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HOUSEHOLD INSECTS.

BY WM. LOCHHEAD, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Who is not interested in the insects that persist in living in our homes as unwelcome guests? Some of these intruders are blood-thirsty creatures, and torment the bodies of their helpless hosts; some confine their attentions to the carpets, woollens, and upholstery, and others are partial to the pantry, but all are heartily hated by the industrious housewife. In a short popular article such as this one, only brief notes will be given regarding the habits of some of the most important house insects, and only the best practical treatment will be indicated. The writer would refer those readers who desire to know more about these insects to the Reports of the Ontario Entomological Society, and to the Bulletins of the Bureau of Entomology at Washington.

For convenience of consideration, household insects may be grouped as follows:

1. Those molesting and annoying the inmates of the house: House-flies, Mosquitoes, Fleas, and Bed-bugs.

2. Those injuring the carpets, woollens and upholstery: Carpet-beetles and Clothes-moths.

3. Those feeding on food products in the pantry: Larder-beetles, Ham-mites, Cheese-skippers, Meal-worms, Flour-beetles and Flour-moths, Cockroaches, and House-ants.

HOUSE-FLIES.—There are several species of these ubiquitous creatures. The common House-fly (*Musca domestica*) may annoy, but it never bites us. The Stable-fly (*Stomoxys calcitrans*) is a frequent visitor to our houses, more especially just before rain, and torments us by its sharp bites. Another species is the Blue-bottle or Blow-fly, but the House-fly is by far the most abundant form. The eggs of this species are deposited mainly on horse-manure about stables. A generation occupies from 10 to 14 days, depending on the temperature, the egg stage lasting about 24 hours, the larval or maggot stage from five to seven days, and the pupal stage from five to seven days. As each female lays over 100 eggs, it will

readily be seen how a few flies wintering over may give rise to millions of flies in late summer.

The prompt treatment of horse-manure with lime in special pits should be insisted upon in towns and cities, but where flies are abundant we must continue to use screens and sticky fly-paper to mitigate the annoyance.

MOSQUITOES.—Here again, there are several species. The most common form is perhaps *Culex pungens*. The eggs are laid on the surface of the standing water of ponds, marshes and rain-barrels; the wrigglers escape from the eggs in about 24 hours, and transform to pupæ in 10 or 12 days, and the adult mosquitoes make their appearance two or three days after, a generation occupying, therefore, 14 to 16 days during warm weather. As in the case of the house fly, the winter is passed in the adult stage. It is now known that one species of mosquito is the cause of malaria and another of yellow-fever.

Careful attention to water-barrels and the drainage of ponds and marshes is absolutely necessary if freedom from mosquito attacks is desired. A little kerosene poured on stagnant water containing wrigglers will kill them.

FLEAS.—The most common flea is the Cat- or Dog-flea *(Pulex serraticeps)* (Fig. 4). These are sometimes very abundant in rooms occupied by dogs and cats. The eggs are deposited loosely among the hairs of these animals, and often drop to the floor or matting, where the larvæ develop, especially if the mats are undisturbed and the floors are not swept. Liberal dusting of the infested animals and floors with pyrethrum insect powder, the renewal of the mats for the dogs, and the burning of the infested mats, will control fleas.

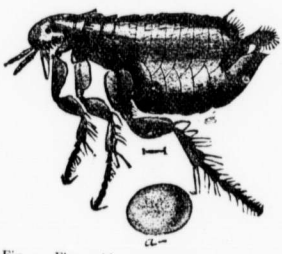

Fig. 4.—Flea and its egg, greatly magnified.

BED-BUGS.—These disgusting insects *(Cimex lectularia)* sometimes get into the houses of the most careful housekeepers, when travellers are entertained. The cheaper hotels in many parts of the west are often badly infested, and the bedrooms have a decided "buggy" odour. These festive insects hide in the daytime in the cracks of the furniture and walls,

but at night they are active. The eggs are white, and are laid in batches in cracks of the woodwork of the room.

Wooden beds should be discarded, and benzine should be carefully applied at intervals to all the crevices, small as well as large.

CARPET-BEETLES.—There are two species, the Buffalo Carpet-beetle (*Anthrenus scrophulariæ*) (Fig. 5) and the Black Carpet beetle (*Attagenus piceus*). The former has become very abundant in many sections of the province, and considerable damage has been reported. The grub, or larva, does the harm, and is readily recognized by the stiff brown hairs that clothe the body. Its length is about one-quarter inch. Its habit is to cut long slits in the carpet, working along the cracks in the floor.

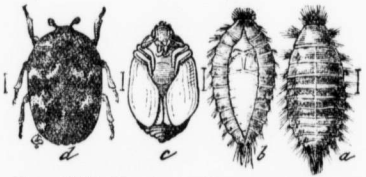

Fig. 5.—Buffalo Carpet-beetle, all stages, much magnified.

The adult is a small, rather pretty beetle, about one-fifth of an inch in length. The colour is black, mottled with red and white markings. Many of the adults appear in the fall, and pass the winter as adults, while others appear in the spring. In heated houses the beetles continue to appear throughout the winter. In spring thousands of the beetles may frequently be observed on the blossoms of Spiræas and many other plants; and no doubt many adults fly into houses from these plants through the open windows.

To rid an infested house of these beetles, it is necessary to take up the carpets, thoroughly beat them out of doors, and to spray them with benzine. The floors should be swept carefully, the cracks dusted out, sprayed with benzine, and filled up with putty or plaster of Paris. Since damage is done mainly along the borders of the rooms, the carpets should be examined from time to time. It is advisable to replace the carpets with rugs, as the latter are easily taken up and beaten.

The Black Carpet-beetle is frequently met with. The larva has a long tuft at the hind end of the body, and is readily distinguished from the Buffalo Carpet-beetle. The adult is a small, oval, black beetle, and has been often noted as a pest in museums and flour-mills, in addition to dwelling-houses.

The treatment recommended for the control of the Buffalo Carpet-beetle will answer for the Black Carpet-beetle.

CLOTHES-MOTHS.—There are three species that are more or less common, viz., the Case-bearing Clothes-moth *(Tinea pellionella)* (Fig. 6),

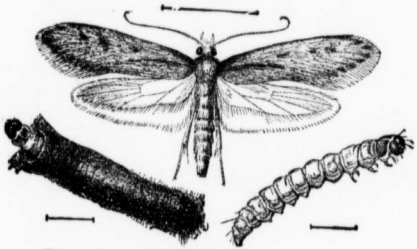

Fig. 6.—Case-bearing Clothes-moth, much magnified.

the Naked Clothes-moth *(Tinea biselliella)*, and the Tube-building Clothes-moth *(Tinea tapetzella)*. The habits of the larvæ of these three species are quite characteristic, and their English names, as given above, describe fairly well their mode of working.

The adults of Clothes moths are tiny moths, not the large "millers" that fly into our houses in the summer.

As a rule, only those articles of wear are injured that are left undisturbed for a time. Consequently clothes that are hung away in closets should be taken out frequently and beaten and exposed to the air out of doors for a few hours. In the spring winter clothing, furs, blankets, etc., should be well brushed and aired, then stored away in paper bags or other suitable pest-proof boxes, care being taken to close tightly the mouths of the bags by the use of paste.

With upholstery it may be necessary occasionally to spray carefully with benzine, and to air for several hours.

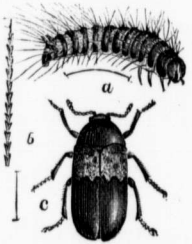

Fig. 7.—Larder-beetle—*a* grub; *b* hair; *c* beetle—all much magnified.

LARDER-BEETLES.—*(Dermestes lardarius)* (Fig. 7). These are dark-brown beetles, with a lighter band across the base of the wing-covers. The larvæ are dark,

hairy grubs, about one-third inch long. They are often found in museums, and sometimes overrun pantries and rooms containing meat, cheese and other animal products.

When a room becomes badly infested, it should be cleared of its contents, and thoroughly treated with either benzine spray or the fumes of carbon bisulphide, when there is no fire or light near. Occasional treatment in this way will keep the room practically free from these disagreeable beetles.

CHEESE, HAM AND FLOUR MITES.—There are two common species of mites infesting the pantry, viz.: *Tyroglyphus longior* and *Tyroglyphus siro*. (Fig. 8.) These pests breed very rapidly, and are especially fond of cheese. They can remain for months in a dormant condition as hard-shelled creatures, and under favourable conditions return to a state of activity. It is believed that it is while they are in this torpid state they are carried to new places and new food supplies.

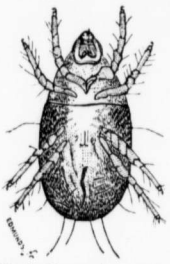

Fig. 8.—Cheese-mite, greatly magnified.

Complete extermination of these mites is difficult, but if the infested room be thoroughly cleaned, and given a careful fumigation with sulphur or carbon bisulphide, little headway can be made by these creatures. Infested food products should be destroyed when first observed.

FLOUR-BEETLES, FLOUR-MOTHS AND MEAL-WORMS.—Some Meal-worms are grubs of certain beetles, while others are caterpillars of certain moths. The most common forms are the Confused Flour-beetle *(Tribolium confusum)*, the Yellow Meal-worm *(Tenebrio molitor)*, the Meal Snout-moth *(Pyralis farinalis)*, the Saw-toothed Grain-beetle *(Silvanus surinamensis)*, and the Cadelle *(Tenebrioides mauritanicus)*, the last two species being most destructive in stored grain.

The most effective treatment of flour and meal pests is fumigation with carbon bisulphide. Half a cupful poured into a saucer placed on the top of the flour will suffice for a barrel, if the whole is covered tightly and left for a day or two. It must be borne in mind, however, that it is dangerous to bring a light near the vapour of carbon bisulphide, and great care should be exercised.

TINY RED ANTS are frequently great nuisances about dwellings. They have "the faculty of getting into articles of food, particularly sugars, syrups, and other sweets" As they nest in the walls or beneath the flooring, it is sometimes difficult to eradicate them, but even inaccessible nests may be reached by the injection of carbon bisulphide. Sponges saturated with a sugar solution will attract ants by the dozens, and have been used successfully as traps. When full of ants the sponges are dropped into boiling water, and then replaced, and this done until the colony is exterminated.

ANOTHER GEOMETRID TANGLE.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

In a paper written not long since (CAN. ENT., Vol. XXXVII., p. 344) I stated that in examining the type of Dr. Hulst's genus Talledega (*Lobophora montanata*, Pack.) the male was possessed of characters which would place it in the genus *Lobophora*, Curtis, and that in consequence the genus *Talledega* would fall. I did not know then that two species, belonging to different genera, were passing under the name of *montanata*, Pack., but such is the fact. *Montanata* was described by Dr. Packard in 1874 from specimens taken in Colorado, and he gives an excellent plate with his redescription of it in Mono. Geom., 1876, pl. 9, fig. 21. With these he mingled specimens from Amherst, Mass., Quebec and Montreal, Can., to which he refers at the close of his description thus: "The specimens from Quebec, and Amherst, Mass., differ from the Coloradean examples in being whiter, with less of a flesh-coloured tint, and with the lines less distinct on the hind wings." Now, this Eastern form, as he considered it, I take quite frequently in the Catskill Mts., and an examination of it led me to believe Dr. Hulst was in error when he defined the genus *Talledega*. This is not the case. *Talledega* stands with the true *montanata*, Pack., as its type, and the associated Eastern species goes into the genus *Lobophora*, Curtis. What species is it? I believe it to be the *inequaliata* of Packard, described and figured also (Mono. Geom., 1876, p. 180, pl. 9, fig. 20) from a single female, taken by Mr. H. K. Morrison on Long Island, and from that locality I also have one ♂ specimen. The plate is an excellent one of this form, but the type is lost so far as I can discover. It is not in the Packard coll. at Cambridge—but Dr. Hulst has decided that *inequaliata*, Pack., is synonymous with *nivigerata*, Walk., which, if correct, would make THIS species the *nivigerata*, Walk., and NOT the small species from California, one-third less in size and not

corresponding with either plate or description of *inequaliata*, now bearing the name of *Philopsia nivigerata*, so called by Dr. Hulst. I have not found any specimens of the latter taken outside California. Certainly it could not have been captured on Long Island, nor at St. Martin's Falls, Hudson's Bay Terr., whence Walker's type came. If I am correct in this (and only by comparison with Walker's type can this be proven) then our California species has never been named or described. If I am mistaken, then what I call *inequaliata* remains a good species in the genus *Lobophora*, Curtis.

Through the kindness of Dr. Wm. Barnes, who sent me his material in this group, I have been enabled to reach these premises and others. Among it were specimens of *T. montanata*, var. *magnolatoidata*, Dyar, so labelled, I think by him, from Arrowhead Lake, Man. In describing it (Proc. U. S. Nat. Museum, Vol. XXVII., p. 889) he says: "It differs from the eastern *montanata* in the much darker colours, etc." Disassociated from the eastern form, which belongs to another genus, and placed with its real relatives from Colorado and California, these contrasts vanish, and, in my opinion, it does not represent even a geographical race. Specimens from Palo Alto, Cal., are darker in colour and the lines more distinct, but in this family such forms appear in every group, and if named at all, should represent a fixed variation, constant in some locality, due to climate or habitat. With these also were specimens of *Talledega tabulenta*, so labelled from Cartwright, Man. His type came from Alert Island, Alaska. These may constitute a good species, but I cannot separate them from our eastern *Lobophora*, of which I have 18 males and 6 females before me. In any event they belong to the genus *Lobophora*, the males having hair pencil on hind tibia. There is also a single ♀ from Victoria, B. C., which may be the Alaskan species. The Hulst type is in such poor condition its markings cannot be compared, but a male specimen is necessary to help settle that point. I would be glad to receive from collectors in Manitoba and B. C. any of this group in both sexes for further study, and I will not confiscate their material without consent. I hope they will second my endeavours to straighten out these complexities, and this is my excuse for presenting some theories now, instead of definite findings later.

It is not impossible that Walker's type of *nivigerata* may be conspecific with the Alaskan, Manitoban or British Columbian species. Who can tell?

(To be continued.)

GUELPH BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The fifth regular meeting of the Guelph Branch was held in the Agricultural College on Wednesday evening, January 10th, 1906, with 19 members and 3 visitors in attendance.

Mr. T. J. Moore gave a very interesting talk on the habits and life-histories of several species of Lepidoptera. He exhibited many very fine specimens in different stages of development.

Mr. D. Jones presented notes on several species of Caddice-flies taken at Guelph in the summer of 1905. One of the species was new to science, and will be described by Mr. Nathan Banks, of Washington.

Mr. G. E. Sanders presented notes on the Cotton moth (*Aletia argillacea*) taken at Guelph in the summer of 1905. It was found after four or five days of strong wind from the south. It has not been known to breed north of the Gulf States.

Mr. C. R. Klinck presented notes on some Pseudoscorpions he found last summer under a board in a poultry-house. These arachnids feed on small insects and mites.

Prof. Sherman announced to the club that the Kilman collection of beetles and other insects had been purchased by the College.

Mr. M. Baker discussed three greenhouse insects, viz.: White fly, Black aphis and Green aphis. Specimens in all stages of their life-history were exhibited under the microscope for examination by the members. Affected plants were also exhibited, and methods for combating the pests were briefly discussed.

The sixth regular meeting was held in the Agricultural College on Wednesday evening, Jan. 24th, with 17 members and two visitors in attendance.

Mr. J. R. Dickson discussed the 17-year Locust. He brought out very many interesting facts about its life-history and habits. This insect has not yet been recorded in Ontario, although quite common in New York and Michigan.

Mr. T. D. Jarvis presented notes on a species of Lecanium attacking the ironwood. This species is probably more abundant than any other in Ontario. Mr. H. A. Bond presented notes on the Two-spotted Lady-beetle. He found several specimens in the nest of a mud wasp.

A brief review of the current literature was given by Mr. B. Barlow.

T. D. JARVIS, Secretary.

TWO NEW SCALE-INSECTS.

BY R. S. WOGLUM, RALEIGH, N. C.

While making a study of the Coccidæ representing the genus Aspidiotus (*sens. latiss.*) in the collection of Cornell University, I found two undescribed species; both are from the United States. These species are characterized as follows:

Aspidiotus oxycoccus, n. sp. (Fig. 9.)

Scale.—The scale of the female is almost flat, and very variable in shape. It is usually circular, or nearly so, but may be elongate with sides parallel. The scales on the upper surface of the leaves are black; those on the under surface are dirty gray to dark brown, usually the lighter

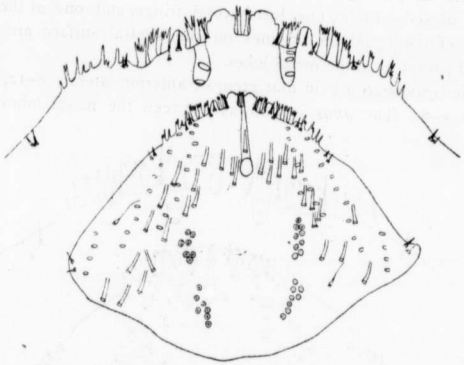

Fig. 9.—Aspidiotus oxycoccus—Pygidium and Anal Fringe.

colour. Exuviæ are central to sub-central. The younger scales have the exuviæ marked by a small brown or blackish nipple-shaped process, which often disappears in the older scales, leaving the yellowish-orange exuviæ exposed. The secretion covering the remainder of the exuviæ is of a dirty gray colour, and usually presents a marked contrast to that part of the scale immediately surrounding it. The scale of the male is similar to that of the female in size and colour. It is elongate with sides parallel.

Female.—The female is dull brown, broadly pyriform, about .47 mm. broad by .57 mm. long. The *pygidium* is furnished with two pairs of lobes.

The mesal lobes are the largest, and are parallel, widely separated, broadly notched once on both outer and inner sides, with ends rounded, and slightly narrowed at the base, 10–12 μ broad by 12–14 μ long. The lobes of the second pair are small, entire or slightly notched on outer side. *Incisions* are wanting. The *plates* are slightly shorter than the mesal lobes, and are situated as follows: Two between mesal lobes, two between first and second lobes, 6–8 laterad of second lobe. The interlobular plates and the first three laterad of the second lobe are deeply and similarly branched; the remainder are simple or irregularly branched. The *spines* are small, shorter than the lobes. On the dorsal surface they are situated as follows: One at the outer part of the base of the mesal lobes, one at the base of the second lobe, one just beyond third plate laterad of second lobe, one just beyond fringe, and one at the anterior margin of the pygidium. Spines on the ventral surface are similarly situated; wanting at the mesal lobes.

The *spinnerets* are in four groups; anterior laterals 9–12, posterior laterals 6–8. The *anus* is midway between the mesal lobes and the

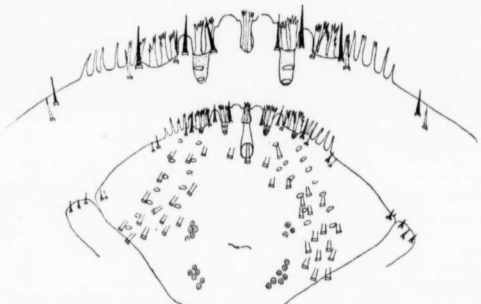

Fig. 10.—Aspidiotus pseudospinosus—Pygidium and Anal Fringe.

posterior lateral spinnerets, or about 50 μ from the mesal lobes. The *vaginal opening* is between the posterior lateral spinnerets. The *pores* are in three rows on either side of pygidium. *Dorsal tubular spinnerets* are numerous, elongated, about 15–20 on either side of pygidium. The body of the insect is fringed at the sides with small spines.

Habitat.—On Cranberry. Collected by J. B. Smith in 1891.

Aspidiotus pseudospinosus, n. sp. (Fig. 10)

Scale.—The scale of the female is circular, or somewhat oval, slightly convex, 1.5–2 mm. in diameter; covered by a brown fungus.

Female.—The female is brownish-yellow, nearly circular, about .58 mm. broad by .6 mm. long. The *pygidium* is furnished with two pairs of lobes. The mesal lobes are large, widely separated (5–6 μ), parallel, distinctly notched on both outer and inner sides, rounded at end, about 12–14 μ broad by 12–13 μ long. Lobes of the second pair are much smaller than the mesal lobes, entire or slightly notched on outer side. *Incisions* are wanting. *Plates* are well developed They are situated as follows: Two between the mesal lobes, two between the first and second lobes, and six to ten laterad of the second lobe. The interlobular plates and the first three laterad of the second lobe are branched; the remainder are simple, unbranched. *Spines* are large. On the dorsal surface they are situated as follows: One at the outer side of the base of the mesal lobe, one at the base of the second lobe, one just beyond the third plate laterad of the second lobe, one just beyond the last plate, and one at the anterior border of the pygidium. The first three spines are as long as or longer than the plates. Spines on the ventral surface are similarly situated; wanting at the mesal lobes. *Spinnerets* are in four groups; anterior laterals 5–7, posterior laterals 3–6. The *anus* is large, and situated at the caudal end of the pygidium, about 28–33 μ from base of mesal lobes. The *vaginal opening* is between anterior and posterior lateral groups of spinnerets. The *pores* are large, in two rows on each side of pygidium; 6–10 pores in each row. *Dorsal tubular spinnerets* are present, short, irregular, or seldom in two rows on each side, about 15–20 on each side.

This species is closely related to *A. spinosus*, Comst., from which it differs mainly by the presence of dorsal tubular spinnerets. The mesal lobes are not prolonged inward as in *spinosus*, and are more widely separated (2–3 μ in *spinosus*). The plates also differ.

Habitat.—The specimens were taken from Saw Palmetto, collected in Florida by W. H. Field in 1882, and since have been in the collection of the Entomological Department of Cornell University.

Types of the two above described species are in the Entomological Department of Cornell University, and the U. S National Museum.

NEW LEPIDOPTERA.

BY ANDREW GRAY WEEKS, JR., BOSTON.

Adelpha Oronoco, sp., nov.

Habitat: Suapure, Venezuela. Expanse, 1.60 inches.

Head and thorax dark brown above, with a slight white dot at base of each antenna; below nearly white. Palpi black above, white below. Abdomen dark brown above, below nearly white, with a dusting of tawny scales on the last two segments. Antennæ dark brown.

The upper side of both wings has the black linings or threads, the brown ground colour, and tawny markings so prevalent in many species of this genus.

Upper side of fore wing rich brown. Hind margin slightly dentated. From the centre of costa a broad tawny band extends downwards to centre of inner margin parallel to hind margin. This band is the prominent feature of the upper surface. The portion of this band in the interspace at the end of the discoidal space suffuses outwards a sixteenth inch towards hind margin. Above the end of this, in apical area, are two tawny spots. These spots might be considered a portion of the band but broken from it by an area of the ground colour. The basal half of the wing, within the tawny band, is rich brown excepting four black lines which cross the discoidal space in pairs, and a slight dash of black close to base. This dash is repeated in less degree in the next lower interspace. The pair of black lines next beyond this dash enclose a small space of dark tawny; these lines are repeated in the first submedian interspace.

The upper side of lower wing is of the same ground colour, crossed by a very prominent band of white, an extension of the tawny band of the fore wing, and tapering somewhat as it approaches anal angle. The outer edge of this band at its upper portion is lightly dusted with tawny scales. The marginal area outside of this band is rich brown, crossed by three bands or lines of black, parallel to one another and following the dentated contour of the hind margin. They join at the anal angle, where there is a prominent tawny spot. The inner marginal area is of the ground colour.

On the under side of fore wing the tawny band of upper surface is nearly white, with suffusions of tawny. The discoidal space is white, crossed by two heavy bands of tawny, edged with black. The costa is tawny. Subcostal space near base is white. The hind margin is slightly edged with black, within which is a tawny marginal band, becoming white in the two lower interspaces. Within this, at the apex, are two indistinct

whitish spots, one below the other, and there are three more prominent white spots in the three lower interspaces. At the apex, nearer the base than these two whitish spots, are two more larger ones, representing the two tawny spots of the upper surface. The general ground colour is blackish, with tawny suffusions.

The markings of under side of hind wing are the same in location and limitation as on the upper surface. The general colouring, however, is much lighter. The white band of upper surface is repeated, showing no suffusion from surrounding areas. Nearer the base is a tawny band running from costa to anal angle. This band is edged with black. Nearer the base is a white band which runs from costa downwards along inner margin, edged with tawny black. The hind marginal area is brown, with a double row of interspacial white lines near the margin, and a band of tawny, edged with black on its basal side, extends from upper angle to anal angle, where it meets the tawny band first mentioned. At their junction they broaden somewhat into a bright tawny anal spot.

This species is in the same group as, and resembles closely, *A. æthalia*, Feld., and *A. thesprotia*, Feld.

Mesene Rochesteri, sp. nov.

Habitat: Suapure, Venezuela. Expanse, .90 inch.

Head black. Antennæ black, with minute white annulations at base of each joint. Club black, with orange tip. Thorax black above, with orange hairs; beneath grayish. Abdomen orange above, beneath grayish. Legs orange above, beneath grayish.

Upper side of fore wing orange. Hind margin, apical area and costa black. This black border is nearly one quarter inch broad, covering more than half the wing area.

Upper side of hind wing orange of same shade as fore wing. The hind margin has a broad black border, the same width as on fore wing. Costa and inner margin are orange.

Under side of fore wing the same as upper surface.

Under side of hind wing the same as upper surface, except that the black border contains two white spots, one near the anal angle, the other midway to upper angle.

Variations.—In the ten specimens in my collection, there is scarcely any variation in the width or density of the black border. In some specimens the fore wing has a white spot at the inner edge of the hind marginal black border midway from apex to lower angle. The two white

spots on under side of hind wing sometimes show on the upper surface. There is also a third spot between them. It is quite probable that in a large series of specimens these white spots would vary in number and development.

It bears a close resemblance to *M. celetes*, Bates, the black border being, however, much broader.

Nymphidium Blakei, sp. nov.

Habitat: Suapure, Venezuela. Expanse, 1.00 inch.

Head, thorax and abdomen above black, beneath white. Antennæ black, with white annulations at base of each joint. Club black above, white beneath. Legs white.

Fore wing above white, excepting costa, apex and hind margin. Costa black. Apical area black. Hind margin black, with a white thread just within the margin. Within this thread is a series of interspacial semicircles of white, which, with the white marginal thread, gives the appearance of a series of interspacial white circles extending from apex to lower angle. At the extreme edge of the hind margin, just below the apex, is a white dot, and another opposite the end of the first submedian interspace.

Upper side of hind wing the same as fore wing, except that the costa is white, and the two hind marginal spots are absent.

The black hind marginal border of both wings, and the black costal border of fore wing, are one-sixteenth inch wide.

Under side of fore wing is the same as upper surface, except that the two hind marginal white spots are more prominent, and there is a third one at the end of the lowest submedian interspace.

The under side of hind wing is the same as upper surface, except that the three hind marginal spots of the under side of fore wing are repeated.

This species is not in the larger collections of this country, nor in the British Museum.

Taken in September, 1899.

Ithomia Drogheda, sp. nov.

Habitat: Suapure, Venezuela. Expanse, 2.50 inches.

Head black, with a white circle around the eyes. Antennæ black. Club tawny. Thorax above black, with a prominent lemon-yellow spot at the junction with the costa of fore wings; beneath lemon-yellow.

Abdomen nearly black above, with four lemon-yellow dots on the lower segments; beneath lemon-yellow. Legs black above, white beneath.

Upper side of fore wing transparent, with tawny, black and yellow markings. Costa black. Discoidal space transparent, with dusting of tawny scales towards the base, and a suggestion of a black spot near the centre. A heavy dusting of black scales extends from the costa downwards across the end of the discoidal space, suffusing to hind margin along the median nervure, and also along the first submedian nervule, somewhat tawny near the margin. Apical area black. Between the apical area and the band or dusting of black scales above noted, the space is transparent, heavily dusted with brown scales near the costa. The space below median nervure to the hind margin is black, with tawny scales along the nervure.

The upper side of hind wing has the same ground colouring. The upper half of the wing, including the discoidal space and its immediate surroundings, is transparent, the nervures and nervules being heavily dusted with lemon-yellow. The edges of this transparent area are black, the lower portion forming a band across the wing from the centre of inner margin nearly to the upper angle. This transparent area shows a tendency to extend downwards to hind margin in the first submedian interspace. Below this the area to hind margin is tawny. The hind margin has a generous black border, wavy on its basal edge.

The under side of both wings is the same as upper surfaces, the dusting of lemon-yellow scales being more marked. At the apex of the fore wing are four interspacial white spots, and in the black border of the hind margin of the lower wing is a series of prominent interspacial white spots.

Variations.—This species varies greatly in the density and suffusions of its markings. The transparent area of the lower wing in some specimens extends downwards to hind margin, cutting off the black band and the tawny area at the first submedian nervule. The white spots at apex of the under side of fore wing are at times entirely wanting.

Euselasia Howlandi, sp. nov.

Habitat: Suapure, Venezuela. Expanse, 1.12 inches.

Head and abdomen mouse colour. Palpi white. Thorax mouse colour above, with a few lighter hairs; beneath gray. Antennæ mouse

colour, with minute white annulations at base of each joint. Club mouse colour, tipped with brown. Legs tawny.

Upper side of fore wing mouse colour, excepting an area within a line drawn from base along median nervure to a point one quarter inch from hind margin, thence downward to inner margin, parallel to hind margin. This area, covering one-third of the total wing area, is light gray, dusted with darker scales near the base. The hind margin has a slight mouse-coloured fringe, becoming white near lower angle.

Upper side of hind wing dark mouse colour, the central area very slightly lighter. Hind margin dentated, and with a white fringe. Along the edge is a dark line slightly touched with tawny on basal side, lower margin grayish white.

Under side of fore wing very light gray, with tawny markings. A prominent tawny line runs from costa downwards across the centre of the discoidal space to the junction of the lower submedian nervule, somewhat concaved, thence straight to inner margin. Beyond this line, nearer apex, is a similar line running from costa downwards across the end of the discoidal space nearly to inner margin. A third line runs from costa to inner margin one-sixteenth inch from hind margin. The interspaces between this line and the line next nearer the base are heavily dashed with tawny, from a line of spots from the costa downward. The central spot of this series, in interspace above the second submedian nervule, is nearly absent. The margin is lined with tawny, the space to the first marginal line being somewhat darker, and dashed with white scales in the interspaces.

Under side of hind wing very nearly duplicates the under side of fore wing in general appearance. The tawny line first above noted in fore wing is continued, starting on the costa near its base, and running downwards across the centre of the discoidal space, and then disappearing. The next tawny line runs downwards from the costa across the end of the discoidal space to the first submedian nervule, where it turns at a right angle and runs to the inner margin. This line is somewhat dentated in the interspaces. The area outside of this, to the marginal line, is very light gray, with a series of interspacial tawny dustings, a continuance of the same in fore wing. The hind margin has a white fringe, within which is a tawny line, and within that a fine, well-developed black thread, following the dentated contour of the margin.

TRICHOGRAMMA PRETIOSA, RILEY: COLOUR VARIATION IN THE ADULT, WITH DESCRIPTION OF A NEW VARIETY.

BY A. ARSENE GIRAULT, WASHINGTON, D. C.

In the original description of this insect,* Dr. Riley says that on account of its uniform pale yellow colour it is easily distinguished from *Trichogramma minutum*, Riley, which is black. Unfortunately, this does not hold.† Out of the hundreds of specimens of *pretiosa* reared during the entire season of 1904, at Paris, Texas, from the eggs of *Heliothis obsoleta*, Fabricius, there appeared from a lot of host eggs on Sept. 20th a number of dark individuals, which could easily have been mistaken for a distinct species. Previous to this, all of the individuals had been normally coloured.

The origin and subsequent history of this variety is as follows:

On the 10th, 11th and 12th of September a generation of 11 males and 22 females, all normally coloured, emerged in confinement from the host eggs on tomato leaves brought in from the field. Sixty-four eggs from moths in confinement were then supplied them on Sept. 11th, and freely parasitized. As a result, there emerged from these parasitized eggs a second generation of 53 males and 58 females, plus 11.

This second generation varied considerably, some of the individuals were very dark, others wholly black. The variation consisted in very light brown to a deep black, and gradations were present from one to the other. In the latter, the black first appeared in the abdomen, and as the variation became greater extended to the thorax and head, until the whole body became black. In this generation the variety was present in the proportion of 1 to 7. Both the typical specimens and the variety were freely copulating with each other.

The adults of this second generation were supplied with 48 fertile host eggs from moths kept in confinement, on Sept. 21st. Oviposition took place, and as a result a third generation began to appear on Sept. 30th. This generation consisted of 47 adults, of which 7 males and 7 females were the black variety.

*CANADIAN ENT., 1879, XI., pp. 161-162.

†Dyar, 1893, CANADIAN ENT., XXV., p. 256, mentioned that the males of *pretiosa* are often black on the dorsum of the abdomen.

In turn, the third generation was allowed to parasitize numerous hosts from moths in confinement during the 1st of October. As formerly, the dark and light specimens were intermating. The resulting fourth generation emerged on Oct. 14th, consisting of 25 specimens, including 5 males and 7 females of the black variety.

Eight males and 16 females of the fourth generation parasitized on Oct. 14th hosts from the field. The resulting fifth successive generation began to appear on Nov. 2nd, when a single specimen emerged. Others emerged at intervals up to Nov. 15th. There were 4 females, 3 males, plus 7, all the dark variety. Three females and two of the males were totally black, one male dark, and the remaining specimens were dusky.

A supplementary fifth generation was obtained from a single black female of the fourth generation, which parasitized five hosts on Oct. 14th. The 9 descendants of this black variety were all black; there were 5 males and 4 females. They appeared on Nov. 7, and later.

Because of the lateness of the season, the parasites began to hibernate, and the work was discontinued. As it became colder the proportion of black individuals increased.

During October and early November *pretiosa* reared from hosts collected from the leaves of corn, included many dark specimens. In fact, the majority were moderately dark, a few entirely black, while many were gradations, having the abdomen only black. Three specimens issuing on Nov. 4th from a single host egg from the field, were similar in colour, the head and thorax yellow, the abdomen black. Thus the variation was not confined to the individuals kept in confinement. It appeared to be quite general. The variety may be named as follows:

Trichogramma pretiosa, Riley, var. *nigra*, n. var.

Like the type. The whole body uniformly black, excepting the antennæ, eyes, legs and wings. Gradating specimens of all degrees present.

From many males and females reared from the eggs of *Heliothis obsoleta*, Fabricius, at Paris, Texas, during September, October, and early November, 1904, in connection with the Cotton Bollworm Investigations, Bureau of Entomology, U. S. Department of Agriculture. Preserved specimens in balsam, therefore no type.

THE COCCID GENUS EULECANIUM.

BY T. D. A. COCKERELL, BOULDER, COLO.

Some years ago I attempted to make tables to separate the species of *Eulecanium*. The attempt was not wholly successful; partly on account of the difficulty of the subject, and partly because there are no doubt more names than species in this genus, and the first step should probably be to reduce a number to the synonymy. Certain characters of undoubted value could not be used because they were not known for many species; for example, the characters derived from the males and the larvæ. The minute characters described by Mr. Thro, of Cornell University, are in the same case; but their value is rather uncertain for closely-allied forms. The forms separated by Mr. Thro were nearly all widely separated otherwise—in fact, of different genera as we now understand them—and hence it remains to apply his test to a more difficult and closely-allied series.

The tables are presented herewith, not because they are perfectly safe guides to the identity of the species, but rather because of their value as indicating groupings, and suggesting the lines of future work. They will at any rate save some trouble in going through descriptions. When a name occurs twice, the species is variable.

(1.) Long. 10–11½, lat. 6–9½ mm.

(a) Larger as a rule, dark red-brown, with white powder; antennæ 7-jointed .... *caryæ.*

(b) Not over 10 mm. long; brown, sometimes varied with yellow; antennæ 6-jointed .... *aceris.*

(2.) Long. 8–9 mm.

(a) Convex; antennæ 6-jointed.

(i) Legs rather slender ..... *pyri.*

(ii) Legs short and robust; scale reddish-brown, sometimes mottled with yellow (*pyri* is darker and not mottled).

(b) Tibia equal to tarsus, fide Signoret ..... *aceris.*

(bb) Tibia longer ..... *capreæ.*

(*aceris* and *capreæ* are no doubt one species.)

The distinction of *pyri* and *aceris* is further confirmed by the males:

(i) ♂ yellow, with wide brownish thoracic band ..... *pyri.*

(ii) ♂ light reddish-brown, with darker band on thorax; abdomen, antennæ and legs yellowish ..... *aceris.*

(aa) Less convex; antennæ 7- or 8-jointed.

(i) Scale with two prominent tubercles; antennæ 8-jointed ..... *Cockerelli.*

(ii) Scale without such tubercles.

(b) Antennæ 7-jointed; scale alt. 2½–3 mm ... *mori.*

(bb) Antennæ 8-jointed.

(c) Joints 3, 4, 5 nearly equal ..... *genistæ.*

(cc) Joint 3 longer than 4, and this longer than 5.

(d) 5, 6, 7 nearly equal; scale narrower, 3 mm. wide; second antennal joint with one hair only, this very long ..... *elongatum.*

(dd) 6 longer than 7, and may be longer than 5; scale broader, 4½ mm. wide; second antennal joint with two long hairs.... *magnoliarum.*

(3.) Long. 7 mm.

(a) Convex, alt. usually 5 or 6 mm.

(i) Antennæ 8-jointed; legs short and robust, tarsus longer than tibia..... ..... *Douglasi.*

(ii) Antennæ 7-jointed; tarsus shorter than tibia.

(b) Legs long and slender..... *coryli.*

(bb) Legs robust; scale higher, alt. 5 mm ..... *ulmi.*

(iii) Antennæ 6-jointed; legs robust, tarsus shorter than tibia; scale highest of this group; alt. 6 mm ..... *capreæ.*

(*ulmi* and *capreæ* are probably one species.)

(aa) Less convex, alt. not over 4 mm., usually less.

(i) Antennæ 8-jointed.

(b) Not pruinose; legs ordinary ..... *rosarum.*

(bb) Pruinose; anterior legs with tarsi very broad ..... *berberidis.*

(ii) Antennæ 7 jointed, joints 3 and 4 about equal; legs ordinary

(b) Pruinose with a whitish powder..... *pruinosum.*

(bb) Not pruinose.

(c) More convex, 4 mm. high..... *quercifex.*

(cc) Less convex, not over 3 mm. high... *mori.*

(4.) Long. 6–6½ mm.

(a) Convex, alt. 4 to 6 mm.

(i) Antennæ 6-jointed.

(b) Legs slender; ♂ abdomen as wide as thorax ..... *tiliæ.*

(bb) Legs robust; tibia longer than tarsus.

(c) Scale finely punctured; alt. 6 mm., the highest of this group ..... *capreæ.*

(cc) Scale strongly punctured on the sides; alt. 4 mm.; ♂ abdomen hardly half as wide as thorax ..... *æsculi.*

(ii) Antennæ 7 jointed; scale not pruinose; legs ordinary.

(b) Scale hemispherical; legs rather slender .. *robiniæ.*

(bb) Scale with the anterior part very convex, the posterior depressed ..... *takachihoi.*

(aa) Less convex, alt. 3 mm. or less.

(i) Antennæ 8-jointed; European.

(b) Anterior legs with very broad tarsi .... *berberidis.*

(bb) Legs ordinary ..... *rosarum.*

(ii) Antennæ 7-jointed; Canadian.

(b) Third joint very long; scale alt. 2⅔ mm..... ..... *caryarum.*

(bb) Third joint not especially long; scale alt. 2 mm ..... *fraxini.*

(iii) Antennæ 6-jointed; France ..... *ciliatum*, var.

(5.) Long. 5–5½ mm.

(a) Flattened form.

(i) Antennæ 6-jointed..... *Kansasense* (alt. 2 mm.) and [*Fölsomi* (alt. 1½ mm.).

(ii) Antennæ 7-jointed ... *Lintneri, assimile* and *aurantiacum.*

(iii) Antennæ 8-jointed..... *hortensiæ, berberidis* and *persicæ.*

(aa) Less flat, alt. 2 to 3 mm ..... *Guignardi, ciliatum* and [*distinguendum.*

(aaa) Convex to subglobular..... *Hoferi, antennatum, quercitronis,* [*bituberculatum, caryarum, corni, cynosbati, pyri,* [*robiniæ, robiniarum, rubi, rugosum, Canadense.*

(6.) Long. 4–4 + mm.

(a) Very convex .... *quercitronis, gibber, prunastri, robiniæ, Cana-*
[*dense, variegatum, perornatum.*

(aa) Less convex ..... *Guignardi, rosæ, Marchali, maculurarum,*
[*cerasi, robiniarum, rugosum, tarsale.*

(aaa) Flattish..... *Lustneri, Lymani, rufulum, assimile, aurantia-*
[*cum, Kansasense, armeniacum, Folsomi.*

(7.) Long. 3–3 + mm.

(a) Convex ..... *quercitronis, prunastri.*

(aa) Less convex..... *rufulum, pallidior, aurantiacum, Kansasense.*
[*Lymani.*

(aaa) Flattened..... *wistariæ.*

(8.) Long. 2–2 + mm..... *prunastri, Fletcheri.*

The following supplementary tables are based on the antennæ; the measurements are all in μ:

Antennæ 6-jointed ..... 1.

Antennæ 7-jointed ..... 7.

Antennæ 8-jointed ..... 18.

1. Joints 3 and 4 equal, 6 as long or nearly so ..... *Lustneri*, King (cf. [Reh., Zeit. f. Ent., 1903, p. 409).

Joint 3 always longest, and *very* much longer than 2, 4 or 5 ..... 2.

2. Joint 6 long, not very much shorter than 3... *rufulum* and *pallidior*.

Joint 6 very much shorter than 3..... 3.

3. 2 shorter than 4 or 5, 6 not much shorter than 5..... *Hoferi* (King).

2 about equal to 4 or 5 (compare also *corni*) ..... 4.

2 longer than 4 or 5..... 5.

4. 6 shorter than 4, which is longer than 2 or 5.. *quercifex* var. (Mass.).

6 much longer than 4 or 5, which are equal..... *Websteri*, var. on [*Cytisus*, from Hamburg (fide King).

6 longer than 4 or 5, 5 longer than 4.... some Kansas *armeniacum.*

5. Joint 5 obviously longer than 4.... *Lymani* (on oak), *Canadense* (on [elm), *prunastri* and *armeniacum.*

4 and 5 equal or almost so ..... *tarsale* (Mass., on *Cornus*), [*rosæ* (on rose), sp. (Germany, on *Prunus*), *Folsomi* [(on pawpaw), *capreæ* (of Douglas), *nigrofasciatum.*

5 shorter than 4..... 6.

6. Scale with a broad central boss.....*ciliatum* (France), *Kansasense* [(Kansas).
(The legs are larger in *ciliatum* than in *Kansasense.*)
Scale without such a boss.....*Websteri* (Ohio), *Kingii.*

7. Joint 3 longest, very long, *much* longer than 4.....8.
3 longest, but not very long, a little longer than 7; 6 shortest, 4 shorter than 2 .....*rosarum* of King and Reh.
1 longest, 2 and 3 nearly as long, or 3 shorter; 4 conspicuously shorter than 3; 5 a little longer than 4 or 6.....*perornatum*
4 conspicuously the longest; 5 shorter than 3.....14.
4 longer than 3, but not greatly so, or equal with 3.....15
3 longer than 4, but not greatly so, or equal with 4.....17.

8. Joint 4 much longer than 5; 5 and 6 shortest and equal.....*Canadense* (Maine, on elm), *caryæ* (cf. King).
4, 5, 6 short and equal or subequal (of *capreæ* and *ciliatum*).....9.

9. Joint 7 short, about as long as 4 or 5; 6 a little shorter than 5 or 7.....*Marchali.*
7 plainly longer than 4, 5 or 6.....10.

10. 6 shorter than 5 (of *antennatum*).....11.
5 and 6 equal, or 6 a trifle longest.....12.

11. 3 over 85 μ.....*rufulum.*
3 under 75 μ.....supposed *robiniæ* from Phœnix, Ariz., on [osage orange.

12. 3 about 80 μ.....supposed *robiniæ* from Phœnix, Ariz., on *Schinus* [*molle*; sp. incert. from Springfield, Mass., on *Quercus* (cf. King.)
3 90 to 110 μ.....13.

13. Joint 2 30 to 35 μ.....*maclurarum.*
Joint 2 40 to 50 μ.....*caryarum.*

14. 5 and 6 equal.....*bituberculatum* from Stuttgart (cf. King).
5 longer than 6.....*bituberculatum* from Oregon.
6 longer than 5.....*prunastri.*

15. 2 longer than 3, 7 as long as 4.....*robiniarum* (original figure).
2 shorter than 3.....16.

16. European.....*assimile, variegatum, Rehi.*
American.....*tarsale* (Mass.), *kermoides* (Les Vegas Hot Springs, [N. M.), sp. on rose from Ohio, *Guignardi,*
[*Fitchii, armeniacum* (California).

17. Joint 5 longer than 6 . . . . *cynosbati, rosæ, aurantiazum, quercifex, fraxini.*

5 and 6 equal, or 6 longer. . . . . *armeniacum* (Calif. and Kans.), *coryli* [of King and Reh, *Lymani, persicæ?* (Canada, under glass, and from Dr. Reh, cf. King, *pruinosum, quercitronis* (Ariz. and Calif.), *vini* of King and Reh, *robiniæ?* (Tempe, Ariz., on osage-orange), *quercifex* (of Signoret), *takachihoi* (Japan), *Canadense* (Maine, on elm), sp. on tulip tree, R. I.

18. Joint 3 conspicuously longest, 5 conspicuously shorter than 4 or 6, 7 shortest of all; 8, 5 and 2 about the same length . . *magnoliarum.*

3 longest, but not long, 5 and 8 about equal, and not much shorter than 3, 4 conspicuously shorter than 3 or 5 . . . . *prunastri* (France).

3 and 4 subequal, or sometimes 3, sometimes 4, a little the longer . . 19.

4 longest, much longer than 3, 3 and 5 about equal . . . *hortensiæ.*

3 longest, and rather long, 4 conspicuously longer than 5; 5 being conspicuously shorter than 4, but a little longer than 6. . . . . 20.

3 longest, 4 and 5 equal or subequal . . . . . 21.

19. 5, 6 and 7 shortest, and equal or almost . . . . . *subsimile* (Chihuahua) and *berberidis.*

6 and 7 shortest and equal, but 5 conspicuously longer. . . . *hortensiæ.*

20. 8 short, shorter than 4, 7 a little shorter than 6. . . . . *quercifex.*

8 longer, longer than 4, 7 a little longer than 6. . . . . *persicæ?* (Canada, on peach under glass, cf. King).

21. 3 very long, much longer than any other joint. . . . . 22.

3 not very long, usually quite short; 4 shorter than 5 . . . . . *Cockerelli, rosarum* of King and Reh, *Marchali.*

22. Joints 4, 5, 6, about equal . . . . . *rufulum.*

5 longer than 4 or 6 . . . . . *Cockerelli.*

The occurrence of the same species in several different places in the above table shows the great variability of the antennæ of these insects; yet I do not believe for a moment that this variability is indiscriminate, or that the antennæ are useless for purposes of identification. They must, however, be used cautiously in this genus, and in conjunction with other characters.

I do not expect to pay much more attention to this genus myself; for Mr. J. A. Sanders, with much better opportunities than I possess, is about to begin an investigation of it; and he will undoubtedly make many things clear which have been obscure.

PRELIMINARY LIST OF THE MACRO-LEPIDOPTERA OF ALBERTA, N.-W.T.

BY F. H. WOLLEY DOD, MILLARVILLE, ALBERTA.

(Continued from page 54.)

GEOMETRIDÆ.

[NOTE.—The generic names are as used by Rev. G. W. Taylor.]

452. *Rachela Bruceata*, Hulst.—Not observed previous to 1898. It appeared in millions in 1902, and in the following year was still more abundant. In those two years hundreds of acres of *Populus tremuloides* were completely denuded by the larvæ during June. It appeared to be aided in its depredations by a Tortrix, the name of which I have not yet discovered, but subsequent observation brings me to believe that by far the greater part of the denudation was caused by this species. I rarely saw more than eight or ten acres cleared in one patch, usually much less, but its ravages extended over a large tract of country, some twenty square miles, between Fish and Sheep Creeks. Beyond that I did not travel where there were poplars in any quantity. Salix was also attacked, but not so vigorously. The moths appeared in early October, and the apterous females could be found in numbers hanging with the males on the leafless twigs of poplars after dark. The males flew freely in the daytime, but in far greater numbers at dusk. Both the Rev. G.W. Taylor and Dr. Fletcher have seen the species.

453. *Talledega montanata*, Pack.—Two ♂ ♂ and a ♀. June 23rd to 28th, 1898 and 1904. Occurs at both the Billing's Mill locality and on Pine Creek.

454. *Eupithecia* (*Tephroclystis*) *Regina*, Taylor (MSS.)—Fairly common some years, flying at dusk. End June and July.

455. *E. borealis*, Hulst?—Mr. Taylor has a specimen from me, dated July 21st, 1901, on which he comments: "A prairie species, and in Mr. Hanham's collection from Winnipeg, bearing Hulst's label *borealis*, but does not agree with the description." I am not aware that I have taken another specimen of the same species.

456. *E. Casloata*, Dyar (Proc. U. S. Nat. Mus., XXVII., 891).—Described from two specimens taken at Kaslo. Eight specimens are at present in my series, and I fancy the species is not altogether rare here. July to middle of August.

March, 1906

457. *E. nimbicolor*, Hulst.—Described from here. The description says, "wings very uniform, blackish-fuscous, blackish cross-lines very faintly showing." Though I cannot, with certainty, trace back the specimen or specimens from which Hulst described the species, a careful process of elimination turns the probability upon one of two specimens, upon which he commented in a letter to me, dated June 14th, 1895: "They are probably *miserulata*, Grt., but the lines are very indistinct." One of these specimens was returned to me at that time. It is badly worn and greasy, but does not misfit the description. It is labelled "Mouth of Fish Creek, June 3rd, 1894." Mr. Taylor has seen it, and has two others from here of the same species, dated May 27th and June 3rd. He feels confident that they are the *nimbicolor* of Hulst, and writes me: "The species is well marked, and I do not know of any other with which it can be confused." Hulst mentions no data as attached to the type.

458. *E. multistrigata*, Hulst.—Mr. Taylor says: "This is *multistrigata*, without much doubt. Dr. Barnes has the type, and has sent me a specimen agreeing with yours, but it is smaller." In the Kootenai list under this name Dr. Dyar mentions two specimens, which, he says, "agree in general with a specimen from Calgary, communicated to me by Rev. George W. Taylor." Mr. Taylor, however, tells me "this is not the species called *multistrigata* by Dr. Dyar in the Kootenai list.... The Kaslo species is quite different." I have a Calgary specimen labelled by Mr. Taylor, dated June 21st, 1895, and at least two other specimens are certainly the same, June 23rd and July 4th, 1898. The description does not misfit, but 24 mm. is given as the expanse, whereas mine vary from 25 (♂) to 27 mm. (♀).

459. *E. ravocostaliata*, Pack.—Decidedly rare. April 23rd to end of May.

460. *E. castigata*, Haw.?—Mr. Taylor returned me a ♀ so labelled out of a series I sent him, commenting: "I believe this to be the European *castigata*. I have it from the prairies and from B. C. My identification is made from a comparison with a good series of European specimens." I have taken altogether about two dozen specimens, which I believe to be the same species, all, or nearly all, during 1904, and on the wing just before dusk. June 23rd to July 2nd.

461. *Eucymatoge anticaria*, Walk.—Common. I have specimens so named by both Hulst and Mr. Taylor. June and July.

462. *E. intestinata*, Gn.—Fairly common. June to middle of July.

463. *E. vitalbata*, Schiff.—Common. End May to middle of July. This species, widely distributed in Europe, was first recorded as North American from Calgary. It occurs in Manitoba. I have it from the Red Deer River, a hundred miles north-east of Calgary; so it seems to be a prairie rather than a mountain species in this hemisphere. In Europe the larva feeds on *Clematis vitalba*, the "Traveller's Joy," whence its name, but from localities where I have sometimes found it here it is almost certain that it does not, at any rate, confine itself exclusively to *Clematis* in Alberta.

464. *Euchœca albovittata*, Gn.—Common, though apparently somewhat local in woods, and rarely met with outside them. End June and July.

465. *E. cretaceata*, Pack.—Fairly common. In this district I have found it more commonly on the prairies than in the hills. In the Kootenai list Dr. Dyar seems to imply that there it occurs most frequently at the higher altitudes. I have met with it very sparingly at Laggan, the highest-up capture being at Agnes Lake (6,850 ft.). End June and July.

466. *Calocalpe (Hydria) undulata*, Linn.—Not common. End June to middle Aug.

467. *Eustroma testata*, Linn.—Fairly common. At light, and occasionally at treacle. August.

468. *E. propulsata*, Walk., = *Packardata*, Lint., = *populata*, Pack., non. Linn.—Rather rare. July 20th to Aug. 13th. The synonymy is Mr. Taylor's, who says: "I don't believe we have the real *populata* in America. Dr. Dyar's (Hulst's) synonymy under this name is all wrong." In the Kootenai list Dr. Dyar suggests that European *populata*, Linn, and *Packardata*, Lint., are probably distinct, but records both forms from British Columbia. Mr. Taylor, however, who has compared a good series of the European *populata*, claims that Dr. Dyar's "true *populata*" from B. C. is quite a different insect, and hitherto undescribed.

469. *E. destinata*, Mœschl.—I have taken five or six specimens in the mountains. On Sulphur Mt., Banff, 4,500 to 6,000 feet, and at Laggan up to about the same altitude. The Laggan specimens are a little the smaller. August 7th to 13th, 1900. Mr. Taylor says: "These appear to be variations of what Dr. Dyar decides to be *Eustroma destinata*. It differs considerably from the *destinata* of the prairies." He refers a Calgary male doubtfully to the same species.

470. *E. nubilata*, Pack.—I have two head of Pine Creek specimens, July 29th and Aug. 24th; one from mouth of Fish Creek labelled "July 5th ? Aug.," and one from near Billing's Mill, Aug. 11th. All are more or less rubbed. The last two mentioned have been named as above by Mr. Taylor.

471. *Neolexia xylina*, Hulst.—Described partly from Calgary material; also from New York, Washington, Montana, and "Canada." Dr. Hulst writes: "The specimen received from Calgary has the cross-bands blackish instead of brown, and the hind wings have a more distinct banding. Very much in appearance like *Eustroma prunata*, with which it may have been confounded, but easily distinguished by the bipectinate antennæ." I kept what I considered a duplicate to the specimen mentioned by Hulst, which is identical with the species referred here by Mr. Taylor. The central band is not always blackish, but I see practically no variation in the secondaries. Not common. July 21st to Aug 6th. I have only one female, which is defective in the two right wings. Dr. Dyar records it from the Kootenai district, mentioning Glacier and Field as localities. Mr. Taylor comments upon Hulst's remarks: "*Xylina* is a common B. C. species. I doubt its occurrence in New York. Hulst refers often to *E. prunata*, but he did not know it. The eastern so-called *prunata* is not that species (which is European), but the *triangulatum* of Packard. The differences between *prunata*, *triangulatum* and *xylina* are chiefly in antennal structure."

472. *N. speciosa*, Hulst.—Described from one male from Calgary. Dr. Hulst, after a detailed description, adds: "This may be a variety of *N. xylina*, Hulst, but the colour and shaping of the bands is different, and there is difference of position in the lines of the hind wings." My notes on the material sent to Hulst in 1895 show me that this was a unique sent labelled No. 9. It is probably a head of Pine Creek specimen, bearing no date. I doubt whether I have seen the form since. Hulst's note to me on No. 9 was "*Neolexia xylina*, var. *speciosa*," and the description was published more than a year later. I had sent him the type of *xylina* as No. 10. I copy from his letter: "9 and 10 are perhaps rather widely varying forms of the same species, but I am not sure. I would not think so, only its correlative *Petrophora prunata* has the same variation. It differs from that species, which it resembles in every other way, in having pectinated antennæ in the male."

473. *Plemyria (Rheumaptera) hastata*, Linn.—Common in the spruce. June and early July.

474. *P. tristata*, Linn.—Very common. End May and June.

475. *P. sociata*, Bork.—Common. Middle June to middle July. According to Mr. Charles G. Barrett this is the same as European *subtristata*, Haw., not *substriata*, as Dyar writes it.

476. *P. luctuata*, Schiff.—Very common in the spruce some years, but seems to be rare on Pine Creek. Middle June and July.

477. *P. Georgii*, Hulst.—I always looked upon this as a great rarity until 1903, when it was fairly common. On flowers of *Solidago virgaurea* at night, and also came to treacle. End Aug. and Sept.

478. *P. subrosuffusata*, Pack.—Not rare. May and June. The colour of the secondaries is decidedly an orange-yellow, but I gather from Mr. Taylor that Packard described them as "brick-red." He writes: "I have had abundant material for study, and there is no doubt as to the species. Our specimens and California ones are exactly the same, and apparently our idea of orange-yellow was Packard's notion of 'brick-red.'" Dr. Holland's figure looks like the Calgary species bleached. One of my specimens bears a red-ink label "*Ochyria carneata*," on Hulst's authority.

479. *Zenophleps lignicolorata*, Pack.—Not rare. Middle July to middle Aug. I have it from the flat prairie to the mountains at Banff, but did not see it there above 6,000 feet.

480. *Mesoleuca gratulata*, Walk.—Rather common in the spruce. My only dates are May 30th to June 6th, and my four specimens are perfect. Mr. Taylor says the species is distinctly western.

481. *Mesoleuca cæsiata*, Schiff.—I have taken in good condition at Laggan, from July 18th to Aug. 10th, from 5,700 ft., and occasionally far above the timber line, one capture being on the summit of Saddle Mt., 7,900 ft. I have a head of Pine Creek ♀, taken at light on Sept. 3rd, 1904, which Mr. Taylor refers as a var. of this species. It entirely lacks the faint though obvious ochreous tinge present in the Laggan form, the ground colour is paler, with distinct smoky central and terminal bands. The specimen is somewhat worn. I took an exactly similar specimen during 1905. In the Kootenai list Dr. Dyar says that he found this a high altitude species, and records it from Banff, Alta, on Sept. 10th.

482. *M. lacustrata*, Guen.—Not common. Middle June to middle July. Notwithstanding the generic separation, this species seems rather easy to confuse with *Plemyria sociata* without some knowledge of the

variation of both. I sent both to Mr. Taylor as one species. Dr. Holland's figure of *lacustrata* is not very clear, and scarcely shows what seem to me to be distinctions in my series. I find differentiating characters in the secondaries not noticeable in that figure. In my *lacustrata* the central band widens out considerably on both costa and inner margin, and in seven out of eight specimens is sharply but narrowly notched on vein 7. *Sociata* has the band narrower, more even in width, and in none of my specimens notched. The notch is shown in Dr. Holland's figure, and the band is widest on the costa. Otherwise the figure might easily pass for *sociata*.

483. *M. intermediata*, Gn.—A single male, quite fresh, on May 13th, 1905. I recognized it as something new to me directly I saw it, though the colour and maculation suggested *Xanthorhoe munitata* more nearly than anything else I take here. In CAN. ENT., XXXVI, 245, Mr. Taylor points out that Dr. Holland's figure under this name is really *Petrophora fluctuata*.

484. *M. truncata*, Hbn.—Not common. Aug.

485. *M. silaceata*, Hbn., = *albolineata*, Pack.—Rather common. Middle June and July.

486.—*M. hersiliata*, Gn.—Two males, Aug. 15th, 1901, at light, and July 5th, 1903.

487. *M. vasaliata*, Gn.—Rather rare. Earliest April 27th. Through May. A fair female specimen June 17th, and worn females up to July 1st.

(To be continued.)

NOCTUID AND GEOMETRID MOTHS TAKEN AT TEMAGAMI LAKE.

BY D. H. HAIGHT, COPPER CLIFF, ONT.

The following list of moths is the result of collections made during the months of June and July, 1904, in the neighbourhood of Temagami Lake, which is situated in the Nipissing District of Ontario, north of Lake Huron, Lat. 48°. The numbers prefixed are from Dyar's Catalogue:

968. Raphia frater, Grote, June 25.
971. Apatela rubricoma, Guen., June 25.
983. " populi, Riley, June 25.
989. " betulæ, Riley, June 25.
1028. " retardata, Walk., June 25.
1278. Hyppa xylinoides, Guen., July 9.

1288. Euplexia lucipara, Linn., July.
1290. Dipterygia scabriuscula, Linn., June 17–25.
1389 Rhynchagrotis gilvipennis, Grote, July.
1454. Agrotis ypsilon, Rott., June 25.
1462. Peridroma occulta, Linn., June 17.
1511. Noctua cynica, Smith, July.
1517. Chorizagrotis auxiliaris, Grote, June 25.
1702. Paragrotis infausta, Walk., July.
1707. " insulsa, Walk., July.
1782. Mamestra lustralis, Grote, July.
2203. Brotolomia iris, Guen., July 25.
2207. Scoliopteryx libatrix, Linn., June 25.
2483. Autographa bimaculata, Steph., June 17.
2505. " rectangula, Kirby, July 9.
2508. " vaccinii, Hy. Edw., July 14.
2613. Eustrotia carneola, Guen., July 7.
3044. Renia sobrialis, Walk., June 6.
3054. Heterogramma pyramusalis, Walk , June 25.
3058. Palthis angulatis, Hubn., July 7.
3065. Bomolocha baltimoralis, Guen., June 23.
3234. Nyctobia limitata, Walk., July 7.
3248. Eudule mendica, Walk., June 23.
3298. Tephroclystis nimbicolor, Hulst, June 23.
3328. Eucymatoge vitalbata, Den. and Sch., July 7.
3332. Euchœca albovittata, Guen., June 25
3340. Hydria undulata, Linn., July 14.
3348. Eustroma gracilineata, Guen., June 20.
3356. " cunigerata, Walk., July 14.
3359. Rheumaptera hastata, Linn., June 6–July 7.
3371. Mesoleuca ruficilliata, Guen, June 25.
3379. " truncata, Hufn., July 9.
3401. Hydriomena multiferata, Walk., June 17.
3417. Triphosa progressata, Walk., June 25.
3419. Cœnocalpe magnoliata, Guen., July.
3463. Petrophora fluctuata, Linn., June 23.
3497. Cinglis similaria, Walk., July 7.
3502. " albidula, Hulst, June 23.
3515. Leptomeris plantagenaria, Hulst, July.

3546. Eois inductata, Guen., June 25.
3587. Aplodes mimosaria, Guen., June 17.
3604. Eufidonia notataria, Walk., June 17.
3606. Orthofidonia semiclarata, Walk., June 23.
3629. Deilinia falcataria, Pack, June 20.
3908. Therina endropiaria, Grote and Rob., June 25.
3913. Metrocampa prægrandaria, Guen, July 14.
3925. Xanthotype crocataria, Fabr., June 17–July 7.
3941. Gonodontis hypocharia, Herr.-Sch, July 7.
3941a. " lateritiaria, Guen., June 23.
4011a. Tetracis aspilata, Guen., June 20.

The following species were taken at Copper Cliff:

3330. Venusia 12-lineata, Pack., May 6.
3417. Triphosa progressata, Walk., April 29.
3563. Nemoria pistaceata, Guen., May 8.
3606. Orthofidonia semiclarata, Walk., May 6.
3683. Macaria glomeraria, Grote, May 6–8.
3755. Apæcasia defluata, Walk., May 6–21.
3795. Alcis 5-linearia, Pack, June 25.
4037. Brephos infans, Mosch, April 26–May 28.

LIST OF COLEOPTERA IN THE COLLECTION OF J. D. EVANS, TRENTON, ONT., WHICH HAVE NOT HERETOFORE BEEN RECORDED AS HAVING BEEN TAKEN IN CANADA.

25b. Cicindela graminea, Schaupp, N.-W. Terr., J. Macoun, 1879–80.
25g. " spreta, Lec., Sudbury.
" roguensis, Harris, British Columbia.
193. Nebria suturalis, Lec., British Columbia.
331. Bembidium incertum, Mots., Crow's Nest Pass, Rocky Mountains.
388. " intermedium, Kirby, Western Ont.
394. " constrictum, Lec., Halifax, N. S.
408 " dubitans, Lec., Crow's Nest Pass, Rocky Mountains.
718. Dicælus purpuratus, Bon., Pelee Island, L. Erie, J. Macoun, 1882.
756. Platynus dissectus, Lec., N.-W. Terr.
767. " opaculus, Lec., Co. Hastings, Ont.
795. " carbo, Lec., Pelee Island, L. Erie, J. Macoun, 1882.
830. " picicornis, Lec., Co. Hastings, Sudbury and N.-W. Terr.

884. Lebia pleuritica, Lec.? Co. Hastings and Western Ontario, 1882.
1063. Agonoderus pauperculus, Dej., Co. Hastings.
1102. Harpalus innocuus, Lec., N.-W. Terr., J. Macoun, 1879.
1108. " viduus, Lec., Western Ontario, J. Macoun, 1882.
1109. " fraternus, Lec., Man. and N.-W. Terr.
1167. Tachycellus nebulosus, Lec., Co. Hastings.
1189. Anisodactylus nigerrimus, Dej, Co. Hastings.
1220. Haliplus punctatus, Aubé, Co. Hastings.
1278. Bidessus lacustris, Say, Western Ont.
1304. Deronectes catascopium, Say, Co. Hastings.
1310. Hydroporus pulcher, Lec., Co. Hastings.
1356. " humeralis, Aubé, Co. Hastings.
9300. Agabus confinis, Gyll., Belleville, Ont.
1425. " æneolus, Cr., Belleville and N.-W. Terr., J, Macoun, 1879.
1450. " clavatus, Lec., N.-W. Terr., 1886.
1465. Rhantus notatus, Fab., N.-W. Terr., J. Macoun, 1879.
1659. Creniphilus dissimilis, Horn, Sudbury, Ont, 1889.
9335. Cercyon tristis, Ill., Trenton, Ont.
1854. Cholerus Zimmermanni, Schaum, Co. Hastings.
1989. Trimioplectus ruficeps, Lec., Co. Hastings.
2081. Gyrophæna socia, Er., Sudbury.
2175. Philonthus quisquiliarius, Gyll., Co. Prince Edward, Ont., 1900.
2180. " discoideus, Grav., Co. Hastings.
2185. Philonthus fusiformis, Melsh, Co. Hastings, Co. Prince Edward and Toronto.
2204. Philonthus sordidus, Grav., Sudbury and Co. Hastings.
2220. " punctatellus, Horn, Co. Hastings.
2222. " microphthalmus, Horn, Co. Hastings.
2225. " instabilis, Horn, Hudson's Bay, from H. Uke.
2232. " confertus, Lec., Co. Hastings.
2234. " aurulentus, Horn, Trenton and Toronto.
2235. Actobius cinerascens, Grav., Co. Hastings.
2284. Leptacinus batychrus, Gyll., Co. Hastings.
2287. " longicollis, Lec., Co. Hastings.
2514. Lathrobium quadratum, Payk., Trenton.
2626. Tachinus pallipes, Grav,, Sudbury and Co. Hastings.
2629. " basalis, Er., Co. Hastings.
2669. Bryoporus flavipes, Lec., Co. Hastings.
2776. Trogophlœus memnonius, Er., Trenton.
2828. Olophrum obtectum, Er, Co. Hastings.
2895. Triga picipennis, Lec., Co. Hastings and Sudbury.

2966. Trichopteryx Haldemanni, Lec., Co. Hastings and Trenton.
3044. Hippodamia glacialis, Fab., N.-W. Terr.
3059. Coccinella v. 5-notata, Kirby, Sudbury.
3059a. " transversalis, Muls., Crow's Nest Pass, Rocky Mountains.
3162. Scymnus punctatus, Melsh., Co. Hastings.
3189. Mycetina testacea, Ziegl., Co. Hastings, 1884.
Crasimus hirtus, Casey, Co. Hastings, 1884.
3356. Loberus impressus, Lec., Trenton and Sudbury.
3374. Cryptophagus fungicola, Zimm., Trenton and Sudbury.
" laticlavus, Casey, Trenton.
" depressulus, Casey, Sudbury.
9923 " acutangulus, Gyll., Sudbury and Trenton.
Agathengis pumilis, Casey, Co. Hastings and Sudbury.
Atomaria oblongula? Casey, Trenton.
" distincta, Casey, Trenton.
3535. Epierus pulicarius, Er., Co. Hastings and Co. Prince Edward.
3564. Paromalus bistriatus, Er., Trenton and Sudbury.
3579. Saprinus posthumus, Mars., Sudbury.
3614. " sphæroides, Lec., Western Ont.
3723. Stelidota 8-maculata, Say, Co. Hastings.
3798. Corticaria serricollis, Lec., Sudbury and Trenton.
3833. Trogosita virescens, Fab., British Columbia.
3965. Heterocerus collaris, Kies., Co. Hastings.
3970. " undatus, Melsh., Co. Hastings.
3986. Philodactyla serricollis, Say, Trenton.
4064a. Anelastes Latreillei, Lec., Trenton and Crow's Nest Pass, Rocky Mountains.
4092. Alaus lusciosus, Hope, Western Ont.
4099. Cardiophorus erythropus, Er., Western Ont.
4105. " fenestratus, Lec., Trenton and British Columbia.
4300. Glyphonyx testaceus, Melsh., Western Ont.
4317. Melanotus Leonardi, Lec., Ottawa, Ont.
4351. Limonius Crotchii, Horn, British Columbia.
4373. " propexus, Cand., Western Ont.
4488. Corymbites carbo, Lec., British Columbia.
4568. Chalcophora angulicollis, Lec., British Columbia.
4600. Buprestis confluens, Say, N.-W. Terr.
4605. " laeviventris, Lec., British Columbia, 1887.
4610. " aurulenta, Linn., British Columbia, 1887.
4646. Chrysobothris carinipennis, Lec., British Columbia.

4766. Pachyscelus lævigatus, Say, Western Ontario.
4889. Podabrus pruinosus, Lec., British Columbia.
5110. Dolichosoma foveicolle, Kirby, Sudbury.
5230. Necrobia rufipes, Fab., Co. Hastings.
5240. Ptinus brunneus, Duft., Co. Hastings.
5468. Aegialia lacustris, Lec., Co. Hastings.
10175. " rufescens, Horn., Co. Hastings, 1884.
5524. Aphodius congregatus, Mann., N.-W. Terr.
5562. " alternatus, Horn, Manitoba.
5568. Aphodius prodomus, Brahm., Co. Hastings, Co. Prince Edward and Ottawa.
5597. Geotrupes semiopacus, Jek., Co. Hastings.
10241. Lachnosterna grandis, Smith, Sudbury and Co. Hastings.
10256. " innominata, Smith, Montreal, Can.
5778. " ciliata, Lec., Co. Hastings.
5782. " balia, Say, Western Ont.
10257. " limula, Horn, N.-W. Terr.
5858. Cyclocephala immaculata, Oliv., Co. Hastings.
5960. Prionus pocularis, Dalm., Co. Hastings.
5963. " fissicornis, Hald., Sudbury.
5980. Criocephalus australis, Lec., Co. Hastings.
6269. Acmæops ligata, Lec., British Columbia.
6282. Strangalia acuminata, Oliv., Co. Hastings.
6302. Leptura deleta, Lec., Co. Hastings.
6323. " instabilis, Hald., British Columbia.
6363. " aspersa, Lec., British Columbia.
6385. Monohammus titillator, Fab., Co., Hastings.
6418. Leptostylus biustus, Lec., Co. Hastings.
6428. Liopus fascicularis, Harr., Co. Hastings and Western Ont.
10335. Donacia pusilla, Say, British Columbia and Co. Hastings.
6542. " pyritosa, Lec., Sudbury.
10336. " rufa, Say, Western Ont. and Co. Hastings.
6531. " porosicollis, Lac., Co. Hastings.
6556. Zeugophora consanguinea, Cr., Co. Hastings.
6567. Lema collaris, Say, Co. Prince Edward.
6596. Babia 4-guttata, Oliv., Co. Hastings.
6604. Exema gibber, Oliv., Western Ont.
10386. Scelolyperus Schwarzii, Horn, British Columbia.
6899. Galerucella americana, Fab., Manitoba.
10416. Disonycha crenicollis, Say, Co. Prince Edward.
6982. Crepidodera Modeeri, Linn., Co. Hastings and Montreal.

7007. Longitarsus melanurus, Melsh., Trenton and Co. Prince Edward.
10434. " turbatus, Horn, Trenton.
7394. Iphthimus serratus, Mann., British Columbia and Western Ont.
7396. Cœlocnemis dilaticollis, Mann., British Columbia.
7526. Phylethus bifasciatus, Say, Co. Hastings.
7556. Helops californicus, Mann , British Columbia.
7615. Mycetochares Haldemani, Lec., Co. Hastings.
10690. Isomira tenebrosa, Casey, Trenton.
7684. Hallomenus punctulatus, Lec., Sudbury.
7692. Canifa plagiata, Melsh., Sudbury.
Mordella irrorata, Lec., Halifax, Co. Hastings and Sudbury.
7796. Mordellistena arida, Lec., Co. Hastings.
7868. Nematoplus collaris, Lec., Sudbury.
Elonus princeps, Casey, Co. Hastings.
Vanonus Wickhami, Casey, Trenton.
10727. Anthicus basilaris, Say, Sudbury, 1892.
7961. " Haldemani, Lec., Co. Hastings.
7980. " melancholicus, Laf., Co. Hastings.
8099. Epicauta oregona, Horn, N.-W. Terr.
8158. Cantharis sphæricollis, Say, Manitoba.
8211. Rhynchites æneus, Boh., Western Ont. and Manitoba.
8223. Pterocolus ovatus, Fab., Co. Hastings.
8293. Mylacus saccatus, Lec., British Columbia.
8443. Listronotus callosus, Lec., Ottawa, Ont.
8449. " sulcirostris, Lec , Co. Hastings.
8563. Phyllotrox nubifer, Lec., Co. Hastings.
11043. Xanthus pygmæus, Dietz., Trenton.
8838. Ceutorhynchus rapæ, Gyll., Co. Hastings.
8860. Cœlogaster Zimmermanni, Gyll , Trenton.
8872. Baris transversa, Say, Co. Hastings.
8982. Sphenophorus Ulkei, Horn, N.-W. Terr.
9146. Scolytus unispinosus, Lec., British Columbia.
9167. Hylesinus aspericollis, Lec., Victoria Island.
9191. Hylastes nigrinus, Mann., Sudbury and Co. Hastings.
9200. Hylurgops rugipennis, Mann., British Columbia.

Almost all of the foregoing list have been determined during the past 25 years by Mr. Henry Ulke, the late Dr. Jno. Hamilton, Prof. H. F. Wickham, Mr. J. D. Sherman, Jr., and others, to whom I have been, and am, deeply grateful for all the kindness bestowed.

ON THE SPECIES OF *EUPITHECIA* OCCURRING AT CALGARY, ALBERTA, WITH DESCRIPTIONS OF FOUR SUPPOSED TO BE NEW.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

Through the kindness of Mr. F. H. Wolley Dod, I have now in my cabinet specimens of 13 species of "Pugs" taken by him in the neighbourhood of Calgary.

Three of these belong to well known and widely-distributed species, viz: Eupithecia cretaceata, Pack.; E. ravocostaliata, Pack.; and Eucymatoge anticaria, Walker.

All the others presented difficulties at first sight, but I have at last identified five of them, I hope correctly, and I herewith offer descriptions of four which I suppose to be new to science. The remaining species is certainly different to any of the others, but I have only seen a single specimen, and therefore think it desirable to defer characterizing it.

The five species already described, in addition to the three named above, are:

Eupithecia nimbicolor, Hulst.—I determined this species from Dr. Hulst's description, but I have since had the opportunity of seeing a specimen which Mr. Wolley Dod thinks was returned to him by Dr. Hulst as conspecific with the type of *nimbicolor*, which was also a Calgary specimen. There is not much doubt, I think, but that we have this species correctly identified.

E. multiscripta, Hulst.—This species was described from Colorado. Dr. Barnes has the type, and he has kindly given me a specimen agreeing therewith. Mr. Wolley Dod's specimens are larger and more heavily marked, and have the margins of the hind wings rather more rounded out, but I should not like to separate them specifically from *multiscripta* without first seeing a larger number of the Colorado form. I may say here that the specimens from Kaslo which are recorded by Dr. Dyar (Proc. U. S. Nat. Mus., XXVII, 890) under this name are, in my opinion, clearly distinct, and I propose for them the specific name *Dyarata*.

E. borealis, Hulst.—This species was described from Winnipeg, and I have seen a specimen in Mr. A. W. Hanham's collection so named by Dr. Hulst.

The published description, however, does not fit the insect at all well. I have good specimens from Mr. Wolley Dod which do not differ in any respect from those taken at Winnipeg by Mr. Hanham.

March, 1906

E. Casloata, Dyar.—Dr. Dyar's types were from Kaslo. This is a large species of the *absynthiata* group, and not likely to be confused with anything else we have on the west coast. Mr. Wolley Dod's specimens (Nos. 114 and 115) agree exactly with others from Kaslo. I have the species from other points in Alberta, through the kindness of Mr. T. N. Willing.

E. castigata, Hubner.—This is a common European species, but specimens taken in B. C. and Mr. Wolley Dod's Nos. 117, 134 and 141 are so very close to those sent me from England that I have decided to include them all under one name. I may be wrong, for there is always a risk in applying European names to American moths, but I really cannot see any differences that I can express in words.

The following species are, I think, new to science :

Eupithecia Regina, n. sp.—Expanse 20 mm. About the size of and otherwise closely resembling *Eupithecia scriptaria*, H. Sch. Palpi short and stout. Abdomen gray, with brown tinge, dorsal tufts black, no transverse band on 2nd segment. Wings rather short, apex rounded.

Fore wings of a soft, even gray (in one specimen tinged with brown), and crossed by many pale, wavy lines. In a perfectly fresh specimen nine of these can be distinguished. The first two are close together, and parallel, and limit the darker basal area. The third is the widest, and includes a very minute discal dot. The next two are very faint, then two more distinct exactly parallel, and occupying the place of the usual extra-discal line ; then a very faint one, and lastly, the usual submarginal line. All these pale lines are most conspicuous on the costa. There is a marginal black line interrupted at the veins ; fringe the colour of the wings, but darker basally.

Hind wings with similar markings, but much obscured, except the double extra-discal line, which is clearly traceable.

Beneath paler, fore wings with basal half smoky, costa with six or seven dark spots, discal spot linear and quite distinct ; about six fairly evident extra-discal lines.

Hind wings with about seven distinct dark lines, and a very small discal dot ; fringe checkered.

Described from five specimens : One from Regina (Mr. T. N. Willing), 25th June, 1905, and four from head of Pine Creek, Calgary (Mr. F. H. Wolley Dod), June 29, 1904 ; July 7, 1901 ; July 22, 1903 ; August 2, 1903.

Eupithecia Alberta, n. sp.—Expanse 25 mm. Palpi short and stout. Abdomen brownish, with paler dorsal line; no band on 2nd segment.

Fore wings brown, much produced, all margins rounded, so much so that the inner angle of fore wings is almost obliterated. Cross lines very faint, all of them in general direction parallel to outer margin; the submarginal whitish line is the most distinct; discal dot small, black; marginal line of black dashes.

Hind wings paler, with marginal dusky band and traces of three or four dark lines on inner margin; discal dot minute, marginal line black; six or seven distinct dots on fringe.

Beneath paler, with the markings of the upper side faintly reproduced; discal dots distinct, black.

Hind wings with two outer discal broad lines emphasized on the veins, fringe distinctly spotted.

The peculiar rounding out of all the margins of the fore wings will serve to distinguish this species from all other Canadian Eupithecias.

Described from two specimens: Head of Pine Creek, Calgary (Mr. Wolley Dod). Both specimens were taken at light, June 30, 1904.

Eupithecia Dodata, n. sp.—Expanse 22 mm. Palpi long and stout. Abdomen mottled gray and brown; dorsal tufts black; first segment pale, second darker.

Fore wings gray, thickly overlaid with fuscous scales, giving them a mottled appearance; many dark, very indistinct cross lines, showing as dark spots on costa and as dots on the veins. Basal line rounded; intradiscal parallel to it; extra discal interrupted, but showing in black dots on veins 2, 3, 4, 5 and 6; a similar series of dots, indicating another parallel line between this and the rather conspicuous white submarginal line, which is terminated by a distinct white dot below vein 2; marginal line black; fringe spotted; a black discal spot.

Hind wings same colour as fore wings, a dark submarginal shade; faint indications of cross lines; discal dot small; marginal line black, distinct.

Beneath paler, discal dots distinct; two extra-discal lines on all wings, commencing as rather large dark blotches on costa of fore wings; marginal line black, distinct; fringe spotted.

Described from two specimens: Head of Pine Creek, Calgary (Mr. F. H. Wolley Dod), 27th June and 3 d July, 1904.

I hope no classical scholar will enquire as to the derivation of the specific name.

Eupithecia adornata, n. sp.—Expanse 24 mm. Palpi short, porrect. Abdomen gray, mottled with brown; hind margin of each segment brown.

Fore wings produced, costa very straight, outer margin oblique; colour gray, overlaid with reddish brown scales, the gray predominating in the central band, and the brown in the basal and marginal areas; basal line black, very close to the base; central band, including about six dark lines, most evident on the costa; discal spot not discernible above, except in one specimen; submarginal line a series of white dots only; marginal line of black dashes, followed by a whitish line at the extreme base of the fringe, which is spotted.

Hind wings with markings of fore wings continued, but very indistinctly.

Beneath fore wings smoky, markings hardly discernible.

Hind wings with two intra-discal and three (sometimes only two visible) extra-discal lines; marginal line and fringe as above; very minute discal dots.

Described from six specimens: Head of Pine Creek, Calgary (Mr. F. H. Wolley Dod), May 25th and 30th, June 3rd, 5th, 10th and 14th.

This species is evidently nearly allied to *Eupithecia Coloradensis*, Hulst, a species I have not yet seen, but I do not think, after studying the description, that it can be the same.

The Calgary list will now stand as follows:

1. Eupithecia Regina, Taylor.
2. " castigata, Hubner.
3. " sp.
4. " Dodata, Taylor.
5. " borealis, Hulst.
6. " multistrigata, Hulst.
7. " adornata, Taylor.
8. " nimbicolor, Hulst.
9. " Casloata, Dyar.
10. " Alberta, Taylor.
11. " ravocostaliata, Pack.
12. " cretaceata, Pack.
13. Eucymatoge anticaria, Walker.

Mailed Feb. 28th, 1906.