A continuous twenty-month survey of the Macroheterocera (Lepidoptera) occurring at a location in McDonald Forest, five miles northwest of Corvallis, Benton County, Oregon was conducted.

Three hundred sixty species of moths were collected; they represented the following families: Sphingidae, Saturniidae, Amatidae, Nolidae, Lithosiidae, Arctiidae, Agaristidae, Noctuidae, Notodontidae, Liparidae, Lasiocampidae, Thyatiridae, Drepanidae, Geometridae, and Epiplemidae. Information is given on the seasonal occurrence, relative abundance, flight habits, and known foodplants of the species collected. Biological and behavioral information is included for 82 of the species. Comparisons are made between the local fauna and that of the northeastern United States, British Columbia, and a specific locality in southern California.
A new device for attracting and holding moths more effectively within the vicinity of the light (a parabolic moth sheet), which does not involve the use of a trap, is described.
THE MACROHETEROCERA (LEPIDOPTERA) OF A MIXED FOREST IN WESTERN OREGON

by

ANTHONY NOEL McFARLAND

A THESIS

submitted to

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MASTER OF SCIENCE

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APPROVED:

Assistant Professor of Entomology

In Charge of Major

Chairman of Department of Entomology

Dean of Graduate School

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Typed by Jolene Wuest
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THE MACROHETEROCERA (LEPIDOPTERA) OF A MIXED FOREST IN WESTERN OREGON

INTRODUCTION

This study was undertaken with the following objectives in mind:

(1) To collect and determine all of the species of moths, other than Microlepidoptera, occurring in the McDonald Forest and Corvallis area of Benton County, Oregon, insofar as possible within a twenty-month period.

(2) To learn something of the habits, life histories, and abundance of the various species encountered.

(3) To determine the effectiveness of a light-reflecting canvas, built in the shape of a parabolic curve, as a means of attracting and holding specimens in the vicinity of the light, without the use of a trap. (This was used in conjunction with a number of other lights, placed against vertical sheets, in the usual manner for attracting nocturnal insects).

Very little was previously known of the occurrence of moths in western Oregon, and many new and interesting records were anticipated. No one had previously done any intensive collecting, over a continuous period, in one location, with the intention of concentrating on moths in this part of Oregon.
Oak Creek Laboratory, situated five miles northwest of Corvallis, Oregon, was an ideal location in which to carry out this study because of the abundant and varied native vegetation. Electrical outlets made it possible to place "black" lights in six different situations, on the grounds of Oak Creek Laboratory. All collecting was carried out in this locality, except for occasional specimens taken in Corvallis, five miles distant. The project was started in October, 1961, and continued through May, 1963. Every month within that period was well-sampled.

Description of the Environment

Climate: The chart of climatological data which follows this page, covers the period from July 1961 through June 1963. It was obtained from records of the Official Weather Bureau, through the Farm Crops Department, Oregon State University.

In general, it could be said that the rainy season is primarily from October through May. The annual rainfall is usually between 35 and 40 inches. The summer is nearly rainless.

It is very common for the sky to become clear at night, even though the day may have been completely cloudy; this pattern is seen time and again between October and May. It has an adverse effect on nocturnal collecting, because of the more rapid drop in
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temperatures if the sky clears up at night. (Mild cloudy nights are excellent for moth-collecting).

**Physical Features:** Oak Creek Fisheries Laboratory is situated within the innermost foothills of the Coast Range, on the western edge of the Willamette Valley. The laboratory is just within the southwestern boundary of McDonald State Forest, at an elevation of exactly 500 feet. (Corvallis, in the Willamette Valley, is at an elevation of approximately 250 feet). Forested hills arise on all sides of the laboratory, with the major canyon (through which Oak Creek flows) opening where the laboratory buildings are situated. This is an important insect flyway, between the higher hills to the north and west and the western edge of the Willamette Valley. The hills in the vicinity of the laboratory reach maximum elevations of slightly over 1000 feet. The Pacific Ocean is 35 miles due west (or about 58 miles by road).

**Vegetation:** The open canyon, through which Oak Creek flows, is lined with a great variety of trees and shrubs (mostly deciduous species), as well as herbs and grasses in the open areas. Most of the hills (immediately above the canyon bottom) are densely covered with Douglas fir (*Pseudotsuga menziesii* (Mirb.) Franco), the dominant tree in the area. *Abies grandis* Lindl., and other coniferous
trees, are also present. The innermost foothills, along the western edge of the Willamette Valley, are often densely covered with groves of *Quercus garryana* Dougl., and certain understory plants commonly associated with it. Oak reaches this area in abundance, but is more often mingled with Douglas fir. A dense oak grove is present on a west-facing hillside about one quarter of a mile south of the laboratory. A tributary of Oak Creek flows through the laboratory grounds (from east to west); it enters Oak Creek 100 yards to the west. Because of these streams, *Alnus rubra* Bong. is the dominant tree immediately around the laboratory. *Pseudotsuga* (and *Quercus* to a lesser extent) dominate the hills on all sides of the laboratory; the many open areas are dominated by grasses and herbs of numerous species, with scattered individuals of Douglas fir, oak, *Rhamnus purshiana* DC., and various smaller shrubs.

The following discussion mentions many of the common plants of the area, with emphasis on the woody species. Unless otherwise stated, they grow within one quarter of a mile of the collecting site. (The sequence follows Gilkey (8)): Fungi, lichens, and mosses abound. Among the lichens, *Usnea barbata* (L.) Wigg. and *Sticta pulmonaria* (L.) Bir. (a foliose lichen) are especially common on oak, ash, and other trees. *Equisetum* is abundant along wet ditches,
and around the edges of three small ponds. *Pteridium aquilinum* (L.) Kuhn is abundant in open fields and along roadsides; a number of other ferns, preferring more shaded or damp locations, are common under the trees. *Veratrum, Allium, Brodiaea, Calochortus, Lilium, Erythronium, Smilacina,* and several other genera represent the Liliaceae. *Iris* and *Sisyrinchium* are common. The Orchidaceae is represented. *Populus trichocarpa* Torr. and Gray is common along Oak Creek, as are willows (*Salix spp.*). *Corylus rostrata Ait. var. californica* A. DC. is common in the forest, or in semi-shaded locations. *Urtica* is abundant along the streams, in certain places. *Phoradendron villosum* Nutt. is common on oak. *Rumex* and *Polygonum* are common weeds along roadsides or in fields. *Montia* is a fairly common herb in certain situations. *Silene hookeri* Nutt. occurs on certain banks and road-cuts. *Ranunculus occidentale* Nutt. is abundant in grassy-weedy fields. *Delphinium trolliifolium* Gray is abundant along Oak Creek, just west of the laboratory. *Berberis aquifolium* Pursh. is scattered throughout the area. A number of herbaceous crucifers are common in the fields and woods. *Ribes sanguineum* Pursh. and one of the spiney gooseberries, is fairly common. Abundant members of the Rosaceae include *Holodiscus discolor* (Pursh.) Maxim., *Physocarpus capitatus* (Pursh.) Ktze. (along streams), *Osmaronia cerasiformis* (T. & G.) Greene, *Rubus*
parviflorus Nutt. (thimbleberry), R. macropetalus C. & S. (wild blackberry), Rosa spp. (wild rose), Fragaria cuneifolia Nutt. (in fields), and Geum macrophyllum Willd. Prunus grows in scattered locations, usually forming small thickets. Amelanchier and Crataegus are generally distributed. Lupinus polyphyllus Lindl. is occasional nearby; a number of herbaceous, weedy legumes are common. Oxalis is represented. Geranium and Erodium grow in open places, with other weeds or small herbs. Rhus diversiloba T. & G. (poison oak) is common, particularly in groves of Quercus, or along road-sides through the woods. Acer macrophyllum Pursh. is common along Oak Creek, and in the forest in general (scattered). Rhamnus purshiana DC. is common, usually scattered in open, sunny areas. Although Ceanothus sanguineus Pursh. is fairly common in certain places, it is very scarce near Oak Creek Laboratory. Malva is an occasional weed. Hypericum perforatum L. is abundant. Viola spp. are very common in the woods. Epilobium, Clarkia, and Oenothera (wet places) are present, but not close to the laboratory. The Umbelliferae is well-represented by a number of herbaceous species; Heracleum lanatum Michx. (cow parsnip) is especially conspicuous, because of its size and abundance. Cornus nuttallii Aud., and C. pubescens Nutt. (along streams) are present. Arbutus menziesii Pursh. is abundant a few miles east of Oak Creek Laboratory, but is
very scarce in this immediate vicinity. *Fraxinus oregona* Nutt. is abundant around Corvallis, and continues up Oak Creek to about the vicinity of the laboratory, where it is represented by several trees. *Apocynum* and *Asclepias* are very scarce. A few polemoniaceous plants occur. *Hydrophyllum occidentale* Gray is abundant near the creek, in certain places. The Boraginaceae is represented. *Labiatae* (*Stachys*, etc.) and *Scrophulariaceae* (*Veronica*, *Synthyris*, *Mimulus guttatus* DC., etc.) are represented by a number of herbaceous genera. *Plantago lanceolata* L. is an abundant weed. *Galium* is abundant in damp, grassy places. *Lonicera* is occasional, and *Symphoricarpos albus* (L.) Blake is extremely abundant (along roadsides, in open woods, etc.). *Sambucus caerulea* Raf. is fairly common. *Dipsacus sylvestris* Huds. is common in the open fields of the area. The Compositae is represented by many herbaceous genera, including *Hypochoeris*, *Tragopogon*, *Taraxacum*, *Sonchus*, *Lactuca*, *Crepis*, *Solidago*, *Aster*, *Erigeron*, *Gnaphalium*, *Madia*, *Achillea*, *Petasites*, *Arctium*, *Cirsium*, and others. Four plants, which are abundant closer to the coast, or in other areas of the Coast Range, are *Castanopsis chrysophylla* (Dougl.) A. DC., *Myrica californica* Cham., *Arbutus menziesii* Pursh., and *Gaultheria shallon* Pursh. If there are any moths restricted to these plants, they are probably not represented in this survey.
A number of fruit trees (and other cultivated plants) grow around the laboratory, and undoubtedly serve as foodplants for some of the moths. Among these plants are apple (several large trees), pear, plum, large grape vines, Lombardy poplar, Thuja, and Viburnum lantana L.

The great importance of alder and oak, as primary foodplants for numerous species of moths, should be mentioned. In many instances, where Alnus is the foodplant, other plant genera (often unrelated) are also acceptable, but the former is preferred. When Quercus is the foodplant, the moths that feed on it are usually restricted to Quercus, or its few close relatives. (If either alder or oak is completely absent in a locality, a number of the moths listed in this survey should be very scarce, or missing from the area).

Collecting Sites

The outline map on page 11 shows positions of the major collecting stations that were used during this survey; only Stations 1, 2, and 3 were in regular use throughout the period of the survey. Stations 4, 5, and 6 were in use from April through October. Stations 7 and 8 were in use only during April and May, 1963.

The nature of each station is described below:

Station 1 - An open roadside area, with a large grassy-weedy
field directly west of it.

Station 2 - An open driveway, bordered by numerous large alders and abundant lower growth.

Station 3 - Facing a small creek, which is bordered by numerous alders, plum trees, and a great variety of lower growth along the creek. An open fern-grass-weed field is directly to the south; this is bordered on the east by a dense stand of Douglas fir, oak, and other growth. The site is quite well-protected from wind, because of the position of a small hill nearby.

Station 4 - The edge of a small pond, with abundant rank herbage, alders, and cottonwood, etc.

Station 5 - An open glade, under large alders, with Rubus and streamside growth.

Station 6 - The weedy lawn of an old garden, bordered by a variety of cultivated trees and shrubs, and some native plants.

Station 7 - Very similar to Station 5.

Station 8 - In a small clearing within a dense plum thicket, with Rubus, ash, alder, Douglas fir, oak, poplar, and grape vines nearby. Rank herbage (of numerous species) covers the wet ground that partly surrounds this site.
Most of these sites shared alder, oak, Douglas fir, Rubus, and numerous weeds, grasses, ferns, etc., but there were distinct differences in the microhabitats.

**Methods of Collecting**

No traps were used at any time. All collecting was directly from the sheet into the killing bottle; a time-consuming method but one that secures the finest possible specimens. This technique also permits the collection of living females in order to obtain eggs for life history studies. The lights were turned on at dusk (or just before) whenever possible; on good nights, collecting was frequently continued until 1 or 2 A.M. Collecting of diurnal moths was carried out in suitable weather, throughout the season when diurnals are on the wing (February to October). In this locality most of the diurnal species fly between March and June, and the most conspicuous ones are geometrids.

**Advantages and Limitations of this Survey**

The single-locality-approach has a distinct advantage in allowing thorough nightly collecting, in all types of weather, throughout the year.

The vegetation of the area chosen for this project is highly
varied, and represents all the important woody species (with the exception of the four species mentioned earlier). Great numbers of herbaceous and weedy species are also well-represented, growing particularly along the roads and in open fields.

In a single locality, with widely-representative native vegetation, most of the moths in the area will sooner or later be encountered, if the locality is well-collected for five (or more) consecutive years.

Complete coverage of all the moths in the area was not possible, for the following reasons:

(1) The survey only lasted for twenty months.

(2) During the periods of July 10th to July 20th, and August 3rd to August 20th, no collecting took place.

(3) Although collecting was frequently continued until 2 A.M., the hours from 2 A.M. to dawn were rarely sampled. Some species fly primarily in the early morning hours. Most of these are probably represented in captures made between 1 and 2 A.M., but a few of the early morning fliers may have been missed.

(4) There may be a few nocturnal species that rarely (if ever) come to lights; if such moths occur here, they may have been missed.
(5) Some moths are restricted to very specific habitats, having little inclination to fly into other areas nearby. As the single-locality-approach was used, some moths in this category have undoubtedly been missed.

(6) Some species may be so consistently scarce in this locality that only a slight chance exists for encountering them within a twenty-month period. (It is quite possible that some of these "scarce" species are more numerous in other localities, or in other restricted habitats).

(7) Some species fluctuate considerably (in relative abundance) from year to year; a number of these could have been missed, if they were at very low numbers during the period of the survey.

All of the common to moderately common species are probably represented in the list, along with numerous scarce to very scarce species (many of which are represented by only one specimen taken during the entire survey).

Ideally, a survey of this nature should extend over a period of five (or more) consecutive years, within the limits of a single locality.
Equipment and Techniques

Lights: 15-watt "black light" (ultraviolet) tubes (G. E. F15T8/BL, without filter) were used at all the sites. (I have been using these black lights since 1956, and have yet to find any other inexpensive source of light that is more effective in attracting nocturnal insects). "BL" tubes (without filters) which emit both invisible near ultraviolet rays, and visible light (ranging on the scale of angstrom units between approximately 3100 and 6200 A.U.) are far superior to "BLB" tubes (with filters), which emit only near ultraviolet rays, between approximately 3100 and 3600 angstrom units. A single, 15-watt "BL" tube seems to be best, for most nocturnal collecting where vertical sheets are used. Of the ordinary incandescent bulbs, the Westinghouse clear blue Daylight (150-watts), is more effective than others, but is not comparable to the black light described above; two of these clear blue bulbs were in regular use at Station 2, along with a 15-watt black light.

Sheets: Ordinary white bed sheets, hung flat against walls, or hung vertically on a frame, were used at all sites except Station 3. Single 15-watt black lights were hung about five to six feet above the ground, in front of the sheets. A ground-sheet was placed under each vertical sheet, to aid in locating moths that fall to the ground.
A 16 x 7 foot "parabolic moth sheet," (invented by the author, with the aid of Mr. Gerald Benedetti), was in regular use at Station 3, where it was directed at the alder-bordered creek. My purpose in constructing such a device was to make a moth-sheet that would tend to hold the moths in the vicinity of the lights, without the use of a trap. At the same time, it seemed desirable to construct something that would be simple to erect or dismantle, and that could be rolled up and easily transported. If a reasonably accurate parabolic curve is maintained, and the source of light is shined upon it, the curving sheet (or canvas) will very effectively (and uniformly) reflect the light out into the area which the sheet faces. Moths coming to this sheet have a greater tendency to remain and settle on it, after flying around within the curve for a certain amount of time. Some moths will fly to the unlighted back side (the outside of the curve) and settle there; it is desirable to leave the back side unlighted, so that moths preferring reduced light intensity will settle there, rather than settling in nearby weeds or bushes, where they would be overlooked. (There will always be some that will settle in the surrounding bushes; it often pays to shake nearby shrubs or the branches, to make hiding moths fly back to the light).

The correct parabolic curve is maintained by closely-spaced poles, all the way across the sheet; these poles are inside vertical
sleeves, which are sewn to the sheet. Guy wires, running from the
tops of the poles to the ground, are needed to hold the entire curve
rigidly in position. The shape of the curve may be changed, but
whenever a change is made, the light must be placed at a different
distance from the inside vertex of the curve. (The light facing the
sheet, at three feet from the vertex, about five feet above the ground
on a pole, was the setting used throughout the survey. The resulting
curve is quite open. This setting was found to be quite effective.
Other parabolic curves remain to be tried). An additional light may
be hung on the same pole, facing away from the sheet. The number
of lights to use, and their exact positioning in relation to the sheet,
is as yet undetermined. There are numerous combinations to be
tried.

On some nights, this parabolic moth sheet attracted far more
moths than all the other stations combined. The site at which the
parabolic sheet was used (Station 3, described earlier) was probably
the best site from the standpoint of varied vegetation and protection
from the wind; these advantages undoubtedly contributed to the suc-
cess of the parabolic sheet used there.

Killing Bottles: Ethyl acetate (acetic ether) was the killing
agent used. It gives much better results with moths than do other
commonly-used killing agents. The major advantages of using it
are: (1) it will not discolor specimens, if the correct amount is used
in the killing bottle; (2) It will keep them soft and relaxed for several days; (3) It causes most moths to die with the wings out flat, which makes them particularly easy to spread in perfect condition; (4) It is not as dangerous as cyanide or carbon tetrachloride. The key to success with this killing agent is never to use too much, but to charge the bottles frequently instead. During regular collecting, it is necessary to lightly recharge the bottles every two or three nights.

(Slightly less than one tablespoonful of fluid is enough for a wide-mouthed, one-pint killing bottle, containing 1 1/4 inches of plaster-of-paris). The bottles should be charged enough to knock out the moths quickly. If the sides of the bottle are the least bit wet with ethyl acetate, the bottle should be aired a few seconds before capturing any moths in it. If perfect specimens are desired, a one-pint, wide-mouthed killing bottle, containing no loose paper or other litter, is preferable. As many as twenty or more moths (of the about same size) may be collected in one bottle, without danger of damage to the specimens. For perfect results with any moths that are colored with green or blue, freezing is an excellent killing-technique. Moths are easily spread after thawing, and they keep perfectly for days in a freezer. If green specimens are killed with ethyl acetate, the jar must be very lightly-charged (just enough to kill); under these conditions, no discoloration will result. Green specimens should always be spread fresh for best results.
NOTES ON COLLECTING, REARING, AND PRESERVING 
LARVAE OF LEPIDOPTERA

Collecting

Beating shrubbery or trees, or sweeping through herbs and grasses with a net, produces a great variety of larvae. It is important to do this both in the daytime and at night, since many nocturnal feeders will be completely off the foodplant during the day, or they will be too low on the stems or branches to be affected by beating. If a certain species is desired, careful searching on the correct foodplant(s) will often produce the best results; again, nocturnal searches should be made as well as diurnal. A large flashlight or lantern, with a large spot-beam, is the most useful source of light. Searching will give much better results than beating or sweeping, where nest-building larvae are involved. Furthermore, such larvae are usually conspicuous because of the nests they build (i.e., webs, curled or rolled leaves, several leaves drawn together with silk, etc.).

If the adult is diurnal, it is often possible to watch the female ovipositing, or at least to gain clues on where to search for the larvae at some later date. When searching for larvae that feed on a very abundant species of plant, it is often much better to search on
isolated plants, or small clumps, rather than searching in the midst of a large colony of the plant. Where trees are involved, small saplings at the edge of a forest grove, in a field, or along roadsides, will often produce excellent results. When collecting on plants that have stiff, leathery leaves (i.e. various chaparral plants) it is usually necessary to search during the limited season when new growth is still soft, or when flowers are present. The larvae feeding on such plants often refuse the older (or hardened) growth. An example of this condition is seen in *Quercus agrifolia* (coast live oak); many of the moth larvae that feed on this tree are present only during that short season (March - April) when the new leaves are growing. These larvae grow rapidly, and most of them will have left the tree by the time the leaves have toughened.

Some pupae may be collected by digging in the soil near or under the foodplant, or by looking under logs, boards, rocks, etc. Other pupae may be discovered in leaf litter that accumulates in the crotches of tree trunks, or around the base of a tree. Some species spin cocoons in bark crevices, or under loose bark. If burlap bags are tied loosely around a tree trunk, certain nocturnal larvae will hide under these by day, and others may pupate in or under them. Larvae that feed on low-growing herbs may sometimes be attracted to boards placed on the ground, and can be collected in the daytime.
Rearing

Whenever possible, it is preferable to rear a species from the egg, as this will provide representatives of all the larval instars, and will show the variation (of color and pattern) within the species. It is better to start with at least 20 or 30 eggs -- preferably 50 or 60 (or more, if time and space permit).

Moths will often oviposit in captivity. With many, all that is needed is confinement in a box (many saturniids, some sphingids, many arctiids, and others). Many noctuids, notodontids, geometrids, and others will oviposit on strips of stiff (i.e. starched) cheesecloth, in a small glass jar. Regular cheesecloth, or strips of paper towel, may be satisfactory in some cases. Some will oviposit inside of brown paper bags (Catocala). Others may require sprigs of the foodplant (with fresh leaves), or stems, or bark of the foodplant. These species often require more space (in order to fly around the foodplant) while ovipositing. Many confined moths will require feeding, as they may only lay a few eggs per night, and will not live long without some liquid. A mixture of one part sugar (or honey) and two parts water is satisfactory for any that require feeding. This should be offered to the moth at least every 48 hours (or more often); a bit of cotton is saturated with the solution, and the
moth is placed on the wet cotton-ball. If the moth does not unroll its tongue to drink, it should be held while its tongue is carefully unrolled with a fine insect pin; when the tongue is touched to the wet cotton, feeding will usually begin. (Peculiar requirements for oviposition will sometimes be encountered. The above discussion mentions only the easiest methods, which are successful in numerous cases).

Where diurnal species are involved, sunlight is often a requirement, as well as regular feeding, and the presence of fresh sprigs of the foodplant. Means must be devised to provide sunlight without killing the moth from overheat, and the plant material upon which it is to oviposit must be kept from wilting. The container used may be a jar, with cheesecloth covering the top, and a piece of thin white sheet partly shading it. Variations can be worked out to suit the species. (Sometimes small screen cages are better).

