable in coloring and maculation, but even the most extreme forms show no noticeable differences in genitalia of the males. Bog specimens are especially dark.

1510,1 *D. pseudorosaria* Hardwick, race *freemani* Hdwk. Plate VI, Figure 6.

Digby, July 1, 1907 (J. Russell). A single male, determined by genitalia. The record may be considered authentic. The only specimen I have taken personally came to light in the spruce forest at three thousand feet in Jefferson Notch, N. H.. Eastern race *freemani* was described from Labrador.

Graphiphora Ochs.

1511 *G. c-nigrum* Linn.

Widely distributed and common, especially at bait. June 12 - September 22. Most plentiful in late summer and fall.

1512 *G. smithi* Snell.

Records from White Point Beach and Digby north to Glenville Cumberland County, but probably throughout. Abundant at bait, August - September 27.

1513 *G. normaniana* Grt.

Distribution similar to the above. Also an abundant species. July 23 - August 26.

1517 *G. oblata* Morr. Plate VI, Figure 5.

Mount Uniacke bog, July 9, 1947, July 18, 1946, at light; Halifax watershed area, July 6, 1951, two specimens at light. I have found it more commonly in boggy areas of north-eastern New Brunswick.

1522 *G. collaris* G. & R.

Numerous records for the Annapolis Valley region from Digby to Grand Pré; elsewhere only at Armdale, Debert and Parrsboro. August 19 - September 17. Scarce.

1523 *G. bicarnea* Gn.

White Point Beach, Digby, Lequille, Bridgetown, Truro and near Halifax. July 21 - September 3. Common at bait.

1525 *G. tenuicula* Morr.

Digby, September 3, 1907; Lequille, July 24, 1949; Parrsboro, August 17, 1944. Rare.

1527 *G. opacifrons* Grt.

Bogs at Mount Uniacke, Peggy's Cove, Herring Cove, and the Prospect Road area near Halifax, and at Aylesford and White Point Beach. Restricted to bogs, where it may be taken in abundance at light and bait during the flight period. Larvae on *Chamaedaphne* and other bog plants in the spring.

Anomogyna Staud.

1555 *A. perquiritata* Morr. Plate VI, Figure 7.

White Point Beach, Digby, Stellarton, Mount Uniacke, vicinity of Halifax, North Mountain, Cape Breton. August 1 - 23, at light. Not uncommon at Goodwood and on the Mount Uniacke bogs, where it came to light in greatest numbers on cool, foggy nights. Larvae on larch and spruce.

1558 *A. imperita* Hbn. Plate VI, Figure 8.

Mount Uniacke bog, August 11-18, 1950 (forty specimens); Prospect Road, Halifax County, August 13, 1951 (one specimen). They came to the lights most frequently when the nights were cold, with the temperature below 50°—too cold for most other species to fly at that time of year. *Imperita* actually seemed less active on the warmer nights when other moths were plentiful. Otherwise known in the east only from Labrador and near timber line in the Appalachians of New England. Little is known of the early stages.

1561 *A. elimata* Gn.

Digby, Annapolis, Lake Rossignol, Coldbrook, Auburn, Mount Uniacke, and various localities in Halifax County. July 14 - September

20, at light. Moderately common. The population is strikingly variable, but so far efforts to split it into more than one species have not ended satisfactorily. On fir, and probably conifers generally.

1562 *A. dilucida* Morr.

Digby, Bridgetown, Auburn, Aylesford, Mount Uniacke, and the vicinity of Halifax. Abundant at both light and bait in Halifax County, including form *youngi* Sm. August 13 - October 9. No doubt more widely distributed but missed through lack of more extensive collecting at that time of year. Bred from a larva on larch, and probably feeds also on other conifers. Bred also from larvae on *Kalmia* (McDunnough).

Aplectooides Butl.

1568 *A. condita* Gn. Plate VI, Figure 9.

White Point Beach, South Milford, Mount Uniacke, Cheticamp River Valley, and McNab's Island, Waverley, Port Wallis, Armdale and Goodwood near Halifax. June 15 - July 30, at light. Widely distributed but scarce. Bred from Balsam Fir by the Canadian Forest Insect Survey.

Anaplectooides McD.

1569 *A. pressus* Grt.

White Point Beach, Digby, Acaciaville, Centreville, Mount Uniacke, Armdale, MacNab's Island, Baddeck. June 30 - August 15, at light. A species characteristic of the northern spruce forest.

1570 *A. prasina* Schiff.

Annapolis, Centreville, Mount Uniacke, Armdale, Shad Bay, MacNab's Island, Baddeck. July 15 - August 16, at light and bait. Locally common.

Protolampra McD.

1571 *P. rufipectus* McD.

Digby, August 29, 1907, one specimen (J. Russell); Aylesford, August 26, 1952, two worn specimens at bait; Debert, August 6, 1952; Baddeck, August 18, 1928 (G. P. Engelhardt).

Cryptocala Benj.

1575 *C. acadensis* Beth. Plate VII, Figure 1.

Bethune, Trans. N. S. Inst. Science, Vol. 2, pt. 3, pp. 84-85, 1869; republished in the Can. Ent., Vol. 2, p. 64, 1870. Type locality: "Ashbourne, near Halifax" (The name *Ashbourne*, changed to *Ashburn*, survives now as the name of a golf course, within the district of Armdale).

White Point Beach and Digby north to Glenville, Cumberland County, Pictou and Baddeck. No doubt general. July 23 - August 18, at light and bait. Often abundant.

Eueretagrotis Sm.

1577 *E. perattenta* Grt.

Digby, White Point Beach, Petite Riviere north to Great Village and Baddeck, though presumably general. Quite common. June 27 - July 30, at light.

1578 *E. attenta* Grt.

Shelburne, White Point Beach, Peggy's Cove, Armdale, Waverley, Centreville, Glenville. July 8 - August 5, at light. Scarcer than *perattenta* but by no means rare.

Abagrotis Sm.

1601 *A. alternata* Grt.

Digby, Auburn, Armdale. July 27 - September 11, at bait. Locally common. Variable in coloration but apparently all one species.

Rhynchagrotis Sm.

1602 *R. cupida* Grt.

Digby, Lequille, Bridgetown, Auburn, Aylesford, Mount Uniacke, Waverley, MacNab's Island. July 29 - September 2, at light and bait. Not very common. Quite variable, and probably includes form *brunneipennis* Grt.

—————*Rhynchagrotis* sp.

An undetermined species with smooth looking, rich red-brown primaries, sometimes suffused with smoky brown. The usual maculation, including the dark scaling of the reniform and orbicular, obsolete. The male genitalia show readily observed differences from those of *cupida*. Centreville, Armdale, Peggy's Cove, MacNab's Island, July 26 - August 29. Scarce.

Ufeus Grt.

1611 *U. satyricus* Grt.

Granville Ferry, Round Hill, MacNab's Island, Waverley, Truro. August 12 - November 30, and March 3 - April 25. Evidently emerges in the fall and hibernates. In spruce and fir areas, but seems to be rare.

Hadeninae

Scotogramma Sm.

1633a *S. trifolii albifusa* Wlk. Plate VI, Figure 11.

Walker, Cat. Lep. Het. Brit. Mus., pt. XI, p. 753, 1857.

Type locality: Nova Scotia.

White Point Beach and Digby north to Parrsboro, Pictou and Baddeck. May 24 - August 26. Rarely common, though widely distributed. Some dark specimens, resembling normal *trifolii* Rott., also occur.

Mamestra Ochs.

1661 *M. curialis* Sm. Plate VI, Figure 12.

MacNab's Island, June 28, 1906; Truro, July 8, 1927.

Polia Ochs.

1663 *P. nimbose* Gn.

Digby, Centreville, Armdale, MacNab's Island, Three Brooks, Pictou County, July 16 - August 18, at light. Locally common.

1667 *P. imbrifera* Gn.

White Point Beach, Digby, Armdale, MacNab's Island, Great Village, Pictou. July 4 - August 6, at light and bait. Commoner than *nimbose*.

1669 *P. purpurissata* Grt.

Digby, White Point Beach north to Springhill and Pictou. Probably general. July 13 - September 5, at light. Often abundant. Bred from a larva on birch; reported on sweet fern, blueberry, *Spiraea*, *Rhodora*, etc.

1672 *P. grandis* Bdv.

Digby, Annapolis, Auburn, Mount Uniacke, scattered points in Halifax County, Glenholme, Baddeck. June 8 - July 18. Moderately common.

1673 *P. subjuncta* G. & R.

Digby, Annapolis, Centreville, Armdale and Mason's Point, Halifax County. June 25 - August 10, at light and bait. Seems to be in the southern counties only. Reported on blueberry.

1675 *P. latex* Gn.

Digby and vicinity, Annapolis, South Milford, Round Hill, Centreville, Mount Uniacke, Armdale, MacNab's Island, Baddeck. May 26 - June 30. Occurs sparingly. Two examples from Annapolis are melanic. On various deciduous trees.

1677 *P. atlantica* Grt.

Digby, Petite Riviere north to Great Village, Pictou and Baddeck. Undoubtedly general. June 3 - July 31. Sometimes abundant at light. Bred from mountain ash by the Canadian Forest Insect Survey.

1679 *P. radix* Wlk.

Digby, June 17, 1907; Baddeck, June 21, 1936. Rare.

1683 *P. legitima* Grt.

Many records from White Point Beach and Lequille to Baddeck and Cheticamp. Moderately common. June 7 - August 31.

1684 *P. tacoma* Stkr. Plate VIII, Figure 1.

Digby, Auburn, Greenwood, Aldershot, Truro, Great Village, Baddeck. June 4 - 30. Not common. Sometimes hard to distinguish from *legitima*, but the records given are of fairly well defined examples. *Tacoma* tends to be larger, with the dark brown suffusion of the basal and median areas contrasting sharply with the smooth, blue-gray postmedian shade. Also the course of the t. p. line is a little straighter than in *legitima* and less dentate.

1685 *P. rugosa* Morr. Plate VII, Figure 4.

Bogs at Mount Uniacke, in the Prospect Road area, Halifax County, Armdale, Peggy's Cove. June 8 - July 18. Also seen from Stellarton. Rarely strays far from its bog or muskeg habitat, where it is sometimes quite abundant at light. Presumably present in suitable locations throughout this region.

1687 *P. lilacina* Harv.

Lawrencetown, Auburn and Greenwood in the Annapolis Valley; Halifax County, Truro, Glenholme, Baddeck, Cheticamp. June 12 - July 17, at light. About fifty percent are referable to the more unicolorous form *illabefacta* Morr.

1691 *P. adjuncta* Bdv.

