The position of the second is as in the living *Neuraulacinus braunsi* Kieffer. The small cuneiform first discoidal cell is characteristic, and the comparatively distinct venation of the hind wings is a primitive feature, lost in the modern *Aulacinus*, but preserved in *Neuraulacinus*.

Vectevania vetula n. sp.

Head narrower than thorax; thorax elongate-oval, 2 mm. long; abdomen claviform, nearly 3 mm. long, obtuse at apex; anterior wing about 4.5 mm. long, clear hyaline, with ferruginous nervures; stigma margined with brown, apparently originally all brown.

British Museum, In. 20535.

PERLIDÆ.

Nemoura (sens. lat.) **priscula** n. sp

Anterior wing, length about 5.4 mm., width nearly 2 mm.; colorless. About 1.7 mm. of the base is lost. The venation is very simple, but similar in principle to that of *Nemoura*. From the fork of the radial sector to the apex is nearly 3 mm. Comparing the venation with recent species, I found nothing very close, and it is probable that a distinct genus is indicated. Some of the species from Prussian amber are interesting for comparison. Thus *Taeniopteryx elongata* Berendt has the cross-nervure at the end of the subcosta, but it is oblique. *Leuctra gracilis* Berendt and *Leuctra linearis* Berendt have this cross-nervure well before the end of the subcosta, in *gracilis* producing an angulation of the subcosta, but not in *linearis*. On the other hand, *L. gracilis* agrees with the English fossil in having the cross-vein connecting R with R₃ beyond the fork of R₃; in the other two amber species it is at the fork. Our fossil nearly agrees with *L. gracilis* in the position of the cross-vein between R₃ and M.

British Museum, In. 17498.

Thirteen species of Perlidæ have been found in Baltic amber, and one in the Oligocene of Rott, but strangely enough none in the American Tertiaries.

UNDESCRIBED LEPIDOPTERA IN THE CANADIAN NATIONAL
COLLECTION.

BY J. MCDUNNOUGH,

Entomological Branch, Ottawa.*

For some time there has been a strong feeling among Canadian entomologists that the types of as many as possible of our Canadian insects should be deposited in the National Collection at Ottawa. During the past half century, owing to the lack of taxonomists in Canada, a large proportion of Canadian insect material has been sent to the United States or Europe for identification and as a result the types of numerous undescribed species have been retained in these countries. With the growth of taxonomy and the discovery of numerous closely allied forms which heretofore had been grouped

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UNDESCRIBED LEPIDOPTERA.

Male clasper of 1. *Ewartema permundanum* Clem.; 2. *E. troglodanum* n. sp.; 3. *E. furfuranum* n. sp.; 4. *E. rusticanum* n. sp.; 5. *E. bolanderanum* n. sp.; 6. *E. terminanum* n. sp.; 7. *Argyropteroce youngana* n. sp.; 8. *A. deceptana* n. sp.; 9. *A. tertiana* n. sp.; 10. *A. buckellana* n. sp.; 11. *A. polluxana* n. sp.; 12. *A. castorana* n. sp.; 13. *A. aspasianna* n. sp.; 14. *A. carolana* n. sp.; 15. *A. vulgana* n. sp.

under a single specific name, the necessity for a study of type material becomes greater and greater; the disadvantages under which a Canadian entomologist labors, where such study involves numerous expensive journeys, become yearly more obvious, and it is with the sole end in view of adding to the type material in the National Collection that the following paper has been prepared. It is possible that in a few instances a named species has been redescribed, as certain identifications have been based on descriptions alone and a study of type material has been impracticable; if such cases should occur, the error may be ascribed to my anxiety to secure as many types as possible for the Ottawa Collection.

SCOPARIINAE.

Scoparia truncatalis sp. n.

Allied to *basalis* Wlk. but with broader and shorter wings and with no olivaceous scaling around the reniform; the genitalia are also distinct. Primaries gray, shaded with smoky; a very short black basal dash; a dark t. a. line, rounded outwards below costa and starting from a small dark costal spot, shaded slightly inwardly with white; included basal space smoky; orbicular occasionally represented by a dark dot close to t. a. line; claviform a dark streak attached to t. a. line; reniform formed by two blackish cusps, making an x-shaped mark; above this some smoky shading but remainder of median space rather pale gray; t. p. line rounded outwardly below costa, then inwardly oblique and minutely dentate, white, shaded on both sides with smoky; terminal space whitish with smoky blotch at centre of outer margin and prominent terminal row of dark spots just inside margin of wing, which appears as a white line. Fringes pale smoky cut by a darker line. Secondaries whitish, slightly smoky outwardly. Expanse 15 mm.

Holotype,—1 ♂, Norway Point, Lake of Bays, Ont. (July 12) (J. McDunnough), in Canadian National Collection.

Paratypes,—6 ♂'s, 1 ♀, same locality and date; 1 ♂, 3 ♀'s, Ottawa, Ont. (July 5, 9, 11) (C. H. Young).

As compared with *basalis* the male claspers are much broader and the aedoeagus contains a bundle of two or three long spines.

PIIYCITINAE.

Acrobasis alnella sp. n.

Primaries dark purplish gray with slight ruddy reflections and paler gray shading; t. a. line arising from a triangular dark shade on costa, well outcurved to cell, then straight to inner margin, pale gray, bordered by a dark line; the space between it and the dark basal scale-ridge dull clay color, median space with paler gray shading below costa and two superimposed black discal dots; t. p. line straight below costa, bulging gently opposite cell and finely dentate, whitish, bordered inwardly by a dark line. A dark terminal line. Secondaries dull smoky. On the underside the male is without black markings. Expanse 17-22 mm.

Holotype,—1 ♂, Ottawa, Ont. (July 9) (J. McDunnough), bred from Alder, in Canadian National Collection.

Paratypes,—4 ♂'s. 3 ♀'s from the Ottawa region, bred from Alder on various dates in July.

The species is closely allied to *betulella* but smaller and shows genitalic differences, notably in the much smaller gnathos; the cocoon is oval, much like a miniature *betulella* cocoon. From *rubrifasciella*, also an *Alnus* feeder, it is at once distinguished by the lack of the bright red antemedian band. It may possibly be *normella* Dyar, the food plant of which was not given in the description and the type of which I have not studied.

EUCOSMIDAE.

Exartema Clem.

In working over the material in the Canadian National Collection belonging to this genus (i.e. species with a cylindrical appendage at base of secondaries in the male sex) an examination of the genitalia soon made it apparent that on the one hand there was a group of species very similar in general superficial appearance but differing markedly from each other in genitalia, whilst on the other hand species which could be readily distinguished from each other by maculation and color possessed genitalia so similar that no definite points of distinction could be found in these organs.

The first group centers around *permundatum* Clem.; our determination of this species is based on a study of the descriptions of Clemens and Zeller and agrees with specimens in the collection determined as this species by Kearfott and Busck; a figure of the clasper is given (c. f. fig. 1). As at the present time it is impossible to examine Walker's type specimens the synonymy as given in Dyar's List is accepted. Several apparently unnamed species are herewith described.

Exartema troglodanum sp. n. (Fig. 2).

Maculation very similar to that of *permundatum* but the general impression given is that of a much darker insect due to the dark bands being thickly covered with rather bright brown scales; the pale lines defining these dark areas are also much less evident in this new species than in *permundatum*. Basal dark area slightly sprinkled with light scales, its outer border is outwardly oblique from costa at $\frac{1}{4}$ to center of wing, then almost perpendicular to inner margin with a slight concavity in the fold. The median band shows very dark shading at costa and the same two projections of the outer border found in *permundatum*; below these the band is completely cut by a narrow line of paler ground color. The anal spot is large and triangular and the oblique subapical dark band is broadly joined to the first dark costal spot. Pale areas with considerable purplish silvery iridescence and cut by a central dark line; fringes pale yellowish, cut at apex and above anal angle with dark scales. Secondaries dark smoky with pale fringes. Expanse 16-18 mm.

Holotype,—1 ♂, Meach Lake, Que. (C. H. Young) (June 17), in Canadian National Collection.

Paratypes,—1 ♂, 2 ♀'s, Ottawa, Ont. (C. H. Young) (June 27, 28), in same Collection.

***Exartema furfuranum* sp. n. (Fig. 3).**

Color and maculation of *permundanum* but slightly more greenish olivaceous and with the pale areas much more strigate with darker lines and dashes; all dark bands very distinctly outlined with pale ochreous. The two outer projections of the median band are very long, the upper one almost touching the oblique subapical band which ends at a point opposite this tooth and does not connect with the dark costal spots. Fringes dusky. Secondaries deep smoky with paler fringes. Expanse 16 mm.

Holotype,—1 ♂, Ottawa, Ont. (C. H. Young) (June 20), in Canadian National Collection.

Paratypes,—1 ♂, 1 ♀, Meach Lake, Que. (C. H. Young) (June 20, 21), in same Collection.

***Exartema rusticanum* sp. n. (Fig. 4).**

Usual type of maculation; pale areas very decidedly silvery-purplish; dark bands suffused with ruddy scales, especially prominent in outer areas (in worn specimens not so noticeable). The two outer projections of median band are short and the lower one quite thick, the space between the two containing a pale ochreous spot; there is also a bluish spot at base of lower tooth enclosed in dark area; the triangular anal spot is generally connected with the oblique subapical band by a fine network of lines, as is also this band with the first costal spot. A thick dark line at base of fringes which are pale, checkered irregularly with black. Secondaries dark smoky. Expanse 15-16 mm.

Holotype,—1 ♂, Onah, Man. (N. Criddle) (July 17), in Canadian National Collection.

Paratypes,—2 ♂'s, 2 ♀'s, Onah, Man. (N. Criddle) (July 17-19), in same Collection.

The genitalia are similar to those of the preceding species but the two species can be readily separated by color and maculation. A ♀ specimen from Trenton, Ont., appears to belong here; it had been identified by Kearfott as *zellerianum* Fern. but Zeller's figure represents quite a different type of maculation and I cannot agree with this determination.

***Exartema fraternanum* sp. n.**

Very similar to preceding species in maculation and genitalia but lacking the ruddy tinges and with pale areas distinctly less silvery, resembling in this respect a small dark form of *permundanum*. The teeth of the median band are less blunt and wider apart than in *rusticanum* and there is no pale area below the inner tooth with the exception of a couple of hair-lines joining the costal and inner portions, this latter being goblet-shaped with short stem resting on inner margin. Oblique subapical band dark, much thickened in upper portion, joined by a fine line to costal spot and also to anal triangular spot. Secondaries dark smoky with pale fringes.

Holotype,—1 ♂, Ottawa, Ont. (July 3) (C. H. Young), in Canadian National Collection.

Exartema bolandanum sp. n. (Fig. 5).

Very similar to *olivaceanum* Fern. and of the same type of genitalia; the general appearance of primaries is more mottled than in *olivaceanum*; the best point of distinction is found in the subterminal area, the oblique band being broader and closer to apex of wing in *bolandanum* with a narrow line of dark scales extending down to anal angle; the apex of the triangular dark spot on inner margin is joined to the center of the oblique band by a narrow dark line and the included pale space above tornus is bisected by another dark line running from the first line to anal angle. Fringes pale at apex and anal angle, dark centrally. Expanse 13 mm.

Holotype,—1 ♂, Ottawa, Ont. (June 10) (C. H. Young).

Exartema versicoloranum Clem.

Exartema versicoloranum Clem. 1860, Proc. Acad. Nat. Sci. Phil., 357.

Sericoris versicoloranum Clem. 1865, Proc. Ent. Soc. Phil., 136.

The original description of this species is very vague and might apply to several species; in his second paper however Clemens states that the species is ordinarily distinguished by the white or yellowish-white costa at the base of wing and the white space toward the hinder margin. There is a single ♂ specimen in the Canadian National Collection from Trenton, Ont. (Aug. 1) which agrees with the above diagnosis, but differs markedly in genitalia from an Ottawa series, captured in June, under the same specific name. As however this latter series fits in excellently with Zeller's description of *appendiceum*, at present listed as a synonym of *versicoloranum* Clem., I propose to use *versicoloranum* Clem. for the species with white costa at base and resurrect *appendiceum* Zell. from the synonymy for the very similar species with dark basal area.

Exartema valdanum sp. n.

Basal and median areas dark olivaceous black-brown, separated by a band of whitish color containing a few dark dots in form of a broken central line; this pale band is upright with margins slightly waved. Median band outwardly with two blunt teeth and an indentation of pale color below inner tooth. The usual dark triangular spot near anal angle and an oblique band running inward from center of outer margin and joined to first costal spot by fine line; a narrow dark area below apex sending hair-lines to costal spots and separated from subapical band by a narrow band of whitish. Remainder of outer area pale, same color as inner band, slightly clouded with smoky. Fringes irregularly checkered black and white. Secondaries dark smoky with pale fringes. Expanse 17 mm.

Holotype,—1 ♂, Ft. Coulonge, Que., (July 7) (S. A. Graham), in Canadian National Collection.

Allotype,—1 ♀, Aylmer, Que. (May 29) (J. McDunnough).

The type of genitalia is that of *permundanum* but the pale bands of primaries rather recall *fasciatanum* Clem.

Exartema nananum sp. n.

Thorax light brown; primaries with usual type of maculation, the dark

areas cinnamon-brown, the pale bands and spots bluish-silvery. Basal area with outer margin bulging outwardly, sprinkled with a few bluish scales in costal half of wing. Antimedial pale band cut by a central brown line. Median brown band with inner margin slightly concave, composed of an upper boot-shaped spot and a lower subquadrate spot joined together narrowly at heel of boot and also near the toe, enclosing a pale bluish spot; there is also a projection on outer margin of the band below costa. The subapical oblique band is thickened in its middle and joined to the first costal spot, the toe of the boot and the anal triangular spot by fine lines, the enclosed areas being of the bluish-silvery color of the antemedian band. Terminal area narrowly brown with a fine bluish line bordering the oblique band outwardly. A dark terminal line. Fringes slightly bluish with dusky apical and median areas. Secondaries smoky with lighter fringes. Expanse 12 mm.

Holotype,—1 ♂, Mer Bleue, Ottawa, Ont. (July 20) (C. H. Young), in Canadian National Collection.

The type of genitalia is that of *permundanum*.

***Exartema bicoloranum* sp. n.**

Primaries cinnamon-brown beneath which towards the base an underlying area of black scaling may be seen with a lens; all maculation very indistinct, consisting of the usual bands and spots in a slightly deeper brown than the general ground color, rather better defined in outer area, where the outer edge of the median band, the anal triangular spot and the oblique subapical band are visible, the latter defined by narrow lines of purplish; a dark terminal line; fringes pale ochreous tinged with smoky. Secondaries pure white, with a smoky terminal border, broadest at costa; fringes pale. Expanse 13 mm.

Holotype,—1 ♂, Barrington Passage, N. S. (July 10) (C. H. Young), in Canadian National Collection.

The type of genitalia is similar to that of *furfuranum* and *rusticanum*; the white secondaries readily distinguish the species from others of the genus.

***Exartema submissanum* sp. n.**

Primaries dull cinnamon-brown with a purplish tinge due to a strong striation of brown scales on a purple ground color; maculation very indistinct, best defined in terminal area, brighter brown than ground-color without purple tinge. Median band with a sharp outward angle below costa, then more or less perpendicular to inner margin, rather narrow; anal triangular spot small, more or less joined to median band; oblique subapical band most distinct of all the maculation, narrow, of even width throughout, joined by a fine line to first costal spot; apex streaked with brown. Dark terminal line; fringes pale ochreous, shaded with smoky. Secondaries whitish hyaline at base shaded with smoky outwardly, forming a more or less diffuse outer dark border. Expanse 16 mm.

Holotype,—1 ♂, Ottawa, Ont. (July 23) (C. H. Young), in Canadian National Collection.

Paratypes,—3 ♂'s, 1 ♀, Ottawa, Ont. (July 17, 23) (C. H. Young), in same collection.

The species resembles somewhat the preceding but is larger with less distinctly white secondaries and the genitalia are of the *permundatum* type. According to Zeller's figure and description it would appear to be fairly close to *zelleranum* Fern. lacking however the prominent tooth of the median band.

***Exartema terminanum* sp. n. (Fig. 6).**

Basal 4/5 of primaries deep purplish-black with a few purple shining striae arising from pale costal spots antemedially indicating the usual pale band. The outer 1/5 of wing is pale ochreous crossed by the blackish subapical band which loses itself in the dark area, is of even width throughout and slightly bent; a few dark streaks at apex and tornus of wing. The usual dark median band is slightly indicated by curved purple striae on its outer edge. Fringes pale ochreous tinged with smoky. Secondaries light smoky, paler in basal area. Expanse 14 mm.

Holotype,—1 ♂, Ottawa, Ont. (July 1), (J. Fletcher), in Canadian National Collection.

Paratypes,—1 ♂, 2 ♀'s, Ottawa, Ont. (July 10, 14, 28) (C. H. Young), in same collection.

This may be merely a form of *concinnum* Clem. as it has the same type of genitalia. In any case, on account of the striking coloration, it would seem worthy of a name.

***Argyroploce capreana* Hbn.**

There are before me four species belonging to this group and all closely allied. *Capreana* may be best distinguished by a small comma-like white mark jutting in from the white apical area to the outer margin of the dark basal area about the center of the wing. It is represented in the National Collection by specimens from Ottawa, Trenton and Sudbury in Ontario, one male from Nordegg, Alta., and one male from Vancouver, B.C. If identifications made by Mr. Kearfott are correct, *frigida* Pack. would appear to be a synonym of this species.

The other species appear to be undescribed. I have carefully compared them with existing descriptions of North America species and also figures and descriptions of the allied European species and cannot match them. I therefore offer the following descriptions.

***Argyroploce youngana* sp. n. (Fig. 7).**

Rather larger than *capreana* but very similar in general appearance. Basal 2/3 of primaries dark purplish-brown, blotched with still darker markings; the costal area, however, for about half the length of wing, is shaded with white, enclosing a quadrate dark patch near base of wing. The outer margin of the dark area is sharply and evenly defined, being perpendicular to below cell, then forming a distinct angle and outwardly oblique to inner margin just before tornus. Apical 1/3 white, clouded with purple-gray at apex, with two dots of similar color on costa from which proceed faint wavy subparallel gray shades crossing obliquely to outer margin. Fringes smoky slightly checkered. Secondaries dull smoky with paler fringes. Expanse 19-20 mm.

Holotype,—1 ♂, Meach Lake, Que. (July 20) (C. H. Young), in Canadian National Collection.

Paratypes,—1 ♂, Chelsea, Que. (July 6); 6 ♀'s, Meach Lake (Aug. 5), Ottawa, Ont. (July 4, 6, 11, 25, 28) (C. H. Young).

The male genitalia have the arm of the clasper narrowed for a considerably greater length than is found in *capreana*; there are also differences in the gnathos and the spining of the aedoeagus.

***Argyroploce deceptana* sp. n. (Fig. 8).**

Much smaller than preceding species; evidently allied to the European *sauciana*. Basal $2/3$ of primaries brown, slightly sprinkled with white scales forming a more or less evident dash from base through center of wing; a small dark quadrate patch on costa near base and a larger one near outer edge of dark area; several irregular dark blotches in central portion of wing. Outer $1/3$ of wing white, the dividing line not very sharply demarcated; a white hook projects into the dark area below cell, leaving a distinct blackish ocellus-like mark, much as in *separatana* Kft., standing out on the margin of the white area; a triangular anal spot is partially separated by pale scaling from the basal dark area. The apex of wing is shaded with brown and directly below this a short blackish oblique subapical band is present, not attaining however to costa. Fringes dusky whitish at anal angle. Secondaries pale smoky, darker outwardly. Expanse 15 mm.

Holotype,—1 ♂, Ottawa, Ont. (June 5) (C. H. Young), in Canadian National Collection.

Paratypes,—2 ♀'s, Meach Lake, Que. (June 17), Ottawa, Ont. (June 24), taken by same collector.

***Argyroploce tertiana* sp. n. (Fig. 9).**

Primaries with basal $2/3$ purplish-brown, sprinkled with bright brown and with several darker blotches centrally; the beginning of an antemedial pale band is visible in a patch of whitish scaling on costa, partially obscured by brown dots; outer margin of dark area oblique and rather irregular; outer $1/3$ of wing white, considerably obscured by dark shading, much more so than in preceding species; three dark dashes along costa; apex of wing dark, shaded with bright brown which continues downward along outer margin; a dark oblique subapical band, not attaining costa and shaded with light brown scales; the space between this band and the dark basal area is almost completely occupied by a broad grayish shade sprinkled with brown, extending upwards from anal angle to a point opposite cell and broadest at its apex which is truncate; a dark terminal line; fringes dusky. Secondaries smoky, paler basally. Expanse 16 mm.

Holotype,—1 ♂, Ottawa, Ont. (June 25) (C. H. Young), in Canadian National Collection.

Allotype,—1 ♀, Ottawa, Ont. (June 5) (A. Gibson), in same collection.

The ♀ shows more ruddy scaling below apex of wing and the dark basal area is continued along costa to include the first costal dash; the secondaries are also darker. I believe these differences are merely sexual.

Argyroploce buckellana sp. n. (Fig. 10).

Allied to the preceding species, especially the ♀, in type of maculation but distinct in genitalia. Primaries dark brown, shaded with blackish, with inconspicuous whitish antemedian band and outer $\frac{1}{4}$ of wing dark brown with blackish shading and with a few orange scales on inner margin at base; the outer edge of this area outwardly oblique to beyond cell, then perpendicular to inner margin; white antemedian band heavily sprinkled with brown scaling and not well defined; median broad oblique dark band of even width throughout, outer edge rather irregular in outline and attaining inner margin just before tornus; beyond this band the ground color is white but so heavily shaded with purplish-gray as to leave the white area only distinct as a fine border line to the median band and a paler area at tornus; this pale edging forms a slight white comma-mark on the dark margin of median band opposite cell; three whitish geminate dashes on costa before apex, a dark apical spot and a short curved dark sub-apical band; a ruddy-brown terminal line; fringes smoky, mixed slightly with brown and white. Secondaries deep smoky with paler fringes cut by a dark basal line. Expanse 15 mm.

Holotype,—1 ♂, Salmon Arm, B. C. (May 28) (W. R. Buckell), in Canadian National Collection.

I take much pleasure in naming the species after the collector, Mr. W. R. Buckell, who has through his careful and painstaking collecting added considerably to our knowledge of British Columbian Lepidoptera.

Argyroploce sordidana sp. n.

Size and general maculation of *glitranana* Kft. but of a much darker appearance, due to the fact that the pale areas between the dark bands are only slightly lighter in color than the bands themselves. Basal area of primaries black, overlaid heavily with brown and ochreous scaling and interrupted by several bluish-silvery dots; median band similar in color to basal area, in shape much as in *glitranana*; the paler space between basal area and median band is defined by two subparallel bands of bluish-silvery spots the included area being scaled with brown, without the underlying blackish color. A triangular anal spot and broad subapical band similar in color to median band, all their edges defined by silvery scaling; remaining areas similar to antemedian band in color. A row of dark spots along costa bordered with pale ochreous and a dark terminal line. Fringes deep smoky, slightly paler below apex. Secondaries deep smoky, almost black, with pale fringes. Expanse 16 mm.

Holotype,—1 ♂, Coliseum Mt., Nordegg, Alta., 6500 feet. (July 12) (J. McDunnough), in Canadian National Collection.

Paratypes,—3 ♂'s from same locality (July 7, 12, 18).

Argyroploce thallasana sp. n.

Allied in size and structure to *duplex* Wlsh. Primaries with basal two thirds dull purplish washed with olivaceous-brown which color forms a faint basal patch and is most prominent as a large irregular patch on inner half of wing, covering the area between anal angle and middle of inner margin. Outer half of wing olivaceous with small brown apical spot and slight brown shading along outer margin. Costa beyond middle with four pairs of pale ochreous

dashes separated by black and giving rise to irregular silvery-purple lines; from the first pair arise two lines very oblique outwardly below costa then broadening and irregularly perpendicular to inner margin, cutting through the dark patch and attaining margin near anal angle; oblique streaks from the second and third pairs of dashes coalesce to form a purple stripe which curves and runs sub-parallel to outer margin, bifurcating above anal angle; from outer of the last pair of dashes a short purple streak extends to outer margin below apex defining the brown apical spot. Some pale terminal dots, most evident above anal angle. Fringes mixed pale and smoky with dark basal line. Secondaries smoky with paler fringes. Expanse 22 mm.

Holotype,—1 ♂, Aweme, Man. (June 17) (N. Criddle), in Canadian National Collection.

Paratypes,—2 ♀'s, Aweme, Man. (June 25); Lauder, Man. (Aug. 1), by same collector.

***Argyroploce aspasiana* sp. n. (Fig. 13).**

Allied to *instrutana* Clem. in color and maculation but much smaller. Base of primaries dark olivaceous-brown with considerable white scaling at extreme base; a whitish transverse antemedian band cut by a brown central hair-line; the band is slightly excurved below costa and the edges are rather irregular; median dark band composed of ruddy-brown scaling on a dark ground-color giving a decided olivaceous-brown tinge; the outer edge is strongly outwardly oblique from costa to centre of wing where it forms a prominent projection and then bends inward to inner margin, the width of band in centre of wing being twice the width of same at costa and inner margin; the apex of the projection is scaled with black; a long narrow triangular brown spot before anal angle and a broad similarly colored oblique subapical band extending from costa to below middle of outer margin and containing a dull leaden patch opposite the cell; intervening pale areas are silvery with scattered white scaling; apex of wing brown, cut by a silvery streak, and with three geminate white streaks at apical portion of costa and a pale line below apex on outer margin. Fringes dusky, slightly cut by brown. Secondaries smoky with paler fringes. Expanse 11 mm.

Holotype,—1 ♂, Mer Bleue, Ottawa, Ont. (July 3) (C. H. Young), in Canadian National Collection.

Paratypes,—1 ♂, 2 ♀'s, same locality and collector, (July 2-3).

The male genitalia are so different as to almost suggest another generic reference but I can see no other structural differences to warrant this at present. The uncus and tegumen are strongly chitinized and the former is long and pointed; the gnathos is well developed but the socii are lacking.

A study of genitalia of series before me from Ottawa, Ont., and Nordegg, Alta., shows that there are several quite distinct species in the difficult *campestrana* group which as yet are unnamed. One of these may possibly prove to be *glaciana* Moesch. but as none of them fits very closely the description and figure of this species (1860, Wien. ent. Monatsschr. IV, 380) and as it is impossible at the present time to get information concerning the genitalia of the type specimen, I venture to propose names for all of these species as follows:—

***Argyroploce castorana* n. sp. (Fig. 12).**

Thorax, palpi, head and abdomen black-brown; primaries black-brown crossed by a white antemedian band and with the apical $\frac{1}{2}$ more or less of the same color. Basal area deep black-brown, the outer edge rather evenly convex with a slight outward projection below cell; white antemedian band with outer edge only slightly irregular and with faint dark central hair-line; median band broad, dark black-brown, slightly suffused with purplish scaling, broadest on inner margin where it is extended to include the triangular anal patch, the outer edge being irregularly concave from costa to above vein 2 and then perpendicular to inner margin just before tornus; on this outer edge in the central area of wing a round blackish spot is more or less distinctly visible, defined on its upper inner edge by a white dot; subterminal area white with a few dark striations and with two black costal spots, separated by white areas through which a fine black hair-line runs; opposite cell is an irregular dark shade which at times connects with the terminal dark area and also with the median band above tornus; apex and outer margin of wing rather broadly black-brown, narrowing to just above anal angle. Fringes smoky, paler at anal angle, with a darker basal line. Secondaries pale smoky with paler fringes which show a dark basal line. Expanse 17 mm.

Holotype,—1 ♂, Nordegg, Alta. (July 7) (J. McDunnough), in Canadian National Collection.

Paratypes,—9 ♂'s, Nordegg, Alta. (June 24, 30, July 4, 5, 7) (J. McDunnough), in same collection.

There is also a series before me from Ottawa, Ont., slightly smaller in size than the Nordegg specimen but with same type of genitalia. The species is best separated from *campestrana* by the fact that *two* instead of *three* postmedian costal spots are present; in this feature it approaches *fuscalbana* Zell., which, however, besides differing in genitalia, has a brighter and more contrasted type of coloration.

***Argyroploce polluxana* n. sp. (Fig. 11).**

Very similar to preceding species but with white areas more silvery-white, giving a more contrasted tone to the coloration. The antemedian white band sends a short rounded projection in the cell into the dark median area, and opposite this is a similar projection from the pale subterminal area; the triangular spot before tornus is not so entirely merged into the median area but is slightly defined inwardly by pale purplish shading; the subapical oblique streak is also partially separated from the dark apical area by paler purplish shading and at times bends backward towards apex of triangular patch; there are three dark costal spots, and the white subterminal area is more striated and blotched with dark color than in *castorana*. Expanse 18-19 mm.

Holotype,—1 ♂, Nordegg, Alta. (July 5) (J. McDunnough), in Canadian National Collection.

Paratypes,—5 ♂'s, same locality and collector (July 7, 14, 20).

The species were taken along with the preceding in a mixed spruce and tamarack swamp. There are a number of specimens from Ottawa, Ont., in the Canadian National Collection which show the same type of maculation and genitalia as the type specimens.

***Argyroploce carolana* n. sp. (Fig. 14).**

Very similar in maculation to the two preceding species but smaller and with a decided olivaceous tinge to the dark areas. In contradistinction to the allied forms the patagia are white with the exception of a dark patch at base, the thorax is also crossed by white bands; on the primaries the outer edge of the basal dark area tends to become irregular, showing (in two specimens) slight rounded excavations in cell and on submedian fold; the outer edge of the dark median band shows a downward indentation of white color at the apex of the triangular patch, which patch is joined to the median area; the subterminal white band is narrow, the whole terminal area being broadly (except at costa and anal angle) suffused with olivaceous brown; there are two olive-brown costal spots which may or may not be connected by hair-lines with the dark terminal area. Expanse 14 mm.

Holotype,—1 ♂, Ottawa, Ont. (June 21) (C. H. Young), in Canadian National Collection.

Paratypes,—1 ♂, same locality and collector (June 24); 1 ♀, Trenton, Ont. (June 11) (J. D. Evans) in same collection.

The type of genitalia is remarkably distinct.

***Argyroploce vulgana* n. sp. (Fig. 15).**

Similar in type of maculation to the three preceding species but in the male sex with the pale areas much duller and largely suffused with dark striations. Basal area and median band dull olivaceous-brown, the latter in shape similar to that of *castorana* and with a fairly evident blackish dot at end of cell; antemedian pale band often very indistinct and at times not attaining inner margin; subterminal pale area reticulate with olive-brown and with two dark costal spots; the dark color of apex and terminal area forms roughly a triangular blotch of which the outer margin is the base; at times this area can be differentiated into an apical blotch and a subapical oblique streak, due to slightly paler scaling between the two component parts; fringes dark at apex, mixed pale and smoky in other areas. Secondaries dull smoky.

In the female the white areas are quite prominent and sharply defined. Expanse, ♂, 15 mm., ♀, 14 mm.

Holotype,—1 ♂, Nordegg, Alta. (July 9) (J. McDunnough), in Canadian National Collection.

Allotype,—1 ♀, Nordegg, Alta. (July 11) (J. McDunnough), in same collection.

Paratypes,—12 ♂'s, 1 ♀, same locality and collector, taken on various dates from June 27 to July 14.

The species was quite common in the muskeg around bushes of dwarf birch on which it probably feeds. The type of genitalia is remarkably distinct.

***Argyroploce nordeggana* n. sp.**

Primaries olivaceous-brown, banded with silvery-white. Basal area dark, the outer edge forming a strong truncate projection in the cell; antemedian band broad, silvery-white with three dark costal dots from central of which a wavy olivaceous line arises, bisecting the band and tending to connect by fine lines with the dark areas on both sides, thus dividing the white area into numerous small

quadrate patches. Median band dark, upright, rather narrower than usual, almost bisected by projections of the surrounding pale area just above submedian fold, the upper portion with two blunt tooth-like projections on its outer margin; this dark area is followed by a subterminal silvery band with central dark line arising from costal spot and with same tendency to divide up into small rectangular patches as in the antemedian band; the pale band bifurcates above anal angle and encloses a large ovate dark spot; the remainder of the wing is occupied by a net-work of olive-brown lines and bands enclosing small patches of leaden-colored scales and containing two geminate white dashes on costa; fringes mixed smoky and white with dark basal line. Secondaries dull smoky. Expanse 20 mm.

Holotype,—1 ♂, Nordegg, Alta. (July 14) (J. McDunnough), in Canadian National Collection.

Paratype,—1 ♂, same locality and collector (July 18).

A female specimen which we are inclined to associate with this species is whiter, especially in the apical area; where the dark bands are reduced and the leaden-colored scales replaced by white ones.

A NEW LITHOBIID OF THE GENUS *PAOBIUS*.

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Through Dr. J. McDunnough I have received for identification a specimen of a diplopod and two specimens of a chilopod collected in Alberta, Canada, by Mr. N. B. Sanson of Banff. The diplopod is apparently a not fully mature male *Parajulus hewitti* Chamberlin, a species described originally from specimens taken by Dr. Hewitt at Agassiz, B.C. The present specimen is much darker in color than the type, with the legs nearly chestnut. The cauda is very similar though somewhat shorter and the lateral striae are more pronounced. It was taken nearing Bryant Creek Cabin, Sept. 22, 1921.

The chilopods represent a new species in the genus *Paobius* of the family Lithobiidae. In the key to species given by the writer in his review of the genus* the present species runs out to *P. orophilus* Chamberlin, a British Columbian species from which, however, it is clearly distinct. The key may be modified to take in the new form as follows:

- a. Dorsal spines of anal legs 1, 0, 3, 0, 0 or 1, 0, 2, 0, 0.
- b. None of the posterior coxae laterally armed; ventral spines of thirteenth legs 0, 1, 3, 3, 1; third joint of first ten or more pairs of legs with but two dorsal spines.....*P. vagrans* Chamb.
- b.¹ Last two pairs of coxae laterally armed. Ventral spines of thirteenth legs 0, 1, 2, 3, 2 or 0, 0, 2, 3, 2; third joint of all legs with three dorsal spines.....*P. boreus* Chamb.
- a.¹ Dorsal spines of anal legs 1, 0, 3, 1, 0.
- b. Dorsal spines of penult legs 1, 0, 3, 1, 1*P. albertanus*, sp. nov.
- b.¹ Dorsal spines of penult legs 1, 0, 3, 1, 0.

*Bull. Mus. Comp. Zool., 1916, 57, p. 162.