Eggs which overwinter are easily kept in good condition. The jar in which they were laid should be kept outdoors until the following spring, when food is available. They should be kept out of sun or rain, in a covered shed or garage, but exposed to natural outdoor temperatures. (Overwintering larvae and pupae are easily handled in the same way). They should not be brought inside until foodplant leaves are well-started (very young leaves are sometimes sticky, or otherwise unsuitable for small larvae). The eggs should
be kept in clean jars, where they were originally laid, and the jar lids should be solid (no holes). Excessive dryness, or any amount of condensing moisture in the jar, should be avoided. If the eggs were laid on fresh leaves, the individual leaves with eggs on them should be separated, and allowed to dry out somewhat, before being closed up in a jar; if the jar "steams" inside, it should be opened for a short period of time. As larvae begin to hatch, they may be transferred from the egg-jar to another jar, containing samples of the foodplant leaves (of varying age and tenderness); the remaining unhatched eggs, which are nearly ready to hatch, should not be placed among green leaves in a humid jar, or they will often fail to hatch. Small jars with solid lids are best for starting larvae; in these jars, they are easily cared for, and they will not become lost. When larvae are first beginning to feed, they occasionally need to be placed on the leaves several times, or they will wander around and finally starve. A small sable-hair brush is useful for transferring newly-hatched larvae. If the foodplant is unknown, the first thing to try is any foodplant eaten by a related species, or another related genus; also, any other plants in the same family as known foodplants. If no clues are available, the following observation is sometimes helpful, in that it eliminates a great number of plants that one would need to try: Moths that lay large eggs (for size of moth) nearly always feed
upon some woody tree or shrub; those that lay small eggs usually feed upon herbaceous plants, weeds or grasses, etc. (I won't attempt to explain this phenomenon, but it applies in nearly every case!) In offering foodplants, the following genera should always be tried, in addition to any others peculiar to a certain locality: (a) woody types - *Quercus*, *Salix*, *Populus*, *Ulmus*, *Juglans* (or other nut tree), *Fraxinus*, *Alnus*, *Rosa*, *Rhus*, *Ceanothus*, *Rubus*, *Prunus*, *Crataegus*, *Cornus*, *Robinea* (or other woody legume), *Eriogonum*, *Sambucus*, *Lonicera*, *Symphoricarpos*, *Pinus* (or other conifer), etc. (b) herbaceous types -- *Brassica* (or other crucifer), *Mentha* (garden mint), clovers, *Lotus*, *Chenopodium*, *Polygonum*, *Plantago*, *Fragaria*, *Galium*, *Oenothera* or *Epilobium* or *Clarkia*, *Pteridium* (or other fern), *Arctium*, *Helianthus*, thistle (or other composites), an annual grass and two or more coarse perennial grasses, etc. The above plants will not, of course, suffice in all cases, but one of them may very likely be acceptable. When various foodplants are tried, only one or two leaves of each type should be offered, to make sure the larvae will be able to crawl over all of them with ease.

As the larvae grow, they may be transferred to larger jars, screen cages, or "sleeves" of netting upon the foodplant (outdoors). At all times ample food should be available, and crowding should not be excessive; if disease does not kill overcrowded larvae, the
resulting adults are likely to be dwarfed. Half-pint, pint, and gal­lon jars (wide-mouthed) are quite suitable for rearing most larvae (unless very large numbers are being reared). There are exceptions: A few arctiids, saturniids, sphingids, lasiocampids, and geome­trids, will not thrive in jars. Lids without holes should always be used. The objective is to keep the jar somewhat humid or "steamed" inside, which in turn keeps the foodplant leaves fresh for several days. Jars should be opened to air (at a convenient time) every day or two. When the larvae are placed on fresh foodplant, the jar should be thoroughly cleaned and scalded, under hot water from the tap. An aluminum baking tin is a very useful container into which to dump larvae prior to changing them; if it is 2" or 3" deep, and smooth, it is difficult for them to crawl out, and the tin is readily washed with hot water, after use. In using jars for rearing, it is necessary to pay close attention to conditions in the jar, and to air them out regularly, or disease may develop. Rearing-jars should be kept in a light (but sunless) location, at 70° F., or less. A gal­lon jar is suitable for about 20 - 50 (depending on size) average noct­tu­id larvae in last instar. The jar-technique is by far the most con­venient and time-saving, in most cases. The important things, for success with this technique are: (1) Use solid lids; (2) Air jars every day or two; (3) Locate the jars in a sunless place, at a
temperature of 70° F. or less; (4) Don't overcrowd the larvae;
(5) Change the food before it runs out, or when the jar becomes too
dirty with frass. Some larvae definitely require sunlight and/or dry
air. (Examples are certain arctiids, saturniids, and others).
They are best kept in screen cages, or other containers that can be
placed in partial sunlight without danger of overheating. The food-
plant is kept fresh in a small jar or tube of water (which should be
plugged, to keep larvae from crawling in and drowning). The
"sleeve" technique (outdoors, on the foodplant) is especially useful
when rearing large numbers of one species.

In handling larvae, those that cling with great tenacity to
the plant stems (most sphingids, saturniids, and some geometrids,
etc.) should never be forcefully pulled off, or the prolegs will be in-
jured; such larvae may then bleed to death. Any larva that is ready
to moult should be left where it is; if dislodged from its silken mat,
it may be unable to pull free from its old skin, and will die when
moultng is attempted. Larvae about to moult are very easy to re-
cognize because of the swelling of the new (larger) head capsule
under (and behind) the smaller old one; such larvae will remain in
exactly the same place for two or more days.

Pupation requirments of larvae vary greatly. Among the
moths, a large number of species (especially sphingids, noctuids,
notodontids, and some geometrids) require soil into which they burrow. This must be provided when the larvae stop feeding, and begin to crawl around the bottom of the jar. Three or four inches of damp loam, in a gallon jar, is suitable for 20 or 30 "average" noctuid larvae. A layer of leaf litter (about one inch deep) should be provided on top. The soil should be damp enough that it will not cave in when the larvae burrow into it, but it should not be wet. After 10 to 14 days, the pupae may be dumped out, to be stored in special containers for pupae (where they will be less exposed to attack by fungi). Other larvae have a very special requirement of soft wood or pith, into which they chew for pupation. Such larvae will die without pupating, if placed on damp soil. (Examples are agaristids; noctuids of certain genera, such as Psychomorpha, Raphia, Behrensia, Pleroma; notodontids such as Cerura). A very useful material for such larvae is yucca pith, split lengthwise. Numerous geometrid larvae spin slight cocoons within loosely-curled leaves, either on the ground or on the foodplant. Most saturniids, arctiids, and a few noctuids and others, spin cocoons above ground; such cocoons offer no special problems. Naked, underground pupae, that do not emerge for many months (i.e., aestivate and/or overwinter), present problems in keeping them alive during this long period. If kept too damp, they are often killed by fungus, or they rot; if kept too dry,
they dry up and die. In general, it is safer to tend toward too dry than too wet conditions; during most of the diapause period, near-dryness (in a closed container) produces good results. Pupae should not be kept in a heated room where the air is dry. When it is time to break the diapause, warmer temperatures and damper soil are usually needed. (There are cases where special conditions are required; these will not be described here). In general, the safest way to handle overwintering pupae is to leave them outdoors most of the winter, if they are native to the area, or to another area that has colder (or equally cold) winters; if early emergence is desired, they can be brought inside in February or March, instead of waiting for normal warming outside. Uniform cold (as in a refrigerator) gives very poor results in overwintering pupae; natural fluctuations seem desirable. Ample provision must be made for emergence of adults, if the pupae are in glass, or other smooth-sided containers. A cheesecloth cover, under the lid, and a strip of cheesecloth leading from the bottom to the lid, are very important, to make certain that the emerging insect can climb up, to a position where its wings can hang down as they expand and dry. If such provision is not made, the emerging adult will often be ruined. (The cheesecloth should be provided soon after pupation, as one cannot always tell whether the pupae will go into diapause, or begin to emerge two or three weeks
later).

Many very helpful and specific details, on caring for larvae and pupae in captivity, are given by Newman (16).

**Preserving**

My technique follows Peterson (18), with a few modifications. The technique gives excellent results with nearly all lepidopterous larvae. Many of the colors are perfectly retained, although blues or greens (which are due to the color of the body fluid) are always lost entirely; other colors may be altered somewhat. For this reason, it is desirable to keep a notebook of color descriptions, to correspond to all preserved specimens. These descriptions should be made from the living larva, before it is preserved. It is also worthwhile to include notes on any distinctive habits or behavior (i.e., resting positions; mode of locomotion; reactions to disturbance; whether or not a nest is built; time of feeding --- diurnal or nocturnal?, etc.). In describing eggs, color changes should be noted (from the time they are laid, until they hatch). Often, two or three distinct color changes occur. In describing a pupa, it should be noted whether or not a glaucous bloom is present, and whether the pupa is capable of abdominal movement, and how vigorous this movement can be, etc. If cocoons or earth-cells are constructed, these
should be described as to where built, texture and thickness of silk, color, etc.; many cocoons can be pinned in the dry collection, and are definitely worth saving.

The basic solution used in preservation (K. A. A. D.) is as follows:

Kerosene - one part
Glacial Acetic Acid - one (or two) part(s)
95 % Ethyl Alcohol - nine parts
Dioxane - one part

(Dioxane may be replaced by Iso-butyl alcohol, but more than one part is needed).

Peterson (18) describes the part played by each ingredient of the solution; knowledge of this makes it possible to modify the basic solution in various ways, in order to achieve good results with all larvae.

I have had such excellent results with the following modified solution, that I use it almost entirely (for lepidopterous eggs, larvae, and pupae):

K. A. A. D. (as given above), using one part acid - 12 parts
Iso-butyl alcohol - three parts
Kerosene - two parts
Glacial Acetic Acid - one part
A modification in technique, which gives excellent results, is to inject all pupae, and any larva over one-half inch in length, using a No. 26 or No. 27 hypodermic needle, on a two cc. hypodermic syringe. The larva should first be killed in the solution; about 10 to 15 minutes later, it should be injected (with the same solution) through the anus, to the extent that all the prolegs pop out. If this causes over-inflation, one small prick with a No. 000 insect pin, in the thin membrane behind the head, will remedy the situation, without letting out too much of the injected fluid. The injected larva is then replaced in the solution, where it should remain for one or more days. If it is a very large larva (size of a tomato sphinx), it should be left in "K. A. A. D. I. " for about one week. The timing is not of great importance so long as the larva is not taken out too soon. Only experience will show what timing to use; it may vary from 30 minutes (for some eggs and very small, or "thin-skinned" larvae) to one week. Little or no damage results from spending more time than required in the solution. The larva is then removed to 95 percent ethyl alcohol, in which it is permanently stored. (Nothing less than 95 percent should be used). It is convenient to have "clean-up jars" of 95 percent alcohol, in which the larvae are first placed; the alcohol in these jars will become green with larval fluids. The larvae are left in these jars for a week or more; finally, they are placed in
clean alcohol (95 percent) for permanent storage, in homeopathic (patent lip) vials. Homeopathic vials are far superior to shell vials, for several reasons: (1) the stopper fits better; (2) a considerably smaller stopper may be used, reducing surface of stopper exposed to alcohol; (3) an oversize stopper may be forced in (using a No. 1 insect pin to let out air), and this gives a tight seal; (4) the vials don't break easily. Ordinary corks are worthless as permanent stoppers, since they begin to break down in about a year, and shower particles in amongst the specimens. The alcohol slowly evaporates. Black rubber stoppers are quite unsatisfactory, as they eventually color the alcohol dark brown, and stain pale larvae; also, these stoppers tend to become stiff. Neoprene stoppers are much more satisfactory. The gray stoppers, manufactured by Western Rubber Co., Goshen, Indiana, are low in price ($1.54 per pound in 1962), and do not dis-color the fluid.* They are very pliable, and give a good, tight fit. The end exposed to alcohol will swell somewhat, but this is of little consequence. Homeopathic vials may be purchased, at a reasonable price, from Scientific Supplies Company, Division of Van Waters and Rogers, Inc. (Seattle, San Francisco, Sacramento, Los Angeles, Phoenix, El Paso, Denver, etc.).

* They are sold only in boxes of five lbs. of one size, and a mini-mum order is $10.00.
Labels used in vials with preserved larvae are of 100 percent rag, typing bond paper. This is thin enough not to damage first instar larvae in the vial, yet is tough and it takes black ink very well.

All stages of one life history (eggs-pupae) are stored in one vial, when larval size permits. Otherwise, eggs and early instars are placed in one vial, and the larger larvae (with pupae) in other vials. The stoppers in the vials, as well as the labels inside, receive the same number that corresponds to the color description, and also to any pinned adults in the dry collection. As to size of homeopathic vial, all of the following are useful: 1, 2, 4, 6, and 8 drams. An 8 dram vial will often hold all the stages of a single species, with enough alcohol for permanent preservation. (Placing too many larvae in one vial should be avoided; the alcohol will gradually dilute, and then the larvae will begin to discolor internally).

About one year after placing specimens in permanent storage, it is well to go through all the vials once, and replace all alcohol (green or otherwise) with clean 95 percent ethyl alcohol.

The techniques outlined above will give excellent results with most larvae and pupae, but various modifications must sometimes be employed for special cases. (Experience will show this). A method for preserving greens and blues is needed, and would be a significant discovery. For discussion of some other modifications of the K. A. A. D. technique, see Atkins (1).
THE ANNOTATED LIST OF SPECIES

Introduction to the List

The families follow the arrangement in Part I of the Check List of Lepidoptera of Canada and the United States of America by J. McDunnough (14). The genera and species are arranged alphabetically, within each family. It is realized that, for comparative purposes, an arrangement following the McDunnough list has its advantages, but at the same time, it seems desirable to break away from a meaningless system of numbering. Because the list is twenty-five years old, and because it is bound to a system of numbers, species that have been discovered since the list was written cannot be conveniently incorporated into the list. For these reasons, I have listed the species (collected in this survey) in alphabetical order. (In a check list, the first consideration should be convenience, or a simplified method by which species can be located).

If a number is given in parentheses, opposite the name, (at the right margin of the page) this is the number under which that species appears in the McDunnough list. For purposes of this survey, the Macroheterocera includes any species belonging to any family included in Part I of the McDunnough list. There is some cross-indexing of names in the list, to facilitate locating any species.
that appears under a generic name that may not be widely known.

If a question mark precedes a specific name, it indicates that there is some doubt as to the correct identity of the species; where there is considerable doubt, no specific name is included. Where subspecies are involved, the subspecific name has usually been included, if it could be applied with certainty. (No mention is made of mere color forms).

The list contains all species collected during the period of the survey, with the exception of a few new records taken between March and June, 1963. Also included in the list are species recorded from the Willamette Valley or Coast Range, based on specimens collected by other collectors; these species, where they appear in the list, are indicated by an asterisk (*) under the generic name. Such records exist in the collection of the Department of Entomology, Oregon State University, and usually refer to specimens collected in or near Corvallis.

At the end of each family, under the heading of "Possible species", are listed those for which no Corvallis records have been seen, even though the chances are that these moths do occur in the area. Further collecting in this area will probably turn up most of these species. (A few records from the Salem and Portland areas have been included here; most of the others are simply predictions).
The following is a sample, to show the format used in the list:

**Celerio lineata** Fabr.  
(799)

1. March-September; diurnal and nocturnal; scarce.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
4. Remarks (usually pertaining to behavior of adults).
5. Information on the early stages and larval behavior, etc.

As shown above, a maximum of five numbers may be given. Any of these numbers (except No. 1) may also be omitted.

Following No. 1, the first thing given is the flight period of the adult; this includes any extreme records which were noted during the survey. Any month following in parentheses represents what appears to be the peak period of abundance, within the general flight period that is given first. The next item given is the word "diurnal", in cases where it applies. If this word is not included, the species may be assumed to be nocturnal in its flight. (Most of the diurnal species are on the wing only on mild, windless, and preferably sunny days. Full sun is ideal, although a bright warm day, with only a thin cloud-cover, is suitable for activity of most diurnal moths).

The last item given after No. 1 is the abundance-rating which I have applied to the species, based on its occurrence at Oak Creek Fisheries Laboratory during the period of the survey. Further discussion of dates and abundance-ratings will be taken up later.
Following No. 2, one or more of the following abbreviations may appear (always in the same order): "NE. U. S."; "B. C."; "Santa Monica Mountains (Calif.)." These items are included only as a matter of interest, and are in no sense meant to imply the complete range of the species. The three areas were chosen for comparison because they are widely separated in three corners of the continent, and because information was available on the moths in these areas. "NE. U. S." indicates that the same species (or another subspecies) is found in New York and/or other eastern states; in many cases, if the species is known from the northeastern United States, it has a very wide range east of the Rocky Mountains, and often into Canada. These records were taken from Forbes (6). It is of considerable interest to note the large number of well-known eastern moths (or their subspecies) that occur in western Oregon. "B. C." indicates that the same species, (or one or more of its subspecies) has been collected somewhere in British Columbia, Canada. These records are taken from Jones (12). The number of species in common with British Columbia is even greater, as might be expected. (Pertaining to this topic, see Linsley (13, p. 50-51). It is possible that some of these species are reaching their southernmost limits in this part of Oregon. "Santa Monica Mts. (Calif.)" indicates that I have collected the same species (or one of its subspecies), while
living at a specific locality in the Santa Monica Mountains of southern California (9601 Oak Pass Road, five miles north of Beverly Hills, Los Angeles County, at an elevation of 1,100 feet). These records are based on about 12 years of collecting in the above locality, between 1938 and 1958. The vegetation there includes a combination of Coastal Sage Scrub, Southern Oak Woodland, and Chaparral plant communities, as described by Munz (16, p. 13-18). Many of the species which are not marked "Santa Monica Mts. (Calif.), do occur in northern California, or (in a few cases) at other locations in southern California.

Following No. 3, some known foodplants are listed. These records were obtained from several sources: (a) the extensive card file of Dr. John A. Comstock; (b) the personal records of Mr. Chris Henne; (c) my own records, from about 1948 to 1962; (d) Crumb (5); (e) Forbes (6); (f) Jones (12). The order in which foodplants are listed has little or no significance. Only the genera are listed, as the objective here is to aid other collectors who may wish to rear some of these moths. For such purposes, it is rarely of much importance to know the species of plant. Time and again, in rearing larvae, I have been impressed by the unimportance of any particular species of foodplant, as long as a member of an acceptable genus is offered. If the short list of foodplants is followed by "etc." this
indicates other genera are also known to be acceptable foodplants.

Following No. 4, is a space for brief miscellaneous remarks, which often refer to the flight habits of the adults.

Following No. 5, is more detailed information on the early stages and larval behavior of the species. Unless otherwise indicated, all information here is drawn from notebooks which are kept in conjunction with my collection of preserved larvae. If a letter-number combination ("Sp. 4", for example) follows the No. 5, in parentheses, this indicates that the early stages of that moth are preserved in my larval collection, under the letter-number combination given. The emphasis here is upon information not published elsewhere. Descriptions, if given at all, are necessarily brief, and only essential distinguishing characters are mentioned; the objective is to characterize the species (in its early stages), by mentioning any distinctive features of its appearance and/or behavior.

Further Comments on Dates and Abundance-ratings

Because the period of emergence may vary by two or three weeks from one year to another, it would be desirable to start searching a short time ahead of the earliest date given, and to continue for three or more weeks after the latest date given, when attempting to collect any of the species in the Corvallis area. Although records of the
exact dates of capture were kept for all species, the exact day of the month is rather meaningless. For the purposes of this list, the months were broken down into thirds: "Early" includes any day from the first through the tenth of the month; "mid" covers the eleventh through the twentieth; "late" covers the twenty-first through the thirty-first.

Abundance-ratings have been treated as follows (starting with the rating used for the "rarest" species encountered): (a) very scarce, (b) scarce, (c) moderate-, (d) moderate, (e) moderate +, (f) abundant (="common"), (g) abundant +. These are comparisons of relative abundance between the various species. Exact numbers of individuals are not implied in this, except at the two lowest levels: "Very scarce" means only one or two individuals seen during the entire survey; "scarce" implies more than two collected, but not more than six. The "moderate" rating covers those species which could not really be called either scarce or abundant. "Moderate -" and "moderate +" are intended to show an inclination either towards rarity or abundance. (In ecologically undisturbed habitats, the majority of species usually fall somewhere within the "moderate" category). Many of these abundance-ratings would probably have to be modified after several years of collecting in this locality; it is possible that certain species were more abundant or less abundant in 1962 than they
normally would be in other years. These abundance-ratings apply only to the specific locality where the survey was made, and are not meant to imply the abundance of a species elsewhere in Oregon. Abundance-ratings are usually omitted for single-starred (*) species, because I have had no contact with these species in the field.

Specimens collected during this survey are distributed among the following collections:

(1) Entomology Department, Oregon State University, Corvallis, Oregon.

(2) Entomology Department, Los Angeles County Museum, Exposition Park, Los Angeles 7, California.

(3) The combined moth collection of William R. Bauer and Steve Buckett (Davis, California).

(4) The Geometridae collection of Carl Kirkwood (Summerland, California).

(5) The moth collection of Noel McFarland (Valyermo, California).


Most of the specimens are distributed among the first three collections listed above.
THE ANNOTATED LIST OF SPECIES

Superfamily SPHINGOIDEA
I. Family SPHINGIDAE (Hawk Moths; Sphinx Moths)

Celerio lineata Fabr. (799)

1. March - September; diurnal and nocturnal; scarce.
2. NE U.S.; B.C.; Santa Monica Mts. (Calif.)
3. Epilobium, Oenothera, Godetia, etc.
4. The adults may be seen flying by day, especially in the morning. They also come readily to lights at night.
5. (Sp. 4): It is worth noting that larvae of this moth occur in two color phases; one is predominantly black, and the other is predominantly green, with black markings. Either color phase may turn up in a single locality. Most of the preferred larval foodplants are low-growing herbs, often rather small plants. For this reason, the larvae are sometimes seen crawling over the ground, among weeds. They rarely hide by day.

Hemaris sp.
(*)

1. April - June; diurnal only; probably scarce to moderate.
2. Symphoricarpos, Lonicera.
5. The following comments are based on observations upon H. diffinis Bdv. (Sp. 2), which is a common species east of the Rockies. My specimens were collected as eggs, upon one of the foodplants (Symphoricarpos orbiculatus), growing on the University of Kansas Natural History Reservation, seven miles NE of Lawrence, Douglas County, Kansas. The egg is laid singly, on the underside of a leaf. It is pale blue-green and shiny. The larva is easily recognized as a member of the Sphingidae, as it bears a pointed, sclerotized caudal horn. Although the larva is predominantly bluish-green to yellow-green dorsally and laterally (respectively), it has a contrasting reddish-brown underside (between and including the prolegs); this aids in its camouflage, as it always clings to the underside of a stem, on its foodplant. When viewed from above, the rich brown underside
is all that is readily seen, and it blends nicely with the brown (older) stems of the foodplant. This cryptic pattern is carried to even greater perfection in the larva of _H. senta_ Stkr., which occurs in the Santa Monica Mountains and elsewhere in California. The larva of _H. senta_ has its underside tinged with rich purplish-brown; as in _diffinis_, its sides and dorsum are various shades of green. The important feature here is that the stems of its foodplant, _Lonicera subspicata_ H. & A., are tinged with purplish or purplish-brown above, where the sun strikes, but shade to green on the underside, which is not "sunburned." As the larva rests on the underside of one of these stems, it is protected by its color, whether viewed from above or below. The _Hemaris_ larva is quite inactive most of the time. When it does crawl, it exhibits a peculiar and very characteristic "forward-inching" type of locomotion, if not disturbed; this allows it to glide inconspicuously along, without drawing much attention to itself. The feeding habits of the older larvae also tend to aid in keeping them inconspicuous. Each leaf that is eaten is entirely consumed, which does not leave much evidence of feeding (at first glance), in the maze of leaves that are within a _Lonicera_ or _Symphoricarpos_ clump. Pupation takes place in the leaf litter. It is of interest to note that when the moth first emerges, and up until the time it takes its first flight, its wings are fully-covered with large, loosely-attached, dull black scales. In the instant that it first vibrates its wings, as it takes off on its first flight, all these loose scales blow off in a cloud; from that moment on, the moth is the familiar clearwing (or bee hawk) known to all lepidopterists. The adult is a very fast flier, active on sunny days only. It is attracted to various flowers (particularly blue, pink, or purple flowers, such as _Gilia_ or thistle, etc.), over which it hovers while feeding. Any sudden movement or noise will alarm it, and it will disappear with speed. Eggs are laid by the female as she hovers at the edge of a leaf of the foodplant. Only an instant is needed, in which to deposit the egg. The easiest way to obtain _Hemaris_ larvae is to collect the eggs. Although _Symphoricarpos_ is abundant, the moths always show a preference for ovipositing only on certain plants, which are in certain types of situations. Preferred oviposition sites are as follows: (a) single plants, growing in open sunny places, or along roadsides; (b) groups or short rows of plants,
growing in sunny clearings, or in sunny situations at the edges of groves of trees, etc. It would be a waste of time to search on the numerous *Symphoricarpos* plants which grow thickly (together), as understory, among trees. This illustrates a principle which is very often applicable, in searching for eggs or larvae of a species that feeds upon an extremely abundant plant. Individuals (of the plant) which grow alone, or in conspicuous situations away from the main concentrations of the plant, should be searched first (and very carefully). These isolated individuals are often preferred oviposition sites for moths and butterflies.