White Point Beach, Annapolis to Springhill and Baddeck. Common. June 12 - August 4, at light. Has been variously reported as feeding on braken fern, *Solidago* and elm, perhaps partly in error.

1693 *P. assimilis* Morr.

White Point Beach, Digby, Lequille to Great Village, Pictou and Baddeck, in moderate numbers. June 10 - August 10, at light. Bred at Wolfville from a green and yellow striped larva on *Comptonia*. The Canadian Forest Insect Survey bred it from white birch at Ingonish. Also reported on alder and ash.

1694 *P. pulverulenta* Sm. Plate VII, Figure 6.

Mount Uniacke bog, July 18, 1946; MacNab's Island, June 30, 1914; Mason's Point, Halifax County, July 7, 1945; Debert, July 17, 1952; Glenholme, June 26, 1952; Great Village, no date. All just single specimens, at light. Larch.

1696 *P. ingravis* Sm. Plate VIII, Figure 3.

Bogs at Mount Uniacke and on the Prospect Road, Halifax County. Halifax watershed area, Peggy's Cove, Glenholme, Great Village. June 5 - July 2, with one late record August 4 (Great Village). Found commonly only on the barrens near Peggy's Cove. Larva on willow in the west, where the species is better known.

1697, 1 *P. frustrata* McD. Plate VIII, Figure 2.

Halifax watershed area, June 20, 1951; Bog, Prospect Road, July 2 1951; MacNab's Island, June 9, 1909; Cole Harbour, May 23, 1951 (W. Harrington); Mount Uniacke, June 7, 1950, June 10, 1953, June 22, 1951. Rare. Bred from larvae on larch in Newfoundland (the types) and at Elmsville, Charlotte County, N. B. (Canadian Forest Insect Survey). Also seen from Maine (the Brower collection).

1699 *P. lutra* Gn.

White Point Beach, South Milford, Annapolis north to Springhill and Baddeck. Common. June 10 - August 17. Larva on birch (Canadian Forest Insect Survey).

1709 *P. detracta* Wlk.

Annapolis, South Milford, Centreville, Mount Uniacke, vicinity of Halifax, Great Village, Baddeck. June 22 - July 23, at light and bait. Sometimes abundant. Reported on *Amelanchier*, gray birch, blueberry.

1710 *P. goodelli* Grt.

Lequille, Annapolis County, June 12, July 24, 1949; Acaciaville, June 29, 1951; Halifax, July 5, 1945. Seemed common in the Annapolis County locality, but evidently very local.

Lacinipolia McD.1712 *L. meditata* Grt.

Lequille, Lawrencetown, Auburn, White Point Beach, Debert. July 15 - August 27, mostly at bait. Locally common.

1714 *L. lustralis* Grt.

Digby, Annapolis, South Milford, Round Hill, Auburn, and near Halifax. June 14 - July 15, at light. Not common. Seems more plentiful northward in New Brunswick.

1716 *L. anguina* Grt.

Annapolis, Greenwood, Auburn, Coldbrook, Mount Uniacke, Prospect Road, Peggy's Cove, Armdale. June 1 - 30. Scarce everywhere except on the barrens at Peggy's Cove, where it came to light in numbers.

1738 *L. renigera* Steph.

Occurs quite commonly everywhere. July 4 - September 4, at both light and bait. Recorded as feeding on chicory (*Papilio*, Vol. 3, p. 133).

1744 *L. lorea* Gn.

Digby, Annapolis, Bridgetown, Stellarton and the vicinity of Halifax, though probably present everywhere. June 17 - July 29, at light. Common.

1745 *L. olivacea* Morr.

White Point Beach, Digby to Parrsboro and Pictou. Common locally at light and bait in the Annapolis Valley and Cumberland County. Scarcer elsewhere. July 31 - August 31.

Lasionycta Auriv.

————— *Lasionycta* sp., undetermined.

Bog near Mount Uniacke, July 9, 1947; Baddeck bog, July 1, 1949, at light. Two specimens only. Also taken at Bartibog, north of Chatham, N. B., July 9, 1950, and one seen from Maine (Brower coll.). Differs from *membrosa* Morr. from New Hampshire in being considerably larger and darker.

Anarta Ochs.1789 *A. cordigera* Thun. Plate VII, Figure 2.

Bog on the Prospect Road, Halifax County, June 7 - 9, 1951; series of twenty taken at flowers of *Andromeda glaucophylla*. Mount Uniacke bog, June 18, 1948, one worn female. Darts about in bright sunlight with a rather bee-like flight, but is readily netted when feeding. Larva on *Vaccinium* and *Arctostaphylos uva-ursi* in Europe.

Sideridis Hbn.1800 *S. rosea* Harv. Plate VIII, Figure 5.

Digby, June 21, 1905, June 25, 1907; Aylesford, Kings County, June 3, 1951; Auburn, Kings County, June 2, 1953.

1801 *S. congermana* Morr. Plate VIII, Figure 6.

MacNab's Island, July 23, 1907; Stellarton, no date.

1802 *S. maryx* Gn.

Digby, Auburn, Mount Uniacke, Armdale, Prospect Road, MacNab's Island, Peggy's Cove, Cole Harbour, Debert, Baddeck. June 6 - July 17, at light. Not common.

Tricholita Grt.1821 *T. signata* Wlk.

Including the form without a white reniform, *igna* B. & B. Acacia-ville, White Point Beach, Mount Uniacke, Sackville, Armdale, MacNab's Island, Peggy's Cove, Stellarton. July 26 - August 28, at light. Common.

Protorthodes McD.1855 *P. oviduca* Gn.

Digby, Annapolis, Aldershot, Armdale, Cole Harbour. June 2 - July 3; Local and not very common.

Orthodes Gn.1871 *O. crenulata* Butl.

White Point Beach, Digby and Lequille to Glenville, Cumberland County and Truro; probably more general northward but overlooked. June 30 - August 15, at light and bait. Occasionally abundant.

1872 *O. cynica* Gn.

Digby and Lequille through the Annapolis Valley to Halifax, and at Baddeck. Probably everywhere. June 5 - July 8, at light and bait. Abundant.

Pseudorthodes Morr.1876 *P. vecors* Gn.

Including the form with a white reniform, *nitens* Grt. White Point Beach, Digby, Lequille, Lawrencetown, Centreville, Petite Riviere, Truro and the vicinity of Halifax. June 8 - August 4, at light. Not especially common.

Homorthodes McD.1890 *H. furfurata* Grt.

Digby, July 29, 1905; South Milford, June 27, 1951; Lawrencetown, Annapolis County, July 15, 1945; Centreville, July 26, 1950; Armdale, July 17, 27, 1945, at light and bait. Scarce.

Nephelodes Gn.1895 *N. emmedonia* Cram. The Bronzed Cutworm.

Generally distributed and abundant throughout the mainland of Nova Scotia. Not seen from Cape Breton, but should certainly be present there as well. August 4 - October 9 at light and bait. The larva is most likely a general feeder on herbaceous plants, including *Gramineae*.

Morrisonia Grt.1903 *M. evicta* Grt.

Digby, Aldershot, Mount Uniacke, Bridgewater, Armdale. Sometimes quite common at bait in the spring. May 7 - June 8. Examples of form *vomerina* Grt. form about half the population.

1904 *M. confusa* Hbn.

Smith's Cove, Digby County, May 17, 1953; Bridgewater, May 28, 1950; Caledonia, Queens County, May 15, 1951; Lake Kejimukujik, Queens County, in beech woods, May 29, 30, 1950, at light. Local. The Canadian Forest Insect Survey records as food plants: basswood, cherry, chestnut, ironwood, maple and poplar.

Xylomyges Gn.1914 *X. dolosa* Grt. Plate VIII, Figure 4.

Aldershot, May 11, 1950; Waverley, May 22, 1949; Armdale, May 27, 30, 1948, May 24, 1950, all single captures at light. In the Halifax watershed area, May 7 and 9, 1951, I encountered this species in excessive abundance, and after selecting a series of about one hundred of the very best specimens, many hundreds more still remained on the sheets. In the same locality, April 22 - 26, 1952, it was again common, though not to the same extent as the previous year. A very few came to bait both seasons. Apparently one brood only. Food plant: poplar.

Orthosia Ochs.1937 *O. rubescens* Wlk. Plate VIII, Figure 7.

Digby County, Waverley, Armdale, April 10 - May 22. Rarest of the three *Orthosias*. Bred from a larva on beech (Digby County) by the Canadian Forest Insect Survey.

1940 *O. revicta* Morr.

Round Hill, Aldershot, Caledonia, Mount Uniacke, Waverley, vicinity of Halifax, Three Brooks, Pictou County. One of the commonest early spring species at bait. April 10 - May 27, with a straggler July 4. Extremely variable in coloration. A general feeder on deciduous trees.

1943 *O. hibisci* Gn.

Greenwood, Kings County, Armdale, MacNab's Island, Great Village. April 2 - May 24, at bait. Usually less common than *revicta* but occasionally more so. Also a general feeder on deciduous forest trees.

Crocigrapha Grt.

1950 *C. normani* Grt.

Digby, Aldershot, Centreville, Mount Uniacke, Armdale, MacNab's Island, Isle Haute, off Cape Chignecto. May 4 - June 21, at bait. Common. Larva on deciduous trees generally.

Ceramica Gn.

1951 *C. picta* Harr.

Acacia Valley, Lequille, Greenwood, White Point Beach, MacNab's Island, Debert, Glenholme. June 5 - August 25, at light. Adults rather scarce but larvae sometimes too plentiful, feeding on most garden plants. Has been recorded as a garden pest (H. G. Payne, Proceedings N. S. Ent. Soc., 1917, No. 3, pp. 44-49).

Protoleucania McD.

1962a *P. albilinea diffusa* Wlk.

Walker, Cat. Lep. Het. Brit. Mus., pt. 9, p. 94, 1856. Type locality: Nova Scotia.

Acaciaville and Annapolis to Armdale, and northward to Three Brooks, Pictou County and Baddeck. May 27 - July 4, and July 27, August 28, at light. Moderately common. Larva on grasses.

Leucania Curt.

1973 *L. pseudargyria* Gn.

Acacia Valley, Digby County and Annapolis Royal. July 21 - August 1, at light and bait. Common in the vicinity of Annapolis. The larvae of all the *Leucanias* feed chiefly on grasses, as far as is known.

1975 *L. inermis* Forbes. Plate VII, Figure 7.

Digby, Annapolis, South Milford, Round Hill, Annapolis County. June 4 - 23, at light. Scarce, though not as local as *pseudargyria*, and seemingly confined to the same general area in southwestern Nova Scotia.

1977 *L. commoides* Gn.

