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A FEW DAYS IN NEWFOUNDLAND.

BY E. M. WALKER, TORONTO.

(Continued from page 221.)

On my fourth day at Spruce Brook I crossed the lake in a skiff, and, following the directions of Mr. Whittington, started on the trail to Beaver Pond, a small lake surrounded by dense woods, which I reached after a few minutes' walk. Here I was equipped with a canoe, kept by the proprietors of the Log Cabin Hotel for the use of fishing parties, and I was thus able to explore all parts of the lake with ease. I found but one marshy spot of any considerable size, at the head of the lake, where it was fed by a cold trout stream.

At this spot there were a few damsel-flies and two or three *Leucorrhinias* flitting over the lily-pads and pond-weeds, but no species was present in even moderately large numbers. Five kinds of damsel-flies were taken here, viz., *Enallagma calverti*, *E. ebrium*, *Cænagrion resolutum*, *C. interrogatum* and *Ischnura verticalis* Say, the last named species being new to Newfoundland, though a very common insect in Eastern Canada and the United States. Of *C. interrogatum* I took but one more specimen. The others were not uncommon.

Of larger forms our familiar *Libellula quadrimaculata* L., found almost everywhere in Canada, as well as in the Old World, was the only species taken at this spot, the *Leucorrhinias* having been frightened away, but a pair of exuviae of *Æshna canadensis*, E. Walk., found upon a tangle of algæ, furnished another record for Newfoundland, although the only adult *Æshnas* I saw at the lake were two or three large blue forms, which I feel sure were *A. eremita* Scudd.

Just after leaving the marsh, I was attracted by a clear-winged dragonfly, evidently a Corduliine, speeding along a few feet above the water and closely following the shore-line. I took up a position

in the shelter of a bush and waited for a chance to strike with the net from behind. In a few minutes I had netted a male of *Cordulia shurtleffi* Scudd, and soon afterwards I had several more. This is a beautiful insect with a bronze-green body and brilliant green eyes. It is a very characteristic northern species, common across Canada to Vancouver Island. I also took here a fine male of *Somatochlora cingulata* Selys, the first I had ever seen. With its dark bronze body, with white transverse abdominal lines and bright green eyes, it looks very like a large form of *S. albicincta*, but it is much less common. It was the last dragonfly I captured in Newfoundland, as I was now obliged to return to the hotel, and, on the same day, to start on my homeward journey.

I have made several allusions to the scarcity of dragonflies in the vicinity of Spruce Brook. How are we to account for such a scarcity under apparently favourable conditions? Of course, there are good and bad years for dragonflies, as for everything else, but I am inclined to believe that some other cause than the usual seasonal ones was operating here. It is worthy of note that all the lakes and ponds where I collected were connected with trout streams, and it is well known that brook trout feed upon dragon-fly larvæ. Beaver Pond, particularly, teems with trout, and is a favourite place for trout-fishing. I saw numbers of fingerlings at the spot when I collected most of my dragonflies. It is therefore a possibility that the scarcity of dragonflies in this locality was due, in part at least, to the abundance of brook trout.

There appeared to be a similar scarcity of other aquatic insects, very few caddis-flies, e.g., having been observed. The little dark *Mystacides sepulchralis* was rather common about Beaver Pond, but the only other species noted were a few specimens of a Limnephilid, not yet determined, and a single example of the large *Glyptotaleius hostilis*, found in a spider's web. Like most of the dragonflies noted, this species ranges widely across the continent in the north.

Diptera and Hymenoptera seemed to be fairly plentiful at Spruce Brook, in individuals if not in species, though little effort was made to collect them. One of the best places to obtain them was a glass-covered passage connecting two parts of the Log

Cabin Hotel. As the doors were kept open, these insects entered in large numbers and collected on the window-panes. The most numerous were the flies, though a large proportion of these were ordinary blue-bottles (*Calliphora erythrocephala*) and allied forms, such as *Lucilia caesar* and *Cynomyopsis cadaverina*.¹ An undetermined Anthomyid was very common, but no house-flies were seen. Syrphididae were numerous, the following species having been taken here and elsewhere in the vicinity: *Sericomyia chalcopyga* Lw., *Syrphus ribesii* L., *S. torvus* O. S., *S. geniculatus* Macq., *S. umbellatarum* Sch., *Sphaerophoria cylindrica* Say., *Xylota vecors* O. S., *Temnostoma aequale* Lw., *T. alternans* and *Eristalis meigenii* Wied.²

Of Hymenoptera wasps were plentiful and included at least three species of *Vespa*, viz., *V. consobrina*, *borealis* and *diabolica*. Bumblebees were abundant in the bushy clearings and roadways, but nearly all belonged to the characteristic Newfoundland species, *Bombus bolsteri* Franklin, though I took also *B. borealis*. The large leaf-cutter bee, *Megachile vidua* was also occasionally seen, but no attempt was made to collect the smaller bees, nor, in fact, any of the Hymenoptera, the few captures made being quite incidental. These few included two saw-flies, *Macrophya trisyllaba* and *Trichiosoma lanuginosum*, a large Cimbicid, which I have taken as far west as Banff, Alta.; a horntail, *Urocerus flavicornis*; a long-tailed ichneumon-fly, *Rhyssa albomaculata*, both of similar wide distribution, and a smaller member of the same family, *Ichneumon feralis*.

The other orders of insects were also of necessity left unmolested. They seemed to be equally poorly represented, the scarcity of butterflies being particularly noticeable. I had expected to pick up a few interesting northern forms, of such genera as *Oeneis*, *Brenthis* and *Eurymus*, but saw only a few of our commonest Canadian species, such as *Brenthis myrina* and *Euvanessa antiopa*.

Of course, no conclusions can be drawn from such fragmentary observations as these, as to the extent of the insect fauna of Spruce

1. Determinations by C. H. T. Townsend. 2. Determinations by M. C. Van Duzee (except *T. alternans*).

Brook, much less that of Newfoundland, but my general impression was that of a fauna poor in species, not only of insects, but of other animal groups. The evidence for this seemed to be fairly definite as regards the Orthoptera, and it is well-known to be true of some of the vertebrate groups. There are no native reptiles nor Amphibia in Newfoundland, and many of the characteristic Canadian mammals are absent, e.g., the Moose, Wapiti, Brown Bear (*Ursus richardsoni*), the Sciuridæ, or squirrel family, etc. In the small streams I saw only trout and stickleback; no minnows, nor other Cyprinoids, and no crayfish.

The absence of these animals, or some of them, has been explained as a result of the Glacial Period, during which Newfoundland, already separate from the continent of North America, was independently glaciated or partially covered by an ice-sheet of its own. As a result, its fauna has been in large measure exterminated, instead of being pushed farther south, as on the mainland, and the re-establishment of such exterminated species on the return of favourable conditions has been in many cases impossible.

A faunistic study of Newfoundland is a great desideratum, especially of those groups of animals to whose natural means of distribution a short distance over sea acts as a barrier. Such, for example, are flightless insects, or those incapable of sustained flight, e.g., many Orthoptera, most vertebrates except birds, exclusively fresh-water fishes, the larger Crustacea, land and fresh-water Mollusca, etc. It is among these same groups, except the Mollusca, that we have already noted evidence of a paucity of species. As regards the Mollusca, I have practically no data at hand. I found a few land and fresh-water forms, including a single Mussel (*Anodonta* sp.), which was common in Beaver Pond, a few fresh-water snails, such as the common *Planorbis campanulatus*, and a few land forms, of which the large *Succinea ovalis* was very plentiful. I also picked up *Pyramidula cronkhitei anthonyi*, a little striated form common almost everywhere in Canada, *Agriolimax agrestis*, a common garden slug, introduced from Europe, and *Helix hortensis*. This last form, already recorded from Newfoundland by Prof. Cockerell, is a species of very interesting distribution, occurring on the eastern coast of North America

and the adjacent islands, from New England to Labrador, in Greenland, Iceland and Western Europe. It is one of the forms whose distribution supports the theory of former connections between these land-masses.

My trip to Newfoundland, from the dragonfly standpoint, was certainly not a success, yet I left the island very reluctantly, realizing more keenly than ever before, that on a long trip to a strange locality one must be prepared to remain there long enough to find the conditions of environment most favourable to the group one is collecting or studying, and to be reasonably sure of a fair proportion of good weather.

APHIDIDÆ FOUND ON THE APPLE IN BRITAIN
AND THE
DESCRIPTION OF A NEW SPECIES FROM AFRICA.

• BY F. V. THEOBALD, M.A.

(Continued from page 242.)

Phorodon humuli Schrank.

Aphis humuli Schrank.

Aphis mahaleb Koch.

Aphis pruni-mahaleb Fonscolombe.

Humifex Amyot.

Aphis pruni Scopoli?

Schrank, Fn. Boica, II, 110n, 1199, 1801.

Kaltenbach, Mono. Pflanz., p. 36, 1843.

Walker, Ann. Nat. Hist., Se. 2, VI, p. 120, 98, 1850.

Koch, Die Pflanz., p. 113, 47, figs. 150-151, pl. XXI, 1857.

Fonscolombe, Ann. Soc. Ent. Fr., X, 175, 15, 187?

Amyot, Ann. Soc. Ent. Fr., 2 Se., V, p. 477, 1872.

Buckton, Mono. Brit. Aph., I, p. 166, pls. XXX and XXXI, figs. 1-4, 1887.

Theobald, Insect and Allied Pests Fruit, pp. 247-252, figs. 181-183, 1908.

Theobald, Rept. Eco. Zool. year 1911, pp. 33-34, 1912.

Scopoli, Ent. Carn., 138, 406, 1763?

This well known hop and prune aphid has been found by me once on apple. It was not only living on the apple foliage, but

August, 1916

was reproducing and developed large colonies at Wye in August and September 1911, which gave rise to an alate brood which migrated during the latter month. It is possible that Scopoli's *Aphis pruni* is this insect.

***Aphis pomonella* nov. sp.**

Alate viviparous female:

Antennæ shorter than body; first segment larger than the second; third a little longer than the fourth, shorter than the sixth, with 5 to 6 round sensoria along its whole length; fourth about the same length as the fifth, the latter with normal sub-apical sensorium; sixth about as long as fourth and fifth, its basal area half as long as the flagellum. All the segments imbricated, the two basal ones dark; base of third and basal half of fourth paler. Head with slight lateral tubercles and slightly raised in the middle. Proboscis reaching to the third coxæ, acuminate. Pronotum with lateral papillæ. Head apparently brownish and green. Eyes

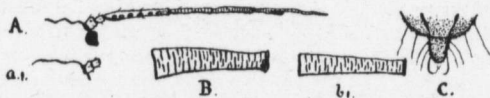


Fig. 9.—*Aphis pomonella* nov. sp. A, Head and antenna of alate viviparous female; a, head of another specimen. B, *A. kochii*; b, hind tibia. C, *Siphocoryne avenae*; c, hind tibia.

dark. Thoracic lobes dark. Abdomen apparently greenish with three large, dark lateral spots before the cornicles. Cornicles moderately long, black, slightly swelling towards the base, markedly imbricated and serrated laterally. Cauda blackish, about half the length of the cornicles, spinose with three pairs of lateral hairs. Anal plate dark, spinose, with two long, apical hairs on each side. A large papilla on each side between the cornicles and cauda, and traces of 3 lateral abdominal ones between the cornicles and thorax. Front legs green with black apices to the tibiæ and black tarsi; hind legs with dark femora, except at the base; coxæ black. Wings normal, veins and stigma yellowish brown to yellowish green.

Length 1.2 to 1.6 mm.

LOCALITY:

Nairobi, British East Africa (T. J. Anderson).

FOOD PLANT: The apple.

Described from a number of alate females preserved in spirit. The colour appears greenish. It somewhat resembles De Geer's *Aphis pomi*, but can at once be separated by (1) the different antennæ and (2) by the shorter cornicles. *Aphis pomi* has a greater number of sensoria on segment 3 of the antennæ, and more irregularly disposed, and also some on segment 4. There were also some nymphæ in which the cornicles are shorter and thicker.

OTHER SPECIES ON APPLE IN AMERICA.

Four other species are recorded on the apple in America, namely:—

1. *Myzus persicæ* Sulzer (Patch, Bull. 233, Maine Agri. Exp. Sta., p. 267, 1914).
2. *Aphis brevis* Sanderson (Bull. 74, Del. Coll. Agri. Exp. Sta., p. 157, 1906). This has not so far been found in Europe. It also feeds on quince, and Patch (p. 257) records it on *Cratægus*. It migrates in summer to clover, sweet peas, etc. On hawthorn it causes the leaves to become distorted into dark purple curls.
3. *Aphis bakeri* Cowen (Bull. 31, Tech. Se. Colo. Exp. Sta., p. 118, 1895) is also an apple pest in America and migrates to clover (Gillette and Taylor, Bull. 133 Agri. Exp. Sta., Col. Agri. Col., 1908).
4. *Aphis medicaginis* Koch, is recorded by Gillette (Journ. Eco. Ent., I, p. 308, 1908, and Bull. 133 Colo. Agri. Coll. Exp. Sta., p. 32, 1908) on tender, new apple shoots.

A NEW GENUS OF LELAPINE CHALCID FLIES FROM THE UNITED STATES.

BY A. A. GIRAULT, GLENNDALE, MD.

The following genus is similar to the Australian *Uriolelaps* Girault, but there are no perfect wings, and only one ring-joint (though apparently two by transverse central division of the one), the antennæ 12-jointed, the club 2-jointed.

August, 1916

Apterolaelaps, new genus.

FEMALE—Name proposed by Ashmead, but never made valid by description of a genotype.

Apterolaelaps nigriscutum, new species. Genotype.

FEMALE—Length 3.00 mm.

Reddish yellow, the following parts black: Upper third of occiput except dorsad centrally, vertex, upper half of face (mostly mesad), antennæ (except scape, pedicel, ring-joint, funicle 1 and narrowly, extreme apex of club); scutum (except cephalic third), the parapsides and the abdomen except its petiole, dorsolaterad at proximal half of segment 2, segments 3-5 (all short) and the meson of venter narrowly. Head and thorax densely scaly-reticulate, the scutellum long-striate distad of the cross-suture, the propodeum with a median ruga and irregular longitudinal rugæ, the neck distinct. Vertex with about a half-dozen long, black setæ; the scutellum with a similar seta laterad at the cross-suture, the cephalic scutum hairy. Caudal margin of scutum broadly arcuate at the meson. Segment 2 of abdomen glabrous, the rest of the abdomen with short, sparse pubescence. Petiole rugulose. Head wider than the thorax, the antennæ inserted on a level with the ventral ends of the eyes, their scrobes long-triangular, reaching nearly to the cephalic ocellus, cross-striate, divided by a thin carina; an arcuate cross-carina just ventrad of the antennæ. Club 2 a little longest of the flagellum; pedicel a little longer than funicle 1, the latter twice longer than wide, 4 quadrate, 7 somewhat wider than long. Mandibles tridentate.

From one female in the U. S. National Museum, Fort Pendleton, West Virginia, "10.7."

TYPE 1—Catalogue No. 20306, U. S. N. M., the female on a tag, the head, pair of wings and caudal tibiæ on a slide.

Fore wings minute, linear, subhyaline, four times longer than wide, the marginal vein with long bristles, half the length of the submarginal and terminating at wing apex; the caudal wings are only somewhat longer than wide.

DESCRIPTIONS OF AND OBSERVATIONS ON SOME
CHALCIDOID HYMENOPTERA—II.

BY A. A. GIRAULT, GLENNDALE, MD.

(Continued from page 246.)

The following is a table to the North American Species of *Euplectrus* Westwood, based on a study of the types, except in the case of Provancher's species. The latter are genuine species of the genus (perhaps excepting *mellipes*).

Females.—Legs all yellow. Propodeum with a median carina. The species do not differ much in sculpture.

Abdomen yellow.

Abdomen black above at distal third and along the margins.

Scutum with a more or less distinct median carina.....

catocalæ Howard.

Abdomen entirely yellow except the lateral and proximal margins. Scutum with a median carina. Propodeum glabrous.

Male mouth broadly white.....

comstockii Howard.

Male face entirely black.....

platypenæ Howard.

The same but the abdomen with a black area at meson at base of distal third. Mouth in both sexes white. Propodeum glabrous. Median carina on scutum more or less distinct.....

leucotrophis Howard.

(=*frontalis* Howard).

The same but mouth black; propodeum coarsely scaly.....

marginatus Ashmead.

Abdomen black. Pronotum not rugose.

Black.....

mellipes Provancher.

Metallic.....

lucens Provancher.

Abdomen black with a large basal area above.

Submetallic.....

virideneus Provancher.

Euplectrus insuetus Gahan (types examined) is not an euplectrine. The caudal tibial spurs are not very large; the scutellum bears a true lateral groove (*mesad* of the bristles).

Diaulinus intermedius new species.

Female.—Like *begini* Crawford but the annulus on the caudal tibiae is *distinctly* broader than the yellow proximad of it (over

twice broader), the postmarginal vein is subequal to the stigmal (distinctly longer in *begini*) and the funicle joints are not subequal. The mandibles are 4- and 5-dentate in both species, and in both the caudal tibial spurs are single. Differs from *pulchripes* in that the said annulus is narrower, not extending to the middle (distad of it in *pulchripes*); also the scape is wholly black (white at basal third in the other species). In *pulchripes*, both mandibles are 5-dentate and the caudal tibial spurs *single*. From *websteri* in the colour of the legs; the median carina of the propodeum is distinct, not as in *pulchripes* but very delicate as in *websteri* and *begini*; and in *websteri* the postmarginal vein is longer than the stigmal. In *websteri* the mandibles and scape are as in *pulchripes*, also the caudal tibial spur.

Propodeal spiracles minute and round, the lateral carinae absent. Funicle 1 longer than wide, 2 subquadrate. Club with a distinct terminal nipple in all four species and this terminates a small conical joint, so that the club is 4-jointed.

Described from one female reared at Kingston, Rhode Island, January 6, 1916, from *Phytomyza chrysanthemi* (A. E. Stone).

Type.—Catalogue No. 20193, U. S. N. M., the specimen in fragments on a slide.

***Pseudiglyphomyia coptodiscæ* new species.**

Female.—Length, 1.60 mm. Characterized by bearing on the fore wing an obtuse brown stain from the stigmal vein and of moderate size (extending nearly across the blade).

Lemon yellow, the following parts dark metallic green; Occiput at upper half, ocellar area, proximal half of pedicel, scape except at extreme base, apex of the neck of prothorax, somewhat over the cephalic third of the scutum (except at lateral margin), the green area with a scalloped caudal margin, the scutellum except lateral margins except at base and the cephalic and caudal margins between the grooves (the cephalic more broadly yellow and irregular), postscutellum except lateral and apical margins, propodeum except laterad of the spiracle, dorsal thorax laterad of the postscutellum and apical scutellum except at lateral margin, base of abdomen narrowly (except at meson more or less); caudal coxæ dorso-proximad broadly, a rather broad stripe around abdomen just

distad of the middle, then a very narrow one (dorsad) and then a slightly broader one near apex, the three more or less fused along the meson, the apical one not as broad as the first one at middle. Middle tibia with a central submetallic cinctus. Propodeum with a median carina only. Thorax scaly. Postmarginal vein not quite so long as the stigmal. Funicle 1 a half longer than wide, 2 somewhat shorter; club terminating in a long conical spine. Pedical as long as funicle 1 or a little longer. Mandibles 5-dentate. Antennæ brownish.

The male is similar but the antennæ are all light yellow (except pedicel and apex of scape broadly, which are darker), the occiput has only a minute dark spot on each side, upper half, the pronotum has a narrow median line at cephalic half from the metallic apex of neck, the scutellum is green between the grooves except very narrowly at apex, the line at base of abdomen is triangular, large, extending nearly to lateral margins while the narrow distal two stripes of the abdomen are absent, the middle stripe with a large rectangular area against it caudad at meson. Also, the terminal spine of the club is small.

From one pair reared from *Coptodisca splendoriferella*, Madisonville, Kentucky, October 16, 1899.

Types.—Catalogue No. 20194, U. S. N. M., the pair on tags, the heads and a male fore wing on a slide.

Asaphes americana Girault.

One pair reared from the clover aphid, Lexington, Kentucky, May 28, 1890 (H. Garman). Compared with types.

The marginal vein is somewhat dilated distad. Petiole of abdomen somewhat longer than wide, longitudinally striate. Abdomen glabrous, segment 2 longest, occupying nearly a third of the surface, 3 large yet somewhat shorter than 2, extending to beyond the middle; 4 half the length of 3, with four cross-rows of minute reddish setæ (except along the median line). Propodeum rugoso-punctate and with a short neck; scutellum with a distinct punctate cross-suture a little before apex, glabrous distad of it. Parapsidal furrows complete. Axillæ and caudal margin of parapside, glabrous. Pronotum transverse-quadrate, shorter than the scutum.

Trichogrammatomyia new genus.

Female.—In my table to the *Chaetostrichini* runs to *Brachygramma* Girault (there is a ring-joint, the antennæ 7-jointed); but the following differences: The marginal vein is not stout yet not long (about six times longer than wide, nearly twice the length of the well-developed stigmal); the ovipositor is inserted proximad of the middle of the venter by a little; the marginal fringes of the not broad fore wings are long (more or less a third the greatest wing-width), the club is not much wider than the funicle; the discal ciliation of the fore wing is moderate and bears regular lines cephalad and caudad only. Caudal wings narrow, not long, with two lines of discal cilia, the caudal marginal cilia as long as the marginal cilia of the fore wing. Habitus of *Trichogramma*. No oblique line of setæ from the stigmal vein. Caudal femur stouter, the tarsal joints more or less equal, longer than wide. Mandibles with two acute teeth and an inner oblique truncation.

The male antenna has the flagellum filiform, only one funicle joint which is nearly twice longer than wide and the club is divided near the middle, the two joints about as long as the funicle or the pedicel; funicle and club with long, stiff hairs.

Trichogrammatomyia tortricis new species. Genotype.

Female.—Length 0.50 mm.

Black, the fore wings dusky from base to end of the stigmal vein, the venation dusky. Face, vertex, lateral margins and median line of scutum and distal third of scutum (more at the meson), orange yellow. Club twice longer than its greatest width (at middle), a little longer than the scape, 1 hemispherical, 2 conical, not spined at apex, over twice the length of 1. Funicle joints subequal, each over twice wider than long; pedicel twice or more the length of the funicle. Fore wings with about twelve lines of discal cilia where widest, the ciliation extending back to the base of the marginal vein (centrally). Tarsi pale.

Described from one male, and seven females from the eggs of *Tortrix cerasivorana*, Guelph, Ontario, Canada, (C. J. S. Bethune).

Types.—Catalogue No. 20195, U. S. N. M., the specimens on two slides.

BEES OF CANADA.—FAMILY MEGACHILIDÆ.

BY F. W. L. SLADEN, OTTAWA.

Principal Characters of Family.—Long-tongued bees, wings with only two submarginal cells, female with pollen brush on underside of abdomen, or, in parasitic genera, absent. The two basal joints of labial palpi very elongate, following joints minute, labrum not exposed.

TABLE OF GENERA.

(Where the genus contains only one species this is included. Subgenera are not included, as a rule. Whether *Chlorosmia*, *Alcidanea*, *Autochelestoma*, *Andronicus*, and possibly *Monumetha* should be entitled to generic rank, or be regarded merely as subgenera, is a matter of opinion. The super-generic name for this group should be *Chelestoma* Lat.).

1. Skin of abdomen with pale bands or spots, or second recurrent nervure received by submarginal nervure beyond apex of second submarginal cell, Subfamily *Anthidiinæ*.....2.
- No pale bands or spots on abdomen, second recurrent nervure always received by second submarginal cell.....3.
2. Margin of 7th dorsal segment in male toothed, female with pollen brush.....*Anthidium* Fab.2a.
- Margin of 7th dorsal segment in ♂ simple, female without pollen brush.....*Stelis* Pz.
- 2a. No pulvillus between claws, makes cottony nest, subg. *Anthidium* Ckll.
- Pulvillus between claws, makes resin nest (Cockerell), subg. *Dianthidium* Ckll.
3. A pulvillus between claws, abdomen strongly convex, Subfamily *Osmiinæ*.....4.
- No pulvillus between claws, abdomen more or less flattened. Subfamily *Megachilinæ*.....17
4. Base of abdomen bordered with a strong transverse ridge, insect coarsely punctured, ♂ with only two ventral segments fully exposed.....*Heriades*, Spin.
- Base of abdomen not bordered with strong ridge.

5. Base of abdomen strongly concave, the definite basin thus formed impunctate *Ashmeadiella*, Ckll.
 No definite basin on base of abdomen..... 6.
6. Not very elongate, cubital nervure between first transverse cubital nervure and first recurrent nervure usually as long as, never less than one-half as long as, first transverse cubital nervure..... 7.
 Very elongate, cubital nervure between first transverse cubital nervure and first recurrent nervure half or less than half as long as first transverse cubital nervure, ♂ with small lateral spine-like tooth on segment 6..... 8.
7. Head with two large teeth beneath, nearly the whole of clypeus impunctate, two small tubercles on margin of clypeus near centre, mandibles very long
 *Cephalosmia* n.g., 1027, *armaticeps*, Cr.
 Invermere, B. C., Okanagan Landing, B. C.—IV, V, VI.
 Cheeks not armed, clypeus punctured..... *Osmia*, Spin.
8. Males..... 9.
 Females..... 13.
9. Brilliant metallic green, ventral segments 1 and 2 with small median tooth..... *Chlorosmia* n.g., 2050, *fulgida*, Cr.
 British Columbia.
 Black..... 10.
10. Terminal antennal joint much narrowed and modified into a curved spine, flagellum widely and shallowly channelled behind, scape dilated *Alcidamea* Cr.
 Terminal antennal joint not much narrowed, not modified into a spine..... 11.
11. Ventral segment 2 with a large tooth, segment 1 with median impressed line at base, segment 7 pointed, compressed, excavated..... *Autochelostoma*, n.g., 2059, *canadensis*, n.sp.
 Ottawa (?), 14, VIII.
 One specimen, Br. Germain, 1914.
 Ventral segment 2 without large tooth..... 12.
12. Antennæ distorted, joints 4 to 7 wider than long and bearing bristles, joints 10 to 13 longer than wide, ventral segment 1 bluntly pointed..... *Andronicus* Cr., 2053, *cylindricus*, Cr.

Toronto, Ottawa, 6, VI.

Antennæ simple, ventral segments 1 and 2 with median apical spine, coat somewhat long.

Monumetha Cr., 2047, *argentifrons* Cr. (—*albifrons* Kirby).
Ontario to British Columbia, Ottawa, 6, VI.

13. Pollen brush black..... 14.
Pollen brush white..... 15.
14. Brilliant metallic green..... *Chlorosmia*, 2056, *fulgida* Cr.
British Columbia.

Skin entirely black, abdomen black-haired, with lateral apical hair patch on segment 1, narrowing on the following segments
..... *Monumetha*, 2048, *argentifrons* Cr. (= *borealis* Cr.).
Ontario to British Columbia, Ottawa, VI.

15. Mandibles very large, head wider than thorax, upper part of clypeus with longitudinal median impression, lower part with large upstanding tooth, a low longitudinal carina between antennæ, first recurrent and first transverse cubital nervures interstitial, labrum long and sheathlike, much longer than wide, maxillary palpi three-jointed, labial palpi four-jointed, the 3rd and 4th joints not divergent, 4th as wide as long, wider than 3rd, 3rd joint pale, 4th dark; insect scantily clothed with whitish hair, which forms narrow apical fringes on segments 2 to 4, and on sides of segment 1, length 8 to 9 mm *Formicapis* n.g., 2055, *clypeata* n.sp.
Aweme, Man.; 6, VII.—One specimen, N. Criddle, 1915.
Waterhole; Alta., 18, VIII.—One specimen, E. H. Strickland, 1915.

- Head no wider than thorax, clypeus normal..... 16.
16. Larger, length 10 to 12 mm., clypeus not more coarsely punctured than vertex, length of cubital nervure between first transverse cubital and first discoidal much longer than half that of the first transverse cubital nervure, pollen brush yellowish, mandibles 4-dentate.

..... *Andronicus*, 2054, *cylindricus* Cr.
Nova Scotia to Manitoba, VI, VII.

Smaller, length 7 to 8 mm., clypeus more coarsely punctured than vertex, cubital nervure between first transverse cubital

and first discoidal about half the length of first transverse cubital nervure, pollen brush white, mandibles 3-dentate.

.....*Alcidamea*, 2052, *simplex* Cr. (= *producta* Cr.)
Throughout settled part of Canada.

17. Eyes not hairy, ♀ with pollen brush, ♂ has on dorsal segment 6 a high transverse ridge, or crest, which forms the apex of abdomen, mandibles in ♂ with a large tooth

beneath *Megachile*, Lat.

Eyes hairy, ♀ without pollen brush, tip of abdomen of ♂ spinose, of ♀ acuminate.....*Calioxys*, Lat.

NOTE.—The author submitted the above paper to Prof. T. D. A. Cockerell, who made some suggestions, most of which have been adopted.

SOME BEES IN THE BRITISH MUSEUM.

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

Andrena (*Opandrena*) *ricardonis* sp. n.

♂.—Length 9 mm; black, the clypeus lemon yellow with two black spots; hair of face, front and thoracic dorsum long and fulvous, of cheeks and underside of thorax pallid but not white; head broader than thorax; cheeks very broad, shining, obtusely subangulate below level of middle of eye; malar space almost obsolete; mandibles long, but not so much produced at end as in *A. flavoclypeata*; yellow clypeus higher in proportion to its width than in *flavoclypeata*, the yellow not approaching eyes at sides; front dull, sides of vertex shining; antennæ long, third joint longer than fourth, but not nearly as long as four and five combined; flagellum light fulvous beneath; disc of mesothorax and scutellum shining, with very sparse and minute punctures; area of metathorax small, triangular, rugose, the apical part smoother but not polished; tegulae dark reddish; wings greyish, stigma rather small, dull amber, nervures dusky testaceous; b. n. meeting t. m.; second s. m. narrow, receiving first r. n. near its end; first t. c. not near stigma; legs slender, with hind margin of hind tibiae, and all the tarsi, ferruginous; abdomen shining, with only very indistinct piliferous punctures, hind margins of second and following segments with

August, 1916

narrow ochreous hair bands, interrupted on second; apical plate (eighth ventral) broadly truncate.

Hab.—Vernon, British Columbia, June 9, 1902 (*Miss Ricardo*); British Museum. Allied to *A. trevoris* Ckll., but distinct by the colour of the antennæ and pubescence; possibly, however, a subspecies.

At Shorts Point, Okanagan Lake, B. C., June 28, 1902, *Miss Ricardo* took *A. medionitens* Ckll., a form with the abdominal hair bands clear white.

Nomada vicinalis aldrichi Ckll.

Male.—Vernon, B. C., May 15, 1902 (*Miss Ricardo*), Brit. Museum. New to British America.

Nomada illinoensis Rob.

Male.—Boston, Mass., Brit. Museum.

Nomada custeriana Ckll.

Male.—West Cliff, Colo., May 19, 1889, (*Cockerell*), Brit. Museum. The specimen still carries my number 9, which shows that it is one of two specimens captured; the other, determined by Ashmead as *N. parata*, is in the U. S. National Museum, and is the type of *N. custeriana*. The species has not been collected since.

Nomada vernonensis sp. n.

♂.—Length about 9 mm; robust, the head and thorax dull and rough (the face somewhat glistening), with erect dull white hair; head broad, vertex elevated, eyes pale grey; head and thorax black (with no red), the thorax with tubercles yellow, but no other light markings; mandibles (except rufous ends, which are simple), labrum (which has an apical patch of hair, but no tooth), band on lower margin of clypeus (narrowest in middle), and narrow lateral facemarks (shaped like the head and slender neck of a bird, upside down, ending narrowly but abruptly about level of antennæ), all bright yellow; posterior orbits wholly black; antennæ long, robust, not denticulate, third joint conspicuously shorter than fourth, but much more than half its length; scape black and red, hardly swollen; flagellum bright ferruginous, the basal half heavily

marked with black above; area of metathorax rugose, but apically with a pair of shining bosses; tegulæ large, pale testaceous, black at base, and with a yellow mark posteriorly; wings clear, with a brownish apical cloud; stigma and nervures ferruginous; b. n. going well basad of t. m.; second s. m. extremely broad, receiving first r. n. far beyond middle; third s. m. above about half as broad as second; tibiæ and tarsi bright red, the anterior and middle tibiæ with a black spot behind; anterior and middle femora red, largely black beneath and at base; hind femora black, with apex and more than apical half above black; abdomen clear ferruginous; first segment with basal half black except a V-shaped red mark in middle; band on first segment, notched in middle, extremely large but widely separated patches on second, large patches on third (pointed and approaching in middle), and bands on 4 to 6, bright yellow, the bands enclosing or nearly enclosing red spots at sides posteriorly; apical plate notched; venter red, with a large deeply bilobed black basal patch, and a small yellow spot beyond middle.

Hab.—Vernon, British Columbia, April 15, 1902 (*Miss Ricardo*), Brit. Museum. A relative of *N. illinoensis* Rob., but much larger, and with the abdomen richly coloured. In the table of Rocky Mountain species it runs to 47, but is not related to the species there indicated.

SOME NORTHERN GEORGIA ACRIDIIDÆ.*

BY H. A. ALLARD, BUREAU OF PLANT INDUSTRY, WASHINGTON, D. C.

Of the musical Orthoptera, the Acridiidae in many respects represent a less highly specialized group. Their limited musical abilities, at least, would rank them far below the more highly specialized and musical Locustidae and Gryllidae. At best, their stridulations are hardly more than a brief lispings, or a noisy crepitation. Some of the Acridiidae while at rest produce, at intervals, a few monotonous lispings by sawing the hind femora

*Mr. A. N. Caudell, of the U. S. National Museum, has kindly attended to the identification or verification of all Orthoptera collected and listed in this paper.
August, 1916

against the edges of the folded tegmina. Others are capable of stridulating only during flight, and produce a noisy clatter which is anything but musical. Members of the Acridiidae are strictly creatures of the sunlight and with darkness all become inactive and silent. I have never yet heard the note of any Acridian after darkness has set in. These interesting grasshoppers are also almost strictly terrestrial, and generally prefer open fields and pastures where they can find an abundance of bright sunshine and unlimited room for their noisy aerial performances.

Whatever the true significance may be, the predominance of green, brown and black in the coloration of the Acridiidae seems to indicate that these colours may have a more or less protective value. The brighter colours, which may be very beautifully patterned, are usually confined to the thin, parchment-like under wings, and are thoroughly concealed by the tegmina when the insect is at rest.

Among the Acridiidae there are many species which possess no powers of stridulation. Notwithstanding this, these insects in many other ways are very interesting. Smallest of all the Acridiidae and among the most interesting are the odd-shaped grouse-locusts. These tiny creatures, which leap almost as actively as fleas, are exceedingly difficult to discern in their natural environment of earth and dead vegetation. As one sweeps a net over the surface of the dry leaves in the woods there is an audible rustling as the tiny creatures hop about very much like tiny toads. At rest, their odd little bodies and sombre hues of greys, yellows and browns assimilate them perfectly with the mottled carpet of dried leaves, grasses, pebbles, bits of dead bark and woods among which they dwell.

Most of the Acridiidae mentioned in this paper were observed in the vicinity of a small settlement in Jackson County known as Thompson's Mills, and situated about five miles west of Hoschton, near the intersection of the counties of Hall, Gwinnett and Jackson.

Tettix arenosus Burm. This grouse-locust is probably a common species at Thompson's Mills. It is found among dry leaves in upland woods.

Tettix hancocki var. *abbreviatus* Hancock. This sombre-hued

little insect is common in the short grass of dry, upland pastures at Thompson's Mills. Such localities are more or less interspersed with young pines. Here I have found only the form with the short pronotum (*abbreviatus*). These grasshoppers are strictly terrestrial, and leap about in the short, scanty grass where their dull colours and mottled patterns make them very inconspicuous. These insects appear to be without stridulatory powers.

Tettigidea lateralis Burm. This grouse-locust is considerably larger than the preceding, and is not uncommon at Thompson's Mills. It occurs in the short grass of dry, upland fields and pastures in late summer in company with the preceding species. The var. *polymorpha*, Burm., occurs in similar situations.

Paratettix cucullatus Burm. Among leaves on sunny, thinly wooded slopes and banks near brooks, etc. Probably common at Thompson's Mills.

Nomotettix compressus Morse. Probably common at Thompson's Mills. It occurs on banks, in pastures, open woods, etc.

Neotettix rotundifrons Hancock. In upland pastures and sunny, thickly wooded hillsides.

Tryxalis brevicornis (L.). This somewhat cone-headed Acridian seems to be locally distributed and not common at Thompson's Mills. I found it in only one locality among some rank meadow grasses bordering a small stream. Here only a few individuals were observed and these were exceedingly difficult to approach or capture, owing to their shy habits and rapid flight. No note has been observed for this species.

Eritettix carinatus Scudd. I first met this little Acridian early in April at Thompson's Mills, in an old pasture grown up to broom grass. It does not appear to be common in this locality. It keeps well down in the grass, moving about occasionally to stridulate. If it leaps and alights near the top of a grass stalk, it moves backward down the stalk until near the ground. Its notes are faint, lisping phrases of a few seconds duration, and are at intervals repeated six or eight times in quick succession: sic-a-sic-a-sic-a-sic-a-sic-a-sic—sic-a-sic-a-sic-a-sic—sic-a-sic-a-sic-a-sic-a-sic. This grasshopper is most active when the sun is shining. Its notes resemble those of *Stenobothrus curtispennis* very much,

and are produced in the same manner by sawing both thighs simultaneously upon the edges of the tegmina.

Orphulella pratorum Scudder. In dry fields and pastures in upland situations, Thompson's Mills. I have recognized no stridulation for this grasshopper.

Chortophaga viridifasciata De Geer. This dimorphic species is exceedingly common at Thompson's Mills, and is the earliest to appear in March. It is generally distributed, being found in alfalfa fields, dry pastures, etc. The brown form, *infuscata*, is equally abundant. The notes of this insect are a noisy crackling produced during flight.

Hippiscus rugosus Scudder. Very common in dry pastures and old fields at Thompson's Mills. A most clumsy, inactive locust and readily captured. It seems to have no distinct stridulation.

Dissosteira carolina L. This widely distributed grasshopper is a very common one at Thompson's Mills. It shows everywhere a preference for the bare soil of roadsides and fields. In such situations its dull gray and brown mottlings make it almost appear a part of the naked soils upon which it alights. The notes of this grasshopper are most peculiar. It ascends a few feet above the ground and, hovering in mid-air for some seconds, flutters its wings and produces a continuous lispng note. This mid-air performance is quite distinct from the usual flights of this insect, which are nearly or quite noiseless.

Trimerotropis citrina Scudder. This insect is a common one at Thompson's Mills, preferring the bare soil of roadsides and cultivated fields as does *Dissosteira carolina*. I have recognized no note.

Schistocerca americana Drury. This is a common grasshopper at Thompson's Mills, occurring almost entirely in dry situations in the vegetation of fields and in weeds and cotton plants. It is a shy species, and possesses vigorous powers of flight. Except for a rustling of the ample, transparent wings during flight, it has no definite stridulation.

Schistocerca alutacea Harris is less common than the preceding. It prefers the tall weeds and grasses of old fields. Its flight, like

that of the preceding, is vigorous and unaccompanied by any definite notes or stridulation.

Schistocerca damnifica Saussure. A common grasshopper at Thompson's Mills, occurring in upland fields and along roads. It is especially common in cotton fields. Unlike the two preceding species of this genus, which usually rest upon weeds or other vegetation, this species prefers to rest upon the bare earth. If frightened, it flies away silently and then may alight upon cotton or other plants. It seems to have no note. The almost uniformly reddish-brown colour of *Schistocerca damnifica* makes it quite indistinguishable from the red-land soils of northern Georgia. This insect appears rather late in summer.

Melanoplus scudderi Uhler. In early October, 1910, I found this short-winged grasshopper very common in the short grass and leaves in thin woods in certain dry, upland situations. At first sight one is ready to consider it only a nymph from its almost wingless appearance. It is an active insect and leaps readily when disturbed. Its dark gray and brown coloration make it very inconspicuous among the leaves, sticks and bogs of its native environment. It does not appear to be an open field species in this locality. Here its abundance seems to be very variable with different seasons.

Melanoplus femoratus Burm. Not uncommon at Thompson's Mills, in old fields. I have recognized no note.

Melanoplus atlantis Riley. This grasshopper is a very common species at Thompson's Mills, occurring in all upland fields and pastures, together with *Melanoplus femur-rubrum*, De Geer. I have observed no stridulation.

Melanoplus punctulatus Scudder. A very common species in all upland fields at Thompson's Mills, together with *M. femur-rubrum*. I have identified no note which it may produce.

Melanoplus femur-rubrum De Geer. An exceedingly common grasshopper at Thompson's Mills, in all upland situations, but especially so in grassy pastures. Its flight is noiseless and I have noted no stridulations while at rest. Scudder says he has seen the male sawing on its tegmina with its femur, but could detect no noise.

Syrbula admirabilis Uhler is also a very common Acridian at Thompson's Mills, especially in the dry fields grown up to broom grass. The male is rather musical, producing a weak, lisping stridulation at intervals—s-s-s-s—s-s-s-s-s-s-s-s, by sawing the hind femur upon the edges of the tegmina.

Arphia xanthoptera Burm. A common locust in old fields at Thompson's Mills. The notes are a loud, harsh crackling, accompanying their flights across the fields.

Arphia sulphurea Fabr. In fields, pastures, etc. A noisy crepitation during flight is the only method of stridulation.

Spharagemon bolli Scudder. Very common in old fields at Thompson's Mills and in pastures. It has been observed that this grasshopper sometimes hovers in air and produces a rustling note similar to the habit of *Dissosteira carolina*, but I have not witnessed this myself. The usual note is a rattling noise during flight.

The Acridiidae confine their habitat almost entirely to the ground stratum, whether in wood or in field. Few species regularly prefer the true herbage or shrub stratum of vegetation, as do many members of the Locustidae and Gryllidae. Even those species which appear to prefer wooded situations confine themselves to the more open, sparsely grassy areas as *Melanoplus scudderi* and some of the Tettiginæ. I have found no species inhabiting deep woods where the ground is hidden with dense herbage. Orthoptera of all kinds are uncommon in such situations.

Tryxalis brevicornis perhaps belongs more strictly to the true herbage stratum of vegetation than any other species listed in this paper.

The species of *Schistocerca*, i. e., *americana*, *alutacea* and *damnifica*, do not confine themselves strictly to the ground stratum, nor can they be considered truly members of the herb and shrub strata. They are somewhat elastic in their habits, however, and show a more marked tendency to choose the habitat of the higher leaf and shrub strata occasionally, than do most Acridiidae.

This does not by any means complete the list of Acridians probably occurring at Thompson's Mills, but many years of patient study and collecting must be pursued to determine the Orthoptera inhabiting any region, and to become familiar with their habits and stridulations.

A REVIEW OF THE PTEROCOMMINI (APHIDIDÆ HOM.).

BY A. C. PAKER, WASHINGTON, D.C.*

A few years ago the writer undertook a study of the Pterocommini. In this he was helped, in her usual generous manner, by Doctor Patch, who sent slides of some different species, and by Professor Gillette, who loaned the writer slides of the specimens he had. The recent paper by Wilson (1915) on this tribe has called the writer's attention again to the species. It seems worth while, therefore, to publish a few notes on the group, since the writer's study showed some points at variance with the results published by Wilson, and since *Pterocomma populifolia* Fitch should be reinstated.

In regard to the genera, the writer believes Wilson's view correct, but in regard to species interpretation he is unable to agree with him. These points of difference will be noted under the species.

***Pterocomma populea* (Kalt.).**

Two American species are made synonyms of this by Wilson. They are *beulahensis* Ckll., and *rufulus* Davidson. *Rufulus* as indicated by specimens from Davidson is quite a different species. The cornicles of *populea* from Spandau, Prussia, are about equal in length to the hind tarsi. In *rufulus*, however, the cornicles are nearly twice the length of the hind tarsi, bearing about the same ratio as do those of *bicolor* Oest. Although *rufulus* proves to be distinct from *populea*, it becomes a synonym of *populifolia* Fitch, a species not mentioned by Wilson.

***Pterocomma populifolia* (Fitch).**

Populifolia was described in 1851, and Fitch's notes give the following numbers as representing the species: Nos. 6118-6121, Nos. 9292-9302 and No. 3712. These are Fitch's personal numbers; not the State Cabinet numbers. Of these numbers the following

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August, 1916

are now present in the National Museum collection: 9292, 9293, 9297, 9390 and 9301. A study of these specimens shows that *rufulus* agrees with *populifoliae* Fitch. Oestlund (1887) considered Fitch's species to be a Chaitophorus, and so described his *populifoliae*. Davis (1910) considered it an Aphis, and described another species under the name. Both of these writers expressed doubt as to their determination. In the writer's opinion, *populifoliae* stands as a good species, easily distinguished from *populea* by the relative lengths of the cornicles and tarsi.

The measurements for the alate viviparous female of this species average: Antennæ III, 0.64 mm.; IV, 0.368 mm.; V, 0.336 mm.; VI, base and unguis (0.192 mm. + 0.288 mm.); cornicle, 0.352 mm.; hind tarsus, 0.24 mm.

Specimens taken on Popof Island, Alaska, and determined as *populea* by Pergande, are certainly *populifoliae*. Pergande concluded that both Kaltenbach and Koch were wrong in stating the cornicles of *populea* to be cylindrical, and he was of the opinion that, "in fact, they are clavate." So, indeed, they are in *populifoliae*, but the cornicles of *populea* are very plainly cylindrical, and in this regard Koch's figure is excellent and the descriptions of Kaltenbach and Koch exact. The Pergande Alaska specimens, now in the collection of the Bureau of Entomology, show the following measurements for the alate viviparous female: Antennæ III 0.656 mm.; IV, 0.4 mm.; V, 0.384 mm.; VI (0.208 + 0.384 mm.); cornicles, 0.38 mm; hind tarsus, 0.25 mm.

It will be seen that these measurements agree almost exactly with those given by Wilson for *populea*. But he gives no measurements of the hind tarsus. It will be seen also that these specimens agree with *populifoliae* Fitch, and it is the writer's opinion that the specimens measured by Wilson were specimens of *populifoliae* Fitch. Specimens of American *populea* show that species to be very different from *populifoliae*. This is most apparent in comparing the cornicles and hind tarsi. Measurements for the alate viviparous female of this species are as follows: Antennæ III, 0.608 mm.; IV, 0.256 mm.; V, 0.24 mm.; VI (0.128 mm. + 0.144) mm.; cornicles, 0.192 mm.; hind tarsus, 0.192 mm. These figures indicate clearly the striking difference between the two species.

Now specimens of *populea* from Europe agree exactly in measurements, etc., with American specimens, excepting that the unguis of segment VI is very slightly longer. Moreover, the examples of both species have a much more cylindrical cornicle than have the specimens of *populifoliae*. The writer is therefore considering these American specimens to be *populea*. The European examples have segment VI usually about (0.128 mm.+0.17 mm.).

In regard to *pilosa* Buckton, the writer has never had an opportunity to study forms supposed to be this species. From the description given by Buckton, it would seem very much as if he had two species before him. His apterous forms would very well agree with *populea*, whereas his alate form seems to be *populifoliae*, or a species near it. This will be seen from the measurements he gives for the cornicles in the two forms. Since Pergande, who had seen the type, placed *pilosa* as perhaps the same as his *populea*, this would also tend to indicate that Buckton's alate form is *populifoliae* Fitch.

Pterocomma beulahensis (Ckll.).

The measurements given for this species by Cockerell would make it very difficult to include it under *populea*. It has, however, the cornicles about equal in length to the hind tarsi. The type slide of the species is now in the National Museum collection, and on it are mounted four alate specimens. These show some variation in the sixth antennal segment. One antenna measures for (0.176 mm.+0.336 mm.), and one (0.16 mm.+0.32 mm.). It will be seen that this proportion is very different from that of *populea*. A more prominent character, however, is met with in the beak. In all our specimens of *populea* the beak is long, reaching beyond the hind coxæ, sometimes even to the base of the cornicles, or very near them. The beak in *beulahensis* is much shorter, extending hardly to the hind coxæ, sometimes not reaching them. The cornicles are somewhat swollen, a character which is not so evident in *populea*. Moreover, *beulahensis* is more elongate, having the general look of *populifoliae*, whereas *populea* has a shorter, "bulkier" appearance.

***Pterocomma salicis* (L.).**

Under this species Wilson discusses the forms determined as *salicis* L. in this country. He concludes that the species does not occur here, and considers the cornicle the distinguishing character. While the cornicles figured by him are very distinct, the writer has examined both American and European specimens in which the cornicles are almost identical. They are not only the same in shape, but the measurements are the same, and a range in variation between the two types is met with in European material. It is not probable that two European species are confused since the variation was seen in aphides collected from one colony in France. Another point of resemblance is the bright orange colour of the cornicles in both European and American forms. It is true that the cornicles of American forms seldom show the distinct bulging met with in *salicis*, but with the variation in the European form, and with the two forms showing the same measurements, it seems hardly possible to separate them on this character of the cornicles. Both European and American forms, moreover, show a more or less distinct dusky bordering to the wing veins.

In an attempt to find some other character to back up the variation in the European cornicle and so to separate the American form, the writer has measured a large series of apterous forms. These have shown no differences. The European form shows more variation in the antennal segments, the third segment particularly being sometimes longer in the European than in the American form. In others, however, they are exactly the same, and this is more often the case than otherwise. This variation in the antennal segments does not seem to be, therefore, any definite character upon which the two species can be separated with certainty. In the meantime, therefore, the writer prefers to hold *salicis* for the American forms.

Measurements of the alate viviparous female of both American and European specimens will show their remarkable similarity in this respect.

European: Antennæ III, 0.72 mm.; IV, 0.464 mm.; V, 0.432 mm.; VI, (0.224 mm.+0.224 mm.); cornicle, 0.56 mm.; hind tarsus, 0.256 mm.

American: Antennæ III, 0.7 mm.; IV, 0.448 mm.; V, 0.384 mm.; VI, (0.208 mm.+0.224 mm.); cornicle, 0.544 mm.; hind tarsus, 0.24 mm..

It will be seen from these measurements that the European and American forms are the same as far as proportions are concerned, and considering the great variation met with in the cornicles of the European, and even of the American examples, there does not seem sufficient basis in the writer's opinion for keeping the species distinct. Certainly the two forms are much more nearly alike than are the American form and *bicolor* Oestlund.

Pterocomma bicolor (Oest.)

The American specimens listed under this species by Wilson do not, the writer believes, belong here. Oestlund gives the length of cornicles as 0.35 mm., whereas Wilson gives them as 0.59 mm.; fully equal to those of *salicis*. The following measurements of the alate viviparous female made from specimens of *bicolor* collected by the writer in Ontario show that Wilson's *bicolor* measurements refer not to this species at all, but perhaps to variations of *salicis*? The cornicles of *bicolor* are quite distinctive and the same as given by Oestlund in his description.

Measurements of alate viviparous female: Antennæ III, 0.672; IV, 0.38 mm.; V, 0.36 mm.; VI, (0.16 mm.+0.352 mm.); cornicles, 0.352 mm.; hind tarsus, 0.22 mm.

It will be seen that this species is separated from *populifolia* by the proportions of segment VI of the antenna. The base is much shorter and the unguis much longer than in Fitch's species. This character may not be a constant one, and in such case *bicolor* will become a synonym. In the National Museum collection there are specimens determined as *bicolor* by Williams. According to Davis (1911) this determination has been confirmed by Oestlund. Williams' specimens in the collection are certainly *populifolia*. The measurements of segment VI, of the two alate specimens present are (0.176 mm.+0.288 mm.) and (0.176 mm.+0.27 mm.). Comparing these with measurements of one specimen in Fitch's collection, which measures (0.144 mm.+0.256 mm.), we see that

there is little difference in proportions. The Ontario material collected on the Karwatha Lakes is uniformly different from this, averaging as previously given (0.16 mm.+0.352 mm.). One specimen had the measurements (0.16 mm.+0.384 mm.) and one (0.176 mm.+0.352 mm.). These measurements agree in proportion with those given by Oestlund, and the writer, therefore, prefers to hold *bicolor* as distinct on this basis until large collections can be made and studied.

In regard to the species *floculosa* Weed, *smithiæ* Mon., and *salicti* Harris, no remarks will here be made, since these species are fully dealt with by Wilson, and the writer has examined some of Weed's specimens, but a species described by Patch (1913) as *antennatum* should be mentioned. It cannot be definitely described in full until alate forms have been found. Another species has been described as *farinosus* by Del Guercio (1913). In this species the cornicles are cylindrical, but very much longer proportionately than those of *populea*.

Pterocomma steinheili (Mordwilko)

A third species, not mentioned by Wilson, is one named *steinheili* by Mordwilko. Through the kindness of Mr. J. J. Davis, I have been able to examine a slide of specimens received by him from Mordwilko. One alate form and several apterous ones are present. The species is very close indeed to *beulahensis* Ckll., and it is the writer's belief that the two are identical. There is one marked difference, however, between the alate specimen of *steinheili* and those of *beulahensis*. The lateral tubercles of the abdomen of *steinheili* are nearly twice the size of those of *beulahensis*. It is quite probable that this is a variable character and that the two species cannot be separated by means of it. Since, however, only one specimen of the alate form of *steinheili* is available for study, it is necessary on this basis to keep them distinct.

Measurements of the alate viviparous female: Antennæ III, 0.432 mm.; IV, 0.288 mm.; V, 0.32 mm.; VI (0.16 mm + 0.272 mm.). Cornicle, 0.256 mm.; hind tarsus, 0.224 mm.

This will then leave the species as follows:

Pterocomma populea (Kalt.)

Synonymy: *Aphis populea* Kaltenbach.
Cladobius populeus (Kalt) Koch.
Pterocomma pilosa Buckton (apterous form).

Pterocomma farinosa (Del Guercio).

Synonymy: *Cladobius farinosus* Del Guercio.

Pterocomma steinheili (Mordwilko).

Synonymy: *Cladobius steinheili* Mordwilko.

Pterocomma salicis (L).

Synonymy: *Aphis salicis* Linne.
Melanoxanthus salicis (L) Buckton, Weed, etc.
Melanoxantherium salicis (L) Schouteden.
Pterocomma salicis (L) Wilson.
? *Pterocomma bicolor* Wilson, not Oestlund.

Pterocomma populifoliae (Fitch).

Synonymy: *Aphis populifoliae* Fitch.
Pterocomma pilosa Buckton (alate form).
Cladobius populeus Pergande, not Kalt.
Cladobius rufulus Davidson.
Melanoxanthus bicolor Williams, not Oestlund.
Melanoxantherium rufulum (Davidson) Essig.
Pterocomma populea Wilson, not Kalt.
? *Melanoxantherium salicti* Patch.
Cladobius beulahensis Wilson, not Cockerell.

Pterocomma flocculosa (Weed).

Synonymy: *Melanoxanthus flocculosus* Weed.
Melanoxantherium flocculosum (Weed) Schouteden
Pterocomma flocculosa (Weed) Wilson.

Pterocomma smithiæ (Mon.).

- Synonymy: ? *Aphis salicti* Harris.
 ? *Aphis salicicola* Uhler.
Chaitophorus smithiæ Monell.
 ? *Lachnus salicicola* (Uhler) Thos.
Melanoxanthus salicti Weed.
Melanoxantherium smithiæ (Mon.) Gillette.
Pterocomma smithiæ (Mon.) Wilson.

Pterocomma bicolor (Oest.)

- Synonymy: *Melanoxanthus bicolor* Oestlund.
Melanoxantherium bicolor (Oestlund) Patch.

Pterocomma antennata (Patch)

- Synonymy: *Melanoxantherium antennatum* Patch.

Pterocomma beulahensis (Ckll.)

- Synonymy: *Cladobius beulahensis* Ckll.

A few misprints are noted in Wilson's paper. On page 347, in listing the described species, *beulahensis* and *salicicola* are misspelled. Cockerell, the author of *beulahensis*, is written as if it were part of the specific name. The citation of "*lanthaniæ*" is different on page 347 from the citation of the species on page 357. If *lantana* Koch is not a *Pterocomma*, as Wilson believes, and if the name is retained as he retains it, it must become *P. lantana* (Pass) based on the description of the oviparous female in *Aphididæ Italicæ*, p. 55. Passerini spelled the name *lantana*, but a new one would be required,

The names listed under *salicis* (Linn.) should be altered as follows: *Aphis salicis* should be in italics. In the lines following, Linn. should be in parenthesis, while the names of the other authors should not be. In the synonymy of *flocculosa* Weed, the first reference should read *Melanoxanthus*, and Weed should not be in parenthesis. In the synonymy of *bicolor* Oest., where the genus is cited as *Melanoxanthus*, Oestlund should not be in parenthesis.

In the synonymy of *populea* Kalt., the third reference, Cladobius should be omitted and Kalt. inserted in parenthesis after *populeus*. Whether or not the word was written thus, and not Cladobius, I have been unable to prove. The first edition of Passerini's *Gli Afidi* was published in 1857. I have not been able to see this nor the 1860 Parma edition. Wilson's reference, however, is incorrectly written. So also is his reference to *Aphididæ Italica*, 1863. *Pilosa* Buckton is cited twice. In the second citation it is indicated that the species was not described as a *Pterocomma*, but was referred to that genus by Wilson. In writing the name *populea* in connection with *Pterocomma*, Kalt. should be in parenthesis.

On page 355 *Aphis salicis* Harris is discussed. This is a misprint for *salicti* Harris, named on page 191 of the first edition of Harris' work. The same is seen in the citation of Oestlund, etc. In listing *smithiæ* as a *Pterocomma*, Monell, which is incorrectly spelled, should be in parenthesis.

In the list of species on page 347, the genera in which they were originally described are placed in parenthesis between *Pterocomma* and the specific name. This is the method given in the international code for the indication of subgenera.

All of these little details are very minor matters, but they are here mentioned for purposes of reference.

KEY TO THE SPECIES OF PTEROCOMMA

1. Cornicles without a distal flange and abruptly constricted at the distal extremity.....*focculosa*.
 Cornicles with a distal flange and not so abruptly constricted at their distal extremities.....2.
2. Cornicles about twice as long as their greatest diameter *smithiæ*.
 Cornicles much more than twice as long as their greatest diameter.....3.
3. Cornicles about equal in length to the hind tarsi.....4.
 Cornicles much longer than the hind tarsi.....6.
4. Beak reaching to the cornicles or nearly to them.....*populea*.
 Beak reaching only to the hind coxæ or not quite to them.....5.

5. Lateral tubercles of the abdomen about equal in length to the second antennal segment.....*steinheili*.
Lateral tubercles of abdomen considerably shorter than the second antennal segment.....*beulahensis*.
6. Cornicles nearly twice as long as the hind tarsi.....7.
Cornicles much more than twice as long as the hind tarsi.....8.
7. Unguis of segment VI of antennæ about equal in length to the cornicle and more than twice as long as base.....*bicolor*.
Unguis of segment VI of antennæ usually shorter than the cornicle and less than twice as long as base.....*populifoliæ*.
8. Cornicles cylindrical or slightly tapering.....*farinosa*.
Cornicles much swollen in the middle.....9.
9. Cornicles bright orange in colour.....*salicis*.

LITERATURE.

1851. Fitch, Asa.—Cat. Hom., N.Y. State Cab. Nat. Hist., p. 66.
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1913. Patch, E. M.—Aphid Pests of Maine—The Willow Family—Bull. Agr. Exp. Station, Me. No. 213., p. 89.
1913. Del Guercio, G.—Generi e Speci Nuove di Afididi—Redia IX, p. 178.
1915. Wilson, H. F. —A Synopsis of the Aphid Tribe Pterocommini—In Annals of the Ent. Soc. of America, Vol. VIII, p. 347.

The remaining literature on the tribe is cited in Wilson's paper.

A. NEW NOCTUID GENUS.

BY WM. BARNES, M.D., AND J. MCDUNNOUGH, PH.D., DECATUR, ILL.

The publication by Dr. Skinner (Ent. News, 1902, XIII; 141) of the species *Psychophora fasciata*, from Alaska, evoked considerable discussion at the time regarding the position of the species (whether a Noctuid or Geometrid), and also concerning the genus *Psychophora* Kirby and its type *sabini* Kirby (Ent. News, 1902 XIII, 191; l. c. 1903, XIV, 193). In the latter paper Dr. Dyar, in the belief that *fasciata* corresponds closely to the generic characters given for *Psychophora*, leaves the species along with *sabini* in that genus, and creates the genus *Skinneria* for *frigidaria* Gn., which he considered wrongly associated with *sabini* Kirby.

In the 4th Volume of Seitz Macrolepidoptera Palæarctica (Geometridæ) Mr. Prout (p. 232) sinks *Skinneria* to *Psychophora*, placing *frigidaria* Gn. in this genus. In reply to a query of ours regarding this action, he has kindly replied that there is a series of specimens under the name *sabini* in the British Museum from Grinnell Land, which "agree so perfectly with Curtis (and well with Kirby) that one cannot hesitate as to the rightness of their determination, especially as the localities are in the same main geographical region, and there is no knowledge of any rival claimant from thence." He further states that *frigidaria* Gn. from Norway, Lapland, etc., "seems evidently a mere local race of *sabini*," but that *phocata* Moesch, according to the figure, is a distinct but closely allied species. All these species he considers to be typical Larentiids. Regarding *fasciata* Skin. he was unable to speak definitely, as he had no material of this species.

The above remarks led us to examine more closely our specimens of *fasciata*, of which we have four ♂'s from the type locality, two of them being co-types. We find that Dr. Dyar in his otherwise excellent characterization of the generic characters of *fasciata* (Ent. News XIV, 194) has overlooked the fact that the mid and hind tibiæ are *well spined*. This fact would almost with certainty prove the species to be a Noctuid, and it would fall into the family *Agrotina* of Hampson, which reference would be further supported by other structural characters, notably the obsolescence of vein 5 on the secondaries from near the middle of the cell. With regard

to the two characters which have led *fasciata* to be considered a Geometer, *viz.*, the fovea at base of primaries and vein 5 of primaries arising from the middle of the cell, we cannot accept either of these points. The so-called fovea is apparently caused by a distinct bifurcation of vein 1 at the base, the space thus included by veins 1 and 1c being somewhat devoid of scales, which in any case are rather sparse on the underside. Regarding vein 5, all our specimens show this vein *distinctly below* the middle of the cell, rather more distant, it is true, from 4 than is usual, but slightly curved downward towards 4 at the point of origin. The antennæ are, in our opinion, very strongly lamellate, giving practically the appearance of bipectinations; the eyes rather small and reniform.

As there is apparently no generic name available for the species, we would propose the name BARROVIA (the species being taken at Pt. Barrow) with type *fasciata* Skin., and would place the genus in the vicinity of *Agrotiphila* Grt., from which it differs by its unspined fore tibiæ and hairy vestiture.

For generic characteristics other than the above-mentioned, we would refer to Dr. Dyar's paper as already quoted.

BOOK REVIEW.

THE LIFE OF INLAND WATERS. An elementary text book of fresh water biology for American students. By James G. Needham, Professor of Limnology in Cornell University, and J. T. Lloyd, Instructor in Limnology in Cornell University. The Comstock Publishing Co., Ithaca, N. Y., 1916. 438 pp. Price, \$3.00.

This is a work that will appeal to many classes of readers, including entomologists working in various fields of special study. It deals with a subject of immense scope, which has been developed gradually through the accumulated researches of innumerable investigators and has only recently acquired the status of a coherent science.

The vast array of facts embodied in this literature has been thoroughly sifted and assimilated by the authors, and the result is an admirably planned and most attractive presentation of the elements of limnology or fresh-water biology.

After an interesting chapter on the history and development of this science, the authors discuss the physical and chemical properties of water, and of natural bodies of water, regarded as aquatic environments, and also the interrelations of land and water. This is followed by a general account of the various types of aquatic environments, under the sub-headings: "Lakes and Ponds," "Streams," and "Marshes, Swamps and Bogs."

The fourth and longest chapter deals with types of aquatic organisms, these being described briefly in untechnical language, particular attention being given to their mode of life and such features of form and structure as indicate their fitness for their particular environment.

This and the two following chapters, entitled "Adjustment to Conditions of Aquatic Life" and "Aquatic Societies," contain much entomological matter. The latter two chapters are of exceptional interest to the biologist, and it is doubtful if there is anywhere to be found a more admirable analysis of the ecological relations of fresh-water organisms.

In the concluding chapter, "Inland Water Culture," the subject is discussed from the economic standpoint, and the possibilities of utilizing the extensive areas of swamp and marsh in North America for intensive fish-culture are clearly demonstrated. Nor are the aesthetic and educational aspects of the subject forgotten, and the authors show their breadth of view in this connection in advocating the preservation of wet lands in part as sanctuaries for wild life.

Throughout the book it is the ecological point of view that is emphasized rather than the systematic and morphological, and from this standpoint there is much that is of great interest to students of all groups of aquatic insects.

The illustrations are numerous and attractive, many of them being reproductions of original photographs and photomicrographs. The chief defect is the somewhat large number of typographical errors, which will doubtless be corrected in a future edition.