**Hemaris thysbe** Fabr.  
(*

1. May - June; diurnal only; probably very scarce.  
2. NE. U. S.; B. C.  

**Pachysphinx modesta** Harr.  
(*

1. June - August; probably scarce.  
2. NE. U. S.; B. C.  
3. *Populus*.

**Paonias excaecata** A. & S.  

1. July - August (July); moderate +.  
2. NE. U. S.; B. C.  
3. *Crataegus, apple, Prunus.*  
5. *(Sp. 10): A large number of larvae of this sphingid were reared from eggs. The mature larva has a very granular texture on the surface of its skin, head, and caudal horn. The granulations are mostly whitish-tipped. The larval resting posture illustrates the typical sphingiform position (upon which the name sphinx moth was based): Fore part of the body is reared high up, and the head is drawn in and somewhat under, with the first one or two pairs of prolegs not clasping the stem, but the remaining pairs clasping tightly. A disturbance will cause the larva to thrash from side to side (a typical sphingid larval reaction).*
Phlegethontius quinquemaculatus Haw.  

(697)  

1. June; probably scarce.  
2. NE. U. S.; B. C.  
5. (Sp. 8): Although P. sextus Joh. probably does not occur in this locality, it is worth noting here that the larvae of these two species, while quite similar in general appearance, are not hard to separate. (In many areas further south, both species occur upon tomato, tobacco, Datura, and other members of the Solanaceae). The caudal horn of P. sextus is red or reddish-tinged; the horn of P. quinquemaculatus is blue, or black and bluish-tinged. The mature larva of P. sextus feels soft to the touch, as it is covered with a fine, colorless pubescence; the larva of P. quinquemaculatus is not pubescent. The pupa (in both species) is unusual in that the tongue-case is free from the body, and projects from the head like a handle, curving down to attach again at its tip; this does not represent a typical sphingid pupa.

Proserpinus clarkiae Bdv.  

(789)  

1. May; diurnal only; probably moderate.  
2. B. C.  
3. Clarkia (=Godetia).

Smerinthus cerisyi Kby.  

(740)  

1. Late April - August; moderate.  
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).  
3. Populus, Salix.  
5. (Sp. 9): At first glance, there does not appear to be much difference between the larvae of this species, and the larvae of Paonias excaecata. First of all, the difference in foodplant preference should be noted. To separate last instar larvae of the two species, a difference in caudal horn colors (of living larvae) is useful: The horn of P. excaecata is the same shade of green as the body, and it is covered with rather sharp whitish granulations. The horn of S. cerisyi is smoother, and is colored with a combination of blue (dorsally), deep pink or reddish (basally, on the underside), fading out to near white at the tip (on the underside). Larvae of P. excaecata have skin that is
rough-granular, with numerous sharp granulations all
over the body; larvae of *S. cerisyi* are smoother in general,
but nevertheless covered with very fine granulations. There
are also differences in the white lines, with which both spe-
cies are marked. The pupae of both are of the ordinary type,
lacking any hint of a free tongue case.

Sphinx chersis oreodaphne Hy. Edw. (719 b)

1. June - July; abundant.
2. NE. U. S.; B. C.
3. *Prunus, Fraxinus*.

Sphinx mordecai McD. (721)

1. June 20; very scarce.
2. B. C.
3. *Symphoricarpos*.

Possible Species

Actonotus lucidus Bdv. (783)

1. Look for: February - April.
3. *Oenothera*.
5. (Sp. 14): This generally scarce sphingid is reported to be
fairly common in parts of eastern Oregon and Washington.
It is a very early flier, and is single-brooded. (Near
Saugus, Los Angeles County, California, the moths are on
the wing in January, on mild nights). Eggs were obtained
from a moth in southern California. The resulting larvae
readily accepted *Oenothera hookeri* T. & G. as a foodplant,
and were reared to maturity. A mature larva was found
under a board, on May 16, '62, by Ken Goeden, near John
Day, Grant County, Oregon. A distinctive feature of the
larva is its lack of any caudal horn, of the usual type. The
horn is replaced by a sclerotized caudal button, ringed by
black, upon which is a minute black "horn" less than .5 mm
long.

Celerio gallii intermedia Kby. (798 a)

1. Look for: June - July.
2. NE. U. S.; B. C.
3. *Epilobium, Galium, Godetia (=Clarkia)*
Pholus achemon Dru. (773)

1. Look for: June - July.
2. NE. U.S.; B.C.; Santa Monica Mts. (Calif.).
3. Vitis.

Sphinx drupiferarum A. & S. (730)

1. Look for: late spring - summer.
2. NE. U.S.; B.C.
3. Prunus.

Sphinx perelegans Hy. Edw. (724)

1. Look for: late spring - summer.
2. B.C.
3. Symphoricarpos.

Superfamily SATURNIOIDEA

II. Family SATURNIIDAE (Giant Silk-moths)

Platysamia euryalus Bdv. (=Samia) (807)

1. Mid April - June; moderate +.
2. B.C.; Santa Monica Mts. (Calif.).
3. Ceanothus, Rhamnus, Arbutus, Alnus, Salix, Acer, Amelanchier, Ribes, etc.
5. (St. 6): This species is mentioned here because Ceanothus is usually listed as its preferred foodplant. However, Ceanothus is very scarce in this locality. Madrone (Arbutus menziesii) seems to be a very readily-accepted foodplant, and may be of importance in this locality. Most of the other listed foodplants are abundant here, but are probably not equally acceptable.

Pseudohazis eglanterina Bdv. (840)

1. Late July - early September (August); diurnal only; moderate-.
2. B.C.
3. Ceanothus, Holodiscus, Rosa, Rubus, Rhamnus, etc.
5. (St. 5): This moth overwinters in the egg stage. The eggs are laid in masses, upon the stems of a suitable foodplant.
(Ceanothus is preferred, in areas where this plant is abundant). The eggs hatch very shortly after exposure to a few warm days. The larvae are colonial when young, following the leader single file, when moving to a new location. They become solitary by the last instar. The middorsal spine clusters have a slight stinging ability, if touched to tender skin. Nearly all Hemileuca or Pseudohazis larvae (this species included), require abundant fresh air and daily sunshine, in order to grow well in captivity. Screen cages are required. They do not feed well until after exposure to sunlight. After a certain amount of sunning, they will begin to feed voraciously. The adult is strictly diurnal, flying only on sunny (or warm) days. Its flight is very fast and erratic; males almost never alight. The adults are likely to be seen almost anywhere, but are not abundant in this locality. They sometimes fly along roadways, at about head height. (One was observed flying across a parking lot, in Corvallis). They are more often seen in McDonald Forest.

**Telea polyphemus** Cram. (=Antheraea)

1. Late April - July; August - September?; abundant.
2. NE. U. S.; Santa Monica Mts. (Calif.).
3. Alnus, Acer, Quercus, Salix, Ribes, Corylus, etc.

Superfamily NOCTUOIDEA

III. Family AMATIDAE (Scape - moths)

**Ctenucha rubroscapus** Men.

1. May - August (July); diurnal only; scarce.
2. Various coarse grasses (Dactylis, Elymus, etc.)
3. The adults may be found in low, wet (or damp), grassy places, in the sun. The flight is "heavy" and direct. They do not wander far in flight.
4. (Am. 2): Larvae were reared from eggs, obtained by David L. Mays, in July, 1962. Although the fullgrown larva could be mistaken for an arctiid -- it is heavily covered with hairs -- its specific requirement of coarse grasses for food separates it from any arctiid occurring in this locality. The hairs are mostly pale gray-tan, tipped with black. There is a mid-dorsal tuft of black...
hairs on abdominal segment one. The skin is mostly dark ashy-gray (varies from one larva to another). The head is a rich, golden brown or light brown, and very shiny. The larva, particularly when small (but also in last instar) has the peculiar habit of literally snapping into a curled position if disturbed; it seems to jump from the grass blade. All one needs to do is touch the rear end of the larva, and it will instantly snap from the leaf and drop. Upon landing, the curled position is only retained a few seconds at the most; then the larva gets up and crawls rapidly away. (No arctiid larva, in this locality, behaves as described above).

Superfamily NOCTUOIDEA
IV. Family NOLIDAE

Celama minna Butl. (891)
1. Mid March - April (early April); abundant.
2. B. C.
3. Ceanothus; Quercus?

Sarbena ? fuscula Grt. (*Meganola) (900)
1. April - mid May (early May); abundant.
3. Quercus; lichens on Quercus ?

Sarbena ? minuscula Zell. (897)
(*)
1. April
2. NE. U. S.; B. C.
3. Quercus leaves, and lichens on the branches.

Superfamily NOCTUOIDEA
V. Family LITHOSIIDAE (Lichen-moths)

Clemensia albata Pack. (952)
1. July - September (July - August); abundant.
2. NE. U. S.; B. C.
3. Sticta pulmonaria, and probably other lichens.
5. (Li. 2): Eggs were obtained from confined moths in September, 1962. The eggs are large, considering the size
of the moth. The larvae showed a preference for the common, foliose, *Sticta pulmonaria*. Feeding takes place only when the lichens are soft and green (after rain or fog). Growth is very slow. Upon this data (March 15, 1963), the larvae are only half-grown, although they hatched from the eggs in October, 1962. The larva is primarily dull olive-green, variously marked and speckled with dull black. It is sparsely covered with short, stiff, nearly colorless hairs. The head is dull brown, and marked with blackish. The mandibles are large. Feeding is only on the upper surface of the lichen, where the green layer is rasped away, leaving the white underneath.

Superfamily NOCTUOIDEA
VI. Family ARCTIIDAE (Tiger-moths)

Apantesis ornata Pack. (1039)

1. Late May - July (early-mid June); diurnal ♀; abundant ♂.
2. B.C.; Santa Monica Mts. (Calif.).
3. General feeder on low-growing plants.
4. Highly variable in color and pattern of secondaries.
5. The nearly-grown larvae may be encountered during April and early May, feeding upon various low-growing weeds, along roadsides or in sunny fields, etc. The larva is covered with straight, stiff brown hairs, and there is a dull yellowish, or orange middorsal line on the skin (beneath the hairs). It is characteristic of most Apantesis larvae to run at a high rate of speed when disturbed, usually burrowing down into tangled grass or weeds to hide. This behavior is only exhibited when it is sufficiently warm. The pupa is characteristic of most Apantesis pupae in that it is covered with a glaucous bloom, and is capable of slow abdominal movement; the discarded larval skin usually remains attached to the rear end of the pupa. The cocoon is slight, and no larval hairs are used in its construction. (It is formed under leaves or other litter). The adult females hardly ever come to light, and are probably most active in the daytime. When recently-emerged, they are so heavy with eggs that they can hardly leave the ground, but are sometimes seen "flying" along (short distances) over the ground.
Arctia caja americana Harr. (1098d)

1. Mid July - early August (late July); moderate +.
2. NE. U. S.; B. C.
3. General feeder on low-growing plants; esp. favors Pteridium, Rubus, Arctium, Urtica.

5. (Ar. 17): The hairy larvae are most often encountered singly, sunning or feeding, on the tops of Rubus or Pteridium leaves. (They will not be found on cloudy days). Full growth is reached in June or early July, after having overwintered as a small larva. In the last instar larva, the skin is charcoal black. Dorsal and subdorsal hairs of the abdominal segments are black, with a scattering of longer, straw-colored hairs mixed in. Lateral abdominal hairs, and all thoracic hairs, are orange-brown or rusty-brown. In general, hair-texture is rather stiff, but the hairs are not sharp. The hairs are very glossy in the sunlight. The chalky-cream spiracles stand out prominently on the black skin. For success in captivity, the larvae require fresh air and daily sunlight; under such conditions, it is usually difficult to keep herbaceous plants fresh, but it was found that Arctium (burdock) leaves are the ideal solution to this problem. A single large leaf will provide ample food for several larvae, and the leaf will stay fresh for a long time, if the petiole is inserted into a vial of water, which is plugged with cotton. Burdock is a very useful foodplant for any larvae that are general feeders on low-growing, herbaceous plants.

Diacrisia pteridis Hy. Edw. (1067)

1. June; diurnal (also nocturnal? ); scarce.
2. B. C.
3. Pteridium, Plantago, Rubus, etc.

Diacrisia vagans Bdv. (1066)

1. Late May - June; diurnal ♀; scarce.
2. B. C.
3. Lupinus, Rumex, Chenopodium, etc.
4. Sexual dimorphism is pronounced in this species.
5. (Ar. 15): At first glance, the fullgrown larva is reminiscent of an Apantesis larva. However, it is much more sluggish in its behavior. A number of larvae were collected on and under a common perennial bush lupine, in sand dunes, along Coast Highway 1, at Ten Mile River, north of Fort Bragg, Mendocino County, California, on September 7, 1961. The moth also occurs around Corvallis, but no larvae were encountered here. The stubby black pupa is incapable of any abdominal movement (in contrast to Apantesis pupae, which are quite capable of slow abdominal movement).

Diacrisia virginica Fabr. (=Spilosoma Steph.)

1. May - June (June); abundant.
2. NE. U. S.; B. C.
3. General feeder on low-growing plants.
5. (Ar. 11): The mature larva of this species is sometimes confused with the larva of Estigmene acraea. Although the hair colors of D. virginica are somewhat variable, the usual dominant hair color is pale orange-brown or golden brown, usually with a few black or black-tipped hairs in the vicinity of the head and thorax, especially just above the true legs. In some larvae, black hairs are generally mixed in. Hairs are soft and very uneven in length. Mature larvae are seen from late summer to early fall. They are general feeders upon various weeds and other herbs. The adult is sometimes confused with Maenas vestalis or Estigmene acraea. The three species are easily separated. (The other two are discussed later). In D. virginica, the coxae and femora of the forelegs are mostly yellow-orange. The wings do not have the sheen of pure, gleaming white, which is seen in Maenas vestalis. (See also, Stilpnotia salicis: Liparidae).

Euchaetias oregonensis Stretch

1. July 4 (2 specimens); very scarce.
2. NE. U. S.; B. C.
3. Apocynum.
4. Quite a few specimens seen for the June 6 - July 27 period, from Eugene, Oregon.
**Halysidota argentata** Pack. (=Halisidota) (975)

1. Mid June - early September (late July); moderate +.
2. B. C.
4. (Ar. 23): This is the only conifer-feeding arctiid in the area. The larvae are quite colonial until nearly fullgrown. Younger larvae weave webs for protection. A web containing about 150 newly-hatched larvae was found on Pseudotsuga, near the fish hatchery near Alsea, Benton County, Oregon, on September 27, 1962. They overwinter as small larvae, and complete growth the following spring and early summer. Larvae are variable, but the hairs are usually predominantly orange-brown or straw-colored, with a middorsal row of short black tufts, surrounded by small tufts of bright yellow hairs. Head is shining black. Pupation occurs in the "typical" arctiid cocoon of silk, into which the larval hairs are incorporated.

**Halysidota maculata** Harr. (980)

1. Late May - early August (June); abundant +.
2. NE. U. S.; B. C.
3. Alnus, Salix, Populus, Arbutus, etc.
4. (Ar. 6): Of outstanding interest here is the great change in hair color which the larva undergoes between the penultimate and last instars. Although variable, younger larvae usually have predominantly white hair (or yellowish-white), with a middorsal row of eight black or red tufts. Occasionally, most of the hairs at either end are black. In the last instar larva, the hairs are divided into three color areas: mostly black at anterior end, and back to abdominal segment two; mostly black at posterior end, and forward to abdominal segment six; yellow or reddish-yellow in the central section of the body. Thin tufts of longer white hairs extend well above the black hairs, at both ends. The larvae rest conspicuously on the leaves and branches of their foodplant.

**Hemihyalea edwardsi** Pack. (974)

1. Mid August - September (September); abundant.
2. Santa Monica Mts. (Calif.).
3. Quercus.
5. (Ar. 3): The larva is restricted to Quercus, and is the only arctiid on Quercus in this locality. A notable feature of the mature larva is its immense head, which is deep brown and very glossy. The skin is grayish above, shading to pale yellow-tan on the ventral side. The hairs are brown and silky-soft, and are of two dominant lengths: (1) short, dense tufts and (2) numerous longer hairs, extending well above the main tufts. Larvae reach full size in August. Feeding takes place after dark; the larvae hide by day inside holes in the trunk or limbs, or under loose bark. At dusk, they crawl out onto the smaller branches to begin feeding. The massive mandibles are well-equipped to chew the stiffest oak leaves. (In Southern California, the larvae feed on Quercus agrifolia and Q. chrysolepis, readily devouring old, tough leaves).

Hyphantria textor Harr. (1074)

(*)
1. May - July; moderate.
2. NE. U.S.; B.C.
3. Juglans, Arbutus, Salix, Alnus, etc.
5. (Ar. 9): This species is colonial in the larval stage, living in "tents" or webs, and feeding within the webs. It cannot be confused with the tent caterpillars (LASIOCAMPIDAE) because its webs do not become conspicuous until August or September, whereas the tent caterpillars have deserted their webs and disappeared by early July. The adult is the smallest of the four white arctiids in this locality.

Isia isabella A. & S. (1069)

1. June; moderate +.
2. NE. U.S.; B.C.
3. General feeder on low-growing plants.
5. (Ar. 10): This is the familiar 3-banded "woolly-bear" larva, seen crossing roads in the fall (October). The larvae are often confused, in this locality, with larvae of Platyprepia guttata (described below). Aside from being distinctly different in appearance, the larvae of the two species are completely separated by the time of year at which they become conspicuous. In Isia isabella, the three color-bands of hairs are (1) black (2) rusty-brown ("orange") (3) black; the black sections are at either end of the larva. The hairs
are stiff, and of about the same length. The mature larva overwinters, and does not pupate until spring.

Maenas vestalis Pack.

1. Late April - June; abundant.
2. Santa Monica Mts. (Calif.)
3. General feeder on low-growing plants.
5. (Ar. 21): The mature larva appears in mid-late summer. The hairs are relatively stiff, and all of approximately the same length. Dorsal and subdorsal hairs are blackish-brown; there are rust-brown hairs in a strip, along either side. The larva readily curls up if handled. It overwinters as a pupa, within a dense cocoon of silk and larval hairs. The adult is the first arctiid seen in spring (in this locality). The wings are gleaming white (as opposed to pure "dead-white," in Diacrisia virginica). The coxae and femora of the forelegs are deep red.

Platyprepia guttata Bdv.

1. June; diurnal only; moderate.
2. B. C.
3. General feeder on low-growing plants; especially favors thistle and Galium, in damp or wet, grassy places.
5. (Ar. 16): The mature larva is seen in May. By June, it is ready to pupate, having overwintered as a small larva. It is not to be confused with the larva of Isia isabella. In P. guttata, the hairs are also arranged in three color bands, but in reverse of the arrangement seen in I. isabella. The color bands are as follows: (1) rusty orange-brown (2) black (3) rusty orange-brown. The black section is in the middle, and is usually the longest section. The hairs are soft and of various lengths. An abundance of longer, whitish hairs rise above the black hairs; these longer hairs are particularly soft to the touch. The cocoon is sticky and web-like, and few (if any) of the larval hairs are used in its construction. The pupa is easily seen through the colorless silk. The gaudy adults are highly variable as to the amount of black or orange on the secondaries. They are strictly diurnal, and are fast, erratic fliers.
Possible species:

Apantesis sp.

1. Look for: July - August.
2.
4. Two males were collected at Portland, Oregon, by Ken Goeden (August 6, 1962). There are distinctive features in the coloration of this striking moth: The thorax is completely jet black; the ground color of the primaries is cream-tan and the markings are black, with a noticeable gap between them in the basal half of the wing; the deep rosy-pink secondaries are nearly immaculate. (Perhaps some form of Apantesis nevadensis G. & R. ?)

Estigmene acraea Dru. (1070)

1. Summer.
2. NE. U. S.; B. C.
3. General feeder (garden plants, weeds, Chenopodium, etc.).
4. No Corvallis records for this species; certainly to be expected.
5. (Ar. 2): The larvae are quite variable as to color of hair or skin. The hairs are of mixed length, and soft to the touch. They may be gray, brown, whitish-cream, or blackish. The skin may be dark ashy-gray to nearly cream-white. On dark-skinned larvae, there is usually evidence of a broken, undulate, cream or whitish band along the side, from about the second abdominal segment to the eighth. The adults are more heavily black-spotted than any of the other white-winged arctids in this locality. In the male, only the primaries are white, the secondaries being yellow-brown. In both sexes, most of the dorsal surface of the abdomen is bright yellow-brown, with a row of large black spots down the middle.

Leptarctia californiae Wlk. (1063)

1. Look for: April - May; diurnal only.
2. B. C.
3. General feeder on low-growing weeds, etc.
4. Jon Shepard found males flying in abundance, on an open hilltop near Alsea, Benton County, Oregon, on April 13, 1963.

5. (Ar. 18): The mature larva can at once be recognized by the much longer hairs arising from abdominal segments eight and nine. (It is reminiscent of a dermestid larva!) The skin is brownish; darker dorsally, to very dilute on the underside. There is a strong middorsal line of pale orange. The hairs are all the same color (grayish-brown). I have collected larvae feeding at night, near Williams, Coconino County, Arizona; they were on Melilotus albus Desr. (August, 1954). The adults emerge in early spring, and are diurnal. The male is a rapid flier. Variation in color and pattern, on the secondaries, is extreme in this species. Two specimens exactly alike are almost never seen. Aside from the black ground-color (or markings), the secondaries may be predominantly red or yellow-orange, or they may be predominantly black, marked with one of these colors. Occasionally specimens are seen that are almost entirely black, or black marked with whitish (on the secondaries).

**Phragmatobia fuliginosa** L. (1028)

1. Look for: June - July.
2. NE. U. S.; B. C.
3. Rumex, Plantago, Solidago, Taraxacum, etc.
4. Recorded from Salem, Oregon (June - July).

Superfamily NOCTUOIDEA

VII. Family AGARISTIDAE (Foresters)

Possible species:

**Alypia langtoni** Couper (*

1. May - June (Alsea, Oregon); diurnal only.
2. NE. U. S.; B. C.
3. Epilobium; Clarkia (Godetia)?, Oenothera?
Alypia octomaculata Fabr.  
(*)  
1. May - July (Portland, Oregon); diurnal only.  
2. NE. U.S.  
3. Vitis; Virginia creeper.

Androloma mac-cullochi Kby. (=Alypia Hbn.)  
(*)  
1. May; June? (Alsea, Oregon); diurnal only.  
2. NE. U.S.; B.C.  
3. Epilobium; Clarkia?, Oenothera?, Vitis?

Superfamily NOCTUOIDEA  
VIII. Family NOCTUIDAE (Owlet Moths)

Abagrotis pulchrata Blkmre.  
1. Late August - September (early September); moderate-.  
2. B.C.  
5. (N. 54): An unsuccessful attempt was made to rear this species. Geum and Rubus were offered. Neither was very satisfactory, although a few larvae reached third instar. Failure was probably due to the wrong choice of foodplants. (Few other plants were available at the time the young larvae hatched, in late September).

Abagrotis sp.  
1. August - September; scarce.  
2.  

Acerra normalis Grt.  
1. Mid March - Mid April; abundant.  
2. B.C.; Santa Monica Mts. (Calif.)  
3. Alnus, Salix, Acer, Prunus, Ribes, etc.  
5. (N. 41): The larva is a "typical", hairless, noctuid larva. The colors (last instar) are variable light browns or grayish-brown dorsally, with a broad, whitish, lateral line. The ventral surface is of dilute dorsal coloration. In earlier instars, the lateral line is intense white, with a yellowish tinge. Larvae hide by day, between leaves or in crevices,
etc., coming out to feed after dark. If disturbed, they are quick to drop from the plant, and curl up. They will also "spit" (regurgitate fluid). The pupa is underground, in a well-formed, silk-lined earth cell.

Achytonix epipaschia Grt.  

1. Mid July - mid August (late July); moderate +.  
2. B. C.  
3. Pseudotsuga  

Achytonix sp.  

1. Late July (3 records); very scarce.  
2.  

Acontia flavipennis Grt.  

(∗)  

1. Late May - early July (Wren, Oregon).  
2.  
3. Possibly Malvaceae spp.  

Acronycta fragilis Gn. (Acronicta Ochs.)  

(∗)  

2. NE. U. S.; B. C.  
3. Betula, Rosa, Crataegus, Prunus, Amelanchier, etc.  
4. The members of this genus have hairy larvae, which are often mistaken for arctiids.  