Digby, Annapolis, Petite Riviere north to Lakelands, Cumberland County and Great Village. June 30 - August 15, at light. Sometimes plentiful, especially in Digby and Annapolis counties.

1979 *L. scirpicola* Gn. Plate VII, Figure 10.

Probably this species. Lequille, June 16, 1949; South Milford, June 27, 1951; Great Village, July 18, 1948. Rare.

1982 *L. multilinea* Wlk.

Digby, Annapolis, Centreville, Mount Uniacke, Armdale and Baddeck. July 9 - August 10. Widely distributed, but never common.

1992 *L. insueta* Gn.

Digby, Annapolis, Petite Riviere north to Springhill and Baddeck. June 30 - August 22. Common.

1994 *L. unipuncta* Haw. Armyworm.

Generally distributed, and always present at baited trees, often in enormous numbers. April 10 - November 27.

1995 *L. luteopallens* Sm.

Seems to occur everywhere, often in abundance at both light and bait. July 5 - September 11.

Cuculliinae

Cucullia Schrank

2038 *C. intermedia* Speyer

White Point Beach, Digby to Stellarton and Baddeck. Not uncommon. May 28 - July 27, at light. Larva on various Compositae.

2041 *C. florea* Gn. Plate VIII, Figure 9.

Lequille, Annapolis, Round Hill, Armdale, MacNab's Island, Enfield. June 13 - August 25. Least common of the recorded *Cucullias*. Bred from green larvae, with thin white and yellowish lines, on *Aster umbellatus* and *Solidago graminifolia*.

2042 *C. postera* Gn. Plate VIII, Figure 10.

White Point Beach, Lequille, north to Three Brooks, Pictou County, Truro and Cole Harbour. June 29 - September 28, at light. Commoner than *florea*, but larva not known.

2046 *C. convexipennis* G. & R.

White Point Beach, Digby, Annapolis to Stellarton and Baddeck. July 6 - August 25, at light. Also taken at dusk along with Sphingidae at honeysuckle and *Oenothera* flowers. Moderately common. The vividly colored larva often found on *Solidago*.

Oncocnemis Led.

2116 *O. piffardi* Wlk. Plate VII, Figure 9.

Digby, August 28, 1937; Halifax (Andrew Downs); Truro, August 20, 1922 (Payne); Debert, September 12, 1952 (Harrington). Rare.

Homohadena Grt.2147 *H. badistriga* Grt.

Economy, Colchester Co., July 16, 1946 (A.D. Hall). Determined by Dr. McDunnough.

Adita Grt.2155 *A. chionanthi* A. & S. Plate VIII, Figure 8.

Digby, September 19, 1907 (Russell). One rather worn specimen.

Apharetra Grt.2156 *A. dentata* Grt. Plate VII, Figure 5.

Digby, White Point Beach, Mount Uniacke, Halifax, Halifax watershed area, Shad Bay, Three Brooks, Glenville. July 12 - August 26. Sometimes quite common at light in the localities near Halifax, especially on the bogs. Larvae on *Vaccinium* (McDunnough). One bred from a larva eating blueberry, Prospect Road bog.

Feralia Grt.2183 *F. jocosa* Gn.

MacNab's Island, June 8-14; Halifax watershed area, May 9, 1951; Mount Uniacke, May 25, 1950., May 5, 1953. The MacNab's Island specimens include an example of form *jocosides* Strand, and an example of an unusual, deep brown form without any green coloring. Larva on spruce, hemlock and probably other conifers. It has been reared through to the adult by the Canadian Forest Insect Survey on red and black spruce.

2185 *F. major* Sm. Plate VIII, Figure 11.

Digby, 1933 (Russell). French Mountain, Inverness County, 1390 feet, June 16, 17, 1953, 2 specimens. Rare.

2186 *F. comstocki* Grt. Plate VIII, Figure 12.

Lake Kejimukujik, Waverley, Mount Uniacke, MacNab's Island, Armdale, Stellarton French Mountain. May 20 - June 18, at light. Not common, but in recent years has occurred much more frequently than *jocosa*. The specimen figured is one from Mount Uniacke, in which most of the green is suffused with brown. White-striped green larvae found repeatedly on balsam fir are probably referable to this species, although none were reared through. In western New York localities where spruce and fir do not grow, the host plant appears to be hemlock.

Psaphida Wlk.2191 *P. grotei* Morr.

Round Hill, Annapolis County, May 10, 1937, at light (F. C. Gilliatt). Larva probably on oak.

Bombycia Steph.

2207 *B. algens* Grt. Plate X, Figure 1.

Aylesford, Kings County, August 26 - September 11, 1951-52. Abundant at light in the same marsh habitat occupied by such species as *Archanara oblonga*, *Hillia iris* and *Macronoctua onusta*. Very local, and seemed concentrated right in the wettest parts of the marsh where the cat-tails grow. A few came to bait. Also at Cole Harbour, a single specimen on August 29, 1951 (Harrington).

Hillia Grt.

2211 *H. iris* Zett. Plate VII, Figures 12 & 13.

Aylesford, September 10, 1952, October 3, 1950; Centreville, October 2, 1950 (three), at light and bait. The form *vigilans* Grt. at Great Village, 1945 (Hall), and Aylesford, September 10, 11, 1952 (six), October 3, 1950 (two). Seems associated with marshy places.

Lithomia Grt.

2215 *L. napaea* Morr.

Bridgetown, Greenwood, Armdale, MacNab's Island, Stellarton. March 16-May 27, and September 29 - October 17. Hibernates as an adult. Often common at bait.

Lithomoia Hbn.

2216a *L. solidaginis germana* Morr.

Digby, through the Annapolis Valley and Mount Uniacke to Halifax, and Wellington Station, Halifax County, Parrsboro and Stellarton. Aug. 19 - October 28, at bait and *Solidago* flowers. Commonest in or near open areas where *Solidago*, the probable host plant, grows abundantly.

Lithophane Hbn. (*Graptolitha* Hbn.)

2220 *L. bethunei* G. & R.

Abundant in the Annapolis Valley; present, though scarcer, at MacNab's Island, Cole Harbour, Armdale, Wellington, Stellarton. September 2 - November 3, and April 8 - June 3. Hibernates as an adult, like all the *Lithophanes*. Bred at Annapolis, August 30, from a larva on oak, and at Kentville, September 5, from apple. Probably the most injurious of the green fruit worms in the Annapolis Valley.

2221 *L. innominata* Sm.

Possibly all as normal form *illecebra* Franclemont. Digby, Mount Uniacke, Wellington, Stellarton and the vicinity of Halifax. Common. September 4 - November 2, April 8 - May 17, at bait.

2222 *L. petulca* Grt.

Digby, Bridgetown, Armdale, MacNab's Island, Purcell's Cove, Stellarton. September 13 - November 3, April 8 - 28. Dark brown suffused form, *ferrealis* Grt. (2223), slightly scarcer than true *petulca*. Probably a rather general feeder on deciduous trees.

2224 *L. amanda* Sm.

Stellarton, no date (Hills coll.). The only specimen seen.

2225 *L. disposita* Morr.

Bridgetown, Aylesford, Centreville, Armdale, MacNab's Island, Stellarton. September 10 - October 3, and April 3. Common at bait in willow-alder swampland at Aylesford. Probably a willow feeder.

2226 *L. hemina* form *lignicosta* Franclemont

Bridgetown, September 29; Wolfville, May 8, 1949; Halifax watershed area, September 29, 1952; Wellington, October 12, 1950; Stellarton, no date. *Lignicosta* is the brown suffused form of *hemina* Grt. corresponding to form *ferrealis* of *petulca*, but there is considerable doubt about the determination of these specimens, partly because the unsuffused *hemina* has never turned up here. I strongly suspect that some of them, perhaps all, are actually referable to the true *innominata* Sm., which bears the same relationship to *illecebra* as *ferrealis* does to *petulca*.

2234 *L. baileyi* Grt. Plate IX, Figure 1.

Digby, September 17, 1906, September 28, 1907; Wellington, Halifax County, October 9, 1950. Rare.

2241 *L. tepida* Grt. Plate IX, Figure 2.

Digby, Bridgetown, Caledonia, Mount Uniacke, Armdale, Peggy's Cove, MacNab's Island, Cole Harbour. September 16 - October 20, April 10-May 19. Not uncommon at bait some seasons.

2244 *L. georgii* Grt. Plate IX, Figure 3.

Digby, Round Hill through the Annapolis Valley and Mount Uniacke to Halifax, and northward at Stellarton. September 10 - October 25, April 13. Not usually common. Probably a rather general feeder as it was bred from apple at the Dominion Entomological Laboratory, Kentville.

2245 *L. laticinerea* Grt.

Digby, Bridgetown, Greenwood, Wellington, Armdale, Peggy's Cove. September 1 - October 25, March 29 - April 18. Rather common. Probably general on deciduous trees.

2246 *L. cinerosa* Grt.

Digby, Bridgetown, Centreville, Armdale. August 23 - October 20, April 10 - 22. Much scarcer than *laticinerea*. Larvae reported from birch and maple by the Canadian Forest Insect Survey.

2247 *L. unimoda* Lint.

Bridgetown, Armdale, Halifax watershed area, Stellarton. October 8-25, April 8 - May 25. Scarce. Reported on cherry, oak and maple.

2248 *L. fagina* Morr.

Digby, Round Hill to Armdale and MacNab's Island, and northward at Stellarton. September 29 - October 25, March 26 - May 28. Always one of the commonest *Lithophanes*. Larva on birch and cherry (Canadian Forest Insect Survey).

2252 *L. pezata* Grt.

Digby, Centreville, vicinity of Halifax, Stellarton, Baddeck. September 5 - October 8, April 8 - May 3. Not uncommon. Larva reported on alder.

2255 *L. lepida* Lint. Plate IX, Figure 4.

Armdale, April 10 and 13, 1945, at bait. Rare.

2258 *L. thaxteri* Grt.

Annapolis, Caledonia, Waverley, Armdale, MacNab's Island, Peggy's Cove, Glenholme. September 22, April 13 - June 12 at light and bait. Scarce. Larva has been reported on larch.

Xylina Ochs.2259 *X. nupera* Lint.

Greenwood, Centreville, Halifax, Parrsboro, Stellarton, Baddeck September 10 - October 18, March 26 - May 21, at bait. Bred from large, green larvae on marsh grasses and *Juncus*.

2260 *X. curvimacula* Morr.

Aylesford, Wellington, Armdale, MacNab's Island, Stellarton. September 24 - November 26, April 2 - May 21. This is always the commonest species of *Xylina*.

2262 *X. thoracica* Put.-Cram. Plate IX, Figure 5.

