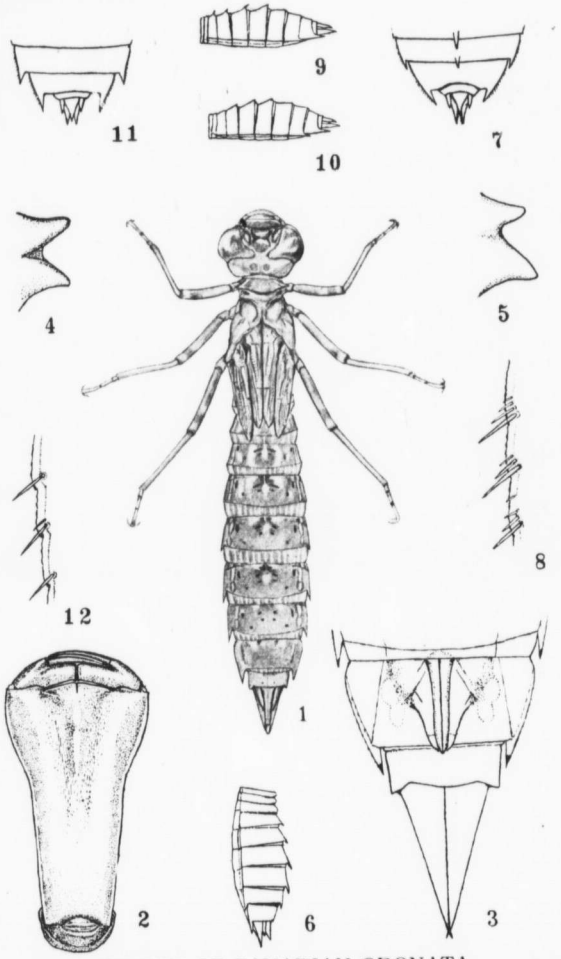

NYMPHS OF CANADIAN ODONATA.

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NEW AND LITTLE KNOWN NYMPHS OF CANADIAN ODONATA.

BY E. M. WALKER, TORONTO.

(Continued from p. 357.)

Æshna tuberculifera Walk.

This rare species was quite common at Lonely Lake, Vancouver Island, a forest pond about two miles from the Dominion Biological Station, Departure Bay. I obtained two mature nymphs, both of which were successfully reared, yielding a specimen of both sexes. Numerous exuviæ were also obtained. They were found in marshy coves, thickly grown up with reeds in water 12-20 inches deep, the conditions of environment being of the usual type that is characteristic of this genus. Six other species of Æshna were taken at the same spot.

Nymph (pl. XXV, figs. 1-3).—The nymph is long and slender and is remarkable for the length of the labium, which closely resembles that of *Anax junius* in both form and size. When closely applied to the ventral surface of the thorax, the hinge reaches the level of the hind coxæ, and this feature alone will serve to distinguish it from all other North American species of Æshna, in none of which the labium reaches back more than half way between the middle and hind coxæ. The length of the mentum slightly exceeds that of the hind femora, while in all other species the reverse is the case.

Eyes slightly less prominent antero-laterally than in other species of the *clepsydra* groups, with a rather long antero-posterior diameter. Lateral margins of head nearly straight, passing into the straight or slightly concave posterior margin by well rounded postero-lateral angles. Mentum of labium very long, the breadth at the base about half that at apex, which is slightly more than half the length; sides in proximal half straight and very slightly divergent, thence gradually curving outwards, the distal third moderately arcuate. Median lobe very broadly obtusangulate; lateral lobes with mar-

gins parallel, apices squarely truncate, the outer apical angle scarcely rounded, the inner with a small dark-brown tooth.

Supra-coxal processes rather small, acute, equal or the posterior sometimes slightly the broader, the apices not, or scarcely, divergent, the interval usually less than a right angle.

Wing-pads narrower than in most species, the outer pair reaching back to about the middle and sometimes the apical margin of segment 4.

Abdomen long and slender, broadest at segment 6 or 7, lateral spines on segments 6 to 9, not at all divergent, extending back on segment 6 one-third to one-half the distance to the hind margin of the segment; on segment 7 to the margin or nearly; on 8 slightly beyond the margin; on 9 to the middle or posterior fourth of segment 10. Lateral appendages three-fifths (male), three-fifths to four-sevenths (female) as long as the inferior appendages. Basal part of superior appendage of male about one-fourth or one-third shorter than the lateral appendages, its basal breadth almost or quite equal to its length, sides slightly concave, apex rather bluntly pointed.

Female genitalia reaching slightly beyond the posterior margin of segment 10; styli reaching end of ovipositor, their apices somewhat incurved.

Colour in life rather light brownish green or olivaceous; pattern as seen in the exuvia as follows: Dorsum of head behind the eyes with a pair of submedian brownish scars and a more or less indistinct oblique brownish streak or line on each side. Sometimes a pale lateral marginal band is present. Pronotum with a pale lateral margin, thorax nearly uniform brownish, with a few pale streaks on the pleura just above the middle and hind coxae. Femora in proximal half uniform brownish, distal half with a dark annulus between two pale annuli, of which the proximal is ill-defined. Tibiæ and tarsi concolorous. Abdomen with pale markings as follows: A median series of spindle-shaped spots, beginning on segment 1 as a narrow streak and ending on segment 7; a pair of ill-defined wavy dorso-lateral streaks, which break up into faint spots on segment 5 or 6, generally disappearing on the last 2-4 segments; a series of faint subcrescentic spots between the dorso-lateral punctae on the basal 3 or 4 segments only; and indications

of pale irregular blotches around the lateral scars. The dorsal and lateral punctae are darker than the ground colour and there are also diffuse darkened areas surrounding the mid-dorsal pale spots on most of the segments.

Length of body 41-45; mentum of labium 8.3-8.7; outer wing-pad, 9.5-9.9; hind femur 7.7-8.3; ovipositor, 3.2-3.5; width of head, 8.1-9; width of abdomen, 7.5-8.8.

In addition to the mature nymphs and exuviæ, we also found a nymph of the penultimate stage, which was successfully brought alive to Toronto and carried through the winter and spring until the time of emergence. During the winter (December to April), when it was kept in the cellar, upon a window-sill, it took no food, but at other times it was very voracious, on one occasion, soon after the long winter fast, feeding on a earthworm continuously for four hours. It underwent the last larval month on June 8 and began to transform into the adult on July 27. Unfortunately I was away from the city at this time and an accident prevented the successful emergence of the imago.

Æshna interrupta Walker.

The nymph described in my monograph as that of *A. interrupta* was correctly referred to this species. A nymph of the same kind, which I obtained at Banff, Alta., and kept for six weeks at the Biological Station, Vancouver Island, commenced to emerge during my homeward journey. The unfavourable conditions of travelling by rail were such that it failed to complete its transformation, but remained alive within the exuvia long enough to develop the colour-pattern quite distinctly. This is easily recognizable as belonging to *interrupta*. The race found at Banff is *lineata* varying towards *interna*. Mr. C. H. Kennedy has also taken a similar form of this species in transformation in Nevada and California, and I have found numerous exuviæ on Vancouver Island under circustances in which all other species were excluded. These exuviæ are all identical, and it is quite evident that the various races of this species do not differ from one another in the early stages. It seem therefore certain that the two nymphs in the Cabot collection, which I referred with considerable doubt to *A. interrupta lineata*, do not belong to this species. It is probable that they are somewhat atypical examples of *A. eremita*.

Æshna palmata Hagen.

During the summer of 1913 I reared a number of specimens of this species and obtained a large number of exuviæ. A study of this material shows that the two exuviæ referred to this species in my "North American Dragonflies of the Genus Aeshna" were correctly placed, but that some of the characters used to separate it from *A. umbrosa* are not valid.

I now possess a large series of exuviæ of both species, including several of *umbrosa* from Vancouver Island, where most of my nymphs of *palmata* were taken. I find that the two species at this stage are so much alike that in many cases it is a difficult matter to separate them with certainty. The form of the living nymph is probably invariably stouter in *palmata*, but this difference is often difficult to detect in preserved material, though usually evident enough, to the trained eye, in the exuviæ. The difference in the form of the labium is often but slight, but it seems to be always slightly broader at base in *palmata*. The absence of an internal apical tooth on the lateral lobes, employed by me as a differential character for this species (N. Am. Aeshna, pp. 68, 162), is a mere individual variation. The tooth is normally present as in *umbrosa*. The differential based upon the supra-coxal processes seems to be constant and is certainly a useful character. The posterior process is always the stouter and often the longer in *umbrosa*, while in *palmata* they are equal or very nearly so, the anterior being sometimes the larger (pl. XXV, figs. 4-5).

The ovipositor is slightly larger in *palmata* and extends slightly beyond the hind margin of segment 9, but seldom covers as much as one-third of segment 10 as given in the key. In *umbrosa* it just reaches the margin.

These differences in width of labium and abdominal segments and in length of ovipositor will be best appreciated by referring to the following table, which is based upon three males and three females of each species, taken at random. The first three of each species are males. The length of these specimens is nearly the same throughout the series. The relative size is roughly indicated by the lengths of the hind femora.

Aeshna palmata.

Locality	Hind. Fem. Length	Mentum of Labium				Seg. 3 Width	Seg. 7 Width	Seg. 9 Width	Ovipos Width
		Length	Bas. Width	Mid. Width	Ap. Width				
Banff (reared)	6.7	6.0	2.5	3.2	4.75	5.0	7.5	5.8	...
Vanc. I. (reared) ...	7.0	6.4	2.5	3.2	4.7	4.8	7.0	5.6	...
Vanc. I.	7.5	6.6	2.7	3.3	4.9	5.0	7.8	6.2	...
Vanc. I. (reared) ...	7.3	6.8	2.6	3.5	4.8	4.6	7.3	6.0	3.3
Vanc. I.	7.0	6.5	2.6	3.5	4.9	4.8	7.5	6.1	3.2
Vanc. I.	7.5	6.8	2.6	3.5	5.0	4.9	7.3	6.0	3.5
Average.....	7.16	6.51	2.59	3.36	4.84	4.85	7.40	5.95	3.33

Aeshna umbrosa.

Georg. Bay (reared)	6.7	6.6	2.3	3.0	4.4	4.5	7.0	5.0	...
Toronto.....	7.0	7.0	2.3	3.2	4.75	3.7	6.7	5.1	...
Toronto.....	7.3	7.0	2.3	3.2	4.9	4.4	6.3	5.25	...
Toronto.....	6.6	6.8	2.3	3.0	4.6	4.6	7.0	5.0	2.8
Georg. Bay (reared)	6.5	6.9	2.2	3.0	4.3	4.75	6.5	5.0	2.8
Vanc. I. (reared) ...	7.0	6.6	2.25	2.9	4.5	4.2	6.0	5.1	2.6
Average.....	6.85	6.81	2.27	3.05	4.57	4.36	6.58	5.07	2.73

It will be seen that the length of the hind femora and of the mentum of the labium is about the same in the two species, but that in the other measurements, particularly the length of the ovipositor, *palmata* has somewhat the advantage. The measurements of segment 3 are less reliable than those of segments 7 and 9, as the form of this segment varies considerably in the exuviæ.

Ecologically there is quite a marked difference between these species. *Umbrosa* is everywhere an inhabitant of small streams, while *palmata* lives in pools and small ponds. I found nymphs of *umbrosa* associated with those of *Cordulegaster dorsalis* in a small forest brook near the Biological Station on Vancouver Island, *palmata* being entirely absent from this stream. About two miles from this spot was a small pool in the woods, grown up with western Skunk Cabbage. This pool contained numerous nymphs of *palmata*, but no other Aeshna.

Sympetrum pallipes Hagen.

We found this species in abundance on Vancouver Island

during the second half of July, and in August, 1913, and obtained plenty of the nymphs from two or three small ponds at Rock City, a village near the Biological Station. From these a number of adults emerged on July 20 and 21.

Most of the adults taken have the legs entirely or almost entirely black and agree with Ris's description of *S. obtrusum morrisoni*. They intergrade, however, with pale-legged specimens and are undoubtedly conspecific with *S. pallipes*, as Ris himself suspected. But I cannot consider them as a variety of *obtrusum*, for, in the first place, I found both *pallipes* and typical *obtrusum*, in every respect like eastern specimens, at Okanagan Landing, B. C., on the Pacific Slope, while *pallipes* ranges eastward to Waterton, Alta., In the second place, the nymphs of *pallipes* are quite distinct from those of *obtrusum*, but are so extremely like those of *costiferum* as to be practically indistinguishable from that species. I have neglected to rear *S. obtrusum* and have no nymphs that I can refer to it with certainty, but I have a number of *S. rubicundulum*, which Professor Needham was unable to distinguish from *obtrusum*, and they are very easily separated from *pallipes*.

The nymphs of *pallipes* like those of *rubicundulum* frequent small stagnant pools or ditches, while *costiferum* seems to prefer shallow reed-grown parts of ponds or lakes.

Nymph (pl. XXV, figs. 6-8).—Eyes moderately prominent, lateral margins of head very oblique, passing into the posterior margins without any semblance of an angle. Mentum of labium narrow at base, the basal breadth being somewhat less than one-fourth the greatest breadth, which is almost equal to the length; sides moderately concavely curved, diverging in the distal fourth at an angle of about 90°, median lobe depressed at an angle of about 30° with the general surface of the mentum. Mental setæ 13-14, the 4th or 5th from the side longest. Lateral setæ 10-11. Movable hook slender, one-fourth to nearly one-third as long as the distal margin of the lateral lobe, the latter with very low crenulations, at the intervals between which are groups of 3 (sometimes a rudimentary fourth in some of the groups) successively longer setæ, the third much longer than the other two (see fig. 8).

Abdomen widening gradually from base to segment 6, narrowing more rapidly caudad, especially on segments 9 and 10. Dorsal

hooks on segments 4-8, straight, or but slightly curved, rudimentary on 4, increasing to 7, on which the hook is almost as long as the segment; lateral spines on 8 and 9, on 8 about one-fourth (measured on the inner margin) as long as the lateral margin of the segment (without spine); on 9 about one-third to one-half as long as the lateral margin, not quite reaching the level of the ends of the lateral appendages, which are about two-thirds as long as the superior appendage, and slightly more than one-third as long as the inferior appendages. Superior appendage slightly longer than broad; both superior and inferior appendages acuminate, terminating in very slender apices.

Colour greenish brown, with rather obscure dark markings. Thorax with a dark longitudinal band on the pleura; femora dark, with two pale annuli, a median and an anteapical; tibiæ also with two pale annuli separated by a median dark annulus.

Length of body 16-18; outer wing-pad 5-6; hind femur 4.6-5; width of head 4.5-4. 9; width of abdomen 5. 5-6.

As already stated, the nymphs of *pallipes* and *costiferum* are practically indistinguishable. The only differences I could find are the slightly greater basal width of the mentum of the labium in *costiferum* and in the spines on the distal margin of the lateral lobes of the labium, which in *costiferum* are usually single or with only one additional rudimentary spinule.

Leucorrhinia hudsonica Selys.

On June 18-20 adults of this species were found in considerable numbers at Nipigon, Ont., where they were associated with *L. glacialis*, although much more numerous. No other Libellulines were as yet abroad, the only other Anisopterous dragonfly being *Cordulia shurtleffi*. Both *L. glacialis* and *C. shurtleffi* were transforming in the marshy borders of the Nipigon River, but careful search failed to result in the finding of a single nymph or transforming imago of *L. hudsonica*. Two exuviæ were found, however, which can belong to no other species.

Nymph (pl. XXV, figs. 9-12).—Similar in form and size to *L. frigida:* head similar, but the eyes somewhat less prominent, more as in *intacta* (see Canadian Entomologist, 45, 1913, pl. 2, figs. 20, 23); rear of head with numerous

long hairs. Mentum of labium almost as broad distally as long; sides nearly straight on the proximal two-thirds, thence bending outwards so as to be rectangularly divergent. Ventral surface in the proximal two-thirds somewhat longitudinally convex; median lobe depressed at an angle of about 30°; apex but little rounded. Mental setæ 12-14; the third to the fifth from the outside longest. Lateral setæ 9 or 10; movable hook slender, nearly half as long as distal margin of lateral lobes, the latter slightly undulate, the spines single or, here and there, a pair, of which the upper is much shorter than the lower; there may be also a third very rudimentary spinule on the opposite side of the long spine (fig. 12).

Abdomen, as in other species of the genus, broad-ovate, widest at segment 6, narrowed almost equally toward apex and base. Dorsal hooks on segments 3 or 4 to 6, vestigial, longest on 5. In one specimen they are considerably better developed than in the other, there being quite a distinct hook on segment 3, while in the other there is no trace of a hook on this segment. In the former the hook on 5 reaches the hind margin of the segment, in the latter it does not nearly reach the margin. Lateral spines on 8 about two-fifths the length of the segment, slightly divergent; spines on 9 about three-fifths the length of the segment, reaching to the level of the apex of the lateral appendages, their inner margins parallel; superior appendage about three-fourths as broad at base as long, sides nearly straight, apex acuminate, slender, somewhat decurved; lateral appendages rather stout, but tapering rather abruptly to fine-pointed apices, about three-fifths as long as the superior appendage and half as long as the inferior appendages, which project a little beyond the former. The setæ on their inner surfaces are longer and coarser than in *L. frigida*.

Colour dull brownish above with faint indications of mottling, but no distinct pattern. Legs apparently without distinct annuli. Under surface of abdomen with three conspicuous, dark brown, longitudinal bands.

Length of body 17-17.5; outer wing-pad 5.3-5.5; hind femur 4.3-4.4; width of head 5-5.2; width of abdomen 6-6.2.

These nymphs differ from the form described by Needham as belonging to *L. frigida* only in the presence of vestigial dorsal hooks, which in Needham's specimens are wholly lacking. I have a

number of specimens identical with Needham's form from Go Home Bay, Georgian Bay, Ont. (date and collector unknown) and two exuviæ, received from Mr. C. H. Kennedy, form Lake McKinney Tahoe, California. I feel confident that they all belong to *hudsonica*, in spite of these differences in the development of the dorsal hooks. There is no other species in the Georgian Bay region which this nymph could fit. *Leucorrhinia proxima* is the only species which could be considered, but it is much larger than *hudsonica*, whereas these nymphs are all of about the same size.

EXPLANATION OF PLATE XXV.

Figs. 1-3.—*Æshna tuberculifera;* 1, female nymph (x2); 2, labium; 3, terminal segments and genitalia of female nymph.

Fig. 4.—*Æshna palmata*, right supra-coxal processes.

Fig. 5.—*Æshna umbrosa*, right supra-coxal processes.

Figs. 6-8.—*Sympetrum pallipes;* 6, lateral view of abdomen; 7, dorsal view of terminal segments; 8, portion of distal margin of lateral lobe of labium.

Figs. 9-12.—*Leucorrhinia hudsonica;* 9, lateral view of abdomen of exuvia from Nipigon, Ont.; 10, same, from another Nipigon specimen; 11, dorsal view of terminal segments; 12, portion of distal margin of lateral lobe of labium.

NOMENCLATURAL AND CRITICAL NOTES ON HEMIPTERA.

BY E. P. VAN DUZEE, LA JOLLA, CALIF.

For the past two years, as many of my correspondents know, I have devoted all my spare moments, which have been all too few, to the preparation of a catalogue of the North American Hemiptera. This is now practically completed, but as it is not certain just when it will be in print, it seems best to call attention in advance to certain features of the nomenclature used, partly in the hope that criticism may show oversights and errors in time for correction in the manuscript.

The following synonymy calls for special mention:

Genus **Cydnus**.—When founding this genus, Fabricius designated *tristis* (= *aterrimus* Forst.) as type. *Cydnus* must therefore

replace *Brachypelta* Am. & Serv., which has the same type and the *Cydnus* of Fieber, Signoret, and Lethierry and Sevrin becomes *Aethus* Dall. with *indicus* Westw. as type.

Subfamily **Asopinæ**.—The synonymy of genus *Asopus* Burm. is complicated by an uncertainty as to where it was first published. Kirkaldy claims that it first appeared in Silbermann's Revue, and therefore names *gibbus* Burm. (=*cayemensis* Lap.) as type, thus making it synonymous with *Discocera* Lap., but Dr. Bergroth in 1911 (Wien. Ent. Zeit., XXX, p. 122) gives us a careful study of the question, and concludes that we should accept *argus* Fabr. (= malabaricus Fabr.) as the type of *Asopus*, and I do not see that we can do better than to follow him. Where we cannot be certain which of two names appeared first, it would seem best to accept the one which least disturbs a long accepted synonymy and gives us the most rational interpretation of the author's meaning. By adopting the above synonymy we are able to retain the well-known subfamily name *Asopinæ*.

Genus **Perillus** Stal.—This genus was founded in 1862 as a subgenus of *Oplomus* with the species *confluens* H. Sch., *virgatus* Stal, and *circumcinctus* Stal, of which *confluens* has properly been selected as type. I can see no justification for Schouteden's new genus *Perilloides*, as it possesses no workable character except the greater convexity of the pronotum, and I have not recognized it in my catalogue. The sulcation of the tibiæ differs inappreciably, if at all, in the two genera.

Genus **Acanthocephala** Lap.—The names *Diactor* Burm. and *Metapodius* Westw. were both given as substitutes for *Acanthocephala* Lap., a name supposed at that time to be preoccupied by a family of that name in the Vermes. By the International Rules a family name cannot preoccupy a generic name and *Acanthocephala* is therefore valid. *Metapodius* has the same type as *Acanthocephala*, and cannot therefore be used as a distinct subgenus as was done by Stal, and we must fall back on *Metapodiessa*, substituted by Kirkaldy for this well-known North American subgenus.

Genus **Leptocorisa** Latr.—So many changes have been made in this genus that a word of explanation seems necessary. Latreille

founded the genus *Myodocha* in 1807 with a fair description and named three species; *tipuloides* (a *Leptocorisa*), *trispinosa* (a *Cydamus*), and *fulvipes* (an *Ischnodemus*), but as his generic diagnosis in no way fits any one of these species, it becomes evident that his manuscript must have been mixed and the genus becomes invalid here. In 1810 he corrects this error and names *serripes* as type of *Myodocha*, but as this species was then undescribed, the genus is still invalid, but becomes of force the following year, when Oliver describes it as *Myodochus* and gives a recognizable description of *serripes*. Leach, in 1815, names *tipuloides* as type of *Myodocha*, and is followed in this by Burmeister and Kirkaldy, but this is obviously invalid. The name *Leptocorisa* first appears as *Leptocorise* in 1825 (Latreille, Fam. Nat. Reg. Anim., p. 421) as a nomen nudum and not in a Latin form. In 1827 Berthold, in his German translation of Latreille's work, changes the French form to *Leptocorixa*, but does not describe the genus nor mention a species, so it is still a nomen nudum. In the 1829 edition of Cuvier's Regnum Animalia Latreille first characterizes the genus making it equivalent to *Gerris* Fabr. (of the Syst. Rhyng.), except *vagabundus*, but does not state that it is a substitute for that name so it need not have the same type. Laporte in 1832 names his *linearis* (= *filiformis* Fabr.) as type, which, being an original species, is valid and must stand.

Genus **Corizus** Fall.—Brullé, 1835, first fixes the type of *Corizus* as *hyoscyami* Linn., and Westwood in 1840 fixes that of *Rhopalus* Schill. as *capitatus* Wolff (= *subrufus* Gmel.). The former is equivalent to *Therapha* Am. & Serv. and the latter is the *Rhopalus* of Stal and the *Corizus* of the Oshanin Katalog. As subgenera, neither are found in our fauna.

Genus **Leptocoris** Hahn.—On account of the close resemblance of this name to *Leptocorisa* Latr. it has been renamed three times, and in each case the name was given as a straight substitute for the supposedly preoccupied *Leptocorisa*, and must take the same type. These names are *Serinetha* Spin., *Lygæomorphus* Blanch., and *Pyrrhotes* Westw. *Leptocoris* is valid and must stand for this genus, and the tribe becomes *Leptocorini*, not *Serithini*. Kirkaldy, in Proc. Hawaiian Ent. Soc., vol. II, p. 123, 1910, has established a new subgenus of *Leptocoris* as *Boisea*. He founds it in but few

words on colour characters and a "slight margination of the pronotum, etc.," for "*vittata*." The only *vittata* in this genus is already the type of the synonymic genus *Tynotoma* Am. & Serv. Both his new subgenus and his species "*vittata*" are absolutely unrecognizable, except as we may assume that his disconnected remark concerning an American species of *Leptocoris* may refer to this, and thus identify his "*vittata*" with *trivittata* Say. Kirkaldy was very severe in his criticisms of others for the use of colour characters and incomplete descriptions, but no one used colour characters more or gave us more fragmentary and unrecognizable descriptions. It is greatly to be hoped that some competent Hemipterist will work out Kirkaldy's oriental genera and species while the types are still available and thus locate, and I might say validate them, for us.

Genus **Neides** Latr.—Latreille founded *Neides* in 1802 with two species, *tipularius* and *clavipes*, and in 1810 named *tipularius* as its type. Fabricius founded *Berytus* in 1803, and then named *tipularius* as its type. I can see no reason why these genera should not be considered strictly identical and every writer so far as I can learn so considered them until 1860, when Flor divided the genus, placing *clavipes* in *Neides*, founding *Sphalerocoris* for *tipuloides* and restricting *Berytus* to *rufescens*. Fieber the next year retains *Neides* for *tipularius* and its allies, and *Berytus* for *clavipes* and its allies, in which he is followed by Puton (1886), Lethierry and Sevrin (1894), and Oshanin (1906 and 1912). Reuter (1888), on the contrary, places *tipularius* as the type of *Berytus* and *clavipes* as the type of *Neides*, and in this is followed by Bergroth in 1906. I believe Kirkaldy was entirely right in considering these genera as homotypical and that he was justified in renaming *Berytus* Fieb. as *Berytinus*. The family thus becomes *Neididæ*, not *Berytidæ*. Most European Hemipterists seem to have overlooked genus *Podicerus* Dumeril founded in 1824 with *tipularius* as type. In the Journal of the New York Entomological Society for 1911 (Vol. XIX, p. 24), Mr. H. G. Barber places my *Jalysus perclavatus* as a synonym of *Hoplinus multispinus* Ashmead, and suggests that my redescription of the species was owing to the poor characterization of Ashmead's species. This, however, does not fully state the case. The difficulty here is that Ashmead's description does

not at all correspond with his supposed type now in the National Museum. I did in this case as I have always done, followed the description rather than the supposed type. It is inconceivable that any one who pretends to know anything about the Hemiptera would describe a *Jalysus* with unarmed connexivum and pronotum and membranous elytra in a genus belonging to a distinct subfamily and having the connexivum and pronotum long-spinose and the corium coriaceous and punctate. Ashmead also distinctly describes the head as trispinose. Characters omitted may be charged to an oversight, but non-existent structural characters cannot be added. His name *multispinus* could hardly apply to any *Jalysus*. I fail to see how the ends of science can be advanced by trying to connect Ashmead's description with his supposed type, and in my catalogue I have retained my species, leaving Ashmead's as a still unknown species of *Hoplinus*. Mr. Barber also sinks my *Jalysus wickhami* as a straight synonym of *spinosus*. It, however, readily separates out as the western form of *spinosus*. The typical form of this species I have not seen from west of the Rocky Mts., although in Texas the two seem to intergrade and may do so wherever their habitats overlap.

Genus **Lygaeus** Fabr.—This genus was founded by Fabricius in 1794 to include a heterogeneous assemblage of species that he could not satisfactorily locate in his other genera, or so it looks to us. Lamarck in 1801 named *equestris* as its type, and in 1803 Fabricius indicates *tenebrosus* as the typical species. Kirkaldy and others claim that his repeating the generic characters in his description of *valgus* in 1794, but without italics, was a valid naming of the type. An argument in favour of this is found in the fact that he did not repeat these type indications in the case of two of the five genera so distinguished in his Systema Rhyngotorum, but in *Lygæus* and one other genus he has indicated a different species as type in his later work, which in a measure will offset Kirkaldy's contention. In these two cases of double type-fixation, if such they be called, I think we should ignore both and take the next valid fixation, which in the case of *Lygæus* is *equestris*, and in the case of *Gerris*, the other genus referred to, is *lacustris*. This procedure, which I believe is perfectly justifiable and logical, conserves these names for the genera as almost universally used

since the time of Latreille, and in the case of *Lygæus* makes that genus synonymous with *Graptolomus* Stal and *Eulygæus* Reuter. Most European entomologists accept Laporte's indication of *familiaris* Fabr. as type of *Lygæus* or follow Kirkaldy in considering *Lygæus* a Coreid genus with *valgus* as type, but I think the solution here given much more reasonable and better in every way.

Genus **Artheneis** Spin.—Dr. Horvath (Ann. Mus. Nat. Hung., VIII, p. 11, 1910) has shown conclusively that the type of this genus should be *foveolata* Spin. Kirkaldy had no reason to name *cymoides* as type and thus to make this genus supercede *Nysius* of Dallas.

Genus **Perigenes** Dist.—I have examined a long series of *Perigenes constrictus* Say from the Northern and Middle States, and have been unable to detect a distinct lunate vitta on the venter of any, although there is a structural fullness at that point which in rubbed specimens has somewhat the aspect of a vitta. The southern specimens sent to me as *Ligyrocoris constrictus* Say have proved to be *abdominalis* Guer. Say's species as represented in the collection of the Boston Society of Natural History is an undoubted *Perigenes*. It is questionable whether this lunate vitta should be considered as a generic character, as genus *Ligyrocoris* as now constituted contains species of at least four genera: *Sphærobius*, *Heræus*, *Orthæa*, and *Perigenes*, and separable therefrom only by this lunate vitta. In my catalogue I have been unable to quote a number of the locality records on account of the mixing of the species.

Genus **Orthæa** Dall.—Say's name *Pamera*, used by Stal for this genus, published in 1832 as a straight substitute for the preoccupied *Pachymerus* Lep. & Serv., a palæarctic genus. The same year Laporte published the name *Arphanus* as a substitute for this same preoccupied name. I know no way to determine for certain which of these works appeared first and personally prefer to use the name *Aphanus* for two reasons: Laporte's paper was a systematic work in which the author undertook to name a type for each of the Heteropterous genera known to him and for this genus he names *rolandi* Linn., which was one of the original species and a perfectly valid type fixation. Say's work was a

faunal paper, and as he names no type nor original species, his name must follow the first valid type fixation for genus *Pachymerus*, which was that of Laporte mentioned above. A further and strong reason for accepting Laporte's name is that Say's name *Pamera* has long been used for a quite distinct assemblage of species, and the transfer of the name would cause serious confusion. It may be well to add here that while Say's paper on the Heteropterous Hemiptera was dated 1831, only the first eight pages were published that year as we are informed by Fitch (2d Annual Rept. N. Y. St. Entomologist, in Trans. N. Y. St. Agricul. Soc., Vol. XV, for 1855, p. 523). The next name quoted by Stal for *Pachymerus* is *Stenocorius* Ramb., which is equivalent to *Paromius* Fieb. It was established in 1842, not 1838 as cited by Stal, and is preoccupied by *Stenocoris* Burm. published in the supplement to the Handbuch, Vol. II, part 2, p. 1010, 1838. This leaves *Orthæa* Dall. the first valid name for the genus with *consuta* Dall. as type. It may be noted in this connection that the genera *Calyptonotus* and *Aphanus* in the Oshanin Katalog must be reversed. The name *Calyptonotus* Dougl. and Scott was published as a substitute for *Rhyparochromus* Fieb. (and Am. & Serv.) and therefore takes as type *alboacuminatus* Goeze. I cannot find that this genus is represented in our fauna.

Genus **Astemma** Lep. and Serv.—This genus was founded simultaneously by Latreille and Lepeletier and Serville in 1825. Latreille's genus was without description or species and consequently was a nomen nudum until 1829, when in the edition of Cuvier's Regnum Animalia of that year he gives it a short diagnosis and names two species: *Salda pallicornis* and *flavipes* of Fabricius, the latter a *Geocoris* not answering to Latreille's diagnosis of his genus, so the former must be taken as the type making it equivalent to *Halticus* Hahn, 1831. Lepeletier and Serville founded their genus *Astemma* in the tenth volume of the Encyclopia Methodique, naming several species and describing *cornuta* as new. In 1832 Laporte designates *königi* Fabr. as the type of *Astemma*, but not being an original species, this type fixation is invalid. Kirkaldy in 1909 names *apterus* Linn. as type of the *Astemma* of Lep. & Serv., but this certainly is invalid, as Stal had in 1870 restricted the genus to *cornuta* and its allies, as he

had a perfect right to do, and thus making it a valid genus related to *Largus*, with *cornuta* as type.

Cenus **Phymata** Latr.—I wish to call attention here to the fact that Handlirsch in his monograph on this genus has, perhaps inadvertently, renamed the typical subspecies of *Phymata erosa* as *linnei* Handl. Under the International Code it must be known as *Phymata erosa erosa* Linn. with *linnei* as a synonym. It also seems to me unquestionable that Stal was right in assigning Wolff's description and figure of *erosa* to our northern form which he renames *wolffi* and of which subspecies *pennsylvanica* Handl. is a straight synonym. Subspecies *fasciata* Gray is undoubtedly the southern form included doubtfully by Stal under *wolffi*. Subspecies *fasciata* Stal has been rightfully renamed by Handlirsch, who calls it *communis*, assuming that he has correctly located it. I am unable to understand why subspecies *chilensis* Handl. should not be known as *carinata* Fabr., but as this form is from outside our territory, I will leave this for others to work out.

Genus **Reduvius** Fabr.—This genus was founded by Fabricius in 1775 without designation of type. In 1801 Lamarck names *personatus* Linn. as such type, a valid type-fixation having priority over Fabricius' designation of *fuscipes* in 1803. While Stal was wrong in accepting *fuscipes* as type of *Reduvius*, he was certainly right in using *angulosus* Lep. & Serv. as the type of *Harpactor* Lap., who distinctly names that species as type when founding the genus. For the large genus *Reduvius* of Stal and Lethierry and Servin (= Harpactor of Am. & Serv.) we must use the name *Rhynocoris* Hahn, 1834, with *cruentus* Fabr. (= *iracundus* Poda) as the type. Our American species belong to this last genus. Of the numerous subgenera used by Stal in this genus, I would recognize but four or five, reducing the others to synonymy. The subfamily *Reduviina* of Stal, 1872, must take the name *Harpactorinæ*, as that was the first name given to the group. It has been so used by Amyot & Serville, Spinola, Dohrn, Puton, Lethierry and Servin, Champion and Oshanin. There are two fairly well marked tribes in this subfamily, the *Harpactocorini* with the mesopleura tuberculate and the *Zelini* without the mesopleural tubercle. The former was named *Hezeda* by Stal in 1859, but as I understand the International Code the typical subfamily

or tribe must bear the name of the typical genus the same as a subgenus, including the typical species of the genus must bear the name of the genus. The second tribe was called *Reduviida* by Stal, but has been properly designated as *Zelini* by Bergroth and others.

Genus **Ectrichodia** Lep. & Serv.—Kirkaldy (Entomologist, XXXIII, p. 239, 1900) goes into an elaborate explanation of why he names *Reduvius cruciatus* Lep. & Serv. as type of *Ectrichodia*, all of which was quite unnecessary as Laporte had already named this species as its type (Essai, p. 7, 1832) and Brullé did the same in 1835 (p. 320). This generic name must therefore replace the old-world genus *Physorhynchus* Am. & Serv. and *Ectrichodia* of Stal must be known as *Rhiginia* Stal with *lateralis* Lep. & Serv. as type. The name of our northern *cruciata* Say, described as a *Petalocheirus*, is not preoccupied by *Ectrichodia cruciata* Lep. & Serv. and will stand as *Rhiginia cruciata* Say.

Genus **Nabis** Latr.—This genus was founded by Latreille in 1802 with two species mentioned, *guttula* and *vagans* Fabr., the latter a synonym of *ferus* Linn. I cannot find that the former was named as type until Kirkaldy did so in 1900. *Vagans* was named as type of *Nabis* by Westwood in 1840, and I cannot see why this type fixation is not valid. *Reduvius apterus* Fabr. was named as type by Latreille in 1810, Laporte in 1832, and Spinola in 1837, but is invalid as *apterus* is not an original species. Latreille in 1804 and 1807 named *apetrus* (= *subapterus*) and *guttula* as examples, but this cannot be considered as a proper type fixation for *guttula*. *Nabis* then = *Coriscus* Auct., = *Reduviolus* Kirby, with type *vagans* = *ferus* Linn. Prostemma Lap. = *Nabis* Stal, 1873, and Reuter, 1908 and 1909, type *guttula* Fabr.

Genus **Cimex** Linn.—This generic name is now so universally used for the "bed-bug" that it seems unnecessary to notice it here further than to draw attention to the fact that Kirkaldy's very positive statements that *Cimex* was not and could never be available for *lectularius* were founded on a careless and imperfect knowledge of the bibliography of this genus and species. Brünnich restricted genus *Cimex* to *lectularius* eleven years before Fabricius founded genus *Acanthia* and restricted *Cimex* to the *Pentatomidæ*,

and furthermore Lamarck named *lectularius* as type two years before Fabricius indicated *rufipes* as type of *Cimex*, so I cannot see that there is any case for discussion. My copy of both Brünnich and Lamarck are from the Kirkaldy library, and are annotated by him, and he could soon have learned these facts had he tried.

Family **Capsidæ**.—It seems to be quite the vogue now to follow Kirkaldy and call this family after the oldest genus, *Miridæ*. This Kirkaldy system is illogical to me as I have stated above, and I would not revert to it did it not seem best to refute Reuter's statement of 1910 that the name *Miridæ* Brullé, 1835, has priority over *Capsidæ* Burm., 1835. In the first place every indication I can discover of the date of these two works show that Burmeister's appeared first, but that would not effect the present case as Brullé's name was in the French form and was not latinized at all. If we accept vulgar names, we must go back to Hahn's Wanzenartigen Insecten, Vol. I, 1831, where we find the family called *Mirides*. However, I think Dr. Horvath was perfectly right in discarding all names not given in the Latin form. By this system the name *Capsidæ* has clear priority and practically universal usage until Kirkaldy devised his system for unstabilizing family nomenclature.

Genus **Salda** Fabr.—This genus cannot be considered without first locating *Acanthia*. Fabricius founded *Acanthia* in 1775 for *lectularius* and its allies without indication of type. Latreille in the "Precis," 1796, restricts *Acanthia* to those of Fabricius' species which inhabit the borders of ponds and streams, but names no species nor type. As it is impossible to name a type from such a statement, his restriction has no value. In 1801 Lamarck identifies *Acanthia* with *Cimex* and names *lectularius* as type. The next year Latreille still clings to his delusion and describes genus *Acanthia* for *littoralis* and *zosteræ* Fabr. One year later Fabricius, perhaps as a protest against Latreille's misuse of his genus, restricts *Acanthia* to *lectularius* and *hemipterus* and indicates the former as its type. At the same time he founds his genus *Salda* for the littoral forms with *zosteræ* as type. This disposition of these species by Fabricius was perfectly valid, and I have so used them in my catalogue. Recently Dr. Reuter has broken up genus *Salda*, very properly restricting *Salda* to *zosteræ* and its allies, but still retains *Acanthia* for the littoral species with *saltatoria* Linn. as type. In accepting

Acanthia in the Fabrician sense as indicated above we find the largest genus in the family without a name and I therefore propose to call it **Saldula**. As a substitute for *Acanthia* of Reuter (Of. Finska Vet. Soc. Forh., Afd. A, No. 12, p. 14, 1912) it takes the same type, *saltatoria* Linn. Nineteen North American species belong to this genus.

Genus **Dictyophara** Germ.—Melichar in his recent monograph on this subfamily places our American species in Stal's genus *Nersia*, which he considers as distinct. Our species are, however, entirely congeneric with *Dictyophara europæa* Linn. and must be retained in this genus.

Genus **Ticida** Uhler.—I now find that my *Loxophora transversa* is a synonym of *Ticida cingulata* Uhler and my genus therefore becomes a synonym of *Ticida*. I was mislead by Uhler's placing his genus in the *Issidæ*.

Genus **Otiocerus** Kirby.—I do not accept Kirkaldy's statement that Vol. XIII of the Trans. of the Linnean Society was published in 1822. The first pages containing Kirby's paper undoubtedly appeared in 1819 or very early in 1820. Germar accepted Kirby's name as the earlier and we must do the same.

Genus **Cicada** Linn—When publishing my note on this genus in 1912 I did not realize that it was Lamarck's intention to name types in this work of 1801, and finding *Cicada* without a valid type, named *tibicen* as such type. There is no doubt, however, but we must accept *ornı* Linn as type of *Cicada* as named by Lamarck, thus making the genus equivalent to *Tettigia* of Kolenati. There is an additional reason for our doing this in the fact that Linneus named this section of his genus *Manniferæ* from the "manna" produced by this insect, which is perhaps the most common European *Cicada*. This is in accord with the Linnean method of restricting his genera to the best known or officinal species. What then shall we do with genus *Cicada* of Stal and other writers? Latreille in 1825 establishes genus *Tibicen* for *plebeja* Scop., but without description. The question is: Was *Tibicen* properly established by the simple naming of a well-known species in 1825, or must it be held over until 1829, when one distinguishing character (of no value) was given and four species (belonging to three genera)

are named? Amyot and Serville take the latter view and name *hæmatodes* as its type. The genus can, however, be much more accurately recognized by the naming of *plebeja* in 1825 than by the characters and species mentioned in 1829, and I think we should accept *plebeja* as its type. Many recent writers ignore *Tibicen* entirely, but this cannot be done. Either it is equivalent to the *Cicada* of Stal with *plebeja* as type or *Tibicina* Kolen. with *hæmatodes* as type. Another question arises in studying this case. Fabricius, who uses *Tettigonia* Geoff. in place of *Cicada* Linn. indicates *tibicen* as its type, and I am not certain but we should consider this a valid naming of a type for genus *Cicada* of Linn. This, of course, would antedate Latreille's genus *Tibicen* and leave genus *Cicada* as it was understood before Distant founded his genus *Rihana*. I can find no ruling on this in the International Code, and therfore for the present use *Cicada* for *orni*, largely on the assumption that Linneus intended that for the type of his section *Manniferæ*, and *Tibicen* for *plebeja*. Latreille in 1810 names *plebeja* as type of genus *Cicada* Linn., but as it was not an original species, this is of course invalid.

Genus **Philænus** Stal.—As I understand the International Rules, a variety name is preoccupied by an earlier species name in the same genus. This necessitates our changing the name of *Philænus leucophthalmus* var. *lineatus* Linn. for which I now propose the name *fabricii*; and we must also change the name of what was formerly the typical *spumarius* of Fallen ,which I propose to call *falleni*. Both of these colour varieties occur in our fauna.

Genus **Ceresa** Am. & Serv.—The name *aculeata* was used in this genus by Fairmaire in 1846, so I now propose the name **stimulea** for the *Ceresa aculeata* published by me in 1909.

Genus **Stictocephala** Stal.—I cannot find that a type has been named for this genus, so I now name *lutea* Walk as such type, as it is the best known species mentioned by Stal when founding the genus.

Genus **Campylenchia** Stal.—I do not feel at all convinced that our North American *latipes* Say is identical with the South American *curvata* Fabr. and have retained it as distinct in my catalogue.

Genus **Bolbonota** Am. & Serv.—Fowler's name *aureosericea* preoccupied in this genus by *aureosericea* Stal, and for the former I propose the name **dubiosa.**

Genus **Gypona** Germ.—*Gypona bimaculata* Woodworth, 1887, is preoccupied by *Gypona bimaculata* Spangberg, 1878, for the former I propose the name **woodworthi.**

Genus **Euscelis** Brullé.—Genus *Athysanus* Burm., 1838, type *argentatus* Fabr., is scarcely separable from *Phrynomorphus* Curtis, 1833, type *lineolatus* Brullé. It seems, however, that both must fall before *Euscelis* Brullé, 1832, type *lineolatus* Brullé. I have not been able personally to examine Brullé's work, nor can I learn that there is a copy in this country, but he seems to have established his genus for *lineolatus*, and as his genus has recently been recognized by Dr. Horvath, it is evidently a valid genus, I recognize the following subgenera: *Athysanus* Burm., type *argentatus* Fabr., *Euscelis* Brullé, type *lineolatus* (= *Conosanus* Osb. and Ball), *Conomellus* Osb. and Ball, type *comma* Van D. and *Stirellus* Osb., and Ball, types *bicolor* Van D.

NOTES ON SCIAPUS, WITH DESCRIPTIONS OF THREE NEW SPECIES.

BY M. C. VAN DUZEE, BUFFALO, N. Y.

Sciapus forcipatus Ald.

Three males from Guatemala differ from Prof. Aldrich's description in having the knob of the halters, lamellæ of the hypopygium, and hind tibiæ yellow; and in having the wings marked with the usual two cross bands, although these bands are not very dark or well defined. The two long bristles at the tip of the abdomen seem to be composed of two or more fine hairs so closely twisted together as to appear as one, in one specimen these hairs are partly separated; the middle tibiæ have two long bristles, one at the middle and one at apical fourth; the middle tarsi in one specimen have two rather long bristles, and several smaller ones on the first joint; all the femora have long white hairs below, the middle pair have also the black bristles mentioned by Aldrich.

I feel quite certain that these differences are not of specific value; in fact, hardly sufficient to warrant separating it as a variety.

Two other males in the same lot have the hind tibiæ yellowish brown and the wings hardly tinged with brown, even in front of the third vein. They come nearer the typical form.

Sciapus tonsus Ald.

I have seen two specimens, one from Bradentown, Fla., and the other from Beaufort, N. C., which answer the description of this species. In one the appendages of the hypopygium are closely drawn up as in the type; in the other they are somewhat extended. They are black and rather long, extending forward to the tip of the fourth ventral segment. The fore metatarsi are about as long as the four remaining joints together, and with rather long hair below.

Sciapus crinitus Ald.

I took this at Bradentown, Fla., and have seen specimens from Georgia.

Sciapus flavipes Ald.

I took a number of these at Bradentown, Fla., in March. I have also seen specimens from Georgia and Erie Co., N. Y.

Sciapus chalybeus, n. sp.

Male—Length 5.5 mm. Face bare, green with blue reflections and coarse gray pollen on the lower part. Front blue-green, pure green on the upper lateral corners; antennæ black, with a few rather long bristles on the second joint, one of which is three-fourths as long as the face; arista more than half as long as the body and with the tip white. Thorax steel-blue or purplish; pleuræ more green; meta-scutellum green; bristles of the thorax and abdomen long. Abdomen concolorous with the thorax, the last two segments green. Hypopygium with a peduncle which is as long as the sixth segment, blue, and bears many long, wavy hairs, which are as long as the fifth and sixth segments together; hypopygium black with pale yellow, curved, somewhat forcipate appendages. Coxæ, trochanters and femora black; extreme tips of fore and middle femora, all tibiæ and fore and middle tarsi yellow; last joint of fore and middle tarsi, extreme tips of hind tibiæ and hind tarsi black; all femora with long white hairs below; fore tibiæ with a row of bristles on the upper surface, two of which are long, the last one about three-fourths as long as the tibiæ; fore tarsi a little more than twice the length of their tibiæ, the

first joint being longer than the remaining four together, and ciliate with long bristles above; the second joint with a long and the third joint with a short bristle at tip; middle tibiæ with three long bristles of increasing length above, and a long bristle-like spur at tip, also several small bristles; middle tarsi about one-and-one-fourth times as long as their tibiæ and ciliate above with close-set bristle-like hairs, which decrease in length but extend to the extreme tip of the fourth joint; fifth joint with minute white hairs above; hind tibiæ without bristles, but with a row of short hairs along the lower inner edge. Tegulæ and their cilia black; halters black, with a pale yellow knob. Wings grayish hyaline, with a brown cloud near the tip in front of the third vein.

Described from one male taken at Philadelphia, Pa. Type in the Cornell University collection.

The formation of the hypopygium and its appendages is much like that of *S. forcipatus* Ald., but the arrangement of the bristles of the legs is quite different and easily separate the species.

Sciapus digitatus, n. sp.

Male—Length 5 mm. Face and front green, the former with rather thick white pollen when viewed from in front, this pollen extending a little on to the lower part of the front; antennæ small, black, the longest bristles on the second joint a little longer than the antennæ; arista about as long as the width of the head; palpi and proboscis brown. Thorax green with very little pollen. Abdomen green, with black bands at the base of the segments, those on the last two segments occupying nearly the whole of the segments; hypopygium small with two small, slender, nearly straight appendages, which are black and about as long as the width of the hypopygium. Coxæ and femora black, the tips of the latter yellow; fore and middle tibiæ yellow; hind tibiæ yellowish brown with black tips; fore tarsi brownish almost from the base; middle and hind tarsi black; fore femora with delicate white hairs and a few black bristles below; fore tibiæ with about four long black bristles on the lower hind edge; fore tarsi about twice the length of their tibiæ, the metatarsi slightly longer than the tibiæ and with two bristles below; middle and hind femora with white hairs below; middle tibiæ with several small scattered bristles; hind tibiæ with only very short bristles, which are hardly distinguishable from the

hairs. Halters yellow, the stem infuscated; tegulæ and their cilia black. Wings hyaline, with the usual cross bands, which are united on the front as far back as the third vein; the last bend in the fourth vein nearly a right angle and little rounded.

Females with yellow femora.

Described from two males and two females from Cuba.

This is very close to *S. breviseta* Coq., differing in having longer bristles on the second joint of the antennæ, smaller lamellæ to the hypopygium and having the middle tarsi entirely black.

Sciapus nigrimanus, n. sp.

Male—Length 7 mm. Face green, more bluish on the upper part, white pollinose when viewed from above; front violet with the orbits narrowly green near the vertex. Antennæ small, black with short bristles on the second joint; arista about as long as the width of the head. Thorax green, white pollinose along the front and sides of the dorsum when viewed from above; pleuræ more blackish, with white pollen; scutellum blue-green. Abdomen green, with black bands at the incisures, that on the second segment extending forward on the centre of the dorsum to the base of the abdomen; hypopygium large with large, somewhat forked, black lamellæ. Coxæ black with white pollen; tips of the fore coxæ yellow; fore and middle coxæ with rather long, delicate white hairs on the front surface; hind coxæ with several pale hairs and the usual black bristle on the outer surface; femora green, fore and middle pairs broadly, and the hind pair narrowly yellow at the tips, all with delicate pale hairs below, those on the hind pair longest; tibiæ yellow, tips of the hind pair black; fore tibiæ with about six slender bristles below and one above near the apex; middle tibiæ with a row of about twelve stouter bristles on the lower front edge, three on the upper side, and three or four small ones on the posterior surface; hind tibiæ with one bristle at basal fourth; front tarsi black from the tip of the first joint, about one-and-two-thirds times as long as their tibiæ; the metatarsi nearly as long as the tibiæ, and with a row of bristles below extending the entire length; second joint short, about twice as long as wide with delicate hairs below, a little widened downward; third joint slightly shorter than the second; fourth joint nearly as long as the two preceding together; fifth joint about as long as the third; middle

tarsi black, the metatarsi a little shorter than their tibiæ and with a close row of erect hair-like bristles below; the remaining four joints together about two-fifths as long as the first; hind tarsi black, shining with rather long hairs, shorter than their tibiæ; the metatarsi longer than the remaining four joints together. Tegulæ yellowish brown, with black tips and cilia; halters yellow. Wings grayish hyaline, with the usual cross-bands, which are united in front as far back as the third vein; a brown cloud fills in the apex of the cell in front of the tip of the first vein; the cells between the first and third veins are tinged with yellow as far as the cross-bands; costa with erect cilia, which is longest at the tip of the first vein; the last section of the fourth vein beyond the fork bent backward so as to be somewhat U-shaped.

Female—Agrees with the male in the colour of the front, body and wings, but differs in having no rows of bristles on the tibiæ and tarsi and no erect cilia on the costa; the front coxæ and all femora are yellow, all the tarsi black, and the face is so thickly covered with white pollen as to conceal the ground colour. Length 6 mm.

Described from two males and three females taken at Los Amates and Marales, Guatemala, in February and March.

This species agrees in most points with the description of *S. genualis* Ald., but differs in the structure of the front tarsi, the first joint of which has a row of stout bristles below for its entire length, the second joint has no bristles, but only short, delicate hairs below, while Prof. Aldrich, in his description of *genualis*, states that the first joint has a few small bristles near the apex and the second joint a number of smaller ones extending its whole length.

FURTHER NOTES ON ALBERTA LEPIDOPTERA.

BY F. H. WOLLEY DOD, MIDNAPORE, ALTA.

(Continued from Vol. XLV., p. 302.)

531. *Diastictis denticulodes* Hulst.—A third specimen from Head of Pine Creek on Aug. 3rd, 1907.

534. *D. loricaria* Eversman.—Messrs. Barnes and McDunnough, in their "Contributions," Vol. I, No. IV, p. 33, and plate XV, figs. 5, 12, figure a winged female type of *Sympherta julia*

Hulst, from Hall Valley, Colo., and a Colorado male compared with a male type in their possession. The male there figured (fig. 12) is the species which was referred by Taylor to *loricaria* Eversman, and listed by me as such. The female type is, as Messrs. Barnes and McDunnough point out, a distinct species, and is very close to my No. 532, for which I have not yet received a name. No mention is made of sexes in Hulst's description.

541. *Apocheima rachelæ* Hulst. I have a wingless female taken here, which is evidently this species, dated April 11th.

543. *Anagoga pulveraria* Linn.—During one or two years, particularly 1909, this species was not uncommon here in June, flying at dusk in the poplar woods.

547. *Xanthotype crocataria* Fabr.—I have a single specimen of this species taken at the head of Pine Creek on July 14th, 1906.

552. *Euchloena astylusaria* Walk.—A male is in my collection taken at Edmonton by Mr. F. S. Carr, May 13th, 1910. A male at the head of Pine Creek on May 31st of the same year, by Mr. E. R. Brill. The latter specimen is about like Holland's figure, but lacks the cloud opposite the cell on primaries. The Edmonton specimen is similar though rubbed. The Red Deer River specimen previously recorded almost lacks the brown irroration, and differs from the others in having a diffuse transverse fuscous shade across all wings, above and beneath, least evident on the primaries above, where it is just posterior to the t. a. line. It is possibly a distinct species.

553. *E. pectinaria* Schiff.—High River. (Baird).

556. *Metanema inatomaria* Gn.—Banff. July 1st, 1907.

557. *M. determinata* Walk.—Banff. July 1st, 1907.

560. *Brephos infans* Moschl.—Calgary, April 19th, 1913, by Mr. Norman Criddle.

563. *Cossus populi* Walk.? vel *orc* Strk.?—Messrs. Barnes and McDunnough commenced their "Contributions" by a "Revision of the Cossidæ" (Vol. I, No. 1, 1911). There on Plate VII, fig 8, is a reproduction from a coloured figure of Walker's type of *populi* in the British Museum, from St. Martin's Falls, Hudson's Bay Territory, on the borders of Ontario. It is a female, and Sir George Hampson states that the abdomen, though distorted laterally by pressure, is more elongate than in any of its allies. Compared

with others of this group, it seems to be characterized also by lack of tendency of the reticulations to form prominent transverse black lines, or in having dark clouds or blotches. The authors mention having only a single female from Calgary which approximates this, and figure the specimen on plate V, fig. 9. This specimen happens to be more like the type than any in my possession, but shows a tendency towards the development of clouds and well-marked lines possessed by all in my series of five. In my only female the abdomen is about as in that figure, but the maculation is nearer to that of fig. 7, an Arrowhead Lake specimen referred doubtfully to *orc* Strecker. The male and female types of *orc*, from the State of Washington, are figured on plate VI. The female type seems a bit more blotchy than mine, but I can match the male very closely, and believe that all my specimens are really of this species, whatever may be the true relationship to *populi* and *undosus*, the authors suggesting that "It is possible that they are merely geographical forms of the same species."

The fragmentary female type of *undosus* Lint. is also figured on Plate VII, fig. 2, and in maculation appears nearer *populi* than *orc*. The authors state that in the type of *undosus* and in all specimens seen by them the collar is distinctly ochreous. A slight ochreous or brownish tint is present in some of mine, one of which is almost exactly like their fig. 8, plate V, of a Colorado specimen called *undosus*. Holland's figure under this name has much heavier black bands than anything I have seen, and lacks the usual blotches. Barnes and McDunnough give Colorado and Wyoming as the habitat of *undosus*, though they do not denote the type locality. I have specimens of the Alberta form, whatever may be its correct name, from High River, where Mr. Baird says it visits the town lights pretty regularly.

569. *Hepialus macglashani* Hy. Edw.—In Can. Ent., XLIII, pp. 290-292, Aug., 1911, Mr. McDunnough gives us some valuable notes on the group included under *hyperboreus* in Dyar's Catalogue. He states that *macglashani* was described from a series from Truckee, Calif., and that, as described, the band is connected with the inner margin of the wing by a spur of silver. The species is said to bear a great resemblance to *ganna* of Europe. He mentions that Dr. Barnes has a female of *macglashani* from the type locality,

four pairs from Hymers, Ont., and three specimens from Calgary. He seems to imply that all of these specimens have the band connected with the inner margin by a spur. My only two Alberta specimens are those previously recorded, and one of them lacks the spur. Both are pale reddish brown, almost salmon tinted. A pair from Hymers, Ont., are similarly maculate, though both have the spur, but the colour is much darker brown, especially in the secondaries. A female from Duncans, V. I., is apparently closely allied to the Calgary form, but is of a more fuscous pale brown, without any reddish tints, and has faint, diffuse fuscous cloudings in various portions of the wing, and two small, faintly silvered discal dots in one of these clouds at the end of the cell on primaries.

Additional Heterocera.

The number of species of Heterocera which have come to hand, or been recognized, or of which authentic records have been procured too late for insertion in their order in my original list, is large, roughly, some hundred and twenty. Considering that it is about nine years since that list was commenced (Vol. XXXVI, p. 345, December, 1904), and seven since its completion (Vol. XXXVIII, p. 267, August, 1906), a much larger number of additions might have been expected, had collecting been done as assiduously of recent years as it was formerly. Mr. Arthur Hudson and the author used to collect, principally at night, on a somewhat extensive scale, for some twelve or fifteen years, though such collecting was for the most part restricted to a very small area. The cessation has been gradual, and, for a variety of reasons, the collecting done by us during the few past years has been practically nil. That the list could yet be largely augmented if researches were carried on extensively further afield, is evinced by the high percentage of fresh species found in occasional small consignments received from distant localities. For instance, Lethbridge, in Southern Alberta, the driest portion of the Province, and practically the northern limit of the desert region, has, to judge from the captures made on occasional visits by one or two collectors there, many species unknown, or of extreme rarity further north. Mr. N. B. Sanson has done considerable collecting, chiefly at light, at Banff, in the Rockies, for the past few seasons, and discovered

a large number of forms previously unrecorded from the province, and several species of extreme rarity in collections, some entirely new. Mr. Bean, who I believe left Laggan for his old home in Illinois about 1895, probably has many records which have not yet come my way, though I found a few of his captures new to me in eastern collections. In a very small collection from Edmonton, shown me by Mr. F. S. Carr, the percentage of fresh records was high, and even the city of Calgary has produced species never taken on Pine Creek. An extensive collection was made at Calgary, and some fifty miles further northwest, near Didsbury, throughout several seasons. But I never had a chance to look through them, though the results of the small portion I did examine were tantalizing. My "List" was quite correctly entitled "Preliminary."

584. *Hemaris thysbe* Fabr. var. *cimbiciformis* Steph.—A specimen taken at sallow blossoms at Edmonton on May 13th, 1910, is now in my collection. I recorded the specimen as *ruficaudis* Kirby in Mr. Gibson's "Record" for 1910. I now follow Messrs. Barnes and McDunnough's treatment of the forms in their List of Sphingidæ, Psyche, XVII, p. 200, Oct. 1910. They there make *thysbe*, *fuscicaudis* and *cimbiciformis* forms of one species, and state that the latter has olive markings on last abdominal segments, and anterior edge to outer brown borders of primaries entire, and not dentate as in *thysbe*, to which they refer *ruficaudis* Kirby—not recognisable from Kirby's description—as a synonym. I have exactly the same form from Field, B.C., dated July 6th, perfectly fresh, and from Chicago, June 28th and Aug. 4th. The form has the olivaceous thorax of Holland's Pl. II, fig. 5, of *thysbe*, and differs in that respect from his fig. 6 under *cimbiciformis*, of which it has the entire border. I have another Chicago specimen almost exactly like this fig. 6.

585. *Lepisesia juanita* Strk.—A male taken by the author, feeding on the wing at thistles, on the Red Deer River, 50 miles northeast of Gleichen, on July 6th, 1905, comparatively fresh. The secondaries are a bit paler, and the anal mark less distinct, but otherwise it is extremely like the *juanita* of Holland's figure. I have *clarkiæ* from Oregon, and from Duncans and Wellington, Vancouver Island. These differ in many details of shape, colour

and maculation, including the absence of the anal ocellate mark on secondaries. *Juanita* was described from Texas.

586. *Amphion nessus* Cram.—I have a single specimen from High River, from Mr. Baird, rather worn, and possibly a migrant.

587. *Sphinx luscitiosa* Clem.—A female is in my collection, taken west of Didsbury, Alta., by a Mr. C. G. Garrett.

588. *S. pinastri* Linn.—Barnes and McDunnough, in their Sphingid paper quoted above, state that Dr. Barnes has two specimens of this species, one labelled California, the other Waghorn, Alberta. Presuming the latter label to be correct, the capture was perhaps made by Mr. P. B. Gregson.

According to Smith's Monograph of Sphingidæ (Trans. Am. Ent. Soc. XV, pp. 49-241, 1888) Strecker described this species under the name *saniptri*, but subsequently referred it as synonymous with the European *pinastri*. His types were a male from "Canada," received from Mr. Reakirt, and a female taken by himself on a fence near some pine woods at Reading, Pa. Holland states that Strecker took the species at Reading on one or two occasions. It is listed by Dyar as a doubtful U. S. species. Judging from the British figures I have seen, it should not easily be confused with anything else North American.

589. *Turuptiana permaculata* Pack.—Red Deer River, northeast of Gleichen, July 1st, 1905, flying at dusk. I have four specimens, exactly like Holland's figure. It did not appear to be by any means rare, and indeed I was assured by local residents who professed to recognize it that it was sometimes very abundant, and I have been given the same report from the Lethbridge district, though, of course, such records are not authentic. I have certainly received and named the species from other points in the western provinces, but cannot at present find the references.

590. *Diachrisia virginica* Fabr.—Edmonton, June 3rd, 1910. (F. S. Carr.)

591. *Euchætias oregonensis* Stretch.—Didsbury, June 27th, 1907. (C. G. Garrett.) A single male is in my collection, agreeing with Holland's figure, and with the description given in Hampson and in Neumœgen and Dyar's "Bombyces."

592. *Panthea virginaria* Grt.—Dr. Barnes told me several years ago that Grote's *Biston virginarius* (No. 3866, Dyar Cat.)

was a *Panthea* allied to *gigantea*. I recently examined the type in the British Museum, and that is evidently correct. It comes from Shasta Soda Springs, California (Hamps. Cat., XIII, 370, pl. CCXXXIV, fig. 10). Mr. Sanson has taken two specimens of a *Panthea* at Banff, a female on July 16th, 1906, on Sulphur Mountain, and a male on June 1st, 1910. I have examined both of these, the former in Smith's collection, and recorded them, apparently wrongly, as rather dark *portlandia* in the "Record" for 1910. I have in my collection a similar female which I took on a station light at Field, B. C., on July 16th, 1907, and this I have compared with Grote's type of *virginaria*, and consider it the same, though it has heavier cross lines. I did not feel confident as to the distinctness of the *gigantea* of the British Museum. I have not seen Grote's description of *portlandia*, but have a Wellington, V. I., specimen agreeing with Holland's figure, and with that in Smith and Dyar's "Monograph of Acronycta," where the habitat given is the northern Pacific coast, from Oregon to Vancouver Island.

593. *Acronycta dactylina* Grt.—I have four males taken here from July 5th to 17th, in 1901, '04, and '09. Two of these were included in my original notes under *canadensis*. The female is from High River, from Mr. Baird. They are a trifle bluer grey than eastern specimens, one of which, from Lowell, Mass., I have compared with Grote's type from New York, but they appear to be the same species. *Hesperida* Smith was described from two males and six females from California; Seattle and Tacoma, Washington; Nanaimo and Vancouver. I have seen three specimens labelled "type," one of which is labelled "Victoria, B. C.," which is presumably intended by "Vancouver" in the description. I consider it a dark variation of *dactylina*, all wings, including even the secondaries in the male, being more suffused with brown than those from east of the Rockies. The dark secondaries, as I have elsewhere pointed out, are a feature common to many B. C. forms. Smith adds that "the dagger mark opposite the anal angle is entirely absent." It is present in two out of my six B. C. specimens, and, moreover, it is sometimes absent from eastern *dactylina*. Hampson figures as *hesperida* a female from Aweme, Man., but it is not typical. I have specimens from Miniota, Cartwright, and Winnipeg, and they are like the local form.

594. *A. felina* Grt.?—I have a single male taken at the head of Pine Creek on June 20th, 1895, being one of those four specimens originally treated by me under *canadensis*, which I have compared with a male type of *felina* from the Sierra Nevada in the British Museum. This type is well figured on Plate CXXVI, fig. 3, of Hampson's Catalogue, but the figure is too brown. My specimen differs in a few minor details, but appears to be the same species. There is a female type of *felina* from the same locality in the Henry Edwards collection, which did not satisfy me as being the same species as that in the British Museum, but this comparison was from memory only. It seemed to me nearer *cyanescens* Hampson, from Vancouver, but paler. At any rate the two are close allies, and *metra* Smith, from Seattle, Wash., and Colorado, is doubtfully distinct from *cyanescens*. The *felina* of the British Museum is not like that figured in Smith and Dyar's Monograph.

595. *Arsilonche henrici* Grt.—Two specimens, June 17th, 1906, and June 5th, 1910. They are much darker and more streaky than my specimens from the east and are irrorate with smoky. The species appears to have a wide range of variation. The type of *henrici* is very streaky and grey, that of *evanidum* being rather even and not grey. Both are in the British Museum and appear to be from New York. *Fumosum* Morr., of which the type is in the Tepper collection, is called "ab. 1" by Hampson, almost entirely suffused with slate-grey." Sir George Hampson keeps *henrici* distinct from the European *albovenosa* as being darker brown and having blunter apices to the primaries. My own notes say, concerning the British Museum series: "All are much more even and less powdery than a series of *albovenosa* here." Some European students, including Tutt, have claimed to have found them identical. As regards my series from each continent, the differences in wing form certainly do not hold, and the contrast between the pale veins and the ochreous or brown interspaces is greatest, as a rule, in North American specimens. My Calgary examples, which seem to be about typical *henrici*, agree very closely in colour with a Bavarian specimen sent me by Bang Haas as ab. *albida* Auriv., but have more dark interspaceal shades. I neither possess, