

NEUROPTEROID INSECTS—Notes and Descriptions.

BY NATHAN BANKS.

(Plates XVII-XIX.)

To the following descriptions of new species I have added notes on some other forms, especially in the families Perlidæ and Limnephilidæ, groups which I hope soon to revise. I have also figured the genitalia of most of our species of the *Goniotaulius* section of *Limnephilus*. The genus *Diplectrona* has not hitherto been recorded from our country.

PERLIDÆ.

Perla concolor n. sp.—Head bright yellowish; a black spot each side starting in front of each posterior ocellus, and extending forward and outward in front of each lateral scar; antennæ pale yellowish-brown, black on the basal joint; pronotum pale brown, a narrow yellowish median stripe; thorax yellowish-brown, darkest near tip; sternum, venter and legs pale yellowish, tips of femora and bases and tips of tibiæ dark. Wings pale brownish; venation yellowish-brown, rather paler on costal space. Head not much broader than the pronotum; posterior ocelli closer to each other than to the anterior ocellus, and still farther from the eyes; pronotum one and one-half times broader than long, narrowed a little behind, sides straight, and angles quite sharp; the wings rather narrow, the radial sector forked three times beyond the anastomosis, the first just beyond, about seven cross-veins in median and in cubital series. The last ventral segment of the male shows below a median area, more than twice as long as broad. Expanse 38 mm.

From San José, California.

Perla modesta n. sp.—Head yellow, broadly black each side behind eyes, a transverse black band across anterior ocellus and toward antennæ, sometimes with projections upward to the posterior ocelli; palpi pale, antennæ brown, basal joint black; pronotum black, with a broad median yellow stripe, broadest behind, thorax brown, a yellow spot on middle of front; abdomen rather paler brown; setæ brownish, paler at base; legs yellowish-brown, femora darkest and tarsi pale. Ocellar triangle, broader than long, hind ocelli as close to eyes as to each other; pronotum one and one-half times broader than long, barely broader in front than behind, anterior angles acute, hind angles less so; abdomen quite long; setæ short, basal joints very short, apical ones very slender. Wings gray hyaline, venation mostly brown, costal basal part yellowish; radial sector usually forked three times beyond anastomosis, sometimes one of the branches is superior, five or six cross-veins in median series; seven or eight in cubital series; the branches of anal vein approximate at base. Expanse 28 mm.

Several from Boulder, Colo. (August), Rohwer.

Perla illustris n. sp.—Head dull black, with a large pale yellow spot each side behind, above eyes and reaching medially to the posterior ocelli, basal joint of antennæ black above and beneath, second joint wholly pale, rest blackish; pronotum uniform dull black, thorax mostly black, one or two pale spots on each side of the mesothorax; sternum black; coxæ yellow; legs pale, femora lined with blackish; abdomen brownish-black, the segments above margined with pale behind; setæ wholly black. Wings pale, rather yellowish, with mostly yellowish venation, the subcosta and the radius brown on basal half, the radial sector also partly brown. The male is similar to the female, but the venter is yellowish and with three rows of black spots; abdomen above pale yellow on basal part, beyond more reddish-yellow, setæ wholly black. In female the ventral plate is strongly produced in middle, more so than in allied forms (*P. tristis*, *P. flavescens*, *P. capitata*, etc.). In the male the superior appendages are recurved as in allied forms, but the fifth segment is not as much prolonged and has a broader tip than allies. Expanse, ♀, 36 mm.; ♂, 28 mm.

From Mont St. Hilaire, and Montreal, Canada, July.

Differs from allies of this section (*Marthamea* Klap.) of *Perla* in genitalia; from *P. capitata* and *P. media* in dark setæ, and from others in paler wings.

Perla excavata n. sp.—Head yellow, a transverse brown mark over posterior ocelli, extending forward and dividing behind the anterior ocellus, each branch extending outward to a stripe at base of antennæ; clypeus black in middle, basal joint of antennæ black, rest yellowish; pronotum brown, rugulose, plainly broader than long, sides parallel, barely tapering behind, thorax brown; abdomen yellow-brown, paler beneath, setæ yellow at base, beyond brown; legs yellow-brown, tips of femora and tibiæ blackish, the tarsi also dark. Wings gray-hyaline, venation brown, radial sector forked three times beyond the anastomosis. Length to tip of wing 30 mm.

Chain Bridge, Virginia, June 9th.

The species allied to *P. excavata* are the following:

Perla fumosa Banks.

From Virginia and North Carolina; a square black spot over ocelli; wings brownish; ventral structure similar to *P. couloni*, but a very much smaller species, and with wings much darker than any of this group.

Perla lurida Hagen.

I do not have this species; from a sketch made from the type, the ventral plate is similar to *P. couloni*, but from the description it is probably distinct.

Perla couloni Pictet.

Our largest species; I have it from New York and Michigan. The spot over ocelli is rather broad in front and concave, not extending toward antennæ; wings grayish, venation brown.

Perla lycorias Newman.

Specimens from New York and Canada. The spot over ocelli is forked behind front ocellus, and connected to spot at base of antennæ; the pronotum is more or less yellowish.

Perla immarginata Say.

Various places in Ohio, also Michigan. No spot over ocelli; rather smaller than *P. lycorias*, especially the males; the wings have a faint yellowish-brown tinge.

Perla carolinensis Banks.

Only seen from North Carolina; black spot over ocelli extends forward so that it is very large; wings brownish, venation blackish; nearly as large as *P. couloni*. All specimens seen have a cross-vein from near tip of upper branch of radial sector to the radius or near tip of radius.

Perla xanthenes Newman.

Specimens from Virginia and North Carolina. Wholly greenish yellow or yellowish, no spot over ocelli, venation pale.

Perla valida Banks.

Only from North Carolina; looks much like *P. immarginata*, no mark over ocelli.

PSOCIDÆ.

Psocus persimilis n. sp.—Head yellowish, nasus finely lineate with black; eyes prominent; their tops higher than vertex; antennæ brown, slender; densely short haired, first joint plainly a little longer than distance between eyes; thorax and abdomen brownish; legs pale yellowish. Wings hyaline; venation mostly brown, a faint pale spot at fork of radial sector, and at outer tip of the discal cell; stigma brown on apical half, the color extending somewhat below, a black dot at base of stigma, and also one at end of anal vein; discal cell slightly five-sided, about one and one-third broader at base than at tip, neither side concave; the third posterior cell is shorter on base than the others, which are subequal; stigma long, evenly rounded behind. Length 4 mm.

Brownsville, Texas (Snow); allied to *P. confraternus*, but smaller, less marked, and with differently shaped discal cell and more rounded stigma.

Psocus cubanus n. sp.—Nasus black, vertex pale; antennæ pale on basal part, darker beyond; thorax dull black, hind margin of mesothorax and metathorax narrowly pale; legs pale yellowish. Wings hyaline, whitish on basal part; a black band across wing from end of anal vein, but not reaching the costa; a black spot at base of pterostigma, a larger black spot in apical part of

pterostigma, and one behind the pterostigma just before the angle; venation mostly black, the pterostigmatal vein yellowish, the apical corners of the cell, and the base of the branch of radial sector are snow-white; the basal part of radius and medius are also pale. The pterostigma is long, the outer side very oblique, and the angle not very sharp, yet not rounded; the cell is five-sided, extending a very short distance on radial sector, it is plainly broader at base than at tip, about one and one-half times as long as broad, and the outer side not concave; the posterior cells are all equally wide at base. Length 3 mm.

Havana, Cuba (Baker). Near *P. floridanus*, but the pterostigma is not as broad, not as angulate behind, the outer side more oblique; and the markings also different.

Myopsocus maculosus n. sp.—Head yellowish, a median brown stripe from ocelli over vertex; nasus lineate with brown; antennæ pale, densely hairy, first long joint plainly longer than width of head; thorax pale brown, a pair of dark brown spots close together on top of the mesonotum; abdomen brown; legs pale yellowish, darker at tips of the femora and tibiæ. Wings hyaline, with many scattered small brown spots, and some larger ones; at base of the pterostigma, at forking of median, at end of anal vein, three in a transverse row; also in apex of stigma, and in third posterior cell; but the general appearance of the wings is much paler than in the other species of the genus. Discal cell nearly twice as long as broad, only a little broader at base than at tip, the outer side strongly concave, stigma large, angulate below. Length 5 mm.

Berkeley, California, June.

Cæcilus clarus n. sp.—Pale yellowish, antennæ slightly brown; wings hyaline, venation pale, a dark dot at base of stigma, the base of radial sector, the cubitus as it leaves the median, and also with brown cloud just before its tip, and also at tip of anal vein, and smaller clouds at ends of branches of median that form the posterior cells, in one specimen these marks are very indistinct. The wings are rather short, the stigma is long, about as long as the width of wing at middle of length, and of even width throughout, the pedicel of the fork of radial sector is about as long as width of a cell, the third posterior cell is small, about twice as long as high. Length 3 mm.

Berkeley, California, on bay laurel.

Polypsocus fasciatus n. sp.—Head dull brownish-yellow, nasus blackish above; antennæ pale yellowish, slightly darker at tips of the joints, very hairy; thorax dull brownish-yellow, rather blackish on the lateral lobes, legs pale yellowish. Wings whitish hyaline, suffused and marked with pale brown; a band along apical margin to angle, where it joins a pterostigmal band, broader in front, the pterostigma not more prominent; along the anal vein is a black streak, a narrow, distinct white interruption, and then a black spot; a costal spot of brown before the stigma, and in the middle of the wing behind the latter spot are several brown patches adjoining white-margined veins. The venation is on the plan of the genus; the anal cell even longer than the pterostigma, and just before the origin of the radial sector are one or two short veins invading the cell from beneath and usually forming one or two small cells. Length 3.2 mm.

From Cayamas, Cuba (Baker).

EPHEMERIDÆ.

Potamanthus medius n. sp.—Pale yellowish, a broad median reddish stripe on prothorax and vertex of head, and less distinctly on mesothorax; the part on head is broader than elsewhere, and on the face it is broadened to reach the eyes, or nearly so; tips of femur and tibia 1 are slightly infuscated; setæ narrowly annulate with brown at the tips of the joints, the median seta rather smaller than the others; eyes of female scarcely if any more than two diameters apart, hind margin of pronotum emarginate on middle. Expanse 22–24 mm.

Douglas Co., Kansas, at electric light, July.

Resembles *P. myops*, but is smaller, and the eyes much closer together.

CHRYSOPIDÆ.

Chrysopa placita n. sp.—Head greenish, a narrow black crescent under each antennæ, a black mark below each on clypeus, and one under each eye, vertex with a rather broad brown streak each side, close to each eye, faint traces of a pair of submedian rufous streaks; antennæ yellowish, basal joint greenish, second not marked with black; pronotum greenish, yellowish in middle, a small black mark on each anterior side, and an indistinct rufous patch each side on disc; thorax green, abdomen greenish, discolored with brown; legs pale greenish. Wings hyaline, with green venation, marked with black, the cross-veinlets mostly black, the anal veins and its branches black, the upper side of the second cubital cell and the divisory veinlet of third (mostly at least) black; also the base of the radial sector; hind wings with venation mostly green; the stigmal region brownish in all wings. Forewings rather long and narrow, not very acute at tips, the third cubital cell is long, and the divisory veinlet ends much beyond the cross-vein; five veinlets in the inner gradate series, six or seven in outer. Expanse 25 mm.

Specimens from Clear Creek, and Chimney Gulch, Golden, Colo. (July), (Osler). The black marks on face and pale second antennal joint are distinctive.

Meleoma verticalis n. sp.—Pale green; a long blackish stripe under each eye toward mouth, mandibles blackish; palpi lined with black; basal joint of antennæ below near tip is reddish, and the second joint has a blackish mark beneath, vertex with a pair of short parallel reddish stripes; the horn is shorter and wider than in *M. innovata*, the basal joint of antennæ much swollen beneath at tip, the third elongate, and very distinctly swollen on inner side. Thorax green, with a pale yellow median stripe; abdomen green. Wings greenish hyaline; venation green, many cross-veins black, all of the branches of the anal and several basal costal veinlets wholly black, many others in part black, but the gradate series green. Expanse 35–38 mm.

Specimens from Chimney Gulch, Golden, August 3rd (Osler); Green Mt. Falls, July (Tucker); Cheyenne Canon, Colorado Springs, July (Tucker), and Arboles, all Colorado; also White

Mountains, Rio Ruidoso, 6,500 ft., July 30th; Santa Fé, July, and Magdalena, all New Mexico; a female from Vancouver Island, British Columbia.

Differs from *M. innovata* in marks on vertex, and more black cross-veins, in shape of the horn, and especially in the long and swollen third antennal joint. Some of these specimens were formerly referred to *M. innovata*, but with more material they appear distinct, and I do not know that *M. innovata* occurs north of Mexico.

Meleoma pallida n. sp.—Head pale yellowish (green in life?), no marks under eyes, palpi pale, unmarked; antennæ very wide apart at base; the horn short and broad, divided by a furrow in the middle, slightly concave in front; basal joint of antennæ very long, swollen near tip, third not elongate nor swollen; vertex and thorax unmarked. Wings hyaline, venation green, many cross-veins black in part, the gradate series brown, but the branches of anal are mostly pale; stigma indistinct in both pairs. Expanse 37 mm.

From Huachuca Mountains, Arizona, August 20, 1905, 8,000 ft., (Oslar).

HEMEROBIIDÆ.

Boriomyia pretiosa n. sp.—Face yellowish-brown; a black mark under each eye, and one between bases of antennæ; vertex with a spot each side near eye, and one in middle; pronotum with brown dots; mesonotum with a basal black band on frontal slope; abdomen dark brown, densely yellowish haired at tip of the male; legs pale yellowish; the coxæ brownish. Wings hyaline, with pale venation, dotted with black; from most of the dark dots small clouds extend out on the membrane, no distinct larger brown spots; stigma indistinct in both pairs. Forewings rather broad, costal region broad near base, three radial sectors, and the first not connected to radius, the third connected to radius once; the last veinlet of the inner gradate series slightly before or at the preceding veinlet; in the hind wings the fork of radial sector is even with the fork of the median vein. The male appendages are similar to those of *B. coloradensis*, but (seen from the side) are much narrower at tip. Expanse 15 mm.

Specimens from Chimney Gulch, Golden, July 22nd, and Clear Creek, both Colorado (Oslar).

Hemerobius placidus n. sp.—Head yellowish, cheeks darker, antennæ yellowish, palpi pale, last joint brown; thorax brown on sides, pale in middle; abdomen brown; legs yellowish. Wings pale brownish, venation darker brown, interrupted with pale, a large dark brown spot over veinlet connecting median and cubital, another smaller dark spot at the first cross-vein beyond, indistinct clouds over each gradate series, margin with black dot at and between ends of each vein; hind wings pale, stigmal region barely darker. Forewings rather long; the median bent toward the cubitus at connecting veinlet, but not as much as in *H. humuli*, three radial sectors; in the inner gradate series the hind cross-

veinlet is barely if any beyond the preceding veinlet, the costal space is only moderately broad at base; in the hind wings the fork of the radial sector is plainly before fork of median vein. Expanse 20 mm.

Specimens from Lake Placid, New York, August 12th; Peru, Mass., August 26th, and Mt. Katahdin, Maine.

By position of posterior veinlet of inner gradate series, and moderate costal area it is allied to *H. stigmaterus*, but the shape of appendages, especially the lower part, separates it from that species.

Hemerobius alpestris n. sp.—Face yellowish, with a transverse blackish band below antennæ, extending down each side to the clypeus, cheeks dark; antennæ pale yellowish, the basal joint brown, beneath pale, pronotum brownish; thorax yellowish-brown; abdomen nearly black, with long golden hair near tip above; legs pale yellowish. Wings faintly brownish, venation brown, interrupted with white, no large brown spots on wings, but the posterior and outer margins are broadly brown, more distinctly brown than rest of surface, indistinct clouds over each gradate veinlet; hind wings pale, stigma rather yellowish. Forewings rather short and broad, costal area moderate, last veinlet of inner gradate series slightly beyond preceding, the median is not bent toward the cubitus at the connecting veinlet, which is nearly as long as veinlet to anal; three radial sectors; in the hind wings the radial sector forks beyond fork of median vein. Expanse 13 mm.

Sugar Loaf Mountain, Colo. (8,500 ft.), May 13th. Mr. Rohwer.

Sisyra apicalis n. sp.—Face yellowish, vertex dark brown, both with golden hair; antennæ yellow-brown on basal joint, jet black beyond for nearly two-thirds of its length, then pale yellowish to near the tip which is black; thorax brown; coxæ brown, rest of legs pale yellowish; abdomen blackish. Wings fumose; veins brown, and a brown streak through each cell. Wings slender; about seven costal cross-veins, all near base, radial sector with three branches and connected back to radius twice, the first three veins beyond end of radius are forked only near margin of wing, the next three are forked near margin and also about one-third the distance across wing. Length 5 mm.

Havana, Cuba (Baker).

Distinct from *S. vicaria* by smaller size, more slender wings, fewer costal cross-veins, by colors of antennæ and minor points.

PANORPIDÆ.

Bittacus texanus n. sp.—Rather reddish-yellow, ocelli on black, hind tarsus brown; wings more rufous-brown than in other species; in color similar to *B. mexicanus*, the costal apex of the wings being darkened as in that species; legs immaculate. Antennæ minutely pubescent; hind femora swollen on basal part as much as in *occidentis*, but the joint is much longer. Male genitalia on the plan of *B. stigmaterus*, but the superior appendages are twice as long as the tenth ventral segment, the tip rounded, hairy, the upper edge barely concave, humped

at base the slender lower appendages (harpes) are longer than the tenth ventral segment, and a little more than one-half as long as the upper appendages.

One specimen from Plano, Texas, July (Tucker).

In size and appearance like *B. mexicanus*, but in that species the lower appendages (harpes) are as long as the superior appendages.

LIMNEPHILIDÆ.

Anabolia assimilis n. sp.—Face pale yellowish, with yellow hair, and a row of black bristles each side near eye; palpi paler; vertex yellowish-brown, ocelli rather large, the discal bristles between ocelli; the posterior warts small and low; basal joint of antennæ brown, beyond yellowish, narrowly annulate with brown; pronotum rather prominent, with many black bristles, and long yellow hairs; thorax brown, with a broad pale median stripe; abdomen yellowish-brown, appendages pale; legs pale yellowish, with black spines, the spurs 1-2-3, those of leg II and III very long and slender, the subapical on III, about one and one-half its length from tip; beneath femur I is a narrow black line. Wings very much like those of *Anabolina diversa*, of a brownish yellow tinge, with yellow and black hairs, the stigmal region brownish, and all behind cubitus (and sometimes a little in front of it) is mottled with brown, the cubitus and anal veins are very dark, other venation brown, interrupted with pale. Forewings long and slender, apex rounded, discal cell longer than pedicel, first apical about width on discal, fourth as wide as third at base, fifth barely in front of the anastomosis. Expanse 26 mm.

Prescott, Arizona.

Although the spur-formula is like *Ecclisopteryx*, the insect is different in many other characters.

Anabolia nigricula n. sp.—Head black, palpi pale; basal joint of antennæ deep black, rest of antennæ brown, annulate with pale, a pale streak in vertex each side close to eyes; thorax black, with a broad median stripe of white pollen, pronotum rather paler above; abdomen brown, apex black, appendages yellowish. Legs yellowish, spines black, spurs rather short, a black streak beneath at base of femur I. Wings brown or almost black, venation black, interrupted with pale, stigma rather darker, cubitus and anal veins broadly black, an oblique hyaline spot at thyridium and one at arculus, elsewhere there are many very small pale dots, especially on anterior half and on the apical part of wing. Hindwings with the stigma dark. Discal cell of forewings longer than the pedicel, first apical its width on discal, fourth fully as wide as third at base, fifth about one-half its width back of anastomosis. Expanse 29 mm.

Clear Creek, Colorado, September 10th; Florissant, Colorado.

Limnophilus rohweri n. sp.—Face pale, with yellow and black hair; palpi pale; vertex brown, with some yellow hair, a transverse yellow wart each side behind; antennæ yellowish, faintly annulate with brown, basal joint with some black hair; pronotum yellow, with yellow hair; thorax yellow-brown, abdomen darker brown; legs yellow, with black spines. Wings mostly hyaline,

mottled with pale brown, the brown much broken up, costal area wholly pale; a narrow oblique thyridio-discal pale stripe, continued outward across anastomosis and through the fourth and base of fifth apical cells to the outer margin of wing, basally this pale stripe extends below median vein toward the base of wing; the brown each side of the pale stripe is darker and more heavily spotted than elsewhere; the whole somewhat resembling *Platyphylax designata*; hind wings gray hyaline, venation pale. Forewings rather long; discal cell as long as pedicel; first and fifth apical cells not their width before the anastomosis; in hind wings the fourth apical at base is about one-half the width of the third. Expanse 26 mm.

From Florissant, Colorado, June 22nd (Rohwer).

Limnephilus macgillivrayi n. sp.—Head yellow, with yellow and white hairs; antennæ and palpi pale yellowish; thorax yellow, with yellowish hair; abdomen brown, appendages yellowish; legs pale yellow, with black spines, a few yellow ones on front pair. Wings unmarked on anterior third, beyond yellow-brown, with an oblique thyridio-discal spot, another in base of first sub-apical and up to front of the anastomosis, another in base of apical cells, and one in apical part of the fourth and fifth apicals and the first and second subapical cells, all pale; a few smaller dots in the brown; hindwings hyaline, venation yellowish. In forewings the discal cell is as long as the pedicel, the first apical scarcely its width on discal, the fifth hardly before the anastomosis; in hindwing the second, third and fifth apicals subequal at base, the fourth much narrower. Expanse 25 mm.

From Axton, Adirondack Mountains, New York, June 12–22nd (A. D. MacGillivray).

Very distinct by shape of superior appendages of male.

Limnephilus (Goniotauius) bifidus n. sp.—Face yellow, with yellowish hair, palpi yellow; vertex brown on middle, rest yellow; antennæ yellow-brown, marked with darker brown; posterior warts long and yellow, bearing yellow bristles; pronotum yellow, with short yellow hair, and longer black bristles; thorax black; abdomen brown; legs all very pale yellowish, spines black. Wings heavily mottled with brown, except on costal area, the bases of apical cells paler, a large thyridio-discal spot, one in apex of subapicals, most of the hyaline spots confluent, in general marked like *G. mæstus*. The superior appendages of the female are two long slender approximate plates, the lower appendages more slender and projecting beyond upper. Expanse 28 mm.

Pullman, Washington State (Piper). A male from Wellington, B. C., May 14, 1897, probably belongs to this species. It has a similar pale face, large discal brown spot on vertex, the tips of tibiæ and tarsal joints blackish; the wings are not fully colored, but from what can be seen they are marked like the female. The male genitalia, as shown in figures, is very characteristic.

Limnephilus (Goniotauius) abbreviatus n. sp.—Face black, with black and yellow hairs; vertex black, the discal bristles somewhat behind the ocelli; antennæ brown, narrowly annulate with pale, pronotum not promi-

ment; thorax black, with a broad, pale median stripe; abdomen brown, segments bordered behind with pale; legs pale yellow, tibia I dusky near middle, subapical spurs of hind tibiæ fully twice their length from the tip. Wings brown, costal area and most of discal to the anastomosis paler, base of apical cells pale, rest of apical part of wings, the stigma and the posterior part (except anal edge) brown, more or less spotted with pale; not many spots in apical part; a large oblique thyridio-discal spot, and many small ones near the posterior anastomosis and along the anal vein. Discal cell longer than pedicel, first apical about one-half its width on discal, fourth about one-half the width of third at base, fifth not reaching before the anastomosis. Superior appendages of male black, slender, shorter and nearer together than in *G. mæstus*. Expanse 21 mm.

From Tabernash, Colo., August (Tucker).

Limnephilus (Goniotaulius) canadensis n. sp.—Face brown, with yellowish and black hair, vertex brown, with stout black bristles and short yellow hairs, the discal pair between the ocelli, a pair of submedian warts behind, and an oblique one on each side near eye, all bearing long stiff black bristles. Abdomen brown, segments margined with pale behind; legs pale yellowish, with black spines, subapical spurs on hind tibiæ not twice their length from tip. Wings pale, very hairy; costal area unmarked; discal area to the anastomosis brownish, with many small rounded spots, the apex and posterior region more or less brownish, and marked with pale spots, a brownish spot on the stigma. Discal cell scarcely as long as pedicel, first apical not its width on discal cell, fourth apical nearly as wide as third at base, fifth not one-half its width back of anastomosis, the tip of abdomen of the female shows above a long plate, cleft to near its apex. Expanse 21 mm.

One from Laval Co., Canada, June 29th; another from Orono, Maine. The latter is rather more heavily marked, especially near pterostigma and along cubital vein.

Limnephilus (Goniotaulius) occidentalis n. sp.—Head black, clothed with mostly black hairs and bristles, the discal bristles are between the ocelli; antennæ brown, narrowly annulate with pale, basal joint black; pronotum quite prominent, with many stout black bristles, thorax and abdomen dark brown or black; femora black, rest of legs pale, tibia marked in middle, and apex of each tarsal joint black, spines black, on hind tibiæ the subapical spurs are about twice their length from tip. Wings more or less brown, often quite dark, with many small pale spots, the costal area pale, an oblique thyridio-discal spot, arculus hyaline; very few spots beyond the anastomosis, and they are small; stigma rather darker than rest of wing; hind wings grayish hyaline, with dark stigma. In forewings the discal cell is rather longer than the pedicel, the first apical is not its width on discal cell, the fourth is about two-thirds as wide as third at base, the fifth not before anastomosis. The female shows two approximate slender superior appendages, and the male has the last dorsal segment prolonged in the middle. Expanse 20 mm.

Many specimens from Wellington, B. C.; Tacoma, September 5th; Pullman, September 21st, May 14th; Temino, September 25th, and Olympia, all in Washington State.

In some specimens the brown along radius, cubitus and anal vein and beyond anastomosis is much darker than elsewhere.

Platyphylax designata Walker.

There are three forms of this species known to me, which, for the present, I consider but varieties of the one species. These three forms are variable in the development of the median stripe; sometimes interrupted at the anastomosis, sometimes continuous; The form in the Northeastern United States I shall consider as the typical *P. designata*; some, at least, of Walker's specimens (if not all) were of this form. The typical *P. designata* is of moderate size, and often quite dark; the superior appendages of the male (seen from the side) are narrowed above before tip.

The specimens from Colorado and further west are larger, paler, and in the male the superior appendages (seen from the side) are not narrowed before tip. This form I call *P. designata* var. *occidentalis*. I have it from various places in Colorado, New Mexico, Washington and California.

The form from Alaska is about the size of the typical *P. designata*, but very much darker; a uniform brown, with a narrow pale stripe behind radius, and the usual median stripe. In the male the superior appendages (seen from the side) are slightly concave below, and not narrowed before the tip; the lower appendages are more acuminate at tip than in other varieties; it may be called *P. designata* var. *alaskensis*.

LEPTOCERIDÆ.

Leptocerus recurvatus n. sp.—Black, clothed with white hairs; sides of thorax brown; antennæ yellowish-brown, narrowly annulate with black, the subantennal tuft yellow-brown; legs yellowish, the fore pair darker; abdomen blackish near base, pale beyond. Forewings brownish, basal anal area paler, also costal area, venation dark brown, a rather blackish spot over ends of first apical fork, the base of the upper branch of the median brown, the rest hyaline until the anastomosis, the pedicels of forks one and three about equal in length; hind wings more hyaline, the anterior venation brown, rest paler. Expanse 22 mm.

From Westfield, N. Y., June, July (Woglum).

HYDROPSYCHIDÆ.

Hydropsyche pettiti n. sp.—Head brown, face and vertex clothed with yellowish hair; palpi brown; antennæ pale yellow, with brown spiral mark; prothorax with long yellow hairs, and tuft at base of wing; dorsum of thorax

with short yellow pile; abdomen black above, gray below; appendages yellowish. Wings heavily marked with brown, a large pale spot over arculus, and rest of wing guttate with greyish-white, venation brown; hind wings with stigma darker, legs pale yellowish. On middle tibiæ basal spurs are but little more than their length from base, but not twice as far from apex. In hind wings no first apical, the upper branch of radial sector not forked. Male appendages as figured, apical part of lower appendages very slender, upper pair bifid from side-view, above with an inward directed point. Expanse 15 mm.

Agricultural College, Michigan, June 20th.

Arctopsyche apicalis n. sp.—Similar to *A. ladogensis*; wings pale, veins fuscous, and more or less margined with fuscous, mostly in spots, and at apex of the veins are other spots, sometimes more or less connected, and two spots on costa near the stigma. Body black, head and thorax clothed with mostly greyish-white hair, some yellow hair on prothorax, and black on the warts; legs pale yellowish, tips of hind tibiæ faintly blackish; antennæ heavy, yellowish, faintly marked with brown. The first pair of spurs on the middle tibiæ are at about the middle of the length. Discal cell of forewings much longer than in the other species, nearly twice as long as in *A. ladogensis*. Expanse 19-24 mm.

Franconia, New Hampshire (Mrs. A. T. Slosson); Fourth Lake, Fulton Chain, Adirondack Mts., N. York, June 12th (Dickerson).

Much smaller than the other species, and also differs from *A. grandis* in lacking the many pale spots on the wings.

Diplectrona modesta n. sp.—Black; with golden hair on head and thorax, especially on the warts, between the antennæ and at bases of the wings, rest of thorax and the abdomen brownish; legs pale yellowish, the femora rather darker; wings brown, venation brown, surface with very short golden hairs. Maxillary palpi very long; antennæ with each joint prominent below; spurs 2-4-4, those on front pair very short, and the first pair on middle tibiæ are at about the middle of length. On the side of abdomen, between the fourth and fifth segment arises a very slender, stiff filament, which in the male reaches nearly to the tip of the body. Wings moderately long; venation similar to that of *D. felix*, but the discal cell is much longer, and in the hindwings fork 1 is extremely short. Expanse, ♂, 17 mm.; ♀, 19 mm.

Riverside, Mass., June (C. W. Johnson).

PLATE XVII.

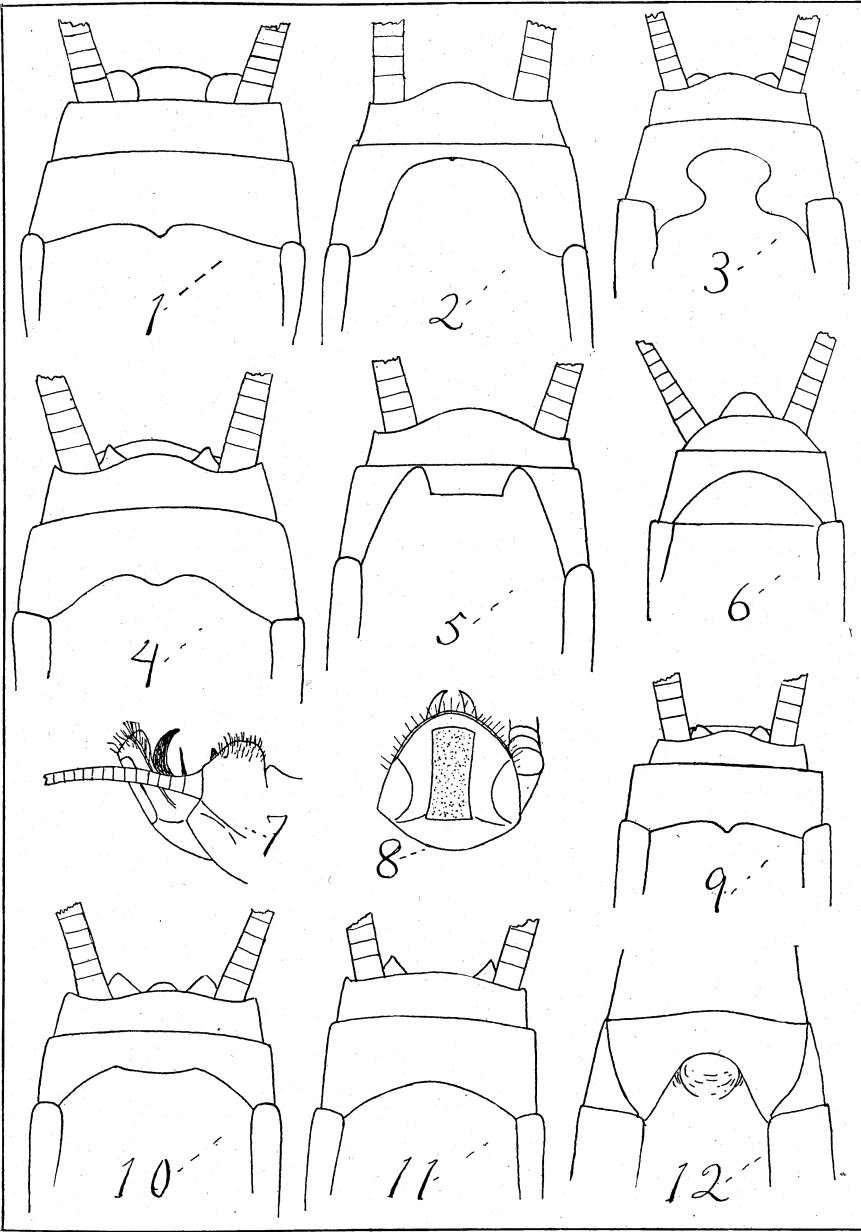
- Fig. 1.—*Perla couloni*, ventral plate.
 “ 2. “ *immarginata*, “
 “ 3. “ *valida*, “
 “ 4. “ *carolinensis*, “
 “ 5. “ *xanthenes*, “
 “ 6. “ *modesta*, “
 “ 7. “ *concolor*, male genitalia, side view.
 “ 8. “ “ “ “ end “
 “ 9. “ *fumosa*, ventral plate.
 “ 10. “ *excavata*, “
 “ 11. “ *lycorias*, “
 “ 11. “ *illustris*, “

PLATE XVIII.

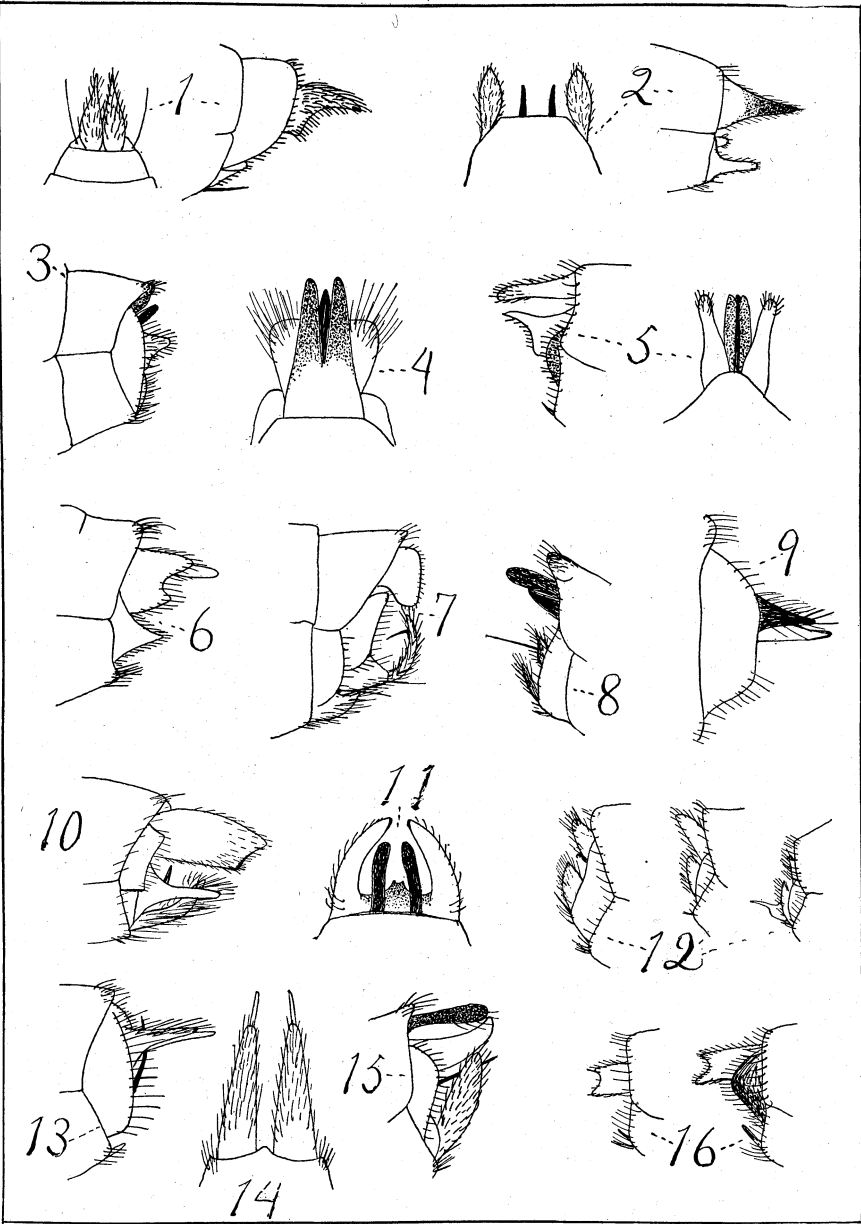
- Fig. 1.—*Limnephilus occidentalis*, female.
 “ 2. “ *rohveri*, male.
 “ 3. “ *occidentalis*, male.
 “ 4. “ *canadensis*, female.
 “ 5. “ *despectus*, female.
 “ 6. “ *extractus*, male.
 “ 7. “ “ female.
 “ 8. “ *abbreviatus*, male.
 “ 9. “ *nebulosus*, male.
 “ 10. “ *macgillivrayi*, male.
 “ 11. “ *bifidus*, male.
 “ 12. “ *submonilifer*, males.
 “ 13. “ *bifidus*, male.
 “ 14. “ “ female.
 “ 15. “ “ female.
 “ 16. “ *submonilifer*, females.

PLATE XIX.

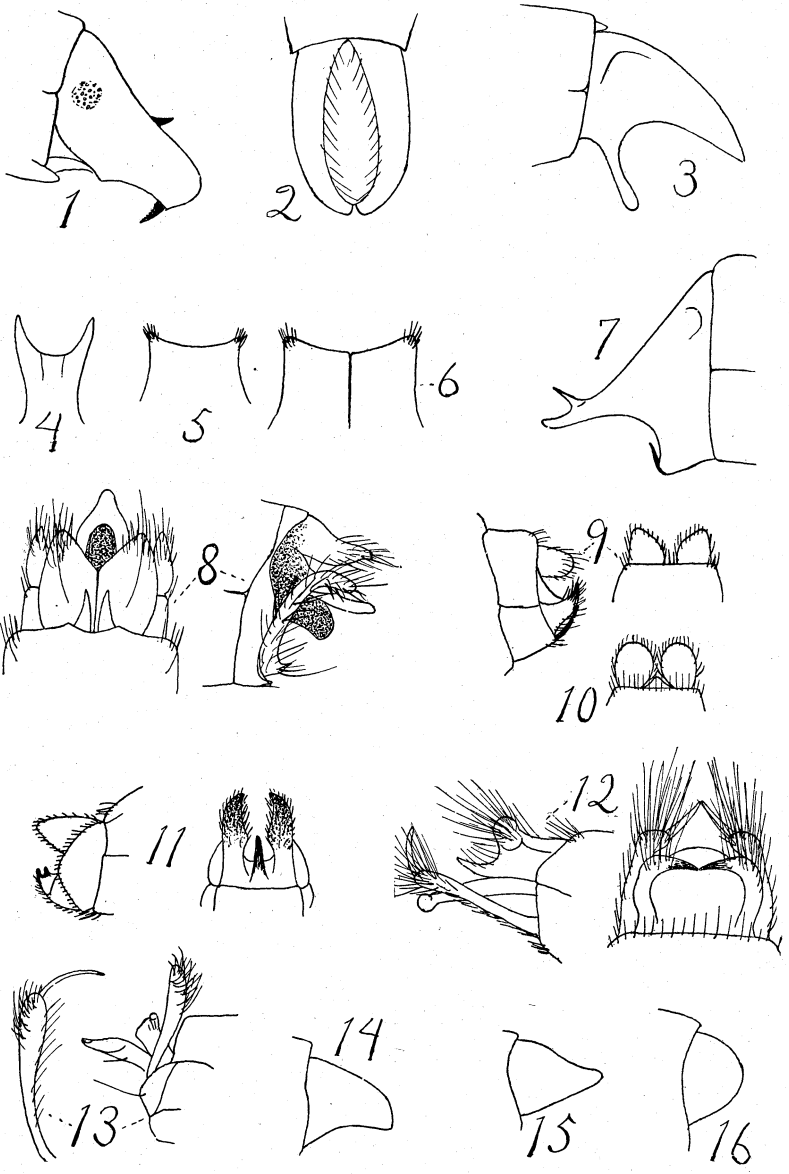
- Fig. 1.—*Boriomyia pretiosa*, male, side.
 “ 2. “ “ male, above.
 “ 3.—*Hemerobius placidus*, male, side.
 “ 4.—*Meleoma pallida*, horn, male.
 “ 5. “ *verticalis*, horn, male.
 “ 6. “ *innovata*, horn, male.
 “ 7.—*Hemerobius alpestris*, male, side.
 “ 8.—*Leptocerus recurvatus*, male.
 “ 9.—*Anabolia assimilis*, male.
 “ 10. “ “ female.
 “ 11. “ *nigricula*, male.
 “ 12.—*Hydropsyche pettiti*, male.
 “ 13.—*Diplectrona modesta*, male.
 “ 14.—*Platyphylax alaskensis*, male, sup. appendage.
 “ 15. “ *designata*, male, sup. appendage.
 “ 16. “ *occidentalis*, male, sup. appendage.



BANKS ON NEUROPTERA.



BANKS ON NEUROPTERA.



Bibliography of the Neuropterida

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