Centreville, October 2, 1950; Armdale, October 1, 1950; MacNabs Island, April 15, 1923; Debert, May 20, 1952; Stellarton no date. The scarcest of the four species. On various plants, but shows a preference for willow (Dod, Can. Ent., Vol. 47, p. 126).

2263 *X. cineritia* Grt. Plate IX, Figure 6.

Greenwood, Armdale, Halifax watershed area, Stellarton. April 10 - May 6, at bait. Quite common some seasons in deciduous woods near Armdale. Feeding habits reported to be similar to *thoracica*.

Xylotype Hamp.2266 *X. acadia* B. & B. Plate IX, Figure 7.

Barnes and Benjamin, Contributions Nat. Hist. Lep. N. A., Vol. V (1), p. 33, 1922. Type locality: Digby

Digby, Centreville, Aylesford, Mount Uniacke bog, Wellington, Armdale, Prospect Road, MacNab's Island, Cole Harbour, Great Village. August 29 - October 12, at light and bait. Not especially common. The date on the allotype, August 3, 1906, is exceptionally early, and might be an error of labelling. Early September is the normal time for the species to appear.

Platypolia Grt.2268 *P. anceps* Steph.

Digby, vicinity of Halifax, Baddeck (Engelhardt). September 10 - October 18, at light, once at bait. Not very common. Bred from *Aster macrophylla* (Dr. Brower).

Mniotype Franclemont2272 *M. ducta* Grt. Plate IX, Figure 8.

Digby, MacNab's Island, Peggy's Cove, Stellarton. June 20 - July 20. Generally rare, although it was taken in series at Digby by Mr. Russell. There is some doubt about the determination of our material, and it needs more careful study.

A single female from Cole Harbour, Halifax County, July 31, 1950 (W. Harrington), is much darker than the others, and seems to differ in other minor ways. It is possibly another species.

Fishia Grt.2283 *F. enthea* Grt. Plate IX, Figure 9.

This is another species that has not been determined with certainty, since so little material is available for study. Debert, September 24, 1952, at light; Great Village, September 7, 1945; Stellarton, no date. Very rare.

Anytus Grt.2285 *A. privata* Wlk.

Digby, Smith's Cove, Lake Rossignol to Parrsboro and Stellarton. Probably general. August 11 - October 1, at light and bait. Common. Varies greatly in the proportions of gray and black scaling on the primaries.

Chaetagnaea Franclemont2289 *C. sericea* Morr.

Aylesford, Centreville, Wellington, Armdale. September 11 - November 3. Abundant at bait in the Annapolis Valley localities; scarcer elsewhere.

Epignaea Grt.2294 *E. apiata* Grt.

Aylesford, Centreville, Armdale, Prospect Road bog, Peggy's Cove, Debert. September 11 - October 4. The first evidence of its occurrence here was a specimen beaten from low vegetation in the daytime on a small, isolated bog at Armdale, September 1950, in a small tract of pine woods known locally as Edmonds' Grounds. Subsequently, it was found to be numerous in suitable boggy areas, and came to both light and bait. At Centreville, a few even came to light in dry woodland. Larva supposedly a cranberry feeder.

Melaxagnaea Franclemont2296 *M. inulta* Grt.

Bridgetown, Auburn, Aylesford, Centreville, Lake Rossignol, Debert, Stellarton, Wellington, and in great abundance in the woods about Halifax. August 24 - November 3, mostly at bait. Commonest of the "Glaeas". Also occurs as a dark smoky-suffused form evidently tending towards melanism.

Pyreferra Franclemont(2299) *P. hesperidago* Gn. (*indirecta* Wlk.)

Armdale, October 15 - November 3, April 8 - 15; Wolfville, May 8, 1949. Hibernates as an adult. Not common. Larva has been reported on *Hamamelis*.

(2300) *P. citrombra* Franclemont (*graefiana* Grt.)

Armdale, Halifax watershed area, Wellington, Wolfville, Caledonia. October 7 - November 3, April 2 - May 16, at bait. Scarce.

Eupsilia Hbn.2303 *E. tristigmata* Grt.

Bridgetown, Kentville, Wellington, Armdale, MacNab's Island, Stellarton. October 12 - November 3, March 22 - May 21. Not uncommon at bait, especially in the spring. Reared from a "dark brown, velvety fruitworm" at the Dominion Entomological Laboratory, Kentville.

2304,1 *E. vinulenta* Grt.

Digby, Bridgetown, Armdale, Wellington. October 12 - November 3, March 26 - May 3, at bait. Rather scarce.

2305 *E. morrisoni* Grt.

Armdale, Halifax watershed area, Wellington, Halifax County, October 12 - November 3, April 12 - May 8, at bait. Often abundant, especially in the spring. Commonest of the *Eupsilias* in the woods near Halifax. Probably rather a general feeder on deciduous trees.

2306 *E. devia* Grt.

Annapolis, Bridgetown, Wellington, Hubbards, Parrsboro, Stellarton and the vicinity of Halifax. September 25 - October 12, March 17 - April 22. Occasionally common at bait. Bred September 4, 1950 from larvae tying up the terminal leaves of *Aster umbellatus* in June, and similar larvae also observed that season on a species of *Solidago*.

Parastichtis Hbn.2309 *P. discivaria* Wlk.

Digby, Lawrencetown, Bridgetown, Centreville, Armdale. July 15 - September 4, at bait. Not common.

Rusina Steph.2312 *R. bicolorago* Gn.

Digby, Aylesford, Centreville, Bridgetown, Wellington, Stellarton, and the vicinity of Halifax. September 11 - November 21. Form *ferrugineoides* Gn. in swarms at bait in late fall, typical form *bicolorago* much scarcer.

Xanthia Ochs.2316 *X. lutea* Strom.

Bridgetown, Aylesford, Centreville, Wellington, Armdale, MacNab's Island, Debert, Stellarton. September 3 - October 9. Sometimes abundant at bait in the Annapolis Valley localities, rare in Halifax County.

Anathix Franclemont2318 *A. puta* G. & R. Plate VII, Figure 8.

Aylesford and Armdale. September 3 - October 4, at light and, more often, bait. Scarce.

Eucirrhoedia Grt.2321 *E. pampina* Gn.

Aylesford, Coldbrook, Centreville, Wellington, Debert, Stellarton, and in the woods about Halifax. Very common and probably present everywhere. August 31 - November 2, at light and bait. Larva on poplar.

Homoglaea Morr.2324 *H. hircina* Morr.

Greenwood, Kings County, March 29, April 19, 1945; deciduous woods, Halifax watershed area, April 13 - May 3, at bait. Normally uncommon. Larva on poplar.

Amphipyridinae*Septis* Hbn.2328 *S. verbascoides* Gn.

Digby, Centreville, Three Brooks, and various localities in Halifax County. July 4 - August 4 at bait and, less commonly, at light.

2334 *S. vulgaris* G. & R.

Acaciaville, Digby County, July 26, 1949. A single worn female at light.

2335 *S. lignicolora* Grt.

Generally distributed and often moderately common at light. June 22 - August 10.

2344 *S. vultuosa* Grt.

Digby, Lequille, Bridgetown, Armdale, MacNab's Island, Three Brooks, Baddeck, French Mountain. June 13 - August 1, at light. Not common.

2346 *S. apamiformis* Gn. Plate IX, Figure 10.

Centreville, Kings County, July 22, 1949. Two females at bait.

2347 *S. plutonia* Grt. Plate IX, Figure 12.

Valley of the Cheticamp River, Inverness County, July 2, 1949. One male at light.

2351 *S. amputatrix* Fitch

Generally distributed and often abundant at light and bait. July 8 - September 6. This is the species formerly known as *S. arctica* Frr., but this name is a homonym of *arctica* Zett.

2353 *S. alia* Gn.

Round Hill, Halifax, Cole Harbour, Great Village. July 7 - 31, at light. Not common. Includes form *rorulenta* Sm.

2355 *S. inordinata* Morr.

Isle Haute, Bay of Fundy, Greenwood, Kings County, Armdale, MacNab's Island. June 5 - July 1, at light. Scarce.

2361 *S. commoda* Wlk.

Truro, August 20, 1923. A single worn male (in the Canadian National Collection).

2362 *S. impulsa* Gn.

Digby, White Point Beach, Petite Riviere, Waverley, MacNab's Island, Armdale, Debert, Stellarton. June 22 - August 25, at light.

2363 *S. mixta* Grt. Plate IX, Figure 11.

Centreville, Kings County, July 22, 1949; Armdale, September 7, 1948; Parrsboro, August 15, 1944. Rare.

2364 *S. indocilis* Wlk.

Digby, Waverley, Armdale, MacNab's Island, Mason's Point, Halifax County. July 2 - August 11, at light. Not usually common.

2365 *S. finitima* Gn.

Digby, South Milford, Centreville, Isle Haute, Truro, Armdale, MacNab's Island, Port Wallis. June 3 - August 6, at light. Not uncommon about Halifax.

Agroperina Hamp.2366 *A. lateritia* Hufn.

Annapolis, Auburn, Kentville, Petite Riviere, St. Margaret's Bay, MacNab's Island, Stellarton. June 29 - July 20. Local and not especially common.

2368 *A. dubitans* Wlk.

Abundant everywhere, mostly at bait, July 16 - October 1.

2638a *A. cogitata* Sm.

Previously placed as just a reddish form or variety of *dubitans*, *cogitata* is now considered a distinct species. Widely distributed from Digby to Baddeck, but it is scarcer than *dubitans* and more local. June 25 - August 4, usually at light. Like *lateritia*, this species occurs most commonly in open country rather than woods.

2370 *A. inficita* Wlk.

Armdale, August 15, 1950, one male at light; St. Peter's, Richmond County, August 14, 1930 (R. E. Balch); top of North Mountain, Inverness County, August 3, 1953.

Crymodes Gn.2375 *C. devastator* Brace

Abundant everywhere at bait. June 20 - September 6.

Protagrotis Hamp.2383 *P. niveivenosa* Grt.

Great Village, Colchester County, no date (A. D. Hall).

Luperina Bdv.2387 *L. stipata* Morr.

Annapolis, Round Hill, Bridgetown, Coldbrook, Grand Pré, White Point Beach, Armdale, MacNab's Island. August 11 - September 20. Inhabits open country chiefly, including salt marshes and dykelands.

2393 *L. passer* Gn.

Digby, Round Hill, Bridgetown, Lawrencetown, Centreville, Baddeck. June 15 - July 23, at light. Scarcer than *stipata*, and probably also limited to open, grassy country.

Oligia Hbn.2412 *O. modica* Gn.

White Point Beach and Bridgetown to Great Village, Stellarton and Baddeck. Seemingly quite general. July 21 - September 10, at light and bait. Sometimes common.

