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NEW SPIDERS FROM UTAH.

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DRASSIDÆ.

Zelotes fratris, sp. nov.

Male.—A species suggesting *Z. ater* in general appearance and structure. Cephalothorax, abdomen and legs black, the tarsi of the latter paler. Posterior row of eyes straight, the eyes nearly equal and equidistant, thus clearly contrasting with *ater*, in which the median eyes are larger and much more approximate to each other than to the laterals. Anterior row of eyes procurved as usual; the medians much smaller than the laterals, being about half the diameter of the latter, more than their diameter from each other, but very close to the laterals. Area of median eyes as wide in front as, or scarcely wider than, behind. Anterior tibiæ wholly unspined, not armed at distal end as in *ater*. Anterior metatarsi with a pair of spines at base. Palpus with apophysis suggesting that of *ater*, the bulb, however, differing decidedly in details and much more similar to that of *tuobus*. See fig. 18, 1 and 2.

Length 6.3 mm. Length of cephalothorax 2.8 mm. Length of tib.+pat. I, 2.6 mm.; of tib.+pat. IV 2.8 mm.

Locality.—Utah: Logan Canyon. Collected by my brother, Seth C. Chamberlin.

Aside from difference in the palpal organs which are represented in the figures, this form differs fom the male paratype of *tuobus* in having the tib.+pat. IV of the same length as the cephalothorax instead of much longer. In the male paratype of *tuobus* the cephalothorax is 3 mm. long, while the tib.+pat. IV measured 3.7 mm.

Zelotes lampra, sp. nov.

Female.—Cephalothorax shining black. Legs black, with all tarsi and the metatarsi of the first three pairs in the type paler. Abdomen black both above and below. Anterior row of eyes procurved in such degree that the tangent to the lower edge of the medians passes through or very near the centres of the laterals. Median eyes much smaller than the laterals, about their diameter apart, much closer to the laterals. Posterior row of eyes straight; median eyes larger than the laterals, scarcely their radius apart, an equal distance from the laterals. Quadrangle of median eyes wider behind than in front, a little longer than wide. Tibia I+II armed beneath near middle (or possibly a pair of spines). Metatarsi I and II each with a pair of subbasal spines beneath. Distinguished readily by the form of the epigynum, which is represented in fig. 19, 3.

Length 5 mm. Length of cephalothorax 2 mm. Length of tib.+pat. I 2 mm.; of tib.+pat. IV 2.36 mm.

Locality.—Utah: Salt Lake Co., Mill Creek.

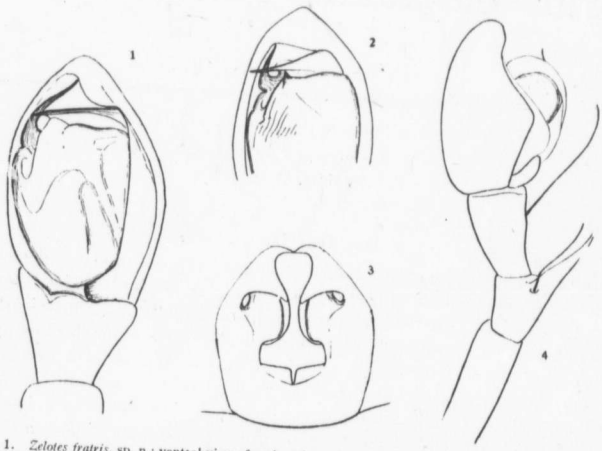

FIG. 19. 1. *Zelotes fratris*, sp. n.; venttal view of male palpus. x44. 2. *Zelotes tuobus* Chamberlin, distal part of tarsus of male palpus, ventral view. x44. 3. *Zelotes lampra*, sp. n., epigynum. x73. 4. *Linyphia hespera*, sp. n., male palpus, dorsal view. x44.

LINYPHIIDÆ.

Linyphia hespera, sp. nov.

Coloration essentially identical with that of *L. phrygiana*, with which it has heretofore been confused. Cephalothorax light yellow, narrowly margined with black and with a black median longitudinal line along dorsum which widens clavately up the head to the eyes, this clavate portion geminate by a median pale line and each half again divided at anterior end by a broad process of yellow. Abdomen marked by the typical dark herringbone longitudinal dorsal stripe, this often in part obliterated anteriorly. Legs yellow, typically annulate as in *phrygiana*, with femora commonly minutely maculate. The markings of body often reddish instead of black. The species is most readily distinguished by the characters of the male palpus. The patellar apophysis is similar in position and general form to that of *phrygiana* but differs uniformly in narrowing continuously distad to the tip, where it is acute instead of being clavate and rounded at the end as it is in *phrygiana*. The conspicuous principal seta of the tibia as viewed from above is inserted towards the distal end instead of near the middle; and at the base of the patella apophysis above is a seta, typically as long as to longer than the apophysis, which is geniculate above its base. See Fig. 19, 4. The epigynum is very similar to that of *phrygiana*. The median lobe seems to have the distal portion a little broader and the narrow isthmus a little shorter.

Length of male type 5 mm. Length of cephalothorax 2.37 mm.; width 2.1. mm. Length of tib.+pat. I 4.1 mm.; of tib.+pat. IV 2.7 mm.

Locality.—Utah: Bear Lake, Logan Canyon. Numerous specimens Females from Chalk Creek, Uintah Mts., seem also to be of this species.

Lepthyphantes lamprus, sp. nov.

Female.—Carapace fulvous, the eyes edged with black and a marginal stripe on each side also black. Sternum dusky, almost black. Legs fulvous, strongly annulate with black, the femur with an annulus at each end and one at middle, the patella with one at distal end, the tibia and tarsus each with one just proximad of middle and one at distal end, and the tarsus darkened at middle. Abdomen in general black, a network of yellowish or whitish lines above separating off a longitudinal row of black spots on each side with a pointed longitudinal mark between them at base. Venter with a light spot in front of spinerets. Head protruding a little forward above clypeus, the upper part of which is depressed, from where the latter slants forward. Anterior row of eyes straight; the median eyes decidedly smaller than the laterals and much nearer together, being rather less than their radius apart but nearly their diameter from the laterals. Posterior row of eyes straight; median eyes larger than the laterals from which separated by scarcely their radius, nearer to each other. Area of median eyes much wider behind than in front. Epigynum as shown in Fig. 20, 1.

Length about 3 mm. Length of cephalothorax 1.3 mm. Length of tib.+pat. IV 1.63 mm., the length of tib.+pat. I the same or very nearly so.

Locality.—Utah: Logan Canyon.

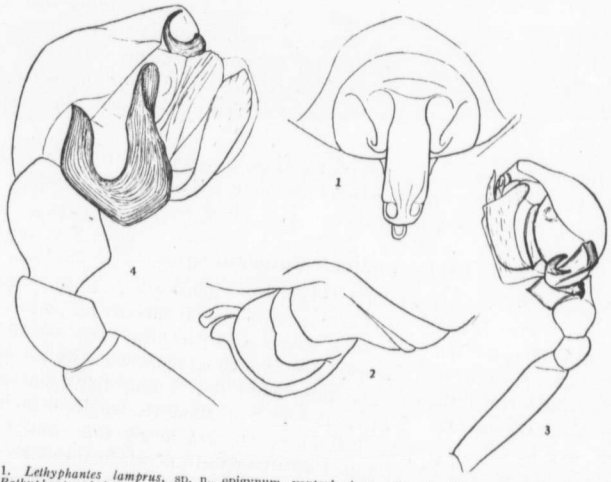

Fig. 20. 1. *Lethyphantes lamprus*, sp. n., epigynum, ventral view. x74. 2. The same, side view. x74. 3. *Bathyphantes phylax*, sp. n., left male palpus, ectal view. x44. 4. *Microneta, ula* sp. n., right male palpus, ectal view. x175.

Bathyphantes phylax, sp. nov.

Male.—Cephalothorax dusky over a yellowish ground. Legs yellowish, slightly darkened, less so distad of the patellæ. Cephalorax longer than wide in about the ratio 9:7. Head highest caudad of eyes, convex; sides rather steep and clypeus subvertical with head a little bulging forward above it. Lateral

eyes on rather pronounced tubercles suggesting those of some species of *Micronela*. Posterior row of eyes straight; median eyes a little less than their diameter apart, and a little more than their diameter from the laterals. Anterior row of eyes straight or scarcely recurved; median eyes less than their radius apart, their diameter from the laterals. Palpal organ with a broad membranous blade curving forward from base beneath the style, its edge denticulate above across its distal end. Hook bent into a semicircle with a subquadrate plate from its ectal side below and a spur at the caudodorsal angle of the latter as shown in Fig. 20, 3.

Length of cephalothorax 1.46 mm.; width 1.14 mm. Length of tib.+pat. I 1.74 mm.; of tib.+pat. IV 1.85 mm. Metatarsus I of nearly same length as tibia I.

Locality.—Utah: Bear Lake. One male.

Microneta uta, sp. nov.

Male.—Cephalothorax, abdomen and palpi black or nearly so. Legs fulvous, in part slightly dusky. Cephalothorax conspicuously narrowed in front of middle, obviously longer than broad (cir. 7:5). Posterior row of eyes straight; the median eyes slightly larger, scarcely their diameter apart. Anterior eyes in a straight line; the eyes nearly equidistant with the medians smaller than the laterals. Head slanting obliquely forward from posterior row of eyes to anterior row, the anterior median eyes carried forward above upper part of clypeus, the clypeus slanting forward, its profile straight. Tibia of palpus widening distad and a little elevated above but without any distinct process. Tarsal hook abruptly bent back, the distal or recurving portion long. See Fig. 20, 4.

Length 1.75 mm. Length of cephalothorax .7 mm.; width .5 mm. Length of tib.+pat. I .76 mm.; of tib.+pat. IV, .86 mm.; of met. IV. 6. mm.

Locality.—Utah: Logan Canyon.

Diplocephalus cryptodon, sp. nov.

Female.—Cephalothorax and legs yellow of a dilute orange tinge. Abdomen dark gray. Posterior row of eyes conspicuously procurved; median eyes less than their diameter and more than their radius part, the same distance from the laterals or nearly so. Anterior row of eyes straight or nearly so; medians considerably smaller than the laterals, about their radius apart and scarcely farther from the laterals. Clypeus in height equalling the length of the median ocular area or a little lower. Median ocular area longer than wide. Upper margin of furrow of chelicera armed with four teeth of which the three nearest the claw are long and subequal, the fourth tooth smaller; lower margin of furrow with four similarly well separated but similarly much smaller teeth. Epigynum as shown in Fig. 21, 3.

Male.—The postocular swelling is slight, scarcely or not at all rising above level of eyes, the hair short and sparse, forming a median longitudinal line; lateral pits conspicuous. Posterior row of eyes procurved; medians half their longer diameter apart, nearly twice as far from the laterals. Anterior row of eyes straight; the medians much smaller than the laterals, less than their radius

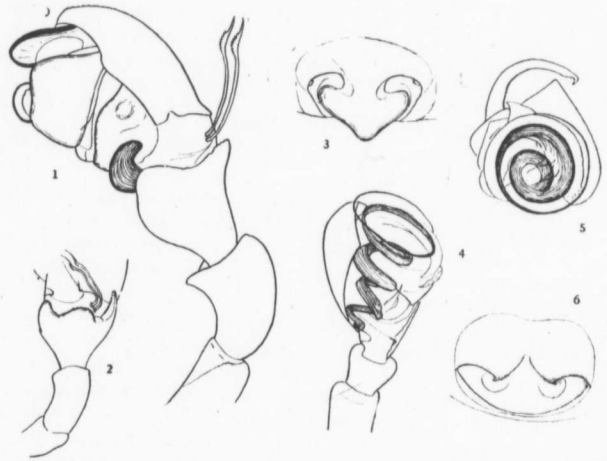

Fig. 21. 1. *Diplocephalus cryptodon*, sp. n., right male palpus, ectal view. x73. 2. Dorsal view of tibia and proximal portion of tarsus of same palpus. x44. 3. Epigynum. x73. 4. *Spirembolus vallicolens*, sp. n., male palpus, ventral view. x86. 5. Male palpus, distal view. x86. 6. Epigynum. x103.

apart, their diameter from the laterals. In the palpus the tibia at its distal end is expanded into a thin cup or calyx over the base of the tarsus as in *dentipalpis* (Emerton). On the inner surface of the dorsal part of this calyx, or hood, is borne a small tooth but this is well removed from the edge and is smaller and less chitinous than that of *dentipalpis*. In contrast with the conspicuously long and exposed embolus of *dentipalpis*, that of the present species is comparatively short though presenting a similar double curve, as shown in Fig. 21, 1 and 2.

Length of male 2.5 mm. Length of cephalothorax 1.2 mm.; width 1 mm.

Locality.—Utah.

SPIREMBOLUS, gen. nov.

Cephalothorax normally narrowed anteriorly, the front obtuse. Clypeus higher than the length of median eye area, strongly convex in dorsal views. Anterior row of eyes from straight to procurved; medians much smaller than the laterals and nearer to each other than to the latter. Posterior row of eyes from straight or slightly recurved, as in the genotype, to slightly procurved; medians farther from each other than from the laterals, or the eyes nearly equidistant (male of *vallicolens*). Area of median eyes wider than long. Anterior tarsi shorter than the metatarsi. In the male palpus the tibia bears a slender apophysis which extends over the tarsus which ends in a slender pointed tip which is bent abruptly. Cymbium of tarsus conspicuously elevated in middle above; bulb characterized by having the embolus coiled in a spiral which widens from the base of the bulb distad, the coils being nearly at right angles to the long axis of the joint, and thus quite from the disposition in *Spiropalpus*.

Genotype.—Cornicularia monticolens Chamberlin.

Includes also the species described below. These forms are at once distinguishable from others by the peculiar male palpi which are notably fixed in structure in comparison with other characters such as those of the cephalothorax.

Spirembolus vallicolens, sp. nov.

Male.—Carapace dusky over yellow, darker toward lateral margins. Legs and palpi somewhat paler than carapace. Labium and endites in colour like the carapace, the sternum darker. Abdomen blackish, without definite markings. Anterior portion of pars cephalica elevated but not bulging forward over base of clypeus as it does in *monticolens*, the lower part of clypeus slanting farther forward, the head in dorsal view not so convex anteriorly. The posterior row of eyes is slightly procurved instead of a little recurved as it is in *monticolens*, and the eyes are equidistant, though in the female the medians are obviously more widely separated. Anterior row of eyes conspicuously procurved instead of straight; median eyes much smaller than the laterals, nearer to each other than to the laterals, but much less widely separated from the latter than in *monticolens* in which the convexity carries the medians far forward. Palpus very similar to that of *monticolens;* the tibial apophysis is more strongly and uniformly curved than in the genotype, in the latter being comparatively straight above the curving basal portion. See Fig. 21, 4 and 5.

Female.—The form of the epigynum is shown in Fig. 21, 6.

Length of male 1.85 mm. Length of cephalothorax .7 mm.; width .58 mm.

Locality.—Utah: Mill Creek. A number of specimens secured by sifting leaves in September.

It will be noted that the less elevated and forwardly protruding head in this form is associated with considerable differences in eye relations from those in the genotype.

CATABRITHORAX gen. nov.

Much resembles Gongylidiellum in its broad cephalothorax with frons much wider than the area occupied by the eyes. Clypeus lower than length of median eye area, in the genotype much so. Anterior row of eyes straight or but very slightly curved, eyes close together, typically less than their radius apart, if any different the median eyes closer than to the laterals, median eyes smaller than the laterals; posterior row of eyes straight, the eyes nearly equidistant, the medians being a little nearer each other than to the laterals. Area of median eyes as wide as or a little wider than [illegible]g. Anterior tarsi shorter than the metatarsi. In the male palpus the tibia has above at anterior end on mesal side a stout simple hook which curves ectad. The tarsal hook arising at distal end of bulb, where it is stout, runs to base of bulb and then bends back distad, this second part substraight, narrowing distad, unbranched, and free from the bulb. Embolus issuing at distal end of bulb from a tube-like fold. (Cf. Figs.)

Genotype.—C. clypiellus, sp. nov.

The structure of the male palpal organ is obviously different from that of *latebricola* Cambridge, type of Gongylidiellum, and the tarsi of the legs are shorter than the metatarsi. The close correspondence of the important features of the palpal organ in the two species here described, while differences in such

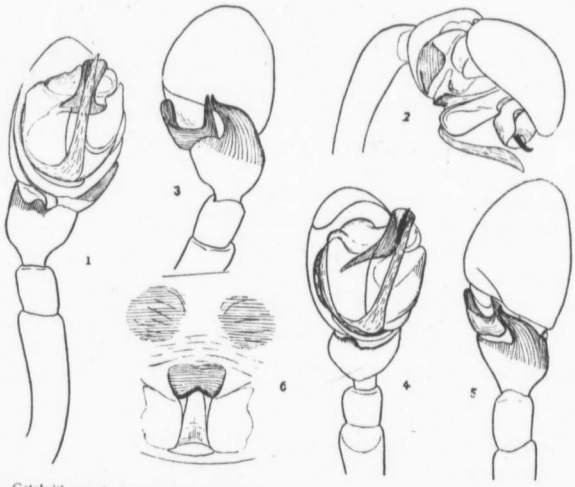

Fig. 22. 1. *Catabrithorax clypiellus*, sp. n., ventral view of left male palpus. x100. 2. Distoectal view of right male palpus. x100. 3. Dorsal view of left male palpus. x100. 6. *Anyphaena intermontana*, sp. n., epigynum. x44.

characters as height of clypeus, etc., are so marked, indicates the importance of the palpal organ in generic distinctions in this group.

Catabrithorax clypiellus, sp. nov.

Male.—Carapace light dusky yellow. Legs yellow. Abdomen light gray. Remarkable for the extremely low clypeus, the height of which is less than the diameter of the lateral eye and does not exceed that of the smaller medians. Anterior row of eyes straight or rather slightly recurved, eyes close together, separated by less than the radius of the median eyes; median eyes smaller than the laterals. Posterior row of eyes straight; eyes equal and equidistant, less than a diameter apart. Area of median eyes as wide as, or very slightly wider than, long, clearly wider behind than in front (ratio about 4:3). Upper margin of furrow of chelicera armed with four teeth, the lower margin with a series of five or six smaller teeth. Sternum broad, shield-shaped, produced between posterior coxæ, posteriorly truncate, strongly convex. Labium very short and broad, distally truncate, not narrowed. Cephalothorax unusually broad and low, the lateral margins widely convex, the anterior end broad, the eye region a little protruding over the clypeus. In the male palpus the tibia presents above a chitinous apophysis which distally curves first outward and then distad. Paracymbium and embolus as shown in Fig. 22, 1, 2 and 3.

Length 1.63 mm. Length of cephalothorax .66 mm.; width .58 mm. Length of tib.+pat. IV nearly equalling width of cephalothorax, the length of tib.+pat. I less than the width of cephalothorax.

Locality.—Utah: Logan Canyon. One male.

Catabithorax ceuthus, sp. nov.

Male.—Cephalothorax and sternum dusky, almost black, the eye region solid black, the black protruding in a rounded spot on upper median part of clypeus. Legs fulvous, slightly smoky. Abdomen dark grey. Cephalothorax of moderate width; head elevated, sides slanting, eye region protruding above clypeus. Sternum rather narrow in comparison with that of *clypiellus*, conspicuously convex, strongly narrowing from the anterior and caudad, sides but moderately convex, narrowly produced between posterior coxæ. Labium anteriorly weakly convex, narrowing distad. Anterior row of eyes very slightly procurved; median eyes smaller than the laterals, very close together, being less than their radius apart, farther from the laterals. Area of median eyes much narrower in front than behind, fully as wide as long. Posterior row of eyes weakly procurved; eyes equal; median eyes about their radius apart, an equal or scarcely greater distance from the laterals. Clypeus equalling or slightly lower than the length of area of median eyes (ratio about 7:8). Tibia of male palpus with an uncate apophysis above, the hook turning outwards and then distad at tip as in *clypiellus*. Structure of palpal organ very similar to that of *clypiellus*, as shown in Fig. 22, 1, 2 and 3.

Length of cephalothorax .75 mm.; width .58 mm. Length of tib.+pat. I equal to width of cephalothorax or very slightly longer (.6 mm.). Length of tib.+pat. IV .65 mm.

Locality.—Utah: Bear Lake. One male.

Separable at once from the preceding species by its much higher clypeus, etc. It is a darker species.

CLUBIONIDÆ.

Anyphaena intermontana, sp. nov.

Female.—Cephalothorax and legs pale, of a weakly greenish tinge, the legs not at all annulate. Abdomen also pale, the dorsum or side with numerous longitudinal spots or streaks of dark, and the middorsal region behind with indistinct and more or less broken dark chevrons. Anterior row of eyes straight or slightly recurved; median eyes smaller than the laterals, about their radius apart, less than half as far from the laterals. Height of clypeus but little more than equalling the radius of an anterior median eye. Posterior row of eyes a little procurved; eyes subequal; median eyes a little more than their diameter apart, about their diameter from the laterals. Tibia I armed beneath with a subbasal and a submedian pair of spines, the first overlapping the bases of the second; a single spine on anterior face. Tibia II with a single subbasal spine and a pair of submedian spines, none at distal end.

Epigynum as shown in Fig. 22, 6.

Length 5.8 mm. Length of cephalothorax 2.6 mm. Length of tib.+pat. I 2.75 mm.

Locality.—Utah: Mill Creek.

In the form of epigynum suggesting *A. pacifica* (Banks), known from the State of Washington, though this is proportionately shorter and is broader anteriorly, with the median channel less elongate, etc. It is readily separable

by the characters of the eyes, the anterior row in *pacifica* being distinctly procurved instead of straight or slightly recurved, with the eyes obviously more widely separated and the medians clearly smaller relatively to the laterals, the clypeus higher, etc. In *pacifica* tibia I bears in front two spines instead of one, the ventral spines do not typically overlap, and tibia II is armed with a spine at the distal end.

A NOTE ON THE WINGLESS TIPULID *CHIONEA VALGA* HARRIS.

BY R. C. TREHERNE,
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During March, 1920, Mr. H. J. Blurton, trapper, of Mara, B. C., brought into my office some specimens of insects taken from above snow line at the north end of the Okanagan Valley. One of these insects has turned out to be the wingless tipulid *Chionea valga* Harris, and it constitutes a new record from the West. The determination was made by Dr. Nathan Banks through Dr. J. McDunnough, of Ottawa, and my attention was drawn to the article on this genus that appears in Psyche, Vol. XXIV, p. 142, October, 1917, by Dr. Werner Marchand of the Department of Animal Pathology, the Rockefeller Institute for Medical Research, Princeton, New Jersey. Owing to the interest of this capture I requested Mr. Blurton to give me the leading notes of his observations for record and publication. These notes follow, arranged in manuscript form.

"I have noticed them for many years in the Hunter's Range of Mountains, east of Mara, B. C., and they have always attracted my attention by their peculiarities in regard to the altitude they live at in the mountains, their mode of travel, and the weather conditions they seem to prefer. These insects seem to live principally between 5,000 and 6,500 feet above sea level, and in a country where spruce and balsam trees grow, living principally in the large, open spaces near timber line, but very seldom where timber is plentiful. When travelling over the snow they always appear to be in a great hurry, and they move in nearly straight lines from one point to another, not travelling in an erratic manner at all, but as if they had some special destination in mind. I noticed when I approached one that it would crouch down when I am near, as if it could feel the vibrations in the snow made by the weight of my snowshoes falling on the snow, and would remain motionless until I had passed. This habit is not invariable, but it happens often enough to be noticeable, showing that this species is either sensitive to vibrations in the snow or to the sounds made by my movements.

It is very noticeable that this insect only selects cold, snowy weather to travel in, and it is very active on the surface of the snow during the months of January, February, March and April, even when the temperature is below zero. If the atmospheric temperature is warm enough to make the snow surface moist they apparently do not travel. I have noticed in April that if the sun in the morning shone brightly, causing a slight thaw, there would be a few *Chionea* visible, but if the weather changed in the afternoon and became colder with a flurry of snow that large numbers of *Chionea* both males and females, came hurrying from all directions. The adults seem very sensitive to warmth and will die in a few minutes if carried in a warm hand, although if placed on the

snow before they are quite dead, they will soon commence to struggle, stretch their legs and eventually recover entirely. I also noticed that if carried in a closed match box in one of my pockets they only lived a very few hours; possibly a large male, under these circumstances, might live 3 to 4 hours. If they were walking over the snow and my warm hand was placed near them they would hurry away from it. On the other hand, they would walk quite freely over my snowshoes, which of course were cold, thus proving to me that it is warmth that they retreat from.

There is another peculiar feature in their habits that I have noticed. They have an extremely strong grip, and it is very difficult indeed to shake them loose from anything to which they are attached. For instance, it is hardly possible to shake them loose from the match-box in which I have frequently stored them when collecting, and it is equally difficult to remove them from sticks or thongs of snowshoes.

Apparently their object in travelling so rapidly over the snow is to enable the sexes to come together. When they were active on stormy days in April, I have captured numbers of both sexes, placing them in my collecting box, and it was only a few moments before copulation took place. The sexual grip is also very strong, it being retained even when placed in alcohol.

My attention has been drawn to the article in Psyche by Werner Marchand, who mentions that *Chionea* is affected by the warmth of the hand and that it travels in straight lines. I could have made fuller observations on this insect if I had known it was of interest. For instance, I could have found out whether copulation takes place in other months than April. It was my belief that *Chionea* was predaceous on the snow fleas but I have changed my opinion, the snow fleas being very active in warm, thawing weather, whereas *Chionea* is not abroad in such weather except to a very limited extent."

CORRECTIONS TO MR. GUNTHORP'S SUMMARY OF WOOD'S MYRIOPODA PAPERS.

It seems desirable for the benefit of those not familiar with the literature of the subject to call attention to certain inaccuracies in Mr. Gunthorp's recent "Summary of Wood's Myriapoda Papers."*

1. Mr. Gunthorp states that Wood's first paper "described four species as new." As a matter of fact twenty new species are there described.

2. Likewise incorrect is the statement that in the second paper, "On the Chilopoda," "twenty-nine new species are included." There are really forty-five described as new.

3. It is written that Wood's paper on "New Polyzoniidæ" is "the one paper he wrote on foreign material." On the contrary, Wood's first paper, mentioned above, is based chiefly on foreign material, sixteen of the twenty new forms described being exotic; and in the second paper, on the Chilopoda, seventeen exotic species are described as new.

4. The number of species described by Dr. Wood "from elsewhere" than the United States is said to be two. The number is actually thirty-five.

*Canadian Entomologist, May, 1920, p. 112.

5. It may be added that in summarizing the genera and species to be credited to Wood, Mr. Gunthorp does not take into consideration those now suppressed as synonyms. Similarly it should have been indicated that the list of species from the United States simply records them as given by Wood, no indication being given of their present generic position or of those relegated to synonymy. Thus, the generic names Cermatia, Opisthemega, and Strigamia are no longer in use, having been antedated by other names; and the species listed under Strigamia, Julus, Polydesmus, etc., are now known to represent a variety of different genera and families.

6. It is stated that Dr. Wood wrote several papers in the Insecta. This seems to be erroneous, as there is no record of his ever having published anything on insects proper.

R. V. CHAMBERLIN.

WOOD-BORING BEETLES OF BLACK LOCUST.

BY O. W. ROSEWALL,
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From time to time it has been noticed that wood-boring insects were plentiful in the dead or partly dead, young Black Locust trees (*Robinia pseudacacia*) in the University Arboretum. During the past year some of the infested wood was placed in glass containers in the University Insectary, and the following beetles were reared:

Order Coleoptera—
- Family Bostrichidæ—
  - *Sinoxylon basilare*, Say.
- Family Buprestidæ—
  - *Agrilus egenus* Gory.
- Family Cerambycidæ—
  - *Ecyrus dasycerus* Say.
  - *Liopus alpha* Say.
  - *Liopus fascicularis* Harr.
  - *Liopus variegatus* Hald.
  - *Neoclytus erythrocephalus* Fab.
  - *Phyton pallidum* Say.

The above-named beetles emerged from about 15 feet of the wood, of which none was over ¾ of an inch in diameter and most of it less than ½ inch in diameter. Practically all the limbs had been removed from these small trees, so the larvæ had attacked the main part of the trees.

The beetles emerged in numbers and dates as follows:

Of *S. basilare* Say., 4 emerged respectively on the following dates, March 23, April 6, May 1 and July 25; of *A. egenus* Gory., 3 emerged respectively on April 5, May 1 and July 1; of *E. dasycerus* Say., 10 emerged between the dates April 21 and June 15; of *L. alpha* Say., 1 emerged on May 1; of *L. fascicularis* Harr., 31 emerged between the dates April 12 and May 2; of *L. variegatus* Hald., 1 emerged on April 2; of *N. erythrocephalus* Fab., 2 emerged respectively on April 1 and May 13; of *P. pallidum* Say., 13 emerged between the dates of April 16 and May 21.

A BIBLIOGRAPHY OF THE LITERATURE ON THE DESCRIBED TRANSFORMATIONS AND FOOD PLANTS OF NORTH AMERICAN SPECIES OF AGRILUS (COL.).

BY C. A. FROST AND H. B. WEISS.*
New Brunswick, N. J.

In 1900 Chittenden published a paper on the "Food Plants and Injury of North American Species of Agrilus,"[1] in which 31 species were listed together with notes on food plants and injury. Since this paper, nothing of a similar nature has appeared, and during the period between 1900 and 1920 new species have been described and much additional biologic information on several economic species has accumulated The present paper, therefore, brings together to date all of the references to the literature on the life-histories, habits and food plants of those of our North American species about which such information is known, supplemented by very brief notes on the important economic ones.

The habits of such species as *vittaticollis* Rand., *bilineatus* Web., *anxius* Gory, *ruficollis* Fab., and *sinuatus* Oliv., appear to be fairly well known, due undoubtedly to their activities as enemies of cultivated and forest trees and plants which necessitated studies. The habits of many other members of this extensive genus are less completely known and of a large number nothing whatever concerning food plants, etc., appears to have been recorded. In the list which follows, references to the places of original description and geographical distribution have been omitted as such information can be found in Leng's "List of the Coleoptera of North America."

List of Species and References.

A. ferrisi Dury.

Blatchley, Col. Ind., p. 798, 1910.
Dury, Ent. News XIX, p. 368, 1908.
Occurs on hackberry (*Celtis occidentalis*) in twigs of which the larvæ bore (Blatchley). Beaten from hackberry (Dury).

A. difficilis Gory.

Chittenden, Bull. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.
Uhler, Proc. Acad. Phila., Vol. VII, p. 416, 1855.
Obtained from a species of willow (Uhler).

A. ruficollis Fab.

Caesar, Ont. Ent. So. Rept. 42, p. 31, 1912.
Chittenden, Bull. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.
" U. S. D. A. Yearbook, pp. 726–733, 1902.
Davis, Proc. Mich. Hort. Soc., pp. 78–83, 1894.
Deans & Peairs, Kan. Agric. Educ., Vol. VI, 2, p. 112, 1913.
Fuller, Amer. Ent., Vol. III, 1880.
Felt, Bul. 37, N. Y. St. Mus., Vol. VIII, 1900.
" Bul. 200, N. Y. St. Mus., p. 142, 1917.
Glover, Rept. U. S. Comm. Agric., pp. 65–91, 1870, 1871.

*The arrangement of the authors' names is alphabetical.
1. Bull. 22, n. s., U. S. D. A., Div. Ent., pp. 64-68, 1900.

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" Ohio Bul. 233, p. 146, 1911.
Haldeman, Amer. Quart. Jour. Agric. Sci., Vol. IV, 8, pp. 300–301, 1846.
" Trans. N. Y. St. Agric. Soc., Vol. VI, p. 373, 1846.
Hamilton, Trans. Am. Ent. Soc., Vol. XXII, p. 364, 1895.
Hitchings, Me. Ent. Rept. 5, p. 4, 1910.
Hoffmeister, Ann. Rept. Iowa St. Hort. Soc., pp. 243–246, 1877.
Hopkins, Ins. Life, Vol. III, pp. 19–20, 1890.
" Bul. 15, W. Va. Agric. Exp. Sta., pp. 81–84, 1891.
Le Baron, Prairie Farmer 22, Apl., Vol. 42, 1871.
Lintner, Cultivator & Count. Gent. 1, Apl., p. 215, 1880.
" 6th Rept. Inj. Other Ins. N. Y., 1890.
" 10th Rept. Inj. Other. Ins. N. Y., 1895.
Lugger, Ann. Rept. Min. St. Hort. Soc., pp. 164–172, 1890.
" Bul. 66, Min. Agric. Exp. Sta., pp. 85–331, 1899.
Marten, Prairie Farmer 24, Dec., 1892.
Nicholson, Okla. Bul. 69, p. 15, 1905.
O'Kane, Inj. Ins., p. 244, 1914.
Perkins, 4th Rept. Vermont Bd. Agric., pp. 128–139, 1877.
Pettit, Mich. Agric. Exp. Sta. Spec. Bul. 24, 1904.
Riley, Amer. Ent., Vol. II, p. 128, 1870.
" Amer. Ent., Vol. III, (n. s. Vol. I), p. 107, 1880.
Sanderson, Ins. Pests, p. 466, 1912.
Saunders, Rept. Ent. Soc. Ont., pp. 7–17, 1873.
Sherman, Bul. N. C. St. Bd. Agric., Vol. XXIV, No. 6, 1903.
Slingerland & Crosby, Man. Fruit Ins., p. 332, 1912.
Smith, Ins. Life, Vol. IV, pp. 27–30, 1891.
" 22nd Ann. Rept. Ent. Soc. Ont., pp. 52–54, 1891.
" Spec. Bul. N., N. J. Agric. Exp. Sta., Nov., pp. 4–8, 1891.
" 13th Ann. Rept. N. J. Agric. Exp. Sta., 1892.
" Ann. Rept. N. J. St. Bd. Agric., pp. 157–176, 1893.
Somes, Mo. Fr. Exp. Sta. Bien. Rept., p. 15, 1913–1914.
Walsh & Riley, Amer. Ent., Vol. II, 1869–1870.
Washburn, 9th Rept. St. Ent. Minn., 1904.
" Minn. Circ. 29, 1914.
Webster, Bul. 45, Ohio Agric. Exp. Sta., pp. 151–217, 1893.
" Ohio Farmer 3, May, p. 357, 1894.

This is the common red-necked cane-borer of blackberry, dewberry and raspberry. The egg is inserted in the bark near the base of a leaf in the new growth and the larva burrows upward in the sapwood going around the stem in a spiral course, thus girdling the cane and causing an irregular swelling or gall, varying from 1 to 3 inches in length, and bearing longitudinal slits or splittings.

A. lateralis Say.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

On poplar sprouts (Blanchard). Beating *Alnus incana* (Frost).

A. otiosus Say.

Blatchley, Col. Ind., p. 798, 1910.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.

Hamilton, Trans. Am. Ent. Soc., Vol. XXII, p. 364, 1895.
Knull, Ent. News, Vol. XXXI, p. 8, 1920.
Packard, 5th Rept. U. S. Ent. Comm., p. 367, 1890.
Smith, Ins. N. J., p. 295, 1909.

Occurs on foliage of oak and hickory (Blatchley). Breeds in hickory, oak, locust, etc., (Smith). Attacks maple, dogwood, redbud, hickory, black walnut (this may refer to *juglandis* Knull), and probably infests butternut, box-elder, oak and perhaps locust (Chittenden). Hickory is host: reared from dead branches of persimmon (*Diospyros virginiana*) (Knull). On *Corylus americana* leaves and oak leaves (Frost).

A. juglandis Knull.

Knull, Ent. News, Vol. XXXI, p. 8, 1920.

Breeds in outer bark of living butternut (*Juglans cinerea*) (Knull).

A. frosti Knull.

From leaves of oak and hickory (Frost).

A. defectus Lec.

Knull, Ent. News, Vol. XXXI, p. 10, 1920.

Reared from dead branches of white oak (*Quercus alba*) (Knull). On oak leaves (Frost).

A. crinicornis Horn.

Frost, Can. Ent., Vol. XLVII, p. 144, 1915.

On leaves of red raspberry (Frost).

A. masculinus Horn.

Blatchley, Col. Ind., p. 799, 1910.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.
Knull, Ent. News, Vol. XXXI, p. 10, 1920.
Stromberg, Can. Ent., Vol. XXVI, p. 36.

On box-elder (Stromberg). On foliage of buckeye (Blatchley). Reared from sapwood of dead box-elder (*Acer negundo*) (Knull). On red oak leaves (Frost).

A. arcuatus Say.

Blatchley, Col. Ind., p. 799, 1910.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.
Knull, Ent. News, Vol. XXXI, p. 10, 1920.
Ruggles, 17th Rept. St. Ent. Minn., p. 15, 1918.
Stromberg, Can. Ent., Vol. XXVI, p. 36.

This species is the oak twig girdler. The egg is deposited on the side of the twig near the terminal bud, and the resulting larva encircles the twig beneath the bark, causing the death of the part beyond the burrows. The adults feed on the foliage, eating out irregular patches near the edges of the leaves.

Reared from girdled branches of beech (*Fagus americana*) and hickory (*Hicoria ovata*) (Knull).

A. arcuatus var. **coryli** Horn.

Blanchard, Ent. Amer. Vol. V, p. 32, 1889.
Blatchley, Col. Ind., p. 799, 1910.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.
Frost, Can. Ent., Vol. XLVIII., p. 386, 1916.
Hamilton, Trans. Am. Ent. Soc., p. 364, 1895.

On hazel (*Corylus americana*) (Blanchard). On hazelnut (Blatchley).
On *Corylus americana* and *C. rostrata* (Frost).

A. arcuatus var. **torquatus,** Lec.

Ruggles, 17th Rept. St. Ent. Minn., p. 15, 1918.
The habits of this variety are similar to those of *A. arcuatus.*

A. cupricollis Gory.

Blatchley, Can. Ent., Vol. LI, p. 29, 1919.
Occurs on huckleberry and other low shrubs (Blatchley).

A. angelicus Horn.

Rohwer, Proc. Ent. Soc. Wash., Vol. XXI, pp. 4–8, 1919.
Infests *Quercus agrifolia.*

A. champlaini Frost.

Britton, Rept. Conn. Agric. Exp. Sta., pp. 291–296, 1912.
Frost, Can. Ent., Vol. XLIV., p. 245, 1912.
The larva of this species causes conspicuous swellings or galls on the branches of the hop hornbeam or ironwood (*Ostrya virginica*).

A. townsendi Fall.

Fall, Tr. Am. Ent. Soc., Vol. XXXIII, p. 234, 1907.
Beaten from *Quercus gambellii* (Townsend).

A. macer Lec.

Chittenden, Bull. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.
Injurious to *Celtis occidentalis* in Texas (Schwarz).

A. vittaticollis Rand.

Austin, Proc. Bost. Soc. Nat. His., Vol. XVII, p. 276, 1875.
Blanchard, Ent. Amer., Vol. V, p. 32, 1889.
Blatchley, Col. Ind., p. 800, 1910.
Brooks, Jour. Agric. Res., Vol. III, 2, pp. 179–185, 1914.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.
Hamilton, Tr. Amer. Ent. Soc., Vol. XXII, p. 364, 1895.
Knull, Ent. News, Vol. XXXI, p. 10, 1920.
Smith, Ins. N. J., p. 295, 1909.
This species, known as the apple root borer, has recently been investigated by Brooks. Eggs are glued to the trunk close to the ground and the larva bores directly through the bark to the cambium, and then through the cambium down the trunk to the ground and outward through a convenient root, finally entering the solid wood of the root where much feeding is done.

Seems to live on shadberry (*Amelanchier canadensis*) (Austin). Feeding on leaves of thorn, shadbush and chokecherry (Blanchard). On leaves of *Oxydendrum* (Fiske). Larva attacks apple, pear, wild thorn, wild crab and service (Brooks). From leaves of *Pyrus* and *Amelanchier* (Frost).

A. dozieri Fisher.

Fisher, Proc. Ent. Soc. Wash., p. 67, 1918.
On foliage of blue birch (*Ostrya* sp.) (Fisher).

A. bilineatus Web.

Anderson & Rankin, N. Y. Cornell Bul. 347, 586, 1914.
Britton, Conn. Rept. 13, p. 250, 1914.
Burgess, U. S. Farmers Bull. 564, p. 5, 1914.
Burke, U. S. D. A. Year Book, p. 401, 1909.

(To be continued.)

Chapman, Jour. Agric. Res., Vol. III, 4, pp. 283–293, 1915.
Chittenden, U. S. D. A., Div. Ent. Circ. 24, 2nd ser. pp. 1–8, 1897.
" U. S. D. A., Div. Ent. Bul. 7, n. s., pp. 67–75, 1897.
" U. S. D. A., Div. Ent. Bul. 22, n. s., pp. 51–64, 1900.
" U. S. D. A., Year Book, pp. 726–733, 1902.
Felt, N. Y. St. Mus. Mem. 8, p. 280, 1905.
" N. Y. Rept. 27, p. 113, 1912.
" Jour. Econ. Ent., Vol. VII, p. 373, 1914.
" N. Y. Rept. 29, 1915.
Hamilton, Trans. Am. Ent. Soc., Vol. XXII, p. 364, 1895.
Harrington, 27th Ann. Rept. Ent. Soc. Ont., p. 71, 1896.
Hopkins, Ins. Life, Vol. VII, pp. 145–151, 1894.
" Can. Ent., Oct., pp. 243–250, 1896.
" Proc. 19th Ann. Meet. Soc. Prom. Agric. Sci., pp. 103–108, 1898.
" U. S. D. A., Div. Ent. Bull. 48, 1904.
Howard, U. S. R. Ent., p. 11, 1914.
Johnson, Ann. Rept. Pa. Dept. Agric., pp. 345–64, 1896.
Knull, Ent. News, Vol. XXXI, p. 10, 1920.
Metcalf & Collins, U. S. Farmers' Bul. 467, p. 10, 1911.
Packard, 5th Rept. U. S. Ent. Comm., p. 222, 1890.
Ruggles, 15th Rept. St. Ent. Minn., p. 54, 1914.
" 14th Rept. St. Ent. Minn., p. 55, 1911–1912.
Smith, N. J. Rept., p. 348, 1910.
" Ins. N. J., p. 295, 1909.
Washburn, Minn. Rept. 14, p. 55, 1912.
" U. S. D. A., Year Book, p. 515, 1906.
" U. S. D. A., Year Book, pp. 574–578, 1908.

The two-lined chestnut borer is known as a serious pest of chestnuts and oaks. Eggs are deposited in small clusters in bark crevices and the winding larval burrows are made in the wood and cambium layer, and occur on the tree from small branches less than an inch in diameter down to the roots. The adults usually eat around the margins of the leaves, but also tear off the epidermis and at times consume nearly the entire leaf, including the midrib.

On trunk of dead white oak and red oak leaves (Frost).

A. auroguttatus Schaef.

Schaeffer, Brook. Inst. Mus. Sci. Bul. 1, 7, p. 149, 1905.

Beating branches of black oak (Schaeffer).

A. granulatus Say.

Blanchard, Ent. Amer., Vol. V, p. 32, 1889.
Burrill, 12th Rept. St. Ent. Ill., pp. 121–122, 1883.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.
Manee, Ent. News, Vol. XXIV, pp. 167–171, 1913.
Packard, 5th Rept. U. S. Ent. Comm., p. 443, 1890.

Burrill states that the larva of this species makes tortuous galleries in the living tissue of the Lombardy poplar, these galleries running for the most part in irregularly horizontal directions across the grain of the wood.

Swept from *Salix* leaves at Littleton, Col. (Frost).

A. pensus Horn.

Frost, Can. Ent., Vol. XLVII, p. 144, 1915.

On leaves of *Ostrya* and beaten from *Alnus incana* (Frost).

A. anxius Gory.

Burke, U. S. D. A., Year Book, p. 403, 1909.
Chamberlain, Sci. Amer. 20, Jan., p. 42, 1900.
Chittenden, U. S. D. A., Div. Ent. Bul. 18, n. s., pp. 44–51, 1898.
" U. S. D. A., Div. Ent. Bul. 22, n. s., pp. 64–68, 1900.
" U. S. Fores. Bul. 46, pp. 63–80, 1904.
Davis, Jour. Econ. Ent., Vol. III, p. 184, 1910.
" Ins. Life, Vol. IV, p. 66 (*torpidus*).
Felt, Count. Gentl. Dec. 15, p. 993, 1898.
" N. Y. St. Mus. Bul., Vol. 8, No. 37, 1900.
" N. Y. St. Mus. Mem. 8, p. 284, 1905.
" N. Y. Rept. 25, p. 98, 1910.
" N. Y. Rept. 27, p. 108, 1912.
" Gard. Mag. Feb., p. 36, 1912.
" N. Y. Rept. 28, p. 101, 1913.
" N. Y. St. Mus. Bul. 200, p. 49, 1917.
Fernald, Jour. Econ. Ent., Vol. V, p. 246, 1912.
" Mass. Rept. 24, I, p. 83, 1912.
" Mass. Rept. 25, II, p. 85, 1913.
Forbes, Bul. 151, Ill. Agric. Exp. Sta., p. 515, 1911.
" Ill. Ent. Rept. 26, p. 53, 1911.
Gibson, Ont. Ent. Soc. Rept. 40, p. 13, 1910.
Hopkins, U. S. D. A., Div. Ent. Bul. 48, 1904.
Houser, Bul. 332, Ohio Agric. Exp. Sta., p. 326, 1918.
Hutchings, 9th Ann. Rept. Quebec Soc. Prot. Pl. p. 65, 70, 1916.
Knull, Ent. News, Vol. XXXI, p. 10, 1920.
Lochhead, Rept. Ont. Agric. Coll. & Exp. Farms, 1902.
Ruggles, 14th Rept. St. Minn., p. 57, 1911, 1912.
Sanders, Wis. Bul. 227, p. 22, 1912.
Slingerland, Proc. West. N. Y. Hort. Soc., Apl., 1899.
" N. Y. Cornell Bul. 234, 1906.
Smith, Ins. N. J., p. 295, 1909.
" N. J. Rept., p. 415, 1909.
" N. J. Rept., p. 348, 1910.
Swaine, Ont. Ent. Soc. Rept. 43, p. 91, 1913.
" 7th Ann. Rept. Quebec Soc. Prot. Pl., pp. 91–115, 1915.
" Can. Fores. Jour., Vol. XIII, p. 1928, 1918.
Turner, Ga. Bd. Ent. Bul. 49, p. 28, 1918.
Washburn, Minn. Rept. 12, p. 98, 1908.
" Minn. Rept. 14, p. 57, 1912.
" U. S. D. A., Year Book, p. 550, 1907.
" U. S. D. A., Year Book, p. 578, 1908.

Known as the bronze birch borer, this species is a serious pest of the birches. Eggs are deposited in crevices in the bark and the first tunnels constructed by the larvæ lie close under the bark. As feeding continues, the burrows are

extended without particular definiteness and extend deep into the wood or near the bark, and become much convoluted affairs. The result is a fatal girdling. Dark reddish-brown spots often form on the bark above where the tissue is riddled. Various species of birch are attacked. Mr. W. F. Turner records this species as infesting pecan. Burke states that it attacks poplars, cottonwoods, aspens and balm-of-gileads. Galls on branches of willow (Davis). On poplar leaves and ovipositing in trunk of living poplar (Frost). Where the references refer to birch and poplar, they are undoubtedly correct, but there is a possibility of *anxius* having been confused with other species where other food plants are mentioned.

A. acutipennis Mann.

Blanchard, Ent. Amer., Vol. V, p. 32, 1889.
Blanchard, Tr. Am. Ent. Soc., Vol. XVIII, p. 308.
Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.

On foliage of oak shrubs (Blanchard). On foliage of *Corylus americana* and red oak (Frost).

A. auricomus Frost.

Frost, Can. Ent., Vol. XLIV, p. 250, 1912.

A. couesii Lec.

Chittenden, Bul 22, n. s., U. S. D. A., Div. Ent., p. 67, 1900.
Cockerell, Jour. N. Y. Ent. Soc., p. 150, 1897.
On *Mentzelia nuda* (Cockerell).

A. pulchellus Blanch.

Chittenden, Bul. 22, n. s., U. S. D. A., Div. Ent., p. 68, 1900.
Breeds in roots of *Erigeron* (Hubbard & Schwarz).

A. cephalicus Lec.

Knull, Ent. News, Vol. XXXI, p. 10, 1920.

Reared from sapwood of dead dogwood (*Cornus florida*) (Knull). On leaves of *Corylus americana* (Frost).

(To be continued.)

DR. SEYMOUR HADWEN.

It will be regretted by many Entomologists and others throughout Canada that Dr. Seymour Hadwen, Pathologist of the Health of Animals Branch, Dominion Department of Agriculture, tendered his resignation and left Ottawa about the middle of June. He is to be congratulated, however, on being appointed Chief Pathologist of the United States Biological Survey. Dr. Hadwen, accompanied by Dr. Nelson, Chief of the Biological Survey, sailed for Alaska, from Seattle, on July 1st, to undertake a series of studies on the diseases affecting the reindeer and caribou. Dr. Hawden will have several technical assistants with him, and a complete laboratory outfit from Washington accompanied the party. Their headquarters will be about one hundred miles inland from Nome.—Adapted from the "Entomological Branch News Letter."

NEW COLEOPTERA. IX.

BY H. C. FALL,
Tyngsboro, Mass.

OMOPHRON Lat.

O. decoloratum, sp. nov.

Broadly oval, form nearly as in *robustum*, size a little larger than the latter, color above testaceous, beneath brown fading to yellow at the margins; markings similar in form and position to those of *robustum* except that the transverse frontal plaga is not produced forward at middle, the sutural stripe is not dilated before the apex, and they are throughout of a pale brownish tint, without trace of metallic lustre. The surface throughout is polished and strongly shining, the elytral striæ fine, entire and set with rather distant punctures.

Length 6.7 to 6.9 mm.; width 4.5 to 4.6 mm.

Described from three examples bearing label Gray Co., Kansas, July 9–15, 1917. Specimens were sent me by Mr. W. Knaus, who received them from the University of Kansas. The type is a female.

This species falls with *pallidum* and *robustum* by Casey's table.* *Pallidum* differs distinctly by its smaller size and dull alutaceous lustre, in which it resembles *gilæ*. *Decoloratum* is more nearly allied to *robustum*, but the pale, washed-out and rather small and indefinite markings, which are not at all due to immaturity, readily distinguish it.

In the Canadian Entomologist—1909, p. 276—Casey describes *O. brevipenne* from Ohio specimens. As its author remarks, this is the species which generally goes as *robustum* in collections. A careful comparison of Ohio specimens with the type of *robustum* shows them to be practically identical in all respects. The unique type of *robustum* was described as coming from Nova Scotia, but so far as I know no other specimens have been taken in that region, and I very much doubt the correctness of the locality; in any case it is quite certain that the Ohio specimens are the same thing.

HETEROCERUS Fab.

Among a lot of miscellaneous Manitoban things recently sent for determination by Messrs. Wallis and Criddle, I find two undescribed species of this genus. It is especially noteworthy that both belong to the subgenus *Littorimus*, of which Horn recognized but a single representative in his Synopsis of the North American species. Opportunity is taken to make known two other undescribed species, one of them a *Littorimus*, which have stood in my collection for many years.

H. minutus, sp. nov.

Very small; entire body and appendages testaceous, the head sometimes feebly infuscate; pubescence short, pale, marginal fringe short. Head and thorax densely, very finely punctate; elytra finely punctate, the punctures separated by about their own diameters, the interspaces excessively minutely punctulate. Prothorax (♂) strongly transverse, evidently wider than the elytra, sides moderately arcuate, not narrowed in front, with the usual apical and basal constrictions, base not visibly margined. Elytra without trace of striæ, but with a broad sulcus extending tending backward from the intrahumeral

*Coleopt. Notices VII, p. 301.

impression, becoming gradually evanescent behind the middle. Metasternum without mesocoxal line, epipleuræ without raised line at base.

Length 1.6 mm.

Luling, Texas, three examples taken by the writer July 4–6, 1893. Two of the three specimens are quite surely males, judging from the broad parallel-sided prothorax; the third has the thorax equal in width to the elytra, but is scarcely more narrowed in front than in the other two; it may be a female. The type is a male.

This minute species is obviously closely related to *pusillus* but the size is conspicuously smaller, the base of the thorax is unmargined, and the male shows no trace of the mandibular lobe which is characteristic of *pusillus*. Horn describes *pusillus* as having the mesocoxal line, but says it is indistinct. There is absolutely no trace of the line in any one of my specimens.

H. mundulus, sp. nov.

Pale flavo-testaceous throughout, elytra with a small, vague fuscous shade behind the scutellum, the labrum also more or less infuscate; pubescence fine short, concolorous, the marginal fringe inconspicuous; entire upper surface very finely densely punctulate. Prothorax moderately transverse, equal in width to the elytra (♂) or slightly wider (♀), with the sides feebly arcuate and subparallel, basal sinuation not distinctly margined. Elytra without striæ. Body beneath finely densely punctulate, metasternum often a little infuscate. Mesocoxal line indistinct but usually traceable, no epipleural line; stridulating ridge of first ventral segment complete.

Length 2.6–2.9 mm.

El Paso, Texas. Nov. 13, 1889. Twelve examples.

This pallid little species together with the much larger *H. pallidus* were seen in abundance on the wing just before sunset in the dry, sandy bed of the Rio Grande on the above-mentioned date. It is only recently that I have discovered the species to be a *Littorimus*. There is very little difference in the form of the thorax in the specimens before me, and I feel somewhat uncertain as to the sexes. In one or two the thorax and head seem slightly larger than the rest, and it is probable that these are males. The metasternal intercoxal process is barely as wide as the coxal width in this species, much narrower than in the other species of *Littorimus*.

H. moleculus, sp. nov.

Form oblong, obtuse at the extremities, as in *auromicans;* colour piceous, sides and median line of prothorax obscure testaceous, elytra with irregular, often interrupted pale fasciæ of the usual type, which vary greatly in development; pubescence very fine, short, yellowish and recurved on the elytra, darker and erect on the prothorax, margin not fimbriate with longer hairs. Head and thorax densely minutely punctulate, elytra with a dual punctuation consisting of relatively coarse punctures separated by their own diameters on the average, the interspaces very minutely punctulate. Prothorax nearly twice as wide as long, as wide as the elytra in the female, just perceptibly wider in the male, sides nearly parallel, feebly narrowed apically, sides of base a little oblique, and very distinctly margined. Elytra not at all striate. Body beneath piceous, legs, tip of prosternal lobe, pro- and epipleuræ and margins of ventral seg-

ments testaceous; mesocoxal and epipleural lines present; stridulating ridge of first ventral entire.

Length 2.2–2.4 mm.

The type bears label "Aweme, Man. 3–IX–1917, M. Criddle." Other examples from Mr. Criddle and Mr. Wallis from same locality bear date 15–VII.

This very small species resembles considerably in miniature *auromicans*, but aside from the size differs in its somewhat finer pubescence and in the character of the elytral punctuation. In *auromicans* the elytral punctures are sensibly equal in size throughout and finer than the coarser punctures of *moleculus*. The pale elytral markings in *moleculus* are usually broader and more confluent, such that frequently they might better be described as testaceous, with base and some detached spots piceous.

H. canadensis, sp. nov.

Similar to the preceding species, except as follows: Size larger, length 3.3 mm., colour piceous except for two narrow sinuous elytral fasciæ and small subapical spot; the propleura and sides of ventral segments obscurely paler; legs entirely dark; pubescence longer, the recurved hairs of the elytra mixed abundantly throughout with short erect hairs; margins of prothorax and elytra distinctly fimbriate. The very fine interstitial punctures of the elytra are fewer and less evident and the larger punctures more conspicuous than in *moleculus*.

Described from a single female specimen taken at Thornhill, Manitoba, I–VII–16 by Mr. J. B. Wallis. Type in my collection.

The four species of the subgenus *Littorimus* now known to me may be easily separated by the following table:

Colour pale testaceous without markings; middle coxæ separated by a distance subequal in width to that of the coxa; base of thorax not margined at sides; epipleuræ without oblique raised line at base; length 2.3–2.9 mm..... *mundulus.*

Colour piceous; elytra fasciate; middle coxæ separated by a distance distinctly greater than the width of the coxa; base of thorax very distinctly margined at sides; epipleural line present.

Margins of body distinctly fimbriate with longer hairs; elytra with abundant intermixed short erect hairs; legs dark; length 3.3 mm..... *canadensis.*

Margins of body not fringed with notably longer hairs; elytral pubescence recurved or recumbent; legs entirely or in great part pale.

Size very small (about 2.3 mm.) elytral punctuation dual.... *moleculus.*

Size much larger (3. to 4. mm.) elytral punctures nearly uniform in size..... *auromicans.*

OLIGOMERODES Fall.

O. delicatulus,. sp. nov.

Form narrow, cylindrical, body piceous, clothed with short ashy appressed pubescence, legs and antennæ brown. Antennæ (♂) very slender, nearly as long as the entire body, first joint relatively stout, arcuately subcylindrical, about twice as long as wide, joint 2 obconic, half as long as the first, 3–8 narrower

and of equal width, not in the least serrate, 3–5 decreasing in length, 3 a little longer than wide, 5 wider than long, 6–8 strongly transverse and compactly joined, 9–11 extremely slender and elongate, 9 about 6 times as long as wide and fully as long as the preceding joints combined, 10 a little longer and feebly arcuate throughout its length, 11 straight, still longer, 9–11 combined nearly as long as the elytra. Head deflexed, finely sparsely punctate; eyes round, prominent. Prothorax about as wide as long, convex, disk a little gibbous profile, side margins narrowly flattened, subparallel medially, narrowed a little anteriorly posteriorly sinuately curved into the rounded base, the edge finely serrulate anteriorly, surface finely, not closely punctate. Elytra scarcely wider at base than the prothorax, 2½ times as long as wide, disk with feebly impressed rows of fine punctures, the striæ a little deeper at sides. Legs, especially the tibiæ and tarsi, very slender, basal joint of hind tarsus scarcely as long as the next two, fourth tarsal joint not perceptably emarginate.

Length 2.85 mm.; width .9 mm.

Described from a single male specimen taken at San Diego, California, 7-16-1909, by Mr. George H. Field.

Although very different in facies from the two known species of this genus, because of the smaller size and more slender build, there is really little upon which to found a new genus, the most conspicuous feature being the extreme length of the three outer joints of the male antennæ. In this connection it should be remembered that there are numerous instances of marked variation in antennal structure within generic limits in this family, and in the genus Oligomerodes the two known species differ appreciably in this respect, the antennæ in *catalinæ* vary considerably from *occidentalis* in the direction of the present species.

HADROBREGMUS Thoms.

H. subconnatus, sp. nov.

Elongate, parallel, moderately convex, brown, opaque, with short, fine, sparse yellowish appressed pubescence. Second and third joints of antennæ smallest, the latter narrower, joints 4–8 subequal, not quite as wide as long, 9–11 subequal to all the preceding in the male, joint 9 about 2½ times as long as wide and a little longer than the two preceding, joint 10 similar to 9 but scarcely as long, 11 three times as long as wide. In the female joints 9–11 are a little shorter than all those preceding, 9 and 10 each scarcely twice as long as wide. Prothorax, when viewed at right angles to the plane of its side margins, is obviously though not greatly wider than long, suboctagonal in outline, sides straight and nearly parallel medially, obliquely narrowed before and behind, the posterior obliquity sinuate, hind margin evenly arcuate, front margin with a short, feeble median sinuation; surface, like that of the head, finely rugulose and feebly granulose; front angles, posterior margin and median line impressed. Elytra slightly wider at base than the prothorax, sides feebly sinuate before the middle, slightly dilated posteriorly, apex rather narrowly truncate; disk punctate-striate, the interspaces finely rugulose, subequal in width to the striæ, nearly flat toward the suture, a little convex laterally. Body beneath alutaceous and minutely punctulate; ventral segments subconnate at middle, first segment short, 2–4 subequal, 5 longer; last two ventral sutures anteriorly arcuate, the

last more distinctly so. Tarsi slender, basal joint slightly shorter than the two following united, 2–4 subequal, 5 a little longer.

Length 3.25 to 4.5 mm.; width 1.35 to 1.9 mm.

Described from a series of six specimens sent me by Mr. Norman Criddle, who took them at Aweme, Manitoba, 7–VI–1919, in rotten spruce. The type is a male in my own collection; paratypes in Mr. Criddle's collection, these probably to be deposited in the national collection at Ottawa.

Because of the partially connate ventral segments, the present species cannot with strict propriety be referred to Hadrobregmus, in which the ventral segments are perfectly free. Furthermore, the prothorax lacks the postmedian dorsal compression or gibbosity common in varying degree to all species of Hadrobregmus, and presents somewhat the aspect of a Coelostethus, so that strictly speaking, it would occupy a place between these two genera, under a new generic title; but since in all other essentials it is in close accord with Hadrobregmus, I prefer for the present to leave it there, placing it at the end of the genus.

A NEW CALIFORNIA METHIA.

BY J. O. MARTIN,
Berkeley, California.

The genus Methia is so sparsely represented in the collections of California coleopterists and in fact in most collections elsewhere, that I am going to submit the following description of an unique example which appears to differ from any of the yet described species. The specimen on which the following description is based was taken by myself on the desert side of the San Bernardino mountains, near Hesperia at the junction of Deep Creek with the Mojave River. It came to my camp light just after a thunder storm.

Methia falli, sp. nov.

Body varying in colour from rufo-castaneous on the head to piceous on the abdominal segments; moderately to sparsely covered with pale yellowish pubescence. Head rufo-castaneous, markedly darker than the disc of the prothorax; front granulose punctate; occiput shining and coarsely variolately punctate, punctures extending more sparsely along the caudal margin of neck, which is shining, and behind the lower lobe of the eye strigose. Eyes large, separated above by about the width of the third antennal joint, deeply emarginate, the upper and lower lobes connected by but two rows of facets.

Antennæ one-half longer than body, rufo-testaceous, gradually slightly darker toward tip; pubescence erect on basal joints becoming decumbent toward the tip; joints three to eleven gradually decreasing in length. Prothorax rufo-castaneous, granulate, moderately constricted at base and apex, sides broadly and evenly rounded. Elytra three-fourths the length of abdomen; lighter in colour than the prothorax, vaguely clouded with black on basal third, more strongly so at the evenly rounded tips; surface granular, dull; bicarinate, the carinæ not meeting and extending but two-thirds of length.

Legs of same colour as elytra. Abdomen nigro-piceous, evenly, sparsely, coarsely punctured. Length 7 mm.

The above like *aestiva* Fall, has the second antennal joint visible but very small.

Falli is more nearly like *aestiva* Fall, than any of the other species of this genus, but differs from it in its darker colour and smaller size; in having the eyes more widely separated on the vertex and the upper lobe of the eye more flattened; also in the possession of the punctured area on the occiput, and the more evenly and broadly rounded outline of the lateral prothoracic profile. In *aestiva* there is a pronounced tooth at the tip of the basal joint of the antennæ which is lacking in *falli*. Type in my own collection.

I take pleasure in naming this species for my friend Mr. H. C. Fall, whose help and kindness has been an inspiration in much of my entomological work.

UROCERUS FLAVICORNIS, FABRICIUS.

This species, which is very similar to the European *Urocerous gigas* Linn., ranges over all parts of Canada. There are the following records of its occurrence, based for the most part upon the work of Bradley and Kirby. It is found from Siberia and Alaska, south along the Pacific Coast to British Columbia, Oregon and along the Rocky Mountains to Arizona and New Mexico, and even Mexico; is unknown from California, and in Colorado, Utah, Arizona and New Mexico is confined to high altitudes. The single record from Nebraska is undoubtedly based upon an individual carried into the State as a larva or pupa in lumber shipped from the Canadian or Hudsonian life zone. This is not different from the record from England upon which Stephens based his species, *bizonatus*. In the east this species extends south from Keewatin through Labrador, Newfoundland, Nova Scotia, Northern New York, New Hampshire and Massachusetts. Specimens have been reported from the Adirondacks, Ithaca, White Mountains, and a small male from Connecticut. Provancher records the species from Canada, presumably Quebec. In the central region it has been reported from Cape Krusenstern, Arctic Regions, Fort Churchill, Hudson Bay, St. Martin's Falls, Albany River and Mackenzie River. I am writing the above to bring the records of distribution together and to record a specimen received from Mr. F. Johansen, which was collected by the Rev. I. O. Stringer along the Mackenzie River in 1896. This specimen comes from the Royal Ontario Museum of Toronto.

ALEX. D. MACGILLVRAY.

In the Royal Ontario Museum there are specimens of *Urocerus flavcornis* also from Spruce Brook, Nfld.; Godbout, Que., and Edmonton, Alta. The specimens from the last-named locality were taken by Mr. F. S. Carr, the others by the writer. The species was apparently common at Godbout, on the north shore of the lower St. Lawrence, near the Gulf.

E. M. WALKER.

Mailed eptember 1st, 1920.