Acronycta funeralis G. & R.  

1. July 4; very scarce.  
2. NE. U. S.; B. C.  
3. Salix, Populus, Crataegus, Prunus, Alnus, Rubus, Holodiscus, Ulmus, etc.  

Acronycta grisea Wlk.  

1. June - July; moderate-.  
2. NE. U. S.; B. C.  
3. Alnus, Salix.
Acronycta hesperida Sm. (1152)

1. June - August (mid June - July); abundant.
2. NE, U. S.; B. C.
3. Alnus, Salix, Betula.
4. Treated as race of dactylina Grt. by Forbes.
5. (N. 35): The larva looks superficially like an arctiid, being well-covered with golden-brown hairs. On abdominal segments one, three, and eight, a small tuft of black hair arises above the shorter brown hair. Some, or most, of the hairs along the sides are whitish. The skin is black, and the head is shiny black. The mature larvae are frequently seen crossing roads in September, having left their foodplant prior to pupation. Pupation occurs in a tough silken cocoon, on a tree trunk, or under a log, etc. Many members of the genus Acronycta have colorful larvae, that are often heavily-covered with hairs; these larvae are frequently mistaken for arctiids. Most of them feed upon various trees and shrubs, particularly Populus, Salix, Alnus, Prunus, and Cornus, etc. (i.e., they are not found upon herbaceous plants, which are the foodplants of most arctiid larvae in this locality).

Acronycta impleta Wlk. (1201)

1. April; scarce.
2. NE, U. S.; B. C.
3. Alnus, Salix, Pyrus, Quercus, Cornus, etc.

Acronycta impressa emaculata Sm. (1204 a)

1. April; moderate -.
2. NE, U. S.
3. Salix, Alnus, Populus, Ribes, Rubus, etc.

Acronycta lepusculina Gn. (1153)

1. July 26; very scarce.
2. NE, U. S.; B. C.
Acronycta marmorata Sm.  
1. Late May - August (late June - early July); moderate +.  
2. B. C.; Santa Monica Mts. (Calif.).  
3. Quercus.  
4. This Acronycta often has a melanic form, which is quite different from typical specimens. (Other members of this genus are often melanic, also).

Adelphagrotis indeterminata innotabilis Grt.  
1. Mid August - mid September; moderate -.
2. B. C.; Santa Monica Mts. (Calif.)
3. Salix, Rubus, Holodiscus, etc.

Adelphagrotis stellaris Grt.  
1. Mid July - August; scarce.
2. B. C.
3. Rubus, Osmaronia, Symphoricarpos, etc.

Agroperina cogitata (See Septis cogitata)

Agrotis sp.  
1. May - July; moderate.
2. B. C.

Agrotis ypsilon Rott.  
1. July - October (September - October); moderate +.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Many low-growing plants.

Aletia oxygala Grt. (=Leucania Ochs.)  
1. Late August - September; June - July?; scarce.
2. NE. U. S.; B. C.
3. Grasses and sedges.
4. Forbes treats luteopallens Sm. as a race of this species.
Amathes c-nigrum Linn. (=Graphiphora Ochs.) (1511)

1. April - September; abundant.
2. NE, U.S.; B.C.; Santa Monica Mts. (Calif.).
3. General feeder.

Amphipyra pyramidoides Gn. (2584)

1. Late August - October; moderate.
2. NE, U.S.; B.C.
3. Various shrubs and herbs (prefer broadleaf, woody plants).
4. After coming to light, the moth often retreats to a dim area away from the strongest light intensity.
5. (N. 42): Larvae were reared from overwintering eggs (laid in October). The eggs hatch in mid April, or whenever it begins to warm up. The larvae accepted almost every type of woody, broadleafed plant offered, but were reared primarily on Fraxinus. The distinctive larvae are often encountered upon various trees and shrubs, usually clinging to the midrib of a leaf, on the underside. The full grown larva is smooth, with a ground color of light, translucent yellowish-green, and is marked with a number of lines and smaller flecks and spots of white or yellow. There is a prominent caudal hump. A good illustration of this larva is given by Holland (11), on p. 173.

Amphipyra tragopoginis L. (2585)

1. July - September; moderate.
2. NE, U.S.; B.C.
3. Various herbs and shrubs.

Andropolia aedon Grt. (2602)

1. Mid July - September (late August); scarce.
2. B.C.

Anomogyna infimatis Grt. (1563)

1. Late August - September; scarce.
2. B.C.; Santa Monica Mts. (Calif.).
3. Amelanchier, Veratrum, Alnus, etc.
Anomogyna mustelina Sm.

1. Mid August - September; very scarce.
2. B. C.
3. Picea, Pseudotsuga, Abies.

Annaphila decia Grt.

1. April; diurnal only; moderate-.
2. B. C.

Annaphila diva Grt.

1. May - June; diurnal only; scarce.
2. B. C.
3. Montia.

Annaphila sp.

1. April; diurnal only; moderate-.

Apamea americana pacifica Sm.

1. August - September; very scarce.
2. NE. U. S.

Aseptis adnixa Grt.

1. June - mid July; moderate.
2. B. C.
3. Osmaronia.

Aseptis binotata curvata Grt.

1. Late July - August; scarce.
2. B. C.
3. Ribes, Osmaronia, Symphoricarpos.

Autographa ampla Wlk. (=Plusia Ochs.)

1. May - July; very scarce.
2. NE. U. S.; B. C.
3. Symphoricarpos, Alnus, Prunus, Salix, Osmaronia, etc.
Autographa brassicae (see Trichoplusia ni)

Autographa californica Speyer

1. July - October (September - October); moderate +.
2. B. C.; Santa Monica Mts. (Calif.).
3. General feeder on various herbs, etc.
4. This species is often diurnal. So are some other species, but all are nocturnal as well.

Autographa celsa Hy. Edw. (=Syngrapha Hbn.)

1. Mid August - September; scarce.
2. B. C.
3. Abies.

Autographa corusca Stkr.

(*)

1. July, October (July); scarce.
2. B. C.
3. Alnus.

Autographa falcifera Kby. (=Plusia Ochs., Anagrapha McD.)

1. June - September; very scarce.
2. NE. U. S.; B. C.
3. Celery, cabbage, lettuce, corn, etc.

Autographa pasiphaeia Grt.

1. July 25; very scarce.

Autographa rectangula Kby. (=Plusia Ochs.)

1. Mid July - August; scarce.
2. NE. U. S.; B. C.
3. Pseudotsuga.

Behrensia conchiformis Grt.

1. Late March - mid April; moderate +.
2. B. C.; Santa Monica Mts. (Calif.).
5. (N. 43): About 50 eggs were deposited singly upon leaves of snowberry. They were obtained by confining a female in a gallon jar with a number of fresh sprigs of snowberry. Only a few eggs were deposited per night. The moth was fed, every 24 hours, on a solution of one part honey and two parts water. (This feeding is necessary, if it is desired to keep a moth alive for several days, or one week or more). The last instar larva is a good match for the lower (woody) stems of the foodplant, upon which it rests, closely appressed to the surface. It comes up to feed on the leaves only after dark. The larva is variously marked with grays and browns, in a pattern of somewhat undulate, longitudinal lines, with whitish on the middorsal, subdorsal, and sub-stigmatal lines of some larvae. There are two small "caudal points" at the posterior end (dorsally, on abdominal segment eight). Pupation is within a cocoon of tough, whitish silk, into which is incorporated chewed-up particles of wood or other dry material. The pupa is slender.

In the Santa Monica Mts. (Calif.), where the larvae of this species feed on Lonicera subspicata, evidence of feeding, in April or May, is very easy to locate, as the larvae seem to prefer the vigorous shoots that Lonicera sends out at that time. Over a period of several nights, one or more larvae will continue to eat leaves (completely) from a prominent shoot, until it is nearly stripped of its widely-spaced leaves. Searching with a flashlight will locate these larvae feeding at night. (See also Pleroma cinerea, which has the same feeding habits in the Santa Monica Mts.).

**Bombycia algens** Grt. (=Cleoceris Bdv.)

1. July 28; very scarce.
2. NE. U. S.

**Bombycia** sp.

1. Late July - August; scarce.
2.

**Bomolocha abalienalis** Wlk.

1. Late July; scarce.
2. NE. U. S.; B. C.
3. **Ulmus**, in the NE. United States.
Bomolocha palparia Wlk. (3690)
1. July 3; scarce.
2. NE. U. S.; B. C.

Caenurgina caerulea Grt. (3428)
1. Late April - June (May); moderate +; diurnal.
2. B. C.
3. (Clover, lupine, or grass?)

Caenurgina erechtea Cram. (3431)
1. April - September (April, September); diurnal and nocturnal; abundant.
2. NE. U. S.; B. C.
3. Clover, lupine, grasses.

Camptylochila americalis Gn. (=Epizeuxis Hbn.) (3734)
1. July; scarce.
2. NE. U. S.; B. C.
3. In the mounds of an ant, Formica rufa, feeding on debris (various dead leaves, Douglas-fir needles and twigs, etc.).

Catocala allusa Hlst. (3350)
1. August - mid September; moderate +.
2. B. C.
3. Salix, Populus.

Catocala ilia zoe Behr (3342 a)
1. September - mid October; very scarce.
2. NE. U. S.
3. Quercus.

Catocala relicta elda Behr (3344 a)
1. September; moderate-.
2. NE. U. S.; B. C.
3. Salix, Populus.
Catocala verrilliana beutenmulleri B. & McD. (3390a)

1. Late July - September (September); moderate +.
2. Santa Monica Mts. (Calif.).
3. Quercus.
4. A mature larva of this species was found resting flatly-appressed to a small branch of Quercus chrysolepis, in the San Gabriel Mts., Los Angeles County, California. The larva has a close resemblance to part of a gray twig. The camouflage is excellent, and the resting-position increases its effectiveness. Catocala larvae usually crawl in a characteristic manner, "semi-looper style" (reminiscent of the usual locomotion of geometrid larvae). Locomotion is usually rapid, and the larva reaches vigorously about in every direction, as it proceeds.

Catocala sp. (*)

1. August - September; very scarce.
2. 
4. One specimen (Corvallis, Oregon), Ernst J. Dornfeld, collector (September 1, 1954).

Cissusa indescrreta Hy. Edw. (=Ulosyneda Sm.) (3542)

1. Mid March - mid April; abundant.
2. Santa Monica Mts. (Calif.).
3. Quercus.

Cosmia calami Harv. (2687)

1. Mid July - mid September (August); moderate.
2. NE. U.S.; Santa Monica Mts. (Calif.).
3. According to Forbes (6), the larva is found on various trees, but feeding largely on other caterpillars, like the Old World species.
4. Cosmia canescens Behr is a form of calami.
5. I have reared the form canescens Behr, upon a number of occasions, in the Santa Monica Mts. of California. In that area, the larvae are to be found feeding upon the tender new leaves of Quercus agrifolia, in March or April. They may be found only at that time, and are easily obtained by beating. Around Corvallis, they would probably be present...
on *Quercus garryana*, during May or June. A notable feature
of the predominantly yellowish-green larva is that it tapers
considerably at the rear end.

**Crymodes devastator** Brace. (*=Septis* Hbn.) (2375)

1. July - September; moderate.
2. NE. U.S.; B. C.
3. Grasses and other plants; larva usually stays in the sod.

**Cucullia dentilinea** Sm. (2031)

1. June 29; very scarce.
2. Santa Monica Mts. (Calif.).

**Dargida procincta** Grt. (1952)

1. May - June; mid August - October; abundant.
2. B. C.; Santa Monica Mts. (Calif.).
3. Grasses and various weeds, including *Trifolium*.
5. (N. 47): The larva is one of the "cutworms", usually to be
found in open fields of weeds and grasses. Two general
color phases are common: One is predominantly deep,
opaque green, with prominent longitudinal stripes of pink
or pinkish-tan. The other color phase is predominantly
dark brown dorsally, but lighter on the sides. The same
stripes are present but are usually tan or flesh-colored,
instead of pink.

**Diarsia cynica perumbrosa** Dyar (1504a)

1. Mid August - mid September; abundant.
2. B. C.

**Diarsia esurialis** Grt. (1509)

1. June; scarce.
2. B. C.
3. *Alnus, Corylus*.

**Diarsia pseudorosaria** Hdwk.

1. May moderate +.
2. B. C.
Dryotype opina Grt.  
1. Mid September - October (late September); moderate.  
3. A legume.

Emboloezia sauzalitae Grt.  
1. September; scarce.  
3. Cirsium, Arctium, Rumex, corn (bores in the host).

Erastria albidula Gn.  
1. June - mid July; semi-diurnal and nocturnal; abundant.  
2. NE. U. S.; B. C.  
4. Adults common in grass of fields and roadsides.

Euclidia ardita Franc. (=Euclidina McD.)  
1. Mid April - mid June; diurnal only; moderate-.  
2.  
3. Grasses, and various herbaceous legumes.  
5. I have observed adults of Euclidia sp. ovipositing upon Lotus scoparius (deerweed), in the Santa Monica Mts. of California. Larvae were successfully reared to maturity on this plant. The larvae were very slender, and most of them were predominantly yellow-tan in ground color. The diurnal adults might, at first glance, pass for skippers of the genus Erynnis (certain dusky-wings), but they do not fly in the same way. Skippers have a more erratic, darting flight.

Eupsilia sp.  
1. October; February; scarce.  
2.  
3.  

Euxoa ? excellens Grt.  
(*1)  
1. September.  
2. B. C.  
3. General feeder on herbs.
Euxoa messoria Harr. (1310)

( * )
1. August.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).

Euxoa ochrogaster Gn. (1378)

(*)
1. July.
2. B. C.

Euxoa septentrionalis Wlk. (1311)

1. August - September; moderate -. 
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).

Euxoa vetusta Wlk. (1386)

1. July 25; very scarce.
2. NE. U. S.; B. C.

Feltia ducens Wlk. (1442)

1. Mid August - mid September (late August); moderate.
2. NE. U. S.; B. C.
3. General feeder on herbs, etc.

Feralia comstocki columbiana Sm. (2186a)

1. April; scarce.
2. NE. U. S.; B. C.
3. Tsuga; Pseudotsuga?
4. This species appears after the two following species have passed their peaks of abundance.

Feralia deceptiva McD. (2184)

1. Late February - mid April (late March); moderate +.
2. B. C.
3. Pseudotsuga.
4. (N. 44): A single larva was reared from an egg. In the last instar, it is clear, translucent green, with smooth and shiny skin. It has three dorsal lines of intense, pure white, and a white stigmatal line which is edged above by dark red. A broken substigmatal line (or series of dashes) is yellow (just above prolegs). The prolegs are reddish-tipped. The
truelegs are red-purple. The larva is sluggish in its behavior, remaining in the same position for hours on end. It feeds upon new needles of *Pseudotsuga menziesii* (late April - May).

**Feralia februalis** Grt.  
1. Late February - mid April (March); moderate.  
2. Santa Monica Mts. (Calif.).  
3. *Sambucus, Cercocarpus, Quercus.*

**Fishia evelina hanhami** Sm.  
1. September 26; very scarce.  
2. B. C.  
3. *Kunzia, Chrysothamnus, Balsamorhiza.*

**Graphiphora c-nigrum** (see *Amathes c-nigrum*)

**Heliothis phloxiphagus** G. & R.  
1. May - September; scarce.  
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.)  
3. General feeder on various plants and their blossoms.  
4. Sometimes seen flying by day, but also nocturnal.

**Heliothis zeae** Boddie (=*obsoleta* Fabr.)  
1. August - November.  
2. NE. U. S.; Santa Monica Mts. (Calif.).  
3. Corn, tobacco, tomato, and many other plants.

**Heliothodes diminutiva** Grt.  
1. Mid May - June; diurnal only.

**Hemerooplanis** sp.  
1. Mid June - early August (late July); moderate.
Hemigraphiphora plebeia Sm. (1580)

1. Late August; very scarce.
2. B. C.
3. Taraxacum.

Homoglaea sp.

1. October - early November; January-March; scarce.
2.
3.
4. There may be two species involved here. The moths hibernate.

Homorthodes communis Dyar (1891)

1. August 31; scarce.
2. B. C.; Santa Monica Mts. (Calif.).
3. Alnus, and other plants.

Homorthodes hanhami B. & McD (1885)

1. Late June - July; scarce.
2. B. C.; Santa Monica Mts. (Calif.).

Hypena californica Behr (3707)

1. Late January - early April (February); July (very few); September-October; abundant.
2. B. C.
3. Urtica.

Hypena humuli Harr. (3706)

1. April - May; September.
2. NE. U. S.; B. C.
3. Urtica, Humulus.

Hyppa ancocisconensis Morr.

1. July; scarce.
2. B. C.
3. General feeder on many plants (woody and herbaceous).
Ipimorpha nanaimo Barnes (2454)

1. Late August - mid September; moderate.
2. B.C.
3. Populus.

Lacinipolia comis Grt. (1746)

1. Mid May-June; moderate.
2. B.C.
3. Trifolium.

Lacinipolia cuneata Grt. (1715)

1. Late May - July; abundant.
2. B.C.; Santa Monica Mts. (Calif.).
3. Alnus, Salix, Ribes, Osmanthus.

Lacinipolia davena Sm.

1. July 24; scarce.
2. B.C.
3. Plantago ?

Lacinipolia illaudabilis Grt. (1751)

1. July 24; scarce.
2. B.C.; Santa Monica Mts. (Calif.).

Lacinipolia olivacea petita Sm. (1745 e)

1. Mid July - August; abundant.
2. NE. U.S.; B.C.
3. Plantago.

Lacinipolia patalis Grt. (1758)

1. June - mid July; moderate.
2. B.C.; Santa Monica Mts. (Calif.).
3. Rubus, Rosa.
Lacinipolia pensilis Grt. (1736)

1. August - September; scarce.
2. B.C.; Santa Monica Mts. (Calif.).
3. A general feeder on various herbs & shrubs; also feeds on dead leaves or floral parts, as do some other members of the genus.

Lacinipolia quadrilineata Grt. (1757)

1. Mid August - mid October (early September); abundant.
2. Santa Monica Mts. (Calif.).
3. Adenostoma, in S. California.

Lacinipolia stricta Wlk. (1739)

1. Mid August - mid September; abundant.
2. B.C.; Santa Monica Mts. (Calif.).
3. Fragaria, Lactuca, Eriogonum, etc.

Laphygma exigua Hbn. (=Spodoptera) (2683)

1. July - October; moderate-.
2. Santa Monica Mts. (Calif.).
3. General feeder on various herbs.


1. Late May - late October; abundant +.
2. B.C.
5. (N. 46): Larvae can be located at night, by flashlight. They will be up feeding on grass leaves. They readily curl up and drop when disturbed. They hide by day, under the grass. Wet or damp areas, where grasses are rank and varied, seem to be favorable habitats. The ground color of a mature larva is pale brown. It is marked with a number of whitish longitudinal lines, and also with some lines of darker brown (subdorsal).

Leucania insueta Gn. (1992)

1. Late April - May; moderate-.
2. NE. U.S.; B.C.
Leucania luteopallens (see Aletia oxygala)

Leucania unipuncta (see Pseudaletia unipuncta)

Leucania sp.

1. Mid May - October; abundant.
2. 

Lithophane amanda Sm. (=Graptolitha Hbn.) (2224)

1. September 26; October 19; April 28; very scarce.
2. NE. U. S.; B. C.
3. Tsuga.

Lithophane baileyi vivida Dyar (2234)

1. September 28; October 29; very scarce.
2. NE. U. S.; B. C.
3. Prunus, apple.

Lithophane contenta Grt. (2233)

1. October - early November; February (mid October); moderate +.
2. B. C.; Santa Monica Mts. (Calif.).
3. Quercus.

Lithophane georgii Grt. (2244)

1. February; very scarce.
2. NE. U. S.; B. C.
3. Salix, Pyrus, Holodiscus, Alnus, Rubus, etc.

Lithophane innominata Sm. (2221)

1. Mid September - October; March - April; moderate +.
2. NE. U. S.; B. C.
Lithophane pertorrida McD.

1. Late September; February - March; moderate-.
2. B. C.
3. Prunus, Salix.

Lithophane petulca Grt. (2222)

1. Mid-late September; March - April; moderate.
2. NE. U. S.; B. C.
3. Pinus, Abies; Pseudotsuga ?
4. The members of this genus emerge in the early fall, hibernate, and fly again in late winter-early spring; best specimens are usually obtained in the fall.

Lithophane sp.

1. February 16; March 20; very scarce.
2. B. C.

Litholomia napaea Morr. (2215)

(*)
1. April.
2. NE. U. S.; B. C.
3. Salix, Amelanchier, Alnus, Populus, etc.

Lithomoia solidaginis Hbn. (2216)

(*)
1. September.
2. NE. U. S.; B. C.
3. Spiraea, Vaccinium, Arctostaphylos, Salix, etc.

Luperina venosa Sm. (2389)

1. Mid May - early July (June); moderate +.
3. Grasses ?

Lycanades pulchella Sm. (2311)

1. Mid September - October; scarce.
2. B. C.
3. Rubus, Rosa, Alnus, Ribes, Salix, Osmaronia, etc.
5. (N. 59): At the time of this writing, March 22, 1963, about 80 third instar larvae are feeding readily upon **Rubus** (new leaves). They hatched from overwintering eggs on March 4, 1963. The ground color (third instar) is soft green. There is a narrow white middorsal line; also narrow white subdorsal lines. Between these are scattered some very small white dots. A substigmatal line of greenish-white is fairly prominent. Some larvae are tinged either pinkish-brown on the dorsum, or darker green, but the majority are light green. Head is shining, dilute green, or pale greenish-tan. Fifth instar larvae, March 30, 1963, are predominantly brown or pinkish-brown in ground color, with prominent blackish triangular marks (paired) on the dorsum. If handled, the larvae may curl up for a short time. They are nocturnal feeders. After completing growth, they formed silk-lined earth cells, near the soil surface; after three weeks in these cells, none of them has yet pupated. It is possible that they will remain as larvae through most of the diapause period.

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**Lycanades purpurea** Grt. (2310)

1. Mid September - October; abundant.
2. B. C.; Santa Monica Mts. (Calif.).
3. **Ribes, Rosa, Alnus, Prunus**, various herbs, etc.

**Metalepsis cornuta** Grt. (1492)

1. Mid February - mid April; abundant.
2. B. C.

**Miselia variolata** Sm. (1810)

1. August 10; very scarce.
2. B. C.
3. Seed capsules of **Silene**.

**Mycterophora longipalpata** Hlst. (3711)

1. Late July; scarce.
2. B. C.
3. On lichens, according to Dyar.
Nedra stewarti Grt. (2590)

1. Mid April - August (May - June)
2. *Hypericum.*

Neperigea albimacula B. & McD. (2641)

1. July 26; very scarce.
2. B. C.; Santa Monica Mts. (Calif.).

Neperigea niveirena Harv. (2640)

1. July 24; very scarce.
2. B. C.

Ochropleura plecta L. (1480)

1. June - July; scarce.
2. NE. U. S.; B. C.

Oligia divesta Grt. (=Chytonix Grt.) (2557)

1. Mid August - mid September; moderate +.
2. B. C.; Santa Monica Mts. (Calif.).

Oligia illocata Wlk. (2423)

1. September; very scarce.
2. NE. U. S.; B. C.

Oligia indirecta Grt. (2413)

1. Late June - July (late July); moderate.
2. B. C.
3. Bores in grasses and sedges.

Oligia tonsa Grt. (2417)

1. Late May - early September; abundant.
2. B. C.
Oligia violacea columbia McD.  
1. July; scarce.
2. B. C.

Onocnemis dunbari Harv.  
1. September 10 and 16; very scarce.
2. B. C.

Onocnemis ? ragani Barnes  
1. July 4 and 22; very scarce.
2. Santa Monica Mts. (Calif.).
3. Lonicera; Symphoricarpos ?
5. This species (which is scarce in most localities) was abundant for many years, in the Santa Monica Mts., five miles north of Beverly Hills, California. In 1956, larvae were reared on Lonicera subspicata, in that locality. The moth was at least triple-brooded.

Orthodes rufula Grt.  
(*)
1. Late April - June.
2. B. C.
3. General feeder on various herbs and woody plants.

Orthosia ferrigera Sm.  
1. Mid March - April (early April); moderate +.
2. B. C., Santa Monica Mts. (Calif.).
3. Quercus.

Orthosia hibisci quinquefasciata Sm.  
1. Late February - April (late March); abundant.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. General feeder on broadleaf trees and shrubs.

Orthosia pacifica Harv.  
1. Mid March - mid April; moderate.
2. B. C.; Santa Monica Mts. (Calif.)
3. Quercus.
5. Again, based on records in the Santa Monica Mts., the larvae have been collected on Quercus agrifolia, in March and April, feeding on young leaves at night.

Orthosia praeses Grt. (1927)

1. January - mid April (February - March); moderate.
2. B. C.; Santa Monica Mts. (Calif.).
3. Ribes, Holodiscus, Spiraea, etc.
5. Larvae have been collected, feeding after dark, on the leaves of fuchsia-flowered gooseberry (Ribes speciosum Pursh.), in the Santa Monica Mts. of California (April - May).

Orthosia transparens Grt. (1926)

1. Late March - early May (April); moderate.
2. B. C.; Santa Monica Mts. (Calif.).

Palthis angulalis Hbn. (3807)

1. June 21; very scarce.
2. NE. U. S.; B. C.
3. Pinus, Pseudotsuga, Acer, Holodiscus, etc.; also, dead plant material.
5. Larvae are said to feed upon a great variety of plants, and upon dead plant material as well. I have collected numerous larvae feeding on the dried, gray-brown seed capsules of Lobelia syphilitica (September-October) at the University of Kansas Natural History Reservation, Douglas County, Kansas. The larvae are dull gray-brown in general color, with rough skin, and they blend superbly with the ragged edges of partially consumed, dry seed capsules. Locomotion is slow, and the larvae are very sluggish.

Panthea portlandia Grt. (1126)

1. Late May - September (late June - July; mostly males) (August - September; females more frequent); abundant.
2. B. C.

4. This species has a noticeably long flight period, with fresh specimens continuously appearing from late May - September.

5. (N. 52): A female confined in a small box, with a sprig of Pseudotsuga, laid about 150 rich yellow, glossy eggs in one night. These were in several elongate masses, well-glued to fir needles. The last instar larva is sparsely hairy, with short, paired hair pencils (of either black or gray-white) arising from the dorsum of abdominal segments one and eight. On thoracic segment one, are either two or three rather short, forward-directed hair pencils. Other hairs are sparse, arising in clusters, from tubercles, to approximately the same height as the hair pencils. Skin color and pattern is highly variable: (1) It may be all charcoal black, with almost no maculation; in this case, the hairs are mostly straw-yellow. (2) It may be marked in a contrasting pattern of blackish and white, being white middorsally, with an irregular black or gray-black pattern subdorsally and laterally, again becoming white in the substigmatal region and on the underside (3) It may be a speckled- reticulate pattern of black, white, grays, and browns (brown on and around most of the tubercles), with a broken and very undulate substigmatal line of pale grey-tan or dull white. The larvae have a definite preference for needles of the previous year's growth; newer needles are avoided.

Peridroma saucia Hbn. (=margaritosa Haw.; porphyrea D. and S.) (1496)

1. July - October (September - October); moderate.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. General feeder on numerous herbs and woody plants.

Perigonica tertia Dyar (1945)

1. Mid March - mid April; abundant.
2.
3.
Platyperigea sp.

1. Mid August - mid September; moderate.
2. 

Pleroma cinerea Sm.

1. Mid September - October (late September); abundant.
2. B.C.; Santa Monica Mts. (Calif.)
3. Lonicera; Symphoricarpos ?
5. Larvae feed on Lonicera subspicata, in the Santa Monica Mts. of California. All references to behavior and feeding habits of Behrensia conchiformis apply here. In the locality discussed, the chances of encountering larvae of P. cinerea are actually far greater than the chances of finding B. conchiformis, as the former is far more abundant. Although the moths of P. cinerea are fall fliers, the larvae are present (last instar) in April or May. The P. cinerea larva is reminiscent of B. conchiformis (superficially), but is not as slender, lacks any "caudal points" on abdominal segment eight, and differs in the details of its maculation.

Pleroma conserta Grt.

1. March - mid April (late March); abundant.
2. B.C.; Santa Monica Mts. (Calif.)
3. Symphoricarpos; Lonicera ?
4. This species sometimes produces a very black form.
5. (N. 39): A female moth, confined in a quart jar for several nights, with sprigs of Symphoricarpos albus, laid over 100 eggs. Early instar larvae are predominantly various shades of brown, with a broad, intense white middorsal line. By fourth instar, the line is dulled by light brown, and by last instar, there is very little pure white visible in the middorsal line, although the line is still evident. The rest of the maculation consists of undulate lines of varying width and different shades of brown. The deepest brown always edges the white middorsal line, particularly in early instars, when this line is so conspicuous. As mentioned under P. cinerea, the larvae are superficially similar to Behrensia, in their general appearance, colors, and maculation. There are no "caudal points" in
P. conserta, and the larva is heavier, with a rounded, slight caudal hump on abdominal segment eight. This hump has a fairly prominent, irregular white line crossing over its apex, from one side to the other. All that is said regarding the habits of Behrensia applies equally well to P. conserta. The larvae are on the plants in April and May.

**Pleroma obliquata Sm.**

1. Mid March - mid April (late March); moderate.
2. B. C.
3. Symphoricarpos.

**Polia adjuncta Bdv.**

1. July 4 and 28; very scarce.
2. NE. U. S.; B. C.
3. Prunus, Alnus, Phlox, etc.

**Polia liquida Grt.**

1. Late April - mid July (May - June); moderate.
2. B. C.
5. (N. 40): A last instar larva that is probably this species was found on top of Marys Peak, Benton County, Oregon, in early October, 1961. It was crossing a road, in a grassy area, probably in search of a place to pupate. The dorsum is chocolate-brown, with a prominent, pale yellow middorsal line, and subdorsal lines of the same color. In the supra­spiracular area it is gray-brown. Substigmatal stripes are pale yellow. It is whitish on the underside and prolegs, often with a pinkish-brown tinge above the prolegs. The head is pale cream-tan, marked with black; shiny.

**Polia lutra glaucopis Hamp.**

1. Mid May - mid July (late June); moderate.
2. NE. U. S.; B. C.
3. Alnus, Pinus, Acer, Salix, Plantago, etc.

**Polia subjuncta G. and R.**

1. Mid June - early August (late June); scarce.
2. NE. U. S.; B. C.
3. Alnus, Acer, Salix, Fragaria, Viola, etc.
Polychrisia sp.

1. June - mid July (mid-late June); moderate.
2. Delphinium trolliifolium. The larvae were abundant in April 1963.

Prodenia praefica Grt. (2679)

1. July - September (mid-late August); moderate.
2. Santa Monica Mts. (Calif.).
3. General feeder on various herbs and woody plants.

Protorthodes rufula (see Orthodes)

Proxenus sp.

1. Mid June - mid July (mid June); moderate.
2. 

Pseudaletia unipuncta Haw. (=Leucania Ochs.) (1994)

(*) 1. April - November.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Primarily on grasses.

Pseudobryomima fallax Hamp. (2174)

1. July 26; very scarce.
2. Santa Monica Mts. (Calif.).

Pseudoglaea olivata Harv. (1574)

1. Mid August - mid September; moderate.
2. B. C.; Santa Monica Mts. (Calif.).
3. General feeder on woody plants: Quercus, Populus, Symphoricarpos, Berberis, etc.

Pseudorthodes irrorata Sm. (1873)

1. July; moderate.
2. B. C.
3. Acer, Salix, Alnus, Ribes, Plantago, etc.
Pseudorthosia variabilis Grt.  
1. Late July – mid September (August); abundant.  
2. B.C.; Santa Monica Mts. (Calif.).  
3. Fragaria, Aster, various woody plants, etc.

Pseudospaelotis haruspica sierrae Harv. (=Noctua L.)  
1. Mid July – mid August; very scarce.  
2. NE. U.S.; B.C.  
3. Pyrus, Osmaronia, Salix, Holodiscus, Rubus, Urtica, Fragaria, etc.

Pyrrhia umbra Hufn.  
(*)  
1. May.  
2. NE. U.S.; B.C.  
3. Antirrhinum, Rosa (buds), Alnus, in seed capsules of Aconitum, cabbage, mustard, etc.

Rancora strigata Sm.  
1. March– mid April; moderate-.  
2. B.C.

Raphia frater Grt.  
1. June – early August (late June); abundant.  
2. NE. U.S.; B.C.  
3. Populus.  
5. (N. 51): A female moth was confined in a jar, with a strip of rough cheesecloth. During a ten day period, she laid about 50 eggs. It was necessary to feed the moth daily (solution of one part honey and two parts water) in order to keep it alive. The mature larva is pale, translucent green. It is sprinkled dorsally and laterally with cream-white dots. Peculiar dorsal, curving crossbands are present on abdominal segments one, five, and eight. On thoracic segment two are two paired, middorsal points. Behavior is peculiar and distinctive: When resting flatly-appressed to a leaf surface (the usual resting position), the larva will suddenly vibrate the fore-part of its body rapidly and vigorously, while reaching around in all directions, yet remaining firmly attached to its original resting place; it
retains hold with its last three pairs of prolegs, which are well-developed. Or, it may simply reach all around, many times without any vibrating. These actions are usually carried out if the larva is blown upon or touched. The cocoon is very distinctive: A depression is hollowed out in old wood or bark, and the particles chewed out in this process are cemented overhead, to form a very hard, waterproof cocoon, which blends perfectly with the wood surface upon which it is located. (A similar type of "wood-chip cocoon" is made by notodontids of the genus Cerura).

**Rhynchagrotis exsertistigma** Morr. (1605)

1. Late June - August; moderate +.
2. B. C.
3. Trifolium, and probably many other herbs.

**Rhynchagrotis insularis** Grt. (1606)

1. Mid June - early September (June - July); moderate +.
2. B. C.; Santa Monica Mts. (Calif.).

**Rusina acta** Sm. (=Sunira Franc.)

1. Mid September - October (early October); abundant.
2. B. C.
3. Acer leaf buds (early spring) - record of Chris Henne.

**Sarrothripus sp.** (=Nycteola Hbn.)

1. September 17; very scarce.
2. 
3. Probably on Populus or Salix.
4. Sometimes placed in the family NYCTEOLIDAE.
5. (N. 48): Numerous last instar larvae of Sarrothripus sp. were collected at Sandpoint, Bonner County, Idaho, on July 8, 1962. They were in small web-nests, which usually involved one or more leaves of the food plants (Populus). Larger larvae were usually on older leaves. The nest is usually confined to the upper surface of one leaf. One or both edges are pulled slightly inward, with a maze of rather fine, colorless, web-like silk. Under this tangled "roof", the larva rests. Occasionally, more than one larva
occupies a single nest. They can move about rapidly under the web-tangle, if pushed. They are not inclined to wiggle or squirm when handled. The cocoon is of tough white silk, pointed at one end and abruptly truncate at the other; the sides are somewhat compressed. The cocoon is surrounded by a more-or-less circular tangle of colorless, web-like silk. The pupa is pale, milky-green, marked above by a well-defined, broad dorsal band of brown, which runs the length of the pupa. As it ages, the green tinge leaves and it becomes opaque cream-white (brown band still prominent). The pupa is capable of abdominal movement, which is always a rapid, vibrating wiggle.

**Scoliopteryx libatrix L.**

1. Late July - early November; moderate.-
2. NE. U.S.; B.C.
3. *Salix, Populus.*
4. This moth may be more common than previously thought; it doesn't come readily to lights.
5. (N. 49): A female confined in a jar, with a strip of rough paper, readily laid over 100 eggs. The egg is translucent whitish. The last instar larva is surprisingly long and slender. The color is rich velvet-green above; slightly paler on the sides. There is a weak grayish middorsal line, and a stronger (blackish) subdorsal line, which is edged inwardly by cream. The head and truelegs are pale translucent green. The larva crawls with a slight humping of abdominal segments one - three. Locomotion is fairly rapid and direct. The resting position is usually parallel to a stem. Pupation takes place within a cocoon of tough, whitish, web-like silk, between leaves which are drawn together.

**Septis alia Gn.**

1. Late May - June; scarce.
2. NE. U.S.; B.C.

**Septis antennata Sm.**

1. Late May - July; moderate +.
2. B.C.
Septis arctica Bdv. (2351)

1. April - August (May - June); moderate.
2. NE. U. S.; B. C.

Septis castanea Grt. (2352)

1. June - July; abundant.
2. B. C.

Septis cogitata Sm. (=Agroperina Hamp.)

1. July 25; very scarce.
2. NE. U. S.; B. C.

Septis cuculliformis Grt. (2327)

1. Mid May - June; moderate-.
2. Santa Monica Mts. (Calif.).
3. Elymus, and other coarse grasses.

Septis finitima Gn. (2365)

1. Mid May - early July; very scarce.
2. NE. U. S.; B. C.
3. Corn, wild rice, and other grasses.

Septis multicolor Dyar (2345)

1. June 21; very scarce.
2. B. C.

Septis sp.

1. Mid April - May (May); moderate +.
2. 

Sideridis rosea Harv. (1800)

1. May 25; very scarce.
2. NE. U. S.; B. C.
Spargaloma sexpunctata Grt.

1. July 25; very scarce
2. NE. U. S.; B. C.

Stretchia muricina Grt.

1. March - mid April (late March); moderate-
2. B. C.
5. I have reared larvae upon fuchsia - flowered gooseberry (Ribes speciosum), in the Santa Monica Mts. of California. Larvae should be looked for in April or May. They are quick to curl up and drop from the foodplant if disturbed.

Sunira Franc. (see Rusina)

Synedoida edwardsi Behr

1. August; diurnal and nocturnal; scarce.
2. Santa Monica Mts. (Calif.).
3. Probably feeds on Rhus (R. trilobata in the Santa Monica Mts.).
4. Members of this genus sometimes visit flowers (especially in the morning hours); later in the day, they are often inclined to sit on the warm, dry ground of dirt roads or trails, flying up when approached, only to land again a short distance ahead. The colorful secondaries flash orange as the insect flies away.

The genus is well-represented in the desert and chaparral areas of California.

Toxocampa victoria Grt.

1. July 26; very scarce.
2. NE. U. S.; B. C.

Trichoplusia ni Hbn. (= Autographa brassicae Riley)

1. July - September; moderate.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. General feeder on various herbs: Cruciferae, Urtica, Solanum, etc.

Ufeus satyricus sagittarius Grt.

1. October - mid December (mid - late October); February - March; moderate +.
2. NE. U. S.; B. C.
3. Populus; Salix ?
4. The adult hibernates.

Ulosyneda indescrcta (see Cissusa)
**Xylena curvimacula** Morr. (2260)

1. October 18; scarce.
2. NE. U.S.; B.C.
3. Picea, Rubus, Alnus, Prunus, Taraxacum, etc.

**Xylena nupera** Ñnt. (2259)

1. September - October; March - April; moderate.
2. NE. U.S.; B.C.
3. Salix, Alnus, Ribes, Rosa, Acer, etc.

**Xylomyges cognata** Sm. (1910)

1. October - December (occasional freak emergences of a few individuals); mid March - mid April; abundant.
2. B.C.
3. Quercus.

**Xylomyges crucialis** Harv. (1909)

1. Mid March - mid April (early April); moderate.
2. B.C.; Santa Monica Mts. (Calif.).
3. Alnus, Quercus.
4. Because of the similarity in spelling, this species is sometimes confused with the one that follows.

**Xylomyges curialis** Grt. (1912)

1. Late March - mid April; moderate.
2. B.C.; Santa Monica Mts. (Calif.)

**Xylomyges februalis** B. & McD. (1911)

1. Late October - November (freak emergences); mid February - mid April (March); abundant +.
2. Quercus.
3. (N. 45): Eggs were readily laid by a confined female, upon a strip of cheesecloth. The last instar larva is predominantly smoky-whitish, with scattered small black flecks and speckles. There is a subdorsal row of short, widely-separated, dark-yellowish dashes (on abdominal segments one to eight). The stigmatal line is cream-white, but not
noticeable as it blends with the whitish ground-color of the larva. The rather large head is pale brown and shiny, with a reticulate pattern of black (variable). Locomotion is rapid and "lumbering". The larvae come out to feed only after dark, hiding between leaves by day. Particularly when young, the larvae construct nests by drawing together some leaves, with whitish, web-like silk.

**Xylomyges hiemalis** Grt. (1906)

1. Late January - early March (February); abundant.
2. B. C.; Santa Monica Mts. (Calif.).
3. Salix, Alnus, Quercus, Prunus, Ribes, etc.

**Xylomyges perlubens** Grt. (1916)

1. Mid March - April; moderate.
2. B. C.; Santa Monica Mts. (Calif.).

**Xylomyges rubrica** Harv. (1915)

1. Mid March - April; abundant.
2. B. C.; Santa Monica Mts. (Calif.).
3. Alnus, Salix, apple, Prunus, Fragaria, etc.

**Xylomyges simplex** Wlk. (1907)

1. March - April; abundant +.
2. B. C.
4. NOTE: *X. simplex* is often confused, in collections, with *X. crucialis*.

**Zale lunata salicis** Behr (3474a)

1. March - May; July - August; (April); moderate.
2. NE. U. S.; Santa Monica Mts. (Calif.).
3. Rubus, Rosa, Salix, Quercus, Pyracantha, Wisteria, etc.

**Zale sp.**

1. May - June; moderate-.
Zosteropoda hirtipes Grt. (1955)

1. Mid June - early August; moderate +.
2. B. C.; Santa Monica Mts. ( Calif. ).
3. Primarily grasses and herbs ( Aster, clover, etc. ); also some woody plants ( Salix, Alnus, etc. ).

Zotheca tranquilla Grt. (2686)

1. June - July (July); moderate.
2. B. C.; Santa Monica Mts. ( Calif. ).
4. The adult appears as a pale greenish-white phase around Corvallis, but also has a brown phase, which is often encountered in other parts of the moth's range.
5. ( N. 36): The very colorful yellow and black-marked larvae make tightly-closed leaf-nests on Sambucus (late March to June, depending on the locality). The nest often consists of one leaflet folded down the middle, and tightly closed with whitish silk; an exit is usually left open at the base of the leaflet. Large larvae draw two or more leaflets together, to make larger nests. The larva rests in a tightly-curlcd position, within the nest. If handled, it will usually "spit", and curl up tightly. Locomotion is rather rapid and "lumbering". If the larvae are present at all, they are usually abundant on any single Sambucus plant.

Possible species:

Abrostola urentis Gn. (3307)

1. Look for: in summer.
2. NE. U. S.; B. C.
3. Urtica.

Anaplectoides prasina Schiff. (1570)

1. Look for: July - September
2. NE. U. S.; B. C.
Anathix aggressa Sm. (2319)

1. Look for: September - October
2. NE. U. S.

Acronycta perdita Grt. (1211)

1. Look for: May - August.
2. B. C.; Santa Monica Mts. (Calif.).
3. Alnus, Salix, Amelanchier, Photinia, Rhus.

Autographa biloba Steph. (3279)

1. Look for: April - August.
2. NE. U. S.; Santa Monica Mts. (Calif.).
3. Lettuce, cabbage, alfalfa, Collinsia, etc.

Bleptina sp.

1. Look for: June - July.
2.
3. Dead leaves of deciduous trees.

Caenurgina crassiuscula Haw. (3430)

1. Look for: May - September.
2. NE. U. S.; B. C.

Chorizagrotis auxiliaris Grt. (1387)

1. Look for: July - September.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).


1. Look for: late spring - early fall.
2. B. C.; Santa Monica Mts. (Calif.).

Erebus odora L. (The Black Witch). (3525)

1. Look for: June - September.
2. NE. U. S.; B. C. (occasional visitor); Santa Monica Mts. (Calif.).
3. **Acacia**; possibly other leguminous, woody plants.
4. This huge noctuid occasionally turns up almost anywhere in the United States. It is well established in and around Los Angeles, Calif., where **Acacia** is abundantly planted.

**Euclidia cuspidea** Hbn. (3426)

1. Look for: April - June; diurnal only.
2. NE. U. S.; B. C.

**Eupsilia** sp.

1. Look for: fall; late winter - early spring.

**Galgula partita** Gn. (2666)

1. Look for: late spring - summer.
2. NE. U. S.; B. C.
3. **Oxalis**.

**Hypena decorata** Sm. (3708)

1. Look for: spring - early summer.
2. B. C.
3. **Urtica**.

**Lithophane thaxteri** Grt. (2258)

1. Look for: September - October; February - April.
2. B. C.
3. **Pseudotsuga**.

**Lithophane torrida** Sm. (2243)

1. Look for: September - October; February - April.
2. B. C.

**Marathyssa inficita** Wlk. (3223)

1. Look for: May - September.
2. NE. U. S.; B. C.
3. **Rhus** spp. (including poison oak).
5. Larvae (of the subspecies minus Dyar) were reared from eggs, on *Rhus trilobata*, at White Cliff Ranch, 2 1/2 miles SSW. of Valyermo, Los Angeles County, California, in July, 1961. The egg is shiny, translucent, pale greenish-white. The last instar larva is soft green, with a frosted (bluish) tinge in all areas above the stigmatal line. The stigmatal line is pale yellow-white. The head is pale greenish-tan. The cervical shield is sometimes brown-tinged. There is somewhat of a swelling in the thoracic region, as well as a slight swelling again on abdominal segment eight, which is rounded dorsally. Growth is rapid (two weeks from egg through last instar). Locomotion is slow, and feeding is mostly after dark. Larvae are not inclined to curl up if handled. The pupa is distinctive with its blunt, rounded posterior end. It is formed in a fairly tough, but soft-walled, silken cocoon of soil particles and other debris, on the surface of the ground, or just below. At first glance, the dark brown pupa looks like a *Neotoma* (woodrat) dropping, in size and outline. It is worth noting that, in the above-mentioned locality, woodrats are frequently common where *Rhus trilobata* grows. Their droppings often litter the ground under these (and other) bushes. The moth is very abundant in that locality, as is its foodplant.

**Melipotis** sp.

1. Look for: May - September.
2. 
4. Remarks under *Synedoida edwardsi* also apply to some *Melipotis* spp.

**Oncocnemis figurata** Harv.  

(2122)

1. Look for: May - September.
2. B.C.
3. Possibly *Symphoricarpos* or *Lonicera*.

**Papaipema insulidens** Bird  

(2497)

1. Look for: September - October.
2. B.C.
3. *Senecio hydrophyllus*. 
Platypolia contadina Sm. (2269)

1. Look for: September - October.
2. B. C.
3. Antirrhinum.

Protoperigea posticata Harv. (2673)

1. Look for: August - October.
2. B. C.; Santa Monica Mts. (Calif.).
3. Probably Quercus.

Scotogramma sp.

1. Look for: September (July - August).
2.
3. Clover, Chenopodium, and other weeds.
4. There may be more than one species in this locality.

Spaelotis havilae Grt. (1473)

1. Look for: May - September.
2. B. C.; Santa Monica Mts. (Calif.).
4. Probably scarce in this locality, if compared with its great abundance in certain more arid regions, but still to be expected.

Synedoida divergens Behr (3573)

1. Look for: May - September (June - July).
2. B. C.; Santa Monica Mts. (Calif.).
4. Remarks under S. edwardsi also apply to S. ochracea and S. divergens.

Synedoida howlandi Grt. (3583)

1. Look for: April - September.
2. B. C.
4. Pale red or deep pinkish ground color on secondaries, as opposed to orange in the three other species listed.
Synedoida ochracea Behr (3572)

1. Look for: May - September (June - July).
2. B. C.; Santa Monica Mts. (Calif.).
4. Considerable lack of pattern on primaries, when compared with divergens.

Superfamily NOCTUOIDEA
IX. Family NOTODONTIDAE (The Prominents)

Cerura cinerea cinereoides Dyar (3935a)

1. May - June; scarce.
2. B. C.
3. Salix or Populus (or both).

Cerura scolopendrina Bdv. (3938)

1. April - June; August; moderate.
2. NE. U. S.; B. C.
3. Salix, Populus.

Dicentria pallida Stkr. (3915)

1. June - early September (mid June - July); abundant.
2. B. C.
3. Alnus, Acer, Rosa, Populus, Salix, etc.
5. (Nd. 8): Last instar larvae were collected on Alnus rubra, in September, 1961. The peculiar larva is reminiscent of some Schizura larvae, but differs in details of coloration and maculation.

The ground-color is pale, translucent, watery cream-gray, with hardly a hint of green anywhere. There are various purplish-gray reticulations and speckles dorsally on all the segments. Most of the intricate lateral reticulations are also purplish-gray. The larva is inclined to rest along the edge of a leaf, often where it has recently been feeding; this resting position is typical of many notodontid larvae, such as Nerice, Schizura, Pheosia, and Cerura, etc. After completing growth in early October, the larva goes to the
ground, where it spins a thin, papery, oval cocoon (similar to thin, "crackly", tracing-paper) between leaves. It remains a larva all winter, inside the cocoon. In May, it molts to become a deep brown pupa.

Gluphisia septentrionalis Wlk. (3939)
1. May - July; September; moderate-.
2. NE. U. S.; B. C.
3. Populus.

Gluphisia severa Dyar
1. Mid March - early June (late March - early April); moderate.
2. B. C.
3. Populus.

Ichthyura albosigma Fitch (3827)
2. NE. U. S.; B. C.
3. Salix or Populus.

Ichthyura apicalis Wlk. (3822)
1. April - May; August; abundant.
2. NE. U. S.; B. C.
3. Salix, Populus.

Nadata gibbosa A. & S. (3857)
1. Mid April - August; abundant.
2. NE. U. S.; B. C.
3. Quercus, Salix, Acer, Populus, Corylus, etc.
5. (Nd. 9): Many larvae were reared from eggs, on Quercus garryana. The last instar larva has a whitish-bluegreen dorsum, which is somewhat shiny. The rather faint sub-dorsal lines are cream or yellowish. The lateral region is more greenish, but minutely white-speckled. The rim of the anal flap is yellow. The larvae cling with great tenacity and locomotion is rather slow. There is no particular reaction when they are handled.
**Pheosia portlandia** Hy. Edw. (3852)

1. Late March - mid April; mid July - early September (late August); moderate.
2. B. C.
3. *Salix, Populus.*
5. (Nd. 10): A female moth, confined in a gallon jar, laid about 200 eggs in one night, all over the sides and bottom of the jar. In the fifth instar, the larvae superficially resemble sphingids (as they also do in early instars), because of the caudal "horn". But other features, of both morphology and behavior, are not at all sphingiform. There are two main color phases:  
   1. rich, "oily" yellow-green dorsally; bright green laterally, with a rich yellow substigmal line; darker green or prolegs and underside.  
   2. "oily" gray-brown or tan-green; little or no green tinge present in this phase.  
Both phases have a purple-gray band over thoracic segment two, as well as a variable amount of purple-gray around or below the spiracles, and on the sides of the prolegs. The spiracles are black, narrowly-ringed with white, which causes them to stand out conspicuously. Both phases are very smooth and shiny, especially on the dorsum, which shines as if polished. The caudal horn is fleshy --- not sclerotized, as in the sphingids. There is a nearly round, rough-surfaced, and highly-sclerotized anal plate, over the anus. There is nothing sphingiform about the resting position, in which the larva will often cling exactly to the contour of the leaf-edge upon which it is feeding; it will cling with all legs, including true legs. Locomotion is slow, and the larvae are very inactive. If annoyed, a "head-thrashing" reaction is displayed. Prior to pupation, the larvae become short and rigid. The shiny, blackish pupa is in a silk-lined, underground cell.

**Schizura concinna** A. & S. (3921)

1. August; scarce.
2. NE. U. S.; B. C.
3. *Rosa, apple, etc.*
5. (Nd. 6): The familiar "red-humped apple caterpillar" was encountered here, in September 1961, feeding on wild rose leaves, in a weedy pasture. The larvae usually rest with the last pair of prolegs elevated. Locomotion is clumsy, and they are easily dislodged.
Schizura ipomoeae Dbldy. (3920)

1. June - early August; abundant.
2. NE. U. S.; B. C.
3. Alnus, Rosa, Acer, Holodiscus, etc.
5. The peculiar-looking larvae are commonly found upon a variety of trees and shrubs, in August - September - early October. They could be confused with larvae of Schizura unicornis in this locality. Both are predominantly green on thoracic segments two and three; they are illustrated by Peterson (19), p. 161.

Schizura unicornis A & S. (3924)

1. June - early August; moderate +.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Prunus, Crataegus, Rosa, Salix, etc.
4. Also occurring here is Schizura unicornis conspecta Hy. Edw. (records in mid-late July).

Superfamily NOCTUOIDEA
X. Family LIPARIDAE (Tussock Moths)

Hemerocampa sp.

1. September; moderate.
2.
3.

Notolophus antiqua L. (=Orgyia) (3943)
(*
1. July - August.
2. NE. U. S.; B. C.
3. Salix, Rubus, Ribes, Crataegus, Quercus, Pseudotsuga, Picea, Pinus, Thuja, etc.

Olene styx B & McD. (=Dasychira Hbn.) (3962)

1. Mid July - early September; moderate.
2. B. C.
Olene vagans B. & McD. (3954)

1. July - early September; moderate.
2. NE. U. S.; B. C.
3. Rosa, apple, etc.
4. (Lp. 3): A larva, that may be this species, was collected on Betula, at 3415 Crest Drive, Corvallis, Oregon, in late May, 1962. It is highly-ornamented with hairs of many types and lengths, in addition to four dense, "toothbrush-like" hair clusters, middorsally on abdominal segments one to four; these are dull velvet-brown. A dense tuft of short, plumose, black hairs is on abdominal segment eight. Hair pencils (paired) of black, plumose hairs of varying lengths, are present on thoracic segment one (pointing forward). Further description will not be given here, other than to state that the mature larva is considerably larger and heavier than any Hemerocampa larva (tussock moth). Its only reaction to prodding is to bend its body toward the source of annoyance, in such a way as to bring some of the stiff, sharp hairs of the dorsal and subdorsal areas into contact with the object; it does not otherwise move, or crawl away, or drop from its leaf. It is quite inactive, moving only when necessary, in order to feed, and usually resting motionless on the upper surface of a leaf.

Stilpnotia salicis Linn. (The Satin Moth) (3966)

1. July; scarce.
2. NE. U. S.; B. C.
3. Populus, Salix.
4. The larvae are sometimes abundant in local outbreaks.
5. (Lp. 5): Eggs were obtained from a female confined in a paper bag (July, 1962). The egg is medium dark green and shiny. The eggs are laid in flat masses, under (dry) frothy, whitish "foam", which is reminiscent of "styrofoam". In late July, the second instar larvae spun frail, round cocoons of whitish, web-like silk. They remained within these until April 1963, when feeding (on new cottonwood leaves) was resumed. At the time of this writing (April 22, 1963), the larvae are in the fourth and fifth instars. The dorsum is black, overlaid with a middorsal row of prominent white spots. The sides are dark gray. Rows of subdorsal and lateral tubercles are light reddish-brown; clusters of pale,
nearly colorless hairs arise from the tubercles. The lateral clusters are more prominent. The head is shiny black. Prior to each moult a cocoon, or protective shield of web is spun. If disturbed while feeding, the larvae will drop on silk threads. Locomotion is rapid and "lumbering". The adult is the only white moth in this locality that might be confused with one of the four species of white arctiids mentioned earlier. It is on the wing in late June and early July. The wings are pure, satiny white, with no markings whatever. No red or yellow is present on the forelegs.

Superfamily BOMBYCOIDEA
XI. Family LASIOCAMPIDAE (Tent Caterpillars and Lappets)

Epicnaptera americana Harr. (3999)
1. Mid March - early July (April - May); abundant.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Alnus, Salix, Populus, Quercus, Ceanothus.
5. (La. 4): The egg is extremely beautiful in its pattern and contrasting colors of pure white and brown. (This is almost completely lost in preservation). It is crossed by various curving, pure white lines, in an intricate but definite pattern; the spaces are filled in with brown. Eggs are readily laid by confined females, and take about two weeks to hatch. The larva rests by day, closely appressed to a stem (or branch) of the foodplant. Distinctive marks on the larva are two orange bars (dorsal), which are present within skin folds on thoracic segments two and three. If the larva stretches out fully, or bends one way or another, these become visible.

Malacosoma ? california Pack. (3992)
1. June - July; moderate.
3. Quercus.
5. (La. 7): Larvae that are probably this species were occasionally seen on Quercus garryana in this locality, and were abundant on Quercus, about four miles S. of Ruch, Jackson County, Oregon, May 18, 1962, David R. Smith, collector. They build no tents, and are easily dislodged from the trees. Thin black hair pencils (consisting of only a few longer,
straight hairs) stand above the other hairs. Most obvious of these are the ones on thoracic segments two and three, but, they are also present on abdominal segments one to nine (paired; dorsal).

Malacosoma distria Hbn. (3997)

1. June - July; abundant.
2. NE. U.S.; B.C.
3. Populus, Alnus, Salix, Quercus, Rosa, etc.
5. (La. 3): Larvae were encountered on a variety of plants in the area (woody, deciduous). A distinctive feature is the series of middorsal white spots or "keyhole" marks, which are prominent (one per segment). Larvae often congregate in groups, "closely-packed", (side by side) on the branches or trunk of the tree upon which they are feeding. No tents are made.

Malacosoma pluviale Dyar (3994)

1. June - July; abundant +.
2. B.C.
3. Alnus, apple, Quercus, Salix, Populus, Prunus, Ribes, etc.
5. (La. 6): The larvae are abundant here, and make conspicuous white tents. They feed both inside and outside the tents. They are contrastingly marked with irregular blotches of rich, light golden-brown, and velvet-black. The middorsal broken line is pale bluish-gray; spots of this same color also appear on the largest black lateral blotches. The cocoon, which is typical of other Malacosoma cocoons, is of tough whitish silk. There is a slight, web-like outer cocoon, and a dense, well-shaped inner cocoon, through which the pupa is faintly visible when held to light. The cocoon is impregnated with a sulfur-yellow powder, which will sprinkle out or blow away, if the cocoon is torn open. The pupa is usually dusted with this same powder. (Other Malacosoma spp. also have powder-filled cocoons). The powder color may vary from white through yellow. (Any Malacosoma cocoon may be immediately recognized by the presence of powder).
Malacosoma sp.
(*)
1. June - July; moderate.
2.
4. Collected by E. J. Dornfeld and others.

Tolype sp.

1. Mid August - mid October (late August - mid September); abundant.
2.
3.
4. The majority of individuals come to lights after midnight. (1 to 3 A. M.).
5. (La. 5): A member of this genus is abundant at 5000' elevation, 2 1/2 miles SSW. of Valyermo, Los Angeles County, California. Eggs were obtained in July, 1961. As with other Tolype spp., the egg stage lasts until spring of the following year. The eggs are laid singly, or in small groups, and are covered with soft hairs from the moth's abdomen; that is, each individual egg has some hairs attached to it, but it is by no means obscured by these hairs. The larvae hatching from the Valyermo eggs were offered new leaves of Quercus garryana, in western Oregon; these were readily accepted. The larva is remarkable in the way that it blends perfectly with the dull gray of oak-bark, upon which it rests by day. It is quite flattened, and the fleshy extensions (lappets) along either side seem to blend into the surface upon which the larva rests, particularly if the larva is in a slight depression. Long black or grayish hairs extend outward and downward, from the lateral lappets; these hairs very effectively make the larva blend into its surroundings, as they smooth out any abrupt break between the larva and the surface upon which it rests. Many of the hairs extending from these lappets are very peculiar, in that they are broadened and flattened at the top; this is easily seen with a hand lens. To the naked eye, these expanded tips look like tiny flakes of dandruff among the hairs. The general dorsal color pattern of the larva is that of a piece of rough, dull blackish-gray bark. The larva rests completely motionless, appressed to the bark of an older twig or branch, where it is hardly visible. If handled, it acts rather limp and sluggish, avoiding movement. It clings with considerable
tenacity. Feeding takes place only after dark. The cocoon is very much flattened, or often spindle-shaped (drawn out greatly at both ends). It tapers off neatly into the surrounding surface. It is formed of papery, tough, tan-white or dirty grayish-white silk, in which a few of the larval hairs are scattered. The outline of the pupa inside is barely visible, if held to a strong light. The cocoon seems to have been injected with a cream-tan substance, which was possibly a fluid at first, but later dried, causing the cocoon to become more opaque.

Another Tolype sp., occurring in the Santa Monica Mts. of California, feeds on Ceanothus megacarpus Nutt. (C. spinosus Nutt., which is abundant in that locality, is refused).

The abundant Tolype sp. near Corvallis, Oregon, feeds upon Pseudotsuga. Over 100 eggs of this species (La. 10) are presently overwintering; these eggs were obtained from a moth in September, 1962, and should hatch in April or May, 1963.

Superfamily DREPANOIDEA
XII. Family THYATIRIDAE (Lutestings)

Euthyatira lorata Grt. (4009)
1. Mid March - mid April (late March); moderate.-
2. 
3. Rubus? Cornus? Corylus?
4. Very short period of flight (peak restricted to one week).

Euthyatira semicircularis griseor B. & McD. (4012a)
1. Late May - mid July (mid-late June); moderate.
2. B. C.

Ceranemota fasciata B. & McD. (=Cymatophora Tr.) (4015)
1. Late September - October 21 (mid October); moderate.
2. B. C.
3. Prunus, Amelanchier.
4. Not highly variable in color or pattern; has pale rust-brown collar.
Ceranemota improvisa Hy. Edw. (4013)

1. October 21 - mid November; abundant.
2. B. C.
3. Prunus.
4. Highly variable in color and intensity of maculation.
5. (Th. 1): Over 100 eggs were readily laid by a female (October, 1962), on strips of rough (starched) cheesecloth, in a quart jar. They are longitudinally ribbed, and elongate-cylindrical in shape, and are deposited end to end in short chains; others are laid singly. In April, 1963, after food-plant leaves were available, the overwintering eggs were brought indoors, and they promptly began to hatch. The first instar larva is dull black, marked with a pair of dull orange-brown subdorsal lines which fade out posteriorly. In shape, the larva tapers noticeably toward the rear. It immediately moves into the newest unfolded leaf, where it does its first feeding. A variety of cultivated plum was readily accepted; wild larvae were later collected on the same tree. Second, third and fourth instar larvae (April 22, 1963) are reddish-brown laterally, marked with white and yellow on the dorsum. An abrupt break in the pale dorsal coloration occurs on the first abdominal segment. By third instar, the larva exhibits a peculiar resting position, in which the posterior end of the body, starting with abdominal segment seven, is tilted abruptly upward. The larvae are quite sluggish, and are easily dislodged from the stems or leaves where they are resting. They are quite prone to disease in the first and second instars; over forty larvae (out of eighty), were lost before they reached third instar.

Habrosyne scripta Gosse. (4004)

1. Mid May - early September (June - July); abundant.
2. NE. U. S.; B. C.
3. Rubus.

Pseudothyatira cymatophoroides Gn. (4007)

1. Late June - early August; moderate +.
2. NE. U. S.; B. C.
3. Alnus, Salix, Populus, Prunus, Rubus, Corylus, Crataegus, Amelanchier, etc.
4. Form *expultrix* Grt. is more common around Corvallis.

Possible species:

**Ceranemota crumbi** Benj.  
(*)
2.  

**Ceranemota tearli** Hy. Edw.  
(4014)
1. Look for: September - October.  
2. B. C.  

**Superfamily DREPANOIDEA**  
XIII. Family DREPANIDAE (The Hook-tips)

**Drepana arcuata** Wlk.  
(4020)
1. Mid April - August; moderate.  
2. NE. U. S.; B. C.  
3. **Alnus.**  
5. (Dr. 1): Eggs were deposited (May 1962) on the bare glass of a jar. They were well-glued to the glass. Color changes in the egg are as follows: at first, clear cream-yellow, gradually becoming clear pale orange, then deeper orange; black prior to hatching. The first instar larvae constructed open nets, of tough silk above them, partially drawing the leaf edge (*Alnus rubra*) inward. They remain on the upper surface of the leaf. Last instar larvae construct more protective nests, in that the leaf edge is usually pulled further inward, and they are at least partially out of sight while under this. More silk is used in the nest construction, and in the "roof-area", which is sometimes partially open. When in its silk-lined retreat, the larva has a peculiar way of rapidly vibrating its head against the leaf surface (if it is disturbed), so as to produce a faint, rapid-tapping noise. Larvae are quick to do this when prodded from the rear. Striking features of the larva are: a short horn at the posterior end, and no anal prolegs; a cream-yellow head with
contrasting, brown, semi-circular bands. The pupa is in a cocoon of tough, pale-brownish silk, within a curled (or folded-over) leaf edge. The pupa has a pair of short, flattened projections on top of the head.

Drepana bilineata Pack. (4021)

1. Mid May - August (June; August); moderate +.
2. NE. U. S.; B. C.
5. (Dr. 2): Eggs were deposited (May 27, 1962) on cheesecloth strips, inside a jar; not one on the glass. (It is interesting to note that D. arcuata was provided with cheesecloth also, but preferred to lay all its eggs on the bare glass; three separate females were observed, and all of them did this). The egg of D. bilineata goes through the following color changes: at first, rich yellow-cream, gradually becoming red - orange, then near raspberry-red, then duller red; black prior to hatching. Although Alnus rubra was offered, it was completely refused; Quercus garryana was tried with slight success. Finally, ornamental birch (Betula) was offered, and this was readily eaten. (There must be a native foodplant here, as the moths are not at all uncommon, and birch is grown only in the cities or residential areas). The first instar larvae do not construct nests or protective webs. They feed by skeletonizing a leaf from the upper surface, and always rest on top of the leaf. Growth is very rapid. In second and third instar larvae, a bird-dropping appearance is simulated; this is further enhanced by a half-curled resting position, on top of a leaf, and by white blotches on the dorsum. In the last instar, the larva resembles a brown birch catkin. It no longer has the white dorsal patches, having become highly-mottled with various shades of brown. Its generally warty surface, in addition to the very mottled brown pattern, suggests a small, brown catkin. The larva usually rests in a somewhat sphingiform posture: front reared up and head held in, but also with the rear end abruptly raised from the leaf surface (which is not a sphingiform habit). As seen in D. arcuata, these larvae also have the habit of rapid head-tapping; in addition, while head-tapping, the rear end is pulled in and out in a peculiar manner. The pupa lacks any prominent paired projections on top of the head, and is completely different from D. arcuata.
in having a very heavy coat of whitish bloom, which develops after several days. This imparts to the whole pupa the appearance of having been dipped in powdered sugar; the bloom is completely lost in alcohol. The cocoon is also distinctive, as it is formed of more-or-less open strands of light yellow, yarn-like silk, within a curled leaf (or between two or more leaves).

Superfamily GEOMETROIDEA
XIV. Family GEOMETRIDAE (Geometers, Loopers, Span-worms, or Measuring-worms)

Amphidasis cognataria fortitaria B. & McD. (=Biston Leach) (4968 b)

1. Late May - mid August; moderate-.  
2. NE. U.S.; B.C.  
3. Alnus, Acer, Populus, Rosa, Ribes, Holodiscus, and numerous other woody plants.  
4. Larvae are much more frequently seen than adults.  
5. (G. 25): The larvae are often seen on Alnus from September to mid October, when they are nearly fullgrown. They are the largest common geometrid larvae on alder, at this season, near Corvallis. Many are parasitized, and they are also quite prone to disease. Ventilated cages are desirable for rearing. Three color phases were found in mature larvae; these are listed in order of abundance: (1) "oily", light yellowish-green (2) dull brownish or brownish-gray, sometimes with a pink tinge (3) dark, glossy, sooty-gray. (This last phase is uncommon). The head coloration is likewise variable. The larva is not very active, and clings with great tenacity. It makes no attempt to hide, but is a fair imitation of a green or brown twig. (The skin surface is rather smooth throughout, which is not particularly effective in rendering the larva inconspicuous). The resting position is usually a "low arch", in which the true legs touch the stem or leaf support. Locomotion is slow, but the larva proceeds in typical looper style. This species is easily separated from other very large geometrid larvae by its deeply bilobed head. The large and heavy pupa is formed in an underground cell, where it overwinters. The moths do not appear until late spring or summer, and seem to be much less abundant than the larvae. They are single-brooded.
Anacampptodes sp.  
(*)
1. May 21, 1958 (Ernst J. Dornfeld, coll.).
2.

Anagoga pulveraria occiduaria Wlk.  
(5042)
1. Late July; very scarce.
2. NE. U. S.; B. C.
3. Salix; Rubus ?

Anavitrinella pampinaria Gn.  
(4908)
1. May - July; moderate.
2. NE. U. S.; B. C.
3. Alnus, Acer, Salix, Rubus, Holodiscus, Larix, Picea, Pinus, etc.
5. (G. 24): This is another geometrid which seems to be much more easily collected in the larval stage than as an adult. Larvae are often found when beating alder (and other woody plants) in September or early October. The resting position is usually a "low arch", with true legs touching the support. Locomotion is rather slow, but in typical looper style.

Anthelia hyperborea Hlst.  
(5020)
1. February - April; moderate-.
2. B. C.
3. Alnus, Pinus.

Anthelia nigroseriata Pack.  
(5021)
1. February - late April; mid July - early August; (March - April); moderate.
2.

Bapta semiclarata Wlk.  
(*)
1. May - July.
2. NE. U. S.; B. C.
3. Prunus.
Besma quercivoraria Gn. (=Ellopia Tr.)

1. Mid April - early June; mid-late August; scarce.
2. NE. U. S.; B. C.
3. Quercus.
4. Considerable variation in sizes of adults (those of the later brood usually smaller).

Brephos infans oregonensis Swett

1. March - early April; diurnal only; moderate +.
2. NE. U. S.; B. C.
3. Alnus, Betula.
4. Flies around the tops of alders, on mild days, when the leaf buds are just beginning to open (or before); occasionally comes to wet ground to drink. The flight is rather fast, direct, and usually at a height of ten feet or more above the ground.

Calocalpe undulata Linn. (=Hydria Hbn.)

1. Late July; very scarce.
2. NE. U. S.; B. C.
3. Prunus, Salix, Populus.

Campaea perlata Gn.

1. Mid June - early July; mid August - early September; moderate +.
2. NE. U. S.; B. C.
3. Alnus, Salix, Acer, Betula, Quercus, Pinus, etc.
4. Considerable variation in sizes of adults; those of the later brood usually smaller.
5. (G. 37): A female moth, confined in a jar (with strips of cheesecloth) for several days, refused to lay any eggs. Feeding (one part honey and two parts water) was necessary to keep her alive. After five days, she settled on the smooth lid of the jar, where she laid two separate, flat masses of eggs. (About 75 - 100 eggs in either mass). Eggs are, at first, shiny yellow-cream, then changing to light milky-orange, to deep orange, to dark lead gray prior to hatching. There are two features of the last instar larva that are of particular interest, and that will separate it from other
geometrid larvae in this locality: (1) It has a fine fringe which borders the venter, along either side, from behind the first pair of true legs up to the last pair of prolegs. (2) It has three pairs of prolegs (the first pair being somewhat reduced). In coloration, it is distinctly two-toned (which is not a common geometrid color pattern); that is, the dorsum and lateral areas (everywhere above the fringe) are almost uniformly cocoa-brown, but the venter contrasts strongly with this, being white, with some bluish-green tinge showing through (especially inside the prolegs). Behavior departs greatly from that of a typical geometrid larva: The resting position is always tightly-appressed to a stem, much like a Catocala larva (Noctuidae). Locomotion is rapid, with considerable reaching around. The larva is quick to settle down, and immediately stretches out against the stem. The pupa is in a weak cocoon of little silk, in a curled leaf.

**Caripeta aequaliaria** Grt. (5127)

1. May - June; mid August - late September; moderate +.
2. B.C.
3. Pseudotsuga.
4. (G. 39): Four females were confined in a gallon jar, with sprigs of the foodplant. After several days of confinement (and feeding), they began to lay a few eggs each night. After ten days, over 50 eggs were obtained, most of which were laid singly or in short rows of two to four. Egg color was pearly, pale whitish-green (milky-green). As in many young geometrid larvae, locomotion of the first instar larva is rapid, with much reaching about. During rest, the first instar larva often wavers faintly. The last instar larva is a good imitation of an old (dead) twig of the foodplant. Colors are dull, drab, mottled grays and browns. Feeding is mostly on older needles, as the larvae tend to remain lower down on the stems, where their "old-twig" camouflage is more effective.

**Caripeta divisata** Wlk. (5125)

1. September 2; very scarce.
2. NE. U.S.; B.C.
Ceratodalia queneata Pack.

1. July - September; moderate.
2. B. C.
3. Polygonum.

Chlorosea sp.

1. June - July; moderate.
2. B. C.
3. Possibly Alnus, Prunus, or Salix.
5. (G. 38): An unsuccessful attempt was made to rear this species from eggs. Although Alnus rubra was accepted, larval growth was incredibly slow, and feeding was slight. By the time third instar was reached, all of them had died. (Other offered plants were refused). The color of a third instar larva was tan, with some markings of darker brown. The larva is distinctive because of its jagged outline, due to deeply-cut extensions along either side of the body. (This appearance, with variations, is typical of many other geometrid larvae in the subfamily Hemitheinae, most of which are various shades of green in the adult stage). The larva is very inactive, usually resting in an arched position along the leaf edge, but elevated enough that its true legs never touch the leaf. In any future attempts to rear this species, Ceanothus and Arbutus menziesii would be offered as food-plants (among other things).

Cingilia umbrosaria nigrovenaria Pack. (=Nepytia Hlst.)

1. Mid July - late August (late July); abundant.
2. B. C.
3. Pseudotsuga.
5. (G. 40): Two females (in mid September) confined in a small jar, with a strip of paper towel, laid over 100 eggs on the paper (mostly along the edges). Egg color is light coffee-brown and shiny; darker before hatching. There is nothing protective in the coloration of these larvae, which stand out obviously among the needles of their foodplant. Although variable, the commonest color phase seen in last instar has a ground color of pale yellow-cream, and is heavily-marked with rich rust-brown, which covers most of the dorsum and much of the lateral areas (irregular pattern
laterally). Sometimes, narrow black "pen-lines" may outline parts of the rust-brown maculation. The venter is pale yellow-cream, with no dark markings. Growth is rather slow; full growth was reached in early November (indoors). Pupation takes place among needles, where a few strands of silk are woven, but this can hardly be called a cocoon.

**Cingilia phantasmaria** Stkr. (=**Nepytia** Hlst.) (5110)

1. Mid September - late October (late September); moderate +.
2. B. C.
4. Overwintering eggs of this species should hatch later this spring. Confined females (October) laid eggs on strips of paper towel.

**Coniodes plumogeraria** Hlst. (4955)

1. Late January - mid March (February); moderate +.
2. B. C.; Santa Monica Mts. (Calif.).
3. *Juglans*, *Quercus*.
4. The female is wingless. A single female was collected at light, in Corvallis. Males are frequent at lights.

**Coryphista meadi** Pack. (4248)

1. Late April - August; scarce.
2. NE. U. S.; B. C.
4. Form **badiaria** Hy. Edw. is also present.

**Cosymbia dataria** Hlst. (4208)

1. April - mid June; mid July - August (second brood prevalent); moderate +.
2. B. C.; Santa Monica Mts. (Calif.).
3. *Alnus*; *Hemizonia* blossoms (Santa Monica Mts., Calif.).
4. I reared this species in July, 1948, from larvae collected upon the flowers of *Hemizonia* sp., in the Santa Monica Mts. of California, five miles north of Beverly Hills. (No records were being kept at that time). The mature larva was a rich yellow, its head included. It blended nicely with the small, bright yellow flowers of its foodplant. Near Corvallis, Oregon, a pupa of this species was found on a leaf of *Alnus*.
rubra. A distinctive feature of the pupa is that it is fastened to the leaf by a silken girdle. It is a slender pupa, with a somewhat widened and truncate anterior end, and has an angular outline. It would be interesting to learn what color the larva is when it feeds on alder leaves; it is not likely to be yellow.

**Cosymbia pendulinaria griseor** McD.  
(4211a)

1. Mid July - late September; moderate.
2. NE. U. S.; B. C.
3. Alnus.

**Deuteronomos magnarius ochreatus** Hlst. (=**Ennomos Tr.**)  
(5170a)

1. August - October (October); abundant.
2. NE. U. S.; B. C.
3. Alnus.
4. (G. 32): A confined female laid many eggs on the glass and lid of a jar. They were laid in long, curving strings, side to side (not end to end), and were heavily glued down with a golden-brown "glue". They overwintered. The last instar larva is a perfect imitation of a young alder twig. Although variable in coloration, it is usually olive-green, with a faint brownish tinge. A large swollen area on abdominal segment two looks like one of the alder stem nodes, and is mottled for a perfect imitation. Similar, but smaller, "nodes" are reproduced on abdominal segments three and five. Also present are small marks which look like lenticels. The resting position is also in imitation of a twig, because the larva stands rigidly, straight out from the stem to which it clings. It is quite inactive by day. For success in captivity, a well-ventilated rearing cage is desirable; unlike most geometrid larvae, it is quite prone to disease if kept in a humid jar. The cocoon is elaborate and well-shaped (for a geometrid). It is large and ample (the pupa usually rattles around inside), and is made of tough white silk, usually somewhat hidden by the leaves (on the foodplant). There is a crude outer cocoon of irregular shape, and a more compact inner cocoon of a definite shape, being more-or-less broadly spindle-shaped. The large pupa is readily seen through both cocoons. Its wing cases, legs, and thorax are usually reticulate, dull blackish and cream-tan, with a slight
glaucous bloom which will rub off. The blackish color may extend over the dorsum and venter of the abdomen for a variable distance, where it is often reduced to speckles. The abdomen is faintly opaque greenish-cream; rings between the segments show the most green, without any faintly glaucous cast. The pupa is capable of lively abdominal movement.

**Diactinia silaceata** Schiff.  
1. Mid April - May; August; moderate-.  
2. NE. U. S.; B. C.  
3. Epilobium; Fuchsia.

**Drepanulatrix falcatoria** Pack.  
1. Late March - mid May; scarce.  
2. B. C.; Santa Monica Mts. (Calif.).  
3. Probably Ceanothus.

**Drepanulatrix monicaria** Gn.  
1. September 21; very scarce.  
2. Santa Monica Mts. (Calif.).  
3. Ceanothus (Santa Monica Mts., Calif.).

**Drepanulatrix rectifascia** Hlst. (=Eudrepanulatrix)  
1. June 21; very scarce.  
2. B. C.  
3. Lepargyraea (Shepherdia), according to McDunnough.

**Drepanulatrix secundaria** B. & McD.  
1. April 24; July 27; scarce.  
2. B. C.

**Drepanulatrix unicalcaria** Gn.  
1. July 3; September 5; very scarce.  
2. B. C.; Santa Monica Mts. (Calif.).  
3. Probably Ceanothus.
Dysstroma bruneata Pack.

1. July 23; very scarce.
2. NE. U. S.; B. C.

Dysstroma citrata Linn.

1. June; September - October; moderate.
2. NE. U. S.; B. C.
3. Geum, Fragaria, Rubus, Vaccinium, etc.
5. (G. 28): A female moth confined in a vial, with a strip of cheesecloth, laid about 30 eggs (October, 1961). These overwintered, and hatched with the first mild days of February, at outdoor temperatures. The larvae accepted Geum macrophyllum, which had some new leaves at that season. Early instar larvae (first and second instars) have two reactions to disturbance: (1) To snap into a rigid and absolutely vertical posture (2) To curl the head and fore part of the body around and under, to look like a tightly-rolled question mark; when in this position the body is so tightly rolled inward that only the rear end with prolegs, which still grasp the leaf, remains uncurled. This pose will even be retained during handling. Such behavior is still retained in last instar as well; or the larvae may let go, curl up, and remain motionless. They are always very inactive. The ground color of a mature larva is yellow-green; slightly more yellowish above than below. A pair of whitish subdorsal lines start behind the head, but end on thoracic segment two. A few larvae have a dull red stigmatic line, which runs through the abdominal segments. Two points project backward, from behind the anal prolegs. The pupa is smooth and faintly shiny; the wing cases are translucent green (during the first few days), and the abdomen is whitish-green and opaque. The tip of the abdomen (near base of cremaster) is quite translucent and nearly colorless. Pupation occurs in a cocoon of whitish silk, in curled leaves.

Dysstroma ethela Hlst.

1. July 27; very scarce.
2. B. C.
Dysstroma formosa Hlst. (4424)
2. B. C.

Dysstroma ? mancipata Gn. (4427)
1. Late June - late July (late July); scarce.
2. .

Dysstroma occidentata Tayl. (4421)
1. July 4; scarce.
2. B. C.

Earophila vasiliata Gn. (4587)
1. Late March - May; abundant.
2. NE. U. S.; B. C.
3. Rubus; Rosa ?
4. Form niveifasciata Hlst. is somewhat more common than
   the typical form in this locality. The "typical form" lacks
   the white or cream band on the primaries. All gradations
   (between white-marked and all brown) occur here.

Ectropsis crepuscularia Schiff. (4946)
1. March - April; mid-late July; abundant.
2. NE. U. S.; B. C.
3. Pseudotsuga, Picea, Taxus, Thuja, Pyrus.

Ellopia Tr. (see Besma and Lambdina)

Elpise lorquinaria Gn. (4799)
1. Late June - September (July); abundant.
2. B. C.
3. Alnus.
4. Seems to come more often to incandescent light than to black
   light.
Enchoria lacteata Pack. (=Euphyia Hbn.)

1. Late February - April (March); diurnal only; abundant.
2. B. C.
4. This is the earliest diurnal geometrid in the area. It is most active on sunny days, between 10 A.M. and 3 P.M., when it is seen flying about two to six feet above the ground, in grassy fields amongst bare oaks, or along woodland edge, but not in deep shade. It flies most of the time, having little inclination to alight, or remain in one place. Emergence is determined by the first series of warm or mild days in late winter or early spring; the earliest record in 1962 was early April, whereas in 1963, they were flying by March 4.

Ennomos magnarius (see Deuteronomos magnarius)

Enypia griseata Grossb.

1. Late May - early July; mid August - mid October (September); abundant.
3. Pseudotsuga.
4. Considerable variation in sizes of adults; those of the later brood usually smaller.
5. (G. 41): Two females, confined in a small jar, with a strip of paper towel, laid about 30 eggs. The egg is at first pale green, soon becoming flesh-gray-brown. When mature, the larva is green, with four strong white longitudinal lines above; also, three white lines on venter. The head is rich brown, with two downward-pointing white marks near its top. The resting position is usually parallel to the flat surface of a needle (closely-appressed). The larvae are not active. The pupa is green all over; slightly paler on the wing cases. During the first few days, the white lines of the larva are present on the abdomen of the pupa; strongest of these are the two, broad subdorsal ones. A thin dark brown line arches over the top of the head, and starts down the antennae, where it fades out. The "cocoon" consists of a few flimsy strands of colorless silk, in a more-or-less sheltered location above ground.
Enypia venata Grt.

1. August - early September; moderate. 
2. B. C. 
3. Abies.

Epirrhoe alternata Mull.

1. Mid-late June; mid-late August; not diurnal; moderate. 
2. NE. U. S.; B. C. 

Epirrhoe plebeulata Gn.

1. Late March - early May (April); diurnal only; abundant. 
2. B. C.; Santa Monica Mts. (Calif.). 
4. Flight behavior as described for Enchoria lacteata Pack. 
5. (G. 30): A female, confined in a pint jar with three small Galium sprigs, in a sunny window, laid over 80 eggs in two days (April 15, 1962). On both days, oviposition occurred only in the afternoon, even though the jar was in and out of the sun all day long. In early instars, the larvae are dirty gray and the skin is translucent. They are slow moving and inactive. The last instar larva is marked dorsally with spots and other markings, in a definite pattern of very dark ashy-gray to black, on a ground of paler grayish (variable). A distinct preference is shown for only the youngest leaves and growing tips of Galium. The frass is quite unusual, being very obnoxious, black, soft, and wet. It is often deposited link-style, with four or more pieces end to end. Larval growth is very rapid; by May 8, all larvae had finished growth. The pupa is formed in a compact cocoon of several layers of silk and soil particles (closely-woven, but not hardened in any way). It fits tightly around the pupa. Considering the size of a mature larva, the pupa is rather small and compact; its color is deep reddish-brown.

Epirrita autumnata omissa Harr.

1. Late September - early November (mid-late October); abundant. 
2. NE. U. S.; B. C. 
4. At first glance, this moth could be confused with Paraptera
danbyi Hlst., which flies at about the same time, though
primarily after the main flight of Epirrita.

Erannis vancouverensis Hlst. (4963)
1. November - February (late November - early January); abundant.
2. B. C.
3. Quercus, Rosa, Crataegus, Salix, etc.
4. This moth is on the wing in December, especially on cloudy
or foggy nights, when the temperature is above 38°F. The
female is wingless. No female ever came to any of my lights,
although males were numerous.
5. (G. 36): A larva that is probably this species was beaten
from oak in May. The dorsal area is pale mustard (yellow)-
tan, shaded with deeper brown. There are a few narrow,
wavy black, subdorsal reticulations on either side of nearly
every segment. The venter contrasts strongly with the dor­
sum, being dilute cream. The head is dull, pale brown,
speckled with slightly darker brown. The skin is very tough
in texture. The larva is rather sluggish, often resting on
top of a leaf. It will assume an odd pose, and remain that
way for long periods of time: The position is of the usual
humped, geometrid-type, clinging with the prolegs, and
also with the true legs touching (or, at least the third pair
touching the leaf); but the distinctive part of the pose is that
the head is tilted up, even though the true legs are touching
the leaf upon which the larva rests. If the larva is not al­
ready in this position, it will often assume it when disturbed.

Euchlaena mollisaria Hlst. (4998)
1. June - July; moderate.
2. B. C.
3. Rubus, Ribes, Salix, Rhamnus, Crataegus, etc.

Euchlaena pectinaria D. & S. (5003)
1. June - July; moderate +.
2. NE. U. S.
3. Prunus, and other woody plants.
Eudrepanulatrix rectifascia (see Drepanulatrix)

Eulype albodecorata Blkmre. (=Rheumaptera Hbn.) (4574)
1. May 26; July 22; diurnal; scarce.
2. B.C.
3. Betula ? Alnus ?

Euphyia centrostrigaria Woll. (4559)
1. January - April; June; late August - early November (October); abundant.
2. NE, U.S.
3. Polygonum; Galium ?
4. Male and female differently marked on primaries.

Euphyia lacteata (see Enchoria)

Euphyia unangulata intermediata Gn. (=Xanthorhoe Hbn.) (4558a)
1. June - early August; moderate.
2. NE, U.S.; B.C.
3. Caryophyllraceae spp.; Rubus ? Alnus ? Salix ?

Eupithecia agnesata Tayl. (4358)
1. Mid March - late April; abundant.
2. B.C.

Eupithecia ? albicapitata Pack. (4366)
1. Late June - early August; scarce.
2. B.C.

Eupithecia columbiata Dyar (4288)
1. May - June; scarce.
2. NE, U.S.; B.C.
3. Picea, Prunus.

Eupithecia cretaceata Pack. (4350)
1. July - early August; moderate.
2. NE, U.S.; B.C.
3. Veratrum.
Eupithecia gilvipennata C. & S.  
1. March - April; moderate.  
2. B. C.; Santa Monica Mts. (Calif.).

Eupithecia graefi Tayl.  
1. Late July - early November (late August - September); moderate.  
3. Possibly Arbutus ?

Eupithecia miserulata Grt.  
1. March - April; scarce.  
2. NE. U. S.  
3. Erigeron flower heads, Quercus, etc.  
5. (G. 27): Many larvae were collected by sweeping through Erigeron canadensis in late September, 1961, about 15 miles north of Corvallis, in Polk County, Oregon. The larvae feed on the flower heads and seeds of the foodplant. They may partially curl up when handled, and are generally inactive. The color and pattern vary greatly, but it is common for a larva to have dorsal brown marks, like arrowheads, pointing forward on abdominal segments one to six. There may be a faint middorsal line, and a rather strong substigmatic line. The ground color varies from whitish to cream to light green. Green larvae are often faintly marked, if marked at all. The pupa is greenish-tan, and is in a rather open cocoon of weak silk and available debris. It is typical of many Eupithecia spp. to feed upon floral parts, in the larval stage. There may be species (in this locality) that feed on the floral parts of willow, alder, or oak, early in the year.

Eupithecia misturata Hlst.  
1. March - June; August - September; moderate +.  
2. NE. U. S.; B. C.  
3. Larix, Ceanothus blooms, etc.

Eupithecia nevadata Pack.  
1. Mid February - late March; moderate.
Eupithecia perfusca Hlst. (4335)

1. February - April; abundant; smaller second brood in summer - fall?
2. B.C.

Eupithecia ravocostaliata Pack. (4383)

1. Early March - mid April; abundant.
2. NE. U.S.; B.C.

Eupithecia subapicata Gn. (4372)

1. Mid March - early May; (mid April); abundant.

Eupithecia unicolor Hlst. (4294)

1. Late June - July; September; moderate-.
2. B.C.

Eupithecia sp.

1. June 22; very scarce.
2.

Eustroma semiatrata Hlst. (=nubilata Pack.) (4398)

1. June; late September - October; moderate-.
2. NE. U.S.; B.C.; Santa Monica Mts. (Calif.).
3. Epilobium; Ribes ? Prunus ?

Gabriola dyari Tayl. (4982)

1. Late June - September (mid-late July); moderate.
2. B.C.
3. Pseudotsuga.

Hesperumia sulphuraria Pack. (4801)

1. July - early August; scarce.
2. NE. U.S.; B.C.; Santa Monica Mts. (Calif.).
3. Ceanothus, Rosa, Vaccinium, Sorbus, etc.
Heterusia albida B. & McD. (=Stamnodes Gn.)

1. April - early May; diurnal only; moderate.
2. B.C.
3.
4. Remarks on flight behavior of Enchoria lacteata also apply here.

Hydria (see Calocalpe)

Hydriomena albifasciata Pack. (4467)

1. April 7; very scarce.
2. B.C.; Santa Monica Mts. (Calif.).
3. Quercus.
4. I have collected larvae in leaf nests (usually two leaves tied flatly together) on Quercus agrifolia, in the Santa Monica Mts. of southern California. They are present on the trees only while the new leaves are still soft, in early spring.

Hydriomena crokeri Swett (4486)

1. March - mid May (mid March - early April); moderate +.
2. B.C.

Hydriomena edenata grandis B. & McD. (4495 a)

1. Mid February - mid April (March); abundant +.
2. B.C.; Santa Monica Mts. (Calif.).
3.

Hydriomena furcata Thun. (4465)

1. July - September (July - August); moderate.
2. NE. U.S.; B.C.

Hydriomena irata Swett (4475)

1. April - July (May - June); very scarce.
2. B.C.
3. Tsuga; Pseudotsuga ?
Hydriomena manzanita Tayl.

1. Mid March - early April (March); abundant.
2. B. C.

Hydriomena nevadae B. & McD.

1. May 26; very scarce.
2. B. C.

Hydriomena nubilofasciata Pack.

1. February - mid April; abundant +.
2. B. C.; Santa Monica Mts. (Calif.).
3. Quercus
4. Sometimes Hydriomena spp. are seen flying in the daytime. They are easily disturbed. On mild, cloudy days, they fly more.
5. I have collected numerous larvae of this insect on Quercus agrifolia, in the Santa Monica Mts. of southern California, during March and early April. The larvae hide in folded leaves, or (usually) between two leaves tied flatly together. They come out to feed after dark, when they are easily collected by beating. Inside the nest, the larva is usually in a half-curled position, flat against the leaf. The ground color of the larva is predominantly white or cream. Pupation is in an earth cell. As the moth is only single-brooded, about eight to nine months are spent in the pupal stage.

Hypagyrtis subatomaria (see Paraphia)

Hyperetis amicaria H. - S.

1. Mid June - mid July; moderate.
2. NE. U. S.; B. C.
3. Alnus, Salix, Acer, Rosa, Cornus, Quercus, etc.

Lambdina fiscellaria somniaria Hlst.

1. Mid September - early November (mid-late October); abundant +.
2. NE. U. S.; B. C.
Lygris xylina Hlst.  
1. July - early August; moderate.  
2. NE. U.S.; B.C.  
3. Salix.

Melanolophia imitata Wlk.  
1. March - May (April); moderate +.  
2. B.C.  
3. Pseudotsuga, Pinus, Thuja, Picea, Abies, etc.

Mesoleuca gratulata Wlk.  
1. Late March - early May (April); diurnal; abundant.  
2. B.C.  
3.  
4. Occasionally comes to light.

Mesoleuca ruficillata Gn.  
1. July 26; very scarce.  
2. NE. U.S.; B.C.  
3. Betula; Rubus ?  
4. The single specimen collected came to light.

Mesothea viridipennata Hlst.  
1. April - early May; diurnal ?; moderate.  
2. B.C.  
4. The adults do not fly as much as do adults of Enchoria lacteata and Epirrhoe plebeculata, but are often found in grassy fields, where they fly short distances, frequently alighting in the grass. For this reason, they are not obvious, and may actually be more common than is at first suspected. They might be expected to come to lights occasionally, although I did not take any at light during this survey.
**Metanema inatornaria** Gn. (5054)

1. Mid August - early September; scarce.
2. NE. U.S.; B.C.
3. Acer, Populus, Pseudotsuga.

**Metarranthis duaria septentrionaria** B. & McD. (5050a)

1. May - mid June; scarce.
2. NE. U.S.; B.C.
3. Alnus, Vaccinium.
4. This species behaves in an unusual way, when it comes to light: It always remains "jumpy" and is reluctant to settle down, flying about in the poorly-lighted areas at the edge of the sheet or canvas, and occasionally flying rapidly up to, or past, the light itself. It is, perhaps, more common than one might suspect.

**Nematocampa filamentaria** Gn. (5044)

1. July - August (late July); very scarce.
2. NE. U.S.; B.C.
3. Vaccinium, Acer, Corylus, Daucus, Pseudotsuga, etc.

**Nemoria darwiniata** Dyar (4059)

1. Mid April - June; mid July - September; abundant.
2. B.C.

**Nemoria pulcherrima** McD. (4066)

1. Early February - early April (mid February - early March); moderate +.
3.
4. The flight period of this single-brooded species is very short, but at the correct time, it is not uncommon. Charles W. Baker found it rather common in an oak grove (coming to lights) in mid February, 1963, on 36th St., Corvallis, Oregon.
5. Many eggs were obtained from females (February), confined with bare oak twigs. These eggs are being kept outdoors, and have yet to hatch (March 27, 1963). The larvae probably feed on oak leaves or floral parts.
Neoalcis californiaria Pack. (4878)

1. July - mid September (late August - mid September); abundant.
2. B. C.
3. Rubus.
4. Male and female differ considerably in appearance.

Neodezia albovittata Gn. (=Trichodezia Warren) (4235)

(*)
1. May - August (June - July); diurnal, in moist places.
2. NE. U. S.; B. C.
3. Impatiens.

Neoterpes edwardsata Pack. (5159)

(*)
1. April - July (May - July); very scarce.
2. Santa Monica Mts. (Calif.).
3. Romneya and Dendromecon in Southern California.

Neoterpes ephelidaria Hbst. (5157)

(*)
1. May 29; very scarce.
2. 
3. Argemone in Southern California.

Neoterpes trianguliferata Pack. (5158)

(*)
1. June 10 (coll. by Ernst J. Dornfeld); July 14 (coll. by David L. Mays); very scarce.
2. B. C.
3. Ribes.

Nepytia phantasmaria and N. umbrosaria (see Cingilia)

Nyctobia limitaria Wlk. (4223)

1. Late March - April; moderate-.
2. NE. U. S.; B. C.
Oporophtera occidentalis Hlst.  
1. November - January (mid November - December); abundant +.
2. B. C.; Santa Monica Mts. (Calif.).
3. Quercus, Acer, Amelanchier, Symphoricarpos.
4. The female of this species is wingless, but occasionally crawls to light. The males are common at lights, on mild winter nights.

Paraphia subatomaria Wood (=Hypagyrtis Hbn.)  
1. Mid July - early August; moderate -.
2. NE. U. S.; B. C.
3. Probably conifers (Pseudotsuga, Pinus, etc.).
4. Male and female differ considerably in size and maculation.

Paraptera danbyi Hlst.  
1. Early November - mid December (early - mid November); abundant.
2. B. C.
3. Quercus, Picea.

Perizoma costiguttata Hlst.  
1. Mid April - late August (July); moderate +.
2. B. C.

Perizoma curvilinea Hlst.  
1. Late February - August; abundant.
2. B. C.

Perizoma grandis Hlst.  
1. Mid June - early July; moderate -.
2. NE. U. S. (P. pasaliata); B. C.

Pero behrensarius Pack.  
1. Mid April - early July (late May - June); abundant.
2. B. C.
3. Pseudotsuga, Picea.
Pero mizon Rindge

1. July - early September; moderate.
2. 

Pero morrisonarius Hy. Edw. (5080)

1. June (single specimen coll. by Dean L. Shumway).
2. NE. U.S.; B. C.
3. Pinus, Abies, Picea, Larix; Pinus ? Pseudotsuga ?

Philedia punctomacularia Hlst. (5027)

1. Mid September - late October; moderate +.
2. B. C.
5. (G. 43): About 70 eggs were obtained from a female, confined in a jar with strips of paper towel (September, 1962). The egg is at first whitish cream, soon becoming salmon-pink. Overwintering occurs in the egg stage. In late April, 1963, when Pteridium leaves were available, the eggs were brought indoors; most of them have hatched at the time of this writing (April 22, 1963), and some of the first larvae are now in second instar. The larva is translucent green, from internal color, and is closely-marked with narrow, reddish-brown, longitudinal lines. The skin is shiny. Unlike most geometrid larvae, they sometimes fail to descend upon silken threads when disturbed; instead, they may drop, and then squirm violently for an instant after landing. (This is reminiscent of the behavior of certain larvae in the Microlepidoptera).

Plagodis phlogosaria approximaria Dyar (5040)

1. April - July (April - May); moderate.
2. NE. U.S.; B. C.
3. Alnus, Betula, Prunus, apple, etc.
5. (G. 33): Many larvae were reared from eggs. Alnus rubra was accepted. Young larvae feed in a characteristic way, making numerous small holes (up to 1/4 inch across) in a leaf, but almost never feeding from the edge. Two resting positions are favored: (1) hanging on silk, below the leaf, in a stretched-out position (2) resting stick-like, on a leaf or twig. In the first three instars, the larva is rather
smooth and not twig-like in appearance. In the fourth and fifth instars, it becomes a good imitation of a small twig that has been broken at a node. The flat head, and swollen thoracic segments directly behind it, represent a node, when they are drawn inward, while the larva rests, rigidly erect, on a twig. A dorsal bump on abdominal segment five looks very much like the point at which a leaf was once attached. The pupa is elongate, with fairly prominent constrictions between abdominal segments four - six. It is smooth, shiny, and light greenish - brown. The free part of the abdomen is slightly downward-arched, but then bends up again, toward the tip. (The distinctive outline of a Plagodis forewing is easily seen in the wing cases). Unusual conditions or materials may be required for pupation, as 25 out of 27 larvae died without forming pupae, even though they were quite healthy upon leaving the foodplant.

Plemyria georgii Hlst.

(4412)
1. Mid August - mid September (early - mid September); moderate.
2. NE. U. S.; B. C.
3. Salix, Alnus, etc.

Prochoerodes forficaria Gn.  

(5210)
1. May - early June; August - early September, (late August - early September); abundant.
2. B. C.; Santa Monica Mts. (Calif.).
3. 

Protitame matilda Dyar  

(4782)
1. Mid May - early August (July); abundant.
2. B. C.

Pterotaea cariosa Hlst.  

(4936)
1. Mid July - August; scarce.

Rheumaptera albodecorata (see Eulype)
Sabulodes caberata Gn.

1. April - May; August - September; moderate.
2. Santa Monica Mts. (Calif.).
3. Numerous trees and shrubs, including Alnus.
4. (G. 23): Many larvae were reared from eggs, obtained from a confined female, in early September, 1961. Alnus rubra was accepted as a foodplant. By the fourth instar, the larva is very brightly-marked with black, yellow, and white longitudinal lines. An orange blotch surrounds (or is close to) each spiracle. The prolegs are orange-brown. The head is orange-tan. The true legs are brownish, marked with black. The underside is pale, with three or four strong midventral black spots. The larva will descend on tough, colorless silk, if disturbed. (Many geometrid larvae will do this). Older larvae construct very thoroughly-lined silk nests, between leaves (or in one folded leaf). They hide in these while not feeding. The cocoon is the same as one of the nests. The pupa is cream-white, sometimes smoky-tinged on the wing cases, legs, and thorax. The antennal cases are strongly-marked with deep brown, and so stand out from the paler ground color.

Scopula quinquelinearia Pack.

1. June - July; September; moderate.
2. B.C.

Scopula ? subfuscata Tayl.

1. May - June; moderate.
2. B.C.

Selenia alciphearia Wlk.

1. Mid March - April; July (small emergence); moderate.
2. NE. U.S.; B.C.
3. Alnus, Salix, Crataegus.
4. Considerable difference in sizes of adults (those of spring brood larger).
5. (G. 29): A confined female laid over 30 eggs, on a strip of stiff cheesecloth, while confined in a jar for several days. The egg is at first white with a very faint greenish tinge; then raspberry red, to still darker red, to black prior to
hatching. Early instar larvae are inclined to hang from threads below leaves. While hanging, they are not stretched out straight, but hold a bent position (J-shaped). Early feeding is through small holes cut anywhere in the leaf, but rarely at the edge. All instars are peculiar, and are distinctively marked. The last instar larva has a ground color of various browns and grays. It has paired dorsal points on abdominal segments four and five; these are bright cinnamon-brown, with yellow streaks near them. A yellow-cream blotch is present near the spiracle of the fifth abdominal segment. A similar yellow-cream area is well-defined above and between the truelegs of the first two thoracic segments. Two narrow, cream-white, dorsal marks are present at the leading edge of abdominal segment two. Pupation occurs in a curled leaf, with a few weak threads to form the "cocoon". The pupa is coffee-brown and quite shiny.

Semiothisa decorata Grossb. (4730)

1. May 31; very scarce.
2. B. C.

Semiothisa denticulata Grt. (4688)

1. Late April - July; scarce.
2. NE. U. S.; B. C.

Semiothisa granitata Gn. (4680)

1. Mid June - July; September 21; moderate.
2. NE. U. S.; B. C.
3. Pseudotsuga, Pinus, Picea, Tsuga, Thuja, etc.
4. Form dispunctata Wlk. also occurs here.

Semiothisa neptaria Gn. (4725)

1. April - early July; late July - early September; moderate +.
2. NE. U. S.; B. C.
3. Populus, Salix, Alnus.

Semiothisa respersata Hlst. (4704)

1. April; very scarce.
2. B. C.
**Sicya macularia** Harr. (5161)

1. August - September; moderate.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Acer, Betula, Vaccinium, Spiraea, Ceanothus, Pinus, Tsuga, etc.
4. In May or June, 1953, I collected a larva of this species on Ceanothus spinosus, in the Santa Monica Mts. of southern California. The pupa was brilliant, with a rich silvery-pearl surface luster. (I do not recall seeing any green showing through from underneath); see **S. snoviaria**, which follows.

**Sicya snoviaria** Hlst. (5163)

1. Mid-late July; September - mid October; moderate +.
2. Phoradendron (mistletoe), on oaks.
3. (G. 18): A confined female, collected near Valyermo, Los Angeles County, California (5000 feet elevation), readily oviposited on Phoradendron, which was growing on oak. The larva is a deep, rich, velvet-green, with an olive tinge, making it an excellent match for mistletoe stems and leaves. There is a whitish patch with gray-brown speckles, in the caudal area. Similar, but smaller, patches are present on the sides of the first pair of prolegs, and at the bases of the third pair of prolegs. Locomotion is accompanied by weak, hesitant vibration of the anterior half of the body. If disturbed, the larva may drop on a tough silken thread. Pupation occurs in a cocoon of whitish silk, in a curled leaf. The pupa is green, with a beautiful, gleaming, silvery-pearl surface luster. As the pupa ages, the surface luster becomes more and more intense, blocking out more of the green. A few pupae (two out of eleven) were speckled and streaked with black; such pupae have a somewhat bronze-silver luster, and show very little green.

**Spargania magnoliata pernotata** Hlst. (4555 a)

1. August - September (probably also earlier in the summer); scarce.
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).
3. Epilobium, Oenothera, Fuchsia.
Stamnoctenis morrisata pearsalli Swett

1. June 28; very scarce.
2. B.C.

Stamnodes affiliata Pears.

1. Mid October - early November; scarce.
3. Salvia mellifera in southern California (record of Chris Henne).

Stamnodes albida (see Heterusia)

Stamnodes delicata Grossb.

1. August; scarce.

Stamnodes topazata albida (see Heterusia)

Stenoporpia albescens Hlst.

1. August - early September (August); may also have an earlier brood; very scarce.
2. B.C.
3. Conifers ?

Sterrha bonifata Hlst.

1. Possible any month, but particularly in the summer.
2. NE. U.S.; Santa Monica Mts. (Calif.).
3. Dried plant materials, stored cereals, dried fruits, etc.
4. To be expected indoors, where it is seen sitting on curtains, walls, or ceilings, etc. The moth is a very weak flier, and does not seem to be attracted to lights. This is probably the smallest species of geometrid in the United States. It is sometimes an herbarium pest.
5. (G. 10): The moths readily oviposit on oatmeal and paper towels. The egg is rather large (for the size of the moth); it is pure white, with a uniformly "bumpy" surface. The last instar larva is very tough-skinned, smoky-gray, with a darker gray middorsal line. The head is deep brown and dull. The locomotion is slow, but in typical geometrid fashion. If handled, the larva "folds up" and falls over on its side, refusing to move. The pupa is in a thin silk-cocoon; it is light golden-brown.
Sterrha demissaria columbia McD.  

1. Mid July - early September (August); moderate +.  
2. NE. U. S.; B. C.; Santa Monica Mts. (Calif.).

Synaxis cervinaria Pack.  

1. May - June; (probably a fall brood also); abundant.  
2. B. C.; Santa Monica Mts. (Calif.).  
3. Quercus, Populus, etc.  
5. Larvae were collected on poplar, in the Santa Monica Mts. of southern California. I only recall the pupal coloration, which was opaque cream-white; the antennal cases were deep red. It is a very striking pupa, somewhat reminiscent of the pupa of Sabulodes, described above.

Synaxis jubararia Hlst.  

1. Mid September - late October (early - mid October); abundant +.  
2. B. C.  
4. Adults are somewhat variable in maculation.

Triphosa affirmaria Wlk.  

1. September - March (mid September - late October) moderate.  
2. NE. U. S.; B. C.  
3. Prunus; Rhamnus ?

Triphosa californiata Pack.  

1. March - April; abundant.  
2. Santa Monica Mts. (Calif.).  
3.

Ultralcis latipennis Hlst.  

1. July 23; September 8; very scarce.  
2. B. C.
Venusia sp.

1. March - April (mid-late March); diurnal and nocturnal; abundant +.
2. 
3. 
4. Although often flying in the daytime, this species also comes abundantly to light.

Venusia obsoleta Swett

1. March - April; diurnal-nocturnal; scarce.
2. B.C.

Xanthorhoe defensaria Gn.

1. April - June; August - September (May); abundant.
2. B.C.
3. Alnus, Salix, Ribes, Acer, Stellaria, etc.

Xanthorhoe ferrugata Clerk.

1. July - September (probably has an earlier brood also); moderate.
2. NE. U.S.; B.C.
3. General feeder on low-growing plants.

Xanthorhoe pontiaria Tayl.

1. May - mid July; abundant.
2. B.C.

Xanthorhoe unagulata (see Euphyia)

Xystrota rubromarginaria Pack.

1. May - June; diurnal; moderate +.
2. NE. U.S.; B.C.
3. The moth flies along roadsides and in fields, on sunny days, frequently alighting on grass, ferns, or other low vegetation. It is alert and comparatively hard to approach. It is most active in the morning hours, or until early afternoon. Very rarely, it comes to light, although it probably is not nocturnal.
Zenophleps lignicolorata victoria Tayl. (4531 a)

1. Late August - September; moderate-
2. B. C.; Santa Monica Mts. (Calif.).

Possible Species

Chlorochlamys sp.

1. Look for: April - September (May - August).
4. The moths might be expected in two color phases: (1) soft, dull green, with cream lines (2) pinkish-brown, with cream lines. The latter is not due to discoloration of the green phase. (These remarks refer to a species occurring in Los Angeles County, California).
5. (G. 20): Larvae of Chlorochlamys sp. were collected on the flower heads of Eriogonum fasciculatum, at White Cliff Ranch, near Valyermo, Los Angeles County, California (July, 1961). The ground color of the mature larva is usually white or cream, though sometimes with a greenish tinge. Well-defined, dorsal, "W-marks" are present on abdominal segments one through five; these are rusty-brown. These two colors (white and rust-brown) are the same colors that the Eriogonum heads show in mid to late summer. The larva is very long and slender, without any lateral lobes or other peculiarities, that are often seen in Nemoria, Dichorda, Synchlora, and others in the Hemilethinae. Its head is cleft at the top. Before crawling, the larva begins to rapidly vibrate the front part of its body. The pupa is pale cream-tan, with a prominent middorsal line of black extending from head to cremaster; in a small cocoon of weak silk and debris.

Euchlaena tigrinaria Gn. (5005)

1. Look for: May - September.
2. NE. U. S.; B. C.
3. Quercus
140

Percnoptilota obstipata Fabr. (4535)
1. Look for: April - November (August - September).
2. NE. U. S.; Santa Monica Mts. (Calif.).
3. Polygonum, and other low plants.

Pero occidentalis Hlst. (5077)
1. Look for: May - August.
2. B. C.

Phengommataea edwardsata Hlst. (5083)
1. Look for: June - August (June - July).
2. B. C.

Scopula sideraria Hlst. (4154)
1. Look for: May - July.
2. B. C.
3. Polygonum, Alnus, etc.

Semiothisa californiaria Pack. (4694)
1. Look for: April - August.
2. B. C.; Santa Monica Mts. (Calif.).
3. Lotus scoparius in Santa Monica Mts.

Semiothisa setonana McD. (4715)
1. Look for: April - August.
2. B. C.

Sericosema sp.
1. Look for: May - August; diurnal and nocturnal.
2. Possibly Ceanothus.
3. Primarily diurnal, flying in grassy fields. When approached, it flies up vigorously but lands again, a short distance away (usually in grass, or on the ground). It often flies in company with the ringlet butterflies (Coenonympha).
Synchlora liquoraria Gn.

1. Look for: April - October (July - October).
2. B.C.; Santa Monica Mts. (Calif.).
3. Flowers of Eriogonum, Solidago, Artemisia, etc.

Superfamily URANIOIDEA
XV. Family EPIPLEMIDAE

Callizzia amorata Pack.

1. July - early August; moderate-.
2. NE. U.S.; B.C.
3. Lonicera.
4. The flight period was very short in 1962.
DISCUSSION

General Remarks on the Occurrence, Flight, and Habits of Moths in the Area Studied

The following factors have an effect on the numbers of moths coming to light: (a) The temperature (b) wind (c) humidity and precipitation (d) presence or absence of moonlight. Some moths fly on nights when the temperature drops as low as 38°F, but numbers of individuals coming to lights are low. Temperatures above 50°F are more favorable. Even a slight wind prevents many moths from flying; in a strong wind, few (if any) come to lights if the lights are in exposed or windy locations. If temperatures are mild, and there is no wind, many moths will be flying in light to moderate rain; if the rain is heavy and continuous, moth flight stops. On clear nights, when the moon is visible, the number of moths coming to light drops noticeably; during or near the full moon, if the sky is clear, hardly any moths come to light. An ideal night for moth-collecting (in this locality) could be characterized as follows: (a) temperature above 45°F. (b) no wind (c) high humidity and a cloudy sky, preferably without rain (or only fine, misty rain) (d) no moonlight.
"Peak nights" (with exceptionally large numbers of moths coming to light) are relatively uncommon here; for many days, or even weeks, only small numbers of moths come to light --- a few species each night, but usually with a considerable variety of species represented. This pattern prevails throughout the main season of moth-flight (i.e., mid February - early November). This contrasts with patterns of great fluctuation, which are often observed by collectors in many parts of the Southwest, and elsewhere in the United States. During 18 months of nearly continuous collecting here, I have yet to observe even a single night when overwhelming numbers of moths come to light, as sometimes happens in Arizona, southern California, or elsewhere. (There are, of course, observable peaks and lows occurring in regular succession, throughout the year, but the peaks are not often spectacular). Major emergences of moths were observed to follow this general pattern during the period of the survey. (Each new period indicates a major turn-over in species):

1. late fall - winter moths (mostly geometrids); November - early February (several emergences in this period)
2. a small but definite emergence of certain very early noctuids and geometrids; February - early March
3. mid March - mid April
4. May - June
5. July - early August
6. mid August - early September
7. late September - late October. The most spectacular of these emergences is probably
the large emergence in mid March - mid April; nearly all of the species appearing at that time are single-brooded species, which are often present in large numbers, for about two weeks within that period. Some of these will reach a peak in one or two nights, and diminish rapidly thereafter. The mid spring - mid summer period is a time when numerous species first make their appearance, but usually not in a short, spectacular emergence; some of these species will reappear in a later brood (late summer or early fall). In July - early August, quite a few single-brooded species that emerge only in mid summer are on the wing. A considerable change in species composition comes about mid to late August, and extends into early September; some of these species are single-brooded. Another striking change occurs in late September or early October, and continues until mid to late October; many of these species are single-brooded. With each major emergence after May - June, a number of the multiple-brooded species reappear as second and (in some cases), possibly third generations. Throughout the year, it was noticed that nearly all the single-brooded species (with the exception of winter moths) have very short and well-defined periods of flight, rarely lasting more than four weeks, and often limited to two weeks, or (sometimes) to only a few nights within a two-week period.

As has been observed everywhere, certain species show
definite habitat preferences. Even within the small area where this survey was conducted, there were quite a few cases where a certain species was taken only at one of the eight locations where lights were operating; the species in question would often be represented by several individuals coming to the same light, over a period of time, but not to any of the other lights in the area.

The following general remarks could be made about the families of moths in this area:

(1) The Sphingidae, Saturniidae, Amatidae, Lithosiidae, and Arctiidae are not well-represented (when compared with their occurrence further south or east).

(2) The Thyatiridae, Drepanidae, and Geometridae are very well-represented (when compared with their occurrence in other parts of the United States). The thyatirids are particularly well-represented, when it is noted that McDunnough (14) lists only 13 species for the entire United States.

(3) The Noctuidae is very well-represented; many of the species involved are very widespread (sometimes even Holarctic), but are often moderate to scarce in occurrence. Seventy-one, out of the total of 177 species collected, were represented by single records (or fewer than six records).

Some general observations were made concerning the habits
of moths when they are not at light. It was noted that many species of geometrids, when at rest in the daytime, are easily alarmed and quick to take wing; such species should not be confused with the ones that are truly diurnal in their flight-habits. Geometrids are easily recognized when flying by the relatively slow, weak (and often erratic or bouncing) flight, in which individual wing-beats are almost observable. (This is opposed to the flight of noctuids and other heavy-bodied moths, in which the usual flight is more rapid and direct, with the wings appearing almost as a blur). Most of the normally nocturnal noctuids are not easily alarmed to flight in the daytime; if they are, the flight is usually darting or rapid, and they are quick to settle again. A few genera in the Noctuidae, while primarily nocturnal, are easily alarmed to flight in the daytime (Catocala, Caenurgina, Synedoida, Autographa, Heliothis, etc.). Autographa, Heliothis, or Synedoida spp. are sometimes observed visiting flowers by day. Autographa spp. usually hover hummingbird style, while feeding from flowers. At night, most of the moths possessing tongues visit flowers, mud puddles, etc., as do butterflies in the daytime. In the early fall, when wild blackberries are over-ripe, and damaged by birds or hornets, nocturnal moths will visit them in considerable numbers, in order to feed upon the juices of the berries. Willow catkins are often visited by moths, on mild nights in early spring.
The general coolness of this climate (even in the summer) seems to slow down the growth rate of larvae in many species. As so many of the nights are clear and cool, it is possible that nocturnal larvae are restricted in their feeding activity. Whether or not this is true, I did observe that, in nearly all the species which I reared from eggs (indoors, at 68° - 70° F.), the growth rate was far more rapid than the growth rate of wild-collected larvae (which were sometimes as much as two months later in reaching the last instar). For this reason dates, attached to larvae reared from eggs, are of but slight value in helping one to determine when it is the correct time to search for the same larvae under natural conditions.

This paper represents only a start, in studies of the moths of one small area in western Oregon. If future studies of this nature are undertaken, it would be of particular interest to learn more about the coastal species, on a month-by-month basis. In what little material I have seen from coastal areas (Newport, Oregon), there were numerous species (and peculiar color forms) that were never collected here, and that were not duplicated by specimens from other parts of Oregon.

As a source of further information on the moths of Oregon (in general), the following collections should be consulted:

(1) The collection of the Entomology Department at Oregon
State University (Corvallis).

(2) The collection of the State Department of Agriculture (Salem). This moth collection is quite extensive, and contains numerous species not represented in the collection at Oregon State University.

For the names and addresses of other moth collectors in Oregon, see the current membership list of the Lepidopterists' Society.
SUMMARY

Three hundred sixty species of Macroheterocera, representing 15 families, were collected during the period of this survey (October, 1961 to February, 1963). There will be a few new records, for the period of March - May, 1963, which will be added later.

Two (or possibly three) noctuids, new to science, were discovered.

<table>
<thead>
<tr>
<th>Family</th>
<th>Total species collected</th>
<th>Known from British Columbia</th>
<th>Known from New York or locality in the N.E. States</th>
<th>Known from Santa Monica Mts. (S. Calif.)</th>
<th>Known from Europe or Asia on the early stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sphingidae</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2. Saturniidae</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>3. Amatidae</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4. Nolidae</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Lithosiidae</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6. Arctiidae</td>
<td>12</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>7. (Agaristidae)*</td>
<td>(3)</td>
<td>(2)</td>
<td>(3)</td>
<td>(0)</td>
<td>(0)</td>
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<tr>
<td>8. Noctuidae</td>
<td>177</td>
<td>140</td>
<td>62</td>
<td>55</td>
<td>9</td>
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<td>9. Notodontidae</td>
<td>11</td>
<td>11</td>
<td>7</td>
<td>1</td>
<td>0</td>
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<td>10. Liparidae</td>
<td>4</td>
<td>4</td>
<td>3</td>
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<td>11. Lasiocampidae</td>
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<td>3</td>
<td>2</td>
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</tr>
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<td>12. Thyatiridae</td>
<td>6</td>
<td>5</td>
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<td>0</td>
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<td>13. Drepanidae</td>
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<td>2</td>
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<td>14. Geometridae</td>
<td>130</td>
<td>110</td>
<td>55</td>
<td>21</td>
<td>7</td>
</tr>
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<td>15. Epiplemidae</td>
<td>1</td>
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<td>1</td>
<td>0</td>
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</table>

* Three species of agaristids are known from the Corvallis area, but none were collected during the survey.

The first column of the above table gives the families and their totals; these totals refer only to the numbers of species actually collected during the survey, and do not include the other species.
mentioned in the list (i.e., single-starred species, or species under the "Possible Species" heading). The next four columns give totals, for other areas, with which comparisons were made. (These areas are discussed on p. 37 - 38 of the Introduction to the Annotated List of Species). The last column lists the number of species (taken in the survey) for which I have information on the early stages.

The following list gives percentages (of the total number of species collected) for the four major families; the remaining 11 families are combined, following (5):

(1) Noctuidae (177 species) ------ 49% (approx.)
(2) Geometridae (130 species) ------ 36%
(3) Arctiidae (12 species) ------ 3%
(4) Notodontidae (11 species) ------ 3%
(5) Other eleven families combined (30 species) ------ 8%
BIBLIOGRAPHY