2415 *O. semicana* Wlk. Plate VII, Figure 15.

Peggy's Cove, July 8, 1951, seven specimens at light; Prospect Road area, Halifax County, August 10, 1950; Mount Uniacke, July 10, 1951, August 11, 1950; Great Village, no date. Scarce.

2417 *Oligia* sp, possibly a race of *tonsa* Grt. Plate VII, Figure 14.

Very dark. Lacks the black bar between the t.p. and t.a. lines. Near Partridge Island, Parrsboro, July 30, 1948, at light. One specimen only.

2420 *O. bridghami* G. & R.

Widely distributed from White Point Beach and Digby north to Parrsboro and Three Brooks, Pictou County, but uncommon most places. July 20 - September 19, at light and bait.

2421 *O. minuscula* Morr. Plate VII, Figure 11, form *grahami*.

Digby, Round Hill, Lake Rossignol, Auburn, Mount Uniacke, Peggy's Cove, Herring Cove and the Prospect Road, Halifax County, August 11 - September 22, at light. Rarely strays far from its bog haunts.

Grahami Benj. (Pan Pac. Ent., Vol. IX, p. 150. Type locality: Cap Rouge, Inverness County. Types a male and a female taken by Graham Fairchild, September 2, 1928) is at best probably only a form, since only a few individuals from scattered localities fit Benjamin's description.

2422 *O. diversicolor* Morr.

Annapolis, Round Hill, Bridgetown, Auburn, Aylesford, Armdale, Peggy's Cove, Great Village, Stellarton. August 24 - September 29, at light. Common in a cat-tail marsh at Aylesford.

2423 *O. illocata* Wlk.

Bridgetown, Aylesford, Mount Uniacke, Armdale, MacNab's Island, Cole Harbour, Peggy's Cove, Stellarton. August 26 - November 3. One of the commonest moths at bait in the fall.

2424 *O. mactata* Gn.

Digby, Bridgetown, Armdale, MacNab's Island, Great Village. August 24 - September 27, at bait. Occurs commonly along with *illocata*.

Eremobina McD.2430 *E. claudens* Wlk. Plate VII, Figure 16.

It seems reasonable to believe that the species occurring in Nova Scotia is *claudens* Wlk., described from Newfoundland, although it is really doubtful whether there is any specific difference between *claudens* and *hilli* Grt. Average Nova Scotian specimens agree better with Hampson's figure of *claudens* than with his figure of *hilli* (Lep. Phal. Br. Mus., Vol. VII, pl. CXVIII, figs. 19 and 21).

Digby, Annapolis, Bridgetown, Mount Uniacke, MacNab's Island, Armdale, Debert, Great Village, Baddeck and St. Peter's, Richmond County. August 14 - September 20, at light and bait. Quite rare.

Spartiniphaga McD.2436 *S. inops* Grt. Plate VII, Figure 18.

Annapolis, Lequille, Round Hill, Lawrencetown, Great Village. August 24 - September 3, at light. Seems to be associated with the marshy grassland bordering the lower, tidal Annapolis River. Might be a salt marsh species.

2437 *S. includens* Wlk.

Walker, Lep. Het. Brit. Mus., pt. XII, p. 813, 1857. Type locality: Nova Scotia.

Armdale, July 18 - August 15; Mount Uniacke bog, August 11; Great Village, no date. Very local. The larva feeds on *Carex stricta*, according to Dr. A. E. Brower.

2438 *S. panatela* Sm. Plate VII, Figure 17.

Annapolis, Lequille, South Milford, Mount Uniacke, Halifax watershed area. June 17 - July 26, at light. Locally common near the coarse grasses that grow in marshy spots in the woods, or along streams.

Archanara Wlk.2439 *A. oblonga* Grt.

White Point Beach, Annapolis, Round Hill, Aylesford, Grand Pré, Great Village, Debert, Parrsboro, Stellarton. August 16 - September 20. Often common at light in marshy areas, where the larvae bore in the stems of cat-tails.

2440 *A. subflava* Grt. Plate X, Figure 2.

White Point Beach, Peggy's Cove, Wolfville, Great Village, Debert. August 8 - September 5. Usually rare, though a number were taken at Great Village. Reported by Dr. Frank Morton Jones as feeding on Great Bulrush (presumably *Scirpus validus* Vahl.) on Martha's Vineyard.

Ommatostola Grt.2445 *O. lintneri* Grt.

Barrington Passage, White Point Beach, Crescent Beach (Petite Riviere), Sable Island (August 16, 1899), July 28 - August 26, mostly at light. A single worn specimen flying by day over the coarse grass of the sand dunes on Crescent Beach.

Hypocoena Hamp.2448 *H. inquinata* Gn. Plate VII, Figure 20.

Acaciaville, West Northfield, Lunenburg County, Herring Cove, Armdale, Halifax watershed area. July 20 - August 17. Locally common in much the same situations as *Spartiniphaga panatela*.

2449 *H. orphnina* Dyar. Plate VII, Figure 19.

Annapolis, Lequille, Round Hill, Grand Pré, Peggy's Cove, Debert, Great Village. July 25 - September 16, at light. These localities suggest an association with the salt marshes surrounding the Bay of Fundy and

extending inland along its tidal rivers. *Orphnina* was quite common at street lamps in Annapolis Royal, a town almost surrounded by open marshes, and at Grand Pré I took it at lights set up along the edge of a salt marsh.

Zenobia Oken

2453 *Z. pleonectusa* Grt.

Digby, Auburn, Aylesford, Centreville, Wellington, vicinity of Halifax, Cole Harbour, Stellarton. July 26 - October 12, at light. Larva on poplar.

Helotropha Led.

2457 *H. reniformis* Grt.

White Point Beach and Acaciaville to Glenville, Cumberland County and Three Brooks, Pictou County. Probably general. July 18 - October 4. Often plentiful at bait, most commonly as form *atra* Grt.

Apamea Ochs.

2458 *A. velata* Wlk.

Numerous records from Digby and White Point Beach to Stellarton and Baddeck. July 15 - August 24, at light. Common.

2459 *A. americana* Speyer

Digby, White Point Beach north to Pictou and Baddeck. Presumably general. July 16 - October 6, at light and bait. Abundant. Larvae supposed to feed in the roots of grasses.

Hydroecia Gn.

2474 *H. micacea* Esp.

Mahone Bay and Cole Harbour to Stellarton, Truro and Parrsboro, and from Annapolis to Hortonville in the Annapolis Valley. Probably much more widely distributed. July 31 - September 29, at light. Common some seasons.

Papaipema Sm.

2479 *P. appassionata* Harv. Plate XI, Figure 1.

Peggy's Cove, September 18 - 22, 1952. Ten specimens at light. The larvae bore in the stems and roots of pitcher plant (*Sarracenia*).

2481 *P. inquaesita* G. & R. Plate XI, Figure 4.

Round Hill, Aylesford, Centreville, Wellington, Armdale, Great Village. September 6 - October 12, at light. Locally common. Form *wyatti* B. & B., with white-filled reniform and orbicular, once only, at Aylesford. The larva is a fern-feeder, reported on *Onoclea*.

2501 *P. harrisi* Grt.

Larvae of a *Papaipema*, assumed to be this species, were found feeding inside the pithy stems of *Heracleum lanatum*, together with the much more numerous larvae of a Micro — *Depressaria heracleana* Linn., on North and French Mountains, Inverness County, August 1 - 5, 1953. Four adults emerged September 1 - 4.

2505 *P. impecuniosa* Grt.

Round Hill, Aylesford, Debert, Great Village. September 16 - October 13, at light. Very common at Great Village, otherwise just taken occasionally. Larva bores in *Aster umbellatus*.

2509 *P. pterisii* Bird

Round Hill, Aylesford, Coldbrook, Centreville, Wellington, Peggy's Cove, Cole Harbour, vicinity of Halifax, Debert, Great Village, Stellarton. August 31 - October 17, at light. Commonest of the *Papaipemas*. The larva bores in the roots of the common bracken fern, *Pteridium aquilinum*.

2521 *P. frigida* form *thalictri* Lyman. Plate XI, Figure 6, *frigida*.

Round Hill, Aylesford, Armdale, Cole Harbour, Stellarton. September 10 - November 2, at light. Typical form *frigida* Sm. only once, Aylesford, October 3, 1950. The larva feeds in the roots of meadow rue (*Thalictrum*).

2530 *P. eupatorii* Lyman. Plate XI, Figure 3.

Aylesford, Kings County, October 3, 1950. One male at light. Host plant Joe-Pye weed (*Eupatorium*).

Euplexia Steph.2533 *E. benesimilis* McD.

Digby, Lequille, St. Margaret's Bay to Stellarton and Baddeck. Presumably general. June 5 - July 26, at light. Common. Reported (as *lucipara* Linn.) on *Viburnum*, *Betula*, etc. by Henry Edwards, but this may refer to the European species.

Phlogophora Tr.2535 *P. iris* Gn.

Annapolis, Stellarton, Three Brooks, Baddeck, Cheticamp, vicinity of Halifax. June 9 - July 20, at light. Usually quite common.

2536 *P. periculosa* Gn.

Generally distributed. July 19 - October 1. Always comes abundantly to bait, *periculosa* and form *v-brunneum* Grt. in about equal num-

bers. Bred at Halifax from larvae on *Acer rubrum* and *Kalmia angustifolia*. The *Kalmia* is apparently a regular food plant, as a number of small larvae found on it in the spring were reared to maturity.

Haploolophus Butl.

2539 *H. mollissima* Gn.

Annapolis Valley, vicinity of Halifax, and at White Point Beach, Bridgewater, Petite Riviere and Baddeck. June 23 - July 25, at light. Not uncommon. Larva probably a fern-feeder.

Euherrichia Grt.

2540 *E. monetifera* Gr.

White Point Beach to Glenville, Cumberland County, Three Brooks, Pictou County and Baddeck. Seems to occur everywhere. June 16 - August 16. Larva on bracken fern.

Fagitana Wlk.

2543 *F. littera* Gn. Plate VII, Figure 21.

Lake Kejimukujik, Queens County, May 29, 1950. One female at light in beech-hemlock woods.

Macronoctua Grt.

2546 *M. onusta* Grt.

Round Hill, Aylesford, Armdale, MacNab's Island, Great Village. September 13 - October 8, at light. Occurs sparingly and locally near marshy areas. Larva on *Iris*.

Chytonix Grt.

2554 *C. palliatricula* Gn.

Form *iaspis* Gn., without the conspicuously white median space, most commonly. Lequille, South Milford, Auburn, Armdale, MacNab's Island, Port Wallis, Pictou, Cheticamp. June 5 - July 31. Often common at both light and bait in mixed forest.

Typical form, *palliatricula*, at Armdale and Rockingham, Halifax County, June 13 - July 22.

Cerma Hbn.

2559 *C. cora* Hbn. Plate XI, Figure 7.

Acaciaville, Annapolis Royal, Lequille, Round Hill, Mount Uniacke. June 15 - July 10, at light. Rare.

Leuconycta Hamp.

2576 *L. diptheroides* Gn.

Annapolis Valley from Digby to Centreville, White Point Beach, vicinity of Halifax, Debert, Baddeck. June 12 - August 11, including form *obliterata* Grt. Common.

2577 *L. lepidula* Grt.

White Point Beach and Annapolis to Three Brooks, Pictou County and Baddeck. June 13 - August 4, at light. Usually commoner than *diptheroides*.

Agriopodes Hamp.

2578 *A. fallax* H.-S.

Occurs from Barrington Passage to Baddeck. June 20 - August 20, at light and bait. Often quite common in deciduous woods. The larva has been reported on poplar and *Viburnum*.

Amphipyra Ochs.

2584 *A. pyramidoides* Gn.

Digby, August 4, 1905; Lake Rossignol, August 21, 23, 1951, at bait. Scarce. A general feeder on deciduous trees.

2585 *A. tragopoginis* L.

Annapolis Valley from Digby to Wolfville, Mount Uniacke, vicinity of Halifax, Truro, Parrsboro, Stellarton, Pictou, Baddeck. July 20 - September 3, at bait. Common. Probably also a general feeder.

Dipterygia Steph.

2587 *D. scabriuscula* L.

Annapolis Royal, Waverley, Mason's Point, Halifax County, Great Village. July 7 - August 10, at light and bait. More taken at Annapolis than elsewhere.

Nedra Oken

2589 *N. ramosula* Gn.

White Point Beach and Annapolis to Parrsboro, Three Brooks and Baddeck. Probably occurs wherever the food plant, St. John's wort (*Hypericum*) grows. Two broods: May 27-June 30 and July 23 - August 22. Often plentiful at light.

Andropolia Grt.

2596 *A. contacta* Wlk. Plate X, Figure 3.

Glenville, Cumberland County, August 9 and 10, 1949. Five specimens at bait in deciduous woods.

Hyppa Dup.2607 *H. xylinoides* Gn.

Generally distributed, Barrington Passage to Baddeck. Two broods, overlapping: May 19 - September 20. Often abundant at bait. A very general feeder.

According to Mr. Franclemont, two species are involved, both of them occurring in Nova Scotia. One of these (*ancocisconensis* Morr.?) has narrower antennae in the male, very different female genitalia and is single brooded. The double brooded species with wide antennae is *xylinoides* Gn.

Elaphria Hbn.2645 *E. versicolor* Grt.

White Point Beach and Digby to Three Brooks and Baddeck. June 4 - July 10, with one very late record for August 19. Often plentiful at light. Larva mottled black and brown with swollen thoracic region, on spruce and fir.

——— *E. georgei* Moore & Rawson. Plate XI, Figure 5.

Lequille, Annapolis Co., June 13 - 22, 1949 and 1950, seven specimens at light in mixed woods; South Milford, June 27, 1951; Mount Uniacke, June 1 and 22, 1951, five specimens at light; Waverley, June 1, 1952; Prospect Road bog, July 3, 1951. Scarce and local. Seen only from Michigan, Quebec and Nova Scotia. *Georgei* was described recently from Livingstone Co., Michigan.

2647 *E. festivoidea* Gn.

White Point Beach, Lake Kejimukujik and Digby to MacNab's Island, Armdale, Mount Uniacke and Centreville. Probably everywhere. May 31 - July 18, and once as late as August 15. Often plentiful at light and bait.

Mr. Franclemont informs me that two or more species have been masquerading under this name, and just which name, if any, is available for the small gayly colored one occurring here has not yet been established.

Platyperigea Sm.2655 *P. multifera* Wlk.

Walker, Cat. Lep. Het. Brit. Mus., pt. X, p. 293, 1856.
Type locality: Nova Scotia.

Annapolis, Bridgetown, Lake Rossignol, Auburn, Armdale, MacNab's Island, Great Village, Stellarton. August 15 - September 12, at light.

Proxenus H.-S.2662 *P. miranda* Grt.

Round Hill, Mount Uniacke bogs, Prospect Road bog, Peggy's Cove, Glenville, Baddeck. June 15 - July 29. Local, but often very common at light where it occurs.

Galgula Gn.2666 *G. partita* Gn.

Round Hill, Petite Riviere and Armdale. July 2, 16, August 2, and August 17 - October 22, at light. Scarce.

Balsa Wlk.2669 *B. malana* Fitch

Digby, Annapolis, Bridgetown, Auburn, Coldbrook, Londonderry, Colchester County, Glenville, Cumberland County, Baddeck. June 5 - July 18, and once on August 22. Never taken in Halifax County, and seems to avoid the whole south-eastern area. Larva on apple.

Prodenia Gn.2678 *P. ornithogalli* Gn.

Armdale, August 2 - September 6, mostly at bait. Not common.

Laphygma Gn.2682 *L. frugiperda* A. & S.

Bridgetown, Wellington, Armdale, Lakelands, Cumberland County. June 30, and July 30 - October 15 at light and bait. Common some seasons.

Enargia Hbn.2685 *E. decolor* Wlk.

Centreville, Kings County, Oct. 2, 1950, at bait (one male, one female); Glenville, Cumberland County, August 11, 1949, at bait. Much scarcer and more local than the following.

2685, 1 *E. infumata* Grt. Plate X, Figure 4.

Digby, Lawrencetown, Mount Uniacke, Armdale, Parrsboro, Glenville. July 15 - September 10. Often abundant at bait. Larva probably on poplar.

Cosmia Ochs.2687 *C. calami* Harv.

Lequille, Round Hill, Lake Rossignol, Cole Harbour, Port Wallis. July 24 - August 29, at light. A specimen from Chester Basin, Lunenburg County bred from red oak (Canadian Forest Insect Survey).

Amolita Grt.2694 *A. fessa* Grt.

Annapolis, Round Hill, Centreville and at Green Bay, Lunenburg County. July 16 - 30, at light. Scarce and seems restricted to the Southern region.

Arzama Wlk.2703 *A. obliqua* Wlk.

Annapolis, South Milford, Centreville, Great Village, Stellarton, Baddeck. June 4 - July 6, at light. Locally common in and near marshes, where the larvae feed in the stems of cat-tail (*Typha*).

Achatodes Gn.2711 *A. zae* Harr.

Armdale, August 15 - 25, at light, and once on the Mount Uniacke bog, August 10. It was rather common at Armdale in 1948, but has not reappeared since. The larvae feed on the pith inside the stems of *Sambucus*, and farther south sometimes attack the stems of cultivated corn.

Pyrrhia Hbn.2715a *P. umbra exprimens* Wlk.

Armdale, MacNab's Island, Baddeck. June 28 - August 19, at light. Local and usually scarce. Larva white, finely flecked and streaked with black, lateral stripe orange and segmental patches of orange on the dorsum; on sweet fern at Annapolis.

Ogdoconta Butl.2773 *O. cinereola* Gn.

Grand Pré, August 28, 1952. Two rather worn specimens at light in open grassy country at the edge of a salt marsh.

Eutricopsis Morr.

2871 *E. nexilis* Morr. Plate XI, Figure 8.

Sackville, Halifax County, May 20, 1951. One specimen taken hovering over blossoms of *Houstonia caerulea* and two others seen. Coldbrook, Kings County, May 24, 1952, visiting flowers of the larval food plant, *Antennaria*

Heliothiinae

Heliothis Ochs.

2932 *H. obsoleta* Fabr. Corn-ear worm.

White Point Beach, Round Hill, Aylesford, Armdale, Peggy's Cove, Mount Uniacke, Cole Harbour, Port Wallis, and James River, Antigonish County. August 9 - October 17, at bait, light and flying by day. Not common as an adult.

Rhodophora Gn.

2941 *R. florida* Gn.

General through southern Nova Scotia, and northward at Great Village, Stellarton and Baddeck. June 29 - July 30. Occasionally common, though very sporadic in its occurrence. The larva feeds on the green seed capsules of *Oenothera*.

Schinia Hbn.

2990 *S. nundina* Dru. Plate XI, Figure 9.

Lawrencetown, Annapolis County, August 24, 1945, at light. Larva reported on flowers of *Solidago*.

3018 *S. arcigera* Gn.

Round Hill, August 5, 1938, August 14, 1939, at light; Digby, September 12, 1937. Rare.

Acontiinae

Cryphia Hbn.

3099 *C. pervertens* B. & McD.

In beech woods at Acaciaville, June 15, July 26, 1949; Annapolis, June 17, 1949; Armdale, July 18, 1945. Not uncommon at light in the Digby County locality; otherwise rare. Bred from elm in Ontario by the Canadian Forest Insect Survey.

Erastria Ochs.3117 *E. bellicula* Hbn.

Common, especially in bogs, from White Point Beach, South Milford and Lequille to Baddeck and Cheticamp. June 14 - August 7, at light and flushed by day.

3118 *E. muscosula* Gn.

Acaciaville through the Annapolis Valley to Halifax County, and at White Point Beach and Baddeck. Probably general. June 15 - August 8.

3119 *E. albidula* Gn.

General and very common through southern Nova Scotia and at Baddeck. Probably everywhere. June 13 - August 1, frequenting open, grassy places.

3120 *E. synochitis* G. & R.

Generally distributed from Halifax County southward and westward, being especially abundant in Annapolis Valley localities. June 14 - July 25, at light.

3122 *E. concinnimacula* Gn.

Acaciaville, Annapolis Royal and Lake Kejimukujik to Truro, Great Village, Baddeck and Cheticamp. Not taken in Halifax County. May 30 - July 20. Scarce.

3124 *E. carneola* Gn.

Annapolis Valley region from Digby to Kentville, and at Truro, White Point Beach and near Halifax. June 5 - September 13, at light. Common. Reported on *Rumex*.

Neoerastria McD.3126 *N. apicosa* Haw.

Annapolis, White Point Beach, Petite Riviere, Armdale, MacNab's Island, Bass River, Baddeck. June 12 - September 9. Common.

Capis Grt.3129 *C. curvata* Grt.

Generally distributed north to Baddeck. June 15 - August 28, at light. Often commonest in bogs, though not restricted to this type of habitat.

Tarachidia Hamp.3176 *T. candefacta* Hbn.

Lequille and Round Hill, Annapolis County, Grand Pré, Kings County. June 8 - July 5, and August 28. Rare and local. Larva reported on *Ambrosia*.

Euteliinae*Marathyssa* Wlk.3223 *M. inficita* Wlk. Plate XI, Figure 10.

Lequille, June 16, 1949; Round Hill, July 29, 1940. Rare. Larva on *Rhus*.

Paectes Hbn.3225 *P. oculatrix* Gn. Plate XI, Figure 2.

Lequille, Annapolis County, June 11 - July 6, 1946-49. Quite common at light in oak, ash and hemlock woods bordering the Lequille Brook, one mile from Annapolis Royal. Apparently very local.

Nycteolinae*Characoma* Wlk.3234 *C. nilotica* Rogenh.

Great Village, August 8, 1947, at light. Determined by Dr. Brower for the collector, Mr. A. D. Hall.

Nycteola Hbn.3235 *N. frigidana* Wlk. Plate XI, Figure 11.

Mount Uniacke, May 19; MacNab's Island, September 19; Baddeck, June 30, at light. Many bred at South Milford, Armdale, Hubbards, Parrsboro and Baddeck, July 11-August 31. The slender green larvae feed on willow, tying the leaves together with silk, and these nests are often conspicuous on the shrubby willows in June and July. Even where the species is known to be common, adults very rarely come to light.

Baileya Grt.3238 *B. doubledayi* Gn.

General and not uncommon through southern Nova Scotia and northward at Baddeck. June 3 - July 21. Several bred from yellow-striped, green larvae on alder.

3239 *B. ophthalmica* Gn.

Annapolis, Lake Kejimukujik, Centreville, Mount Uniacke, Port Wallis, Lakeview, Waverley. May 29 - July 4, in oak or beech woods. Scarcer than *doubledayi*. Larva reported on ironwood and beech in Ontario.

Plusiinae

Syngrapha Hbn.3246 *S. microgamma* Hbn. Plate X, Figure 5.

Flying by day on bogs in the Prospect Road area, about seven miles from Halifax; ten specimens taken, many others seen—extremely hard to capture. Also seen on the barrens near Peggy's Cove. Two additional specimens taken at light, one in each locality. June 13-July 26, 1945 - 52. These are large specimens, and represent a race or species distinct from *montana* Pack. of the White Mountains and Gaspé regions.

(3254) *S. rectangula* Kby.

General from Digby, Lequille, White Point Beach to Stellarton and Baddeck. Probably everywhere. July 3 - August 16, at light, flying by day, and often visiting flowers of thistle, dogbane, etc. along with Sphingidae at dusk and after dark. Bred by the Dominion Forest Insect Survey from larvae on spruce and balsam fir.

(3257) *S. alias* Ottol.

Taken in many scattered localities from Barrington Passage to Whyecomagh and Baddeck. July 11 - August 30, mostly at light. Not quite as common as *rectangula*. Bred from spruce by the Dominion Forest Insect Survey.

(3259a) *S. altera variana* Ottol. Plate X, Figure 6.

White Point Beach, Armdale, MacNab's Island, Stellarton. July 15 - August 28, at light. Quite rare. *Variana* was described from Saint John, N. B.

(3260) *S. octoscripta* Grt. Plate X, Figure 7.

White Point Beach, Barrington Passage, Round Hill, Mount Uniacke and near Halifax. July 6 - September 20, mostly in August. Scarce. It was bred at Ottawa from a larva on *Vaccinium*.

(3263) *S. surena* Grt. Plate X, Figure 8.

Only one specimen of this rare species seen, a female taken on French Mountain, Inverness County, August 20, 1952 (W. Harrington).

(3264) *S. epigaea* Grt.

White Point Beach, Annapolis, Round Hill, Auburn, vicinity of Halifax, Parrsboro. June 15 - August 29. Common at light some seasons at Armdale. Bred June 29, 1951 from a larva on *Myrica gale* at Mount Uniacke. Also reported on *Vaccinium*.

(3266) *S. selecta* Wlk.

Digby, Lequille, Mount Uniacke, Armdale, MacNab's Island, Truro, Glenville, Baddeck. July 24 - September 7. Scarce. I have seen a specimen supposed to have been bred from white spruce (Canadian Forest Insect Survey), but the reliability of such host plant data on individual specimens beaten from conifers is always questionable.

Anagrapha McD.(3252) *A. falcifera* Kby.

Kirby, "Fauna Boreali-Americana: Insecta". See also "Insects of the Northern Parts of British America", by Rev. C. J. S. Bethune, p. 149.

Type locality: Nova Scotia (Type collected by Dr. McCulloch).

General in grassy areas from White Point Beach and Annapolis to Cape Blomidon, Parrsboro and Stellarton. Probably in suitable locations everywhere. Two broods, May 31 - July 3 and July 21 - September 22. Common. Form *simplex* Gn. possibly seasonal, and referring to the summer generation.

Trichoplusia McD.(3269a) *T. ni brassicae* Riley

Annapolis, White Point Beach, Armdale, MacNab's Island, Cole Harbour. June 30 - September 28. Locally common. As its name implies, the American race *brassicae* is sometimes an injurious pest on cultivated Cruciferae, but apparently it has never been recognized as such within our area.

Pseudoplusia McD.(3280) *P. oo* Cram. Plate XI, Figure 12.

Armdale, September 5, 1945; Wellington, Halifax County, October 12, 1950. Rare.

Rachiplusia Hamp.(3289) *R. ou* Gn.

Cole Harbour, July 13, 1951, at light. One male, determined by genitalia.

Chryspidia Hbn.

(3273) *C. putnami* Grt.

Locally common in grassy places from White Point Beach, Digby and Annapolis to Parrsboro, Great Village, Stellarton and Baddeck. June 27 - August 17, at light and flushed by day.

(3304) *C. venusta* Wlk.

Round Hill, MacNab's Island, Cole Harbour, Great Village, Stellarton, Baddeck. July 3 - August 9. Local.

Autographa Hbn.

(3265) *A. ampla* Wlk.

White Point Beach and Digby to Three Brooks, Pictou County and Baddeck. July 6 - August 29. Common. Bred at Armdale, June 17, 1951 from a stout, bright green larva on alder. Also reported on blueberry (Canadian Forest Insect Survey).

(3272) *A. rubida* Ottol. Plate X, Figure 9.

Truro, June 23, 1927 In the (Canadian National Collection); Centreville, June 2, 1951, at light. Very rare.

(3279) *A. biloba* Steph.

Digby, Round Hill, Armdale, MacNab's Island, Petite Riviere, August 14 - October 29. Rare.

(3281) *A. precatationis* Gn.

Generally distributed and commonest of the *Autographas*. Two broods, June 12 - July 8 and July 15 - October 17. The larva has been reported on a variety of low plants, such as *Plantago* and *Taraxacum*.

(3285) *A. bimaculata* Steph.

Generally distributed and common through southern Nova Scotia north at least to Stellarton. July 9 - August 24.

(3286) *A. mappa* G. & R. Plate X, Figure 10.

Various localities from Barrington Passage to Truro and Glenville; also present at Dorchester, N. B. Seems well distributed through western Nova Scotia but occurs sparingly. June 19 - August 11, at light.

(3291) *A. flagellum* Wlk.

Barrington Passage, Digby, Annapolis, White Point Beach, Petite Riviere, Mason's Point, Halifax, Cole Harbour, Great Village and French Mountain Inverness County July 3 - September 5, at light. Not common.

Chrysanympha Grt.

(3305) *C. formosa* Grt.

White Point Beach and Acaciaville to Glenville, Cumberland County and Baddeck. July 12 - August 17, at light. Locally common. Larva on *Vaccinium*.

Eosporopteryx Dyar

(3300) *E. thyatiroides* Gn.

Digby, Acaciaville, Waverley, Armdale, MacNab's Island, Chignecto. July 26 - August 23, at light and visiting flowers at dusk with other *Plusiinae*. Usually scarce. Supposed to feed on *Thalictrum*.

Pseudeva Hamp.

(3301) *P. purpurigera* Wlk.

White Point Beach, Acaciaville, Lequille, Port Wallis, Stellarton. July 13 - August 27, at light. Local.

Plusia Ochs.

(3295) *P. aereoides* Grt.

White Point Beach and Annapolis to Truro, Stellarton and Baddeck. June 30 - August 5, at light. Widely distributed and quite common in some localities. Larva reported on *Spiraea* (Thaxter).

(3297) *P. balluca* Geyer

Digby, 1904; MacNab's Island, August 20, 1907; "Nova Scotia. From Lieut. Redman's collection" (Walker). Rare. Larva on *Humulus*.

Abrostola Ochs.

3307 *A. urentis* Gn.

Great Village and Glenholme, Colchester County. June 26 - July 29, at light. Common in that general area, judging by the number of specimens seen.

Catocalinae

Catocala Schrank

3316 *C. antinympha* Hbn.

Many records from Digby and White Point Beach to Fenwick and Glenville, Cumberland County and Three Brooks, Pictou County.

July 23 - September 17. One of the commonest species of *Catocala* wherever the food plant, *Comptonia*, grows. The larvae are readily swept or beaten from sweet fern bushes in early summer.

3317 *C. coelebs* Grt.

Taken in numerous localities in the counties of Digby, Annapolis, Halifax, Queens, Cumberland, Pictou, Antigonish and Victoria. August 1 - September 21, at bait. Not very common. Bred from larvae on sweet gale on the Mount Uniacke bogs and at Baddeck, and on bayberry at Halifax. The adults of *coelebs*, like most of the *Catocalas*, became widely dispersed, and may often be taken long distances from the nearest colony of the food plant.

3338 *C. subnata* Grt. Plate XII, Figure 1.

Taken at bait in Fleming Glen, a Halifax park bordering the North West Arm opposite the city, August 13, 1944. One male in very fresh condition. Food plant unknown, but supposedly walnut, butternut or hickory, none of which is native to Nova Scotia.

3342 *C. ilia* Cram.

Including form *conspicua* Worth. Digby, Lequille, Lake Rossignol, Coldbrook, Halifax. July 23 - August 30, and once (Digby) September 31. Not uncommon some seasons in Fleming Glen, Halifax, and in the oak woods of the Annapolis Valley region. Despite their large size, the larvae of *ilia* must mature very quickly, as it is one of the earliest species to appear. Food plant: oak.

3343 *C. cerogama* Gn.

Digby, August 25, 1906; Fleming Glen, Halifax, August 11, 12 and 24, 1944. Rare. The food plant is *Tilia americana*, which is not a native tree in Nova Scotia. In this area *cerogama* might have transferred its attentions to the widely planted European Linden, *Tilia glabra*.

3344 *C. relicta* Wlk.

Walker, Cat. Lep. Het. Brit. Mus., pt. 13, p. 1192, 1857.

Type locality: Nova Scotia.

Numerous records from Yarmouth and White Point Beach north to Port Howe and Pictou. Probably present everywhere, including Cape Breton, but missed through inadequate late summer collecting. August 9 - October 15. One of the commonest *Catocalas* at bait; *clara* Beut. and *relicta* in about equal numbers, the gray form *phrynea* Hy. Edw. scarcer. Larva on poplar.

3346 *C. unijuga* Wlk.

Annapolis Valley from Digby to Centreville, Halifax and vicinity, Truro, Glenville, Fenwick and Three Brooks. July 22 - October 9, at bait. Locally common. Melanic form *agatha* Beut. appears occasionally. Poplar and willow.

3347 *C. parta* Gn.

Digby, Annapolis, Lawrencetown, Wolfville, Springhill, Pictou, and frequently in Halifax County. July 31 - October 3. Locally common. Bred from a larva on a shiny-leaved species of willow at Armdale. Probably also on poplar.

3357 *C. briseis* Edw.

Digby, Bridgetown, Aylesford, Armdale, MacNab's Island, Parrsboro, Three Brooks, Baddeck. August 1 - September 20. Scarce. Occasionally as form *briseana* Strand. Larva on poplar and willow.

3361 *C. semirelicta* Grt.

Great Village, 1945 (A.D. Hall). In the Canadian National Collection.

3373 *C. concumbens* Wlk.

White Point Beach and Digby to Parrsboro, Glenville, and Three Brooks. Presumably general. August 2 - September 28. Often one of the commonest moths at bait. Bred from a larva on willow at Halifax. Normally a poplar feeder.

3374 *C. amatrix* Hbn.

Walker mentions three Nova Scotian specimens in the British Museum, from Lieut. Redman's collection (Lep. Het. Brit. Mus., pt. 13, p. 1195, 1857). Poplar.

3385 *C. sordida* Grt.

Widely distributed and common on the Nova Scotia mainland. July 21 - September 11, at light and bait. I have taken up to fifty or sixty specimens at bait in one evening in Fleming Glen, Halifax, but have never met with such numbers elsewhere. Form *metalomus* Mayf., with black inner margin, forms possibly five percent of the population. Larvae reared on blueberry.

3389 *C. coccinata* Grt. Plate XII, Figure 2.

Halifax watershed area, August 21, 1949. One worn male at bait in deciduous woods. Food plant: oak.

3395 *C. ultronia* Hbn.

Digby, Armdale, MacNab's Island, Parrsboro, Stellarton. July 31 - September 14. Common locally at Armdale, much scarcer elsewhere. Larva on Rosaceous trees, possibly *Amelanchier* in Halifax County, *Crataegus* and *Prunus* in other localities.

3396 *C. crataegi* Saund. Plate X, Figure 11.

Sackville, Waverley, Debert, Glenholme, Great Village, Three Brooks. July 29 - August 28, at bait. Scarce and local. On Rosaceous trees—probably *Crataegus*, *Prunus* and *Amelanchier*.

3399 *C. praeclara* G. & R.

Digby, Lawrencetown, White Point Beach, Mount Uniacke, Waverley, Armdale, Peggy's Cove, MacNab's Island. August 1 - September 17, at light and bait. Food plant supposed to be oak.

3401 *C. blandula* Hlst.

Acaciaville and Lequille to Parrsboro, Pietou, Antigonish and Baddeck. July 23 - September 17, at light and bait. Often plentiful, although not present everywhere. Probably on the same food plants as the very similar *crataegi*.

3411 *C. connubialis* Gn. Plate X, Figure 12.

Oak woods at Lequille, July 25, 26, 1949 (three specimens, one of them at light); Round Hill, September 5, 1939; Coldbrook, July 23, 1949 (bait); oak woods at Lake Rossignol, Queens County, August 24, 1951, two specimens at light; Armdale, August 4 (seen) and August 12, 1944, at bait. Larva on oak.

Parallelia Hbn.3422 *P. bistrariis* Hbn.

Generally distributed and usually plentiful. May 27 - August 21, most commonly at bait. Larva on maple.

Caenurgina McD.3431 *C. erectea* Cram.

Generally distributed and common in grassy areas, including open bogs and marshes. Two broods, May 13 - August 9 and July 27 - August 25. Most commonly flushed by day, but will come to both light and bait. Larva probably on grasses in this area. In the literature there are numerous reports of the food plant being clover, but perfectly fresh specimens of the small spring form occur here on the sphagnum bogs where there is no clover or other Leguminosae.

Doryodes Gn.3460a *D. bistrialis grandipennis* B. & McD.

Taken by day on the salt marshes at Wolfville, and near Bass River, Colchester County. July 28 - August 19. Debert, August 6, 1952, at light. I found it common along an old dyke on the marsh just across the railway track from Wolfville.

Zale Hbn.3474 *Z. lunata* Dru.

Peggy's Cove, Armdale, MacNab's Island. August 19 - November 1, at bait. Scarce. A rather general feeder on deciduous trees and shrubs.

3480 *Z. aeruginosa* Gn.

Digby, Centreville, Bridgewater, Caledonia, Mount Uniacke, vicinity of Halifax, Three Brooks, Pictou County. May 16 - June 22, at bait. Often abundant.

3484 *Z. minerea* Gn.

Digby, Wolfville, Caledonia, Mount Uniacke, vicinity of Halifax, Truro, Three Brooks, Baddeck. May 7 - July 11, and one late record; September 23. Usually the commonest *Zale* at both light and bait, extremely variable in coloring. Larva a general feeder on deciduous trees.

3490 *Z. duplicata* Beth.

Digby, Lequille, Coldbrook, Centreville, Caledonia, Bridgewater, Halifax, Waverley, and seen also from Cumberland County. May 2 - June 17, at bait. Not common. *Duplicata* is a pine feeder, and seems to have been most commonly bred from *Pinus strobus*.

Curious looking examples from Armdale and Waverley may not be *duplicata*, and rather resemble *Z. submediana* form *lemmeri* McD.

3499 *Z. cingulifera* Wlk.

Caledonia, Queens County, May 15, 1951. One male at bait. Kentville, May 17, 1952, at bait.

3501 *Z. horrida* Hbn.

Digby, Annapolis, Caledonia, Armdale, MacNab's Island, Stellarton, Baddeck. May 16 - July 7, and one on September 16. One of the commonest *Zales*, occasionally outnumbering *minerea* at bait. Seems commonest in beech woods.

Erebus Latr.3525 *E. odora* L.

Yarmouth, June 30, 1906 (E. Chesley Allen); Granville Centre, Annapolis County, August 20, 1907 (V. A. Eaton), Payne collection; Sydney, Cape Breton, about 1900 (Miss Margaret Brown).

Synedoida Hy. Edw.3565 *S. grandirena* Haw.

Digby, Lequille, South Milford, Lake Rossignol, White Point Beach, vicinity of Halifax, Debert. June 10 - August 25, at light. Abundant in the rich woodland along the Lequille Brook in Annapolis County where a long series was reared from larvae on *Hamamelis*. Larvae were also found commonly on the witch hazel bushes at Lake Rossignol. The larva is slender, tapering, light brown in color, very Catocaline in appearance and behaviour. They feed only at night, crawling to the ground and hiding during the day. Chewed leaves with only the vein network remaining betray their presence.

3578b *S. adumbrata alleni* Grt.

Annapolis Royal, June 27, 1946, at light; Granville Ferry, July 13, 1909 (Payne); Debert, July 9, 1952; Cumberland County, June, 1939 (Hall). Rare.

Anticarsia Hbn.3590 *A. gemmatilis* Hbn. Velvet Bean Caterpillar.

Round Hill, September 20, 1938; Armdale, September 10, 1943, at bait; Peggy's Cove, September 20, 1952, at light. A casual migrant from the south.

Calpe Treit.3608 *C. canadensis* Beth.

Acaciaville, Lequille, White Point Beach, Petite Riviere, Halifax watershed area, Shad Bay, Mount Uniacke, Stellarton, Baddeck. June 30 - August 18, at light and bait. Usually scarce, although a number were taken at Lequille. Larva reported on *Thalictrum*.

Scoliopteryx Germ.3615 *S. libatrix* L.

Taken or observed in numerous localities from Digby through the Annapolis Valley and Mount Uniacke to Halifax, and northward at Glenville, Parrsboro and Stellarton. May 8 - June 20, and July 23 - October 9, at bait. Probably hibernates as an adult. Bred from a larva on willow; also feeds on poplar.

Alabama Grt.

3616 *A. argillacea* Hbn. The Cotton Worm

Armdale, MacNab's Island, Stellarton. October 8 - 18, at bait. A migrant from the south. In 1941 it appeared in abundance at bait, but since then only occasional individuals have been noted.

THE DELTOIDS

The following three subfamilies comprise what were formerly known as the "Deltoid" moths, and are still loosely referred to by that term. They form an interesting group still much in need of careful study. The last extensive revisional treatment of the North American species was that by J. B. Smith (Bull. 48, U.S.N.M., 1895).

Some of the species are obscure and hard to determine, particularly in *Zanclognatha*. *Z. theralis* Wlk. and *minoralis* Sm. have long been confused, but since Walker's name was based on a specimen from Nova Scotia it seems safe to apply his name to our material. All of these small gray *Zanclognathas* taken here probably belong to the one species, although there is considerable variability. The descriptions and figures in Smith's Deltoid Revision being rather inadequate, the true identity of his *minoralis* is still none too certain.

There are four distinct species of *Hypenodes* in Nova Scotia, three of which are new and described in a separate paper still in manuscript. In the present paper I am withholding the new names to preclude any possible confusion of the literature by their untimely appearance in print before the intended original descriptions.

Not a great deal is known about the early stages of the deltoids, but it is apparent that some of them have rather unique feeding habits. Hence the larvae have been generally overlooked by collectors. Many species are scavengers, feeding on dead or even decomposing vegetable matter, and possibly animal matter, rather than on living, green vegetation. Larvae of the southern *Epizeuxis gopheri* Sm. feed in the waste matter and general debris in burrows of the gopher tortoise. Some species may be associated with birds' nests. Others subsist on a diet of fungi or lichens, as shown by Mr. J. G. Franclemont's success in rearing species of *Metalectra* on dead bark and bracket fungi, and *Epizeuxis* on reindeer moss (*Cladonia*). *Bomolocha*, *Lomanaltes*, *Plathypena* and *Hypena* appear to have very ordinary foliage-feeding larvae, but the Thallophyte-feeding *Metalectra* seems to constitute an exception within the Hypeninae. The Rivulinae may be fungus-feeders in some very select habitat according to current belief, but only inspired and systematic rearing work of the sort begun by Franclemont will provide the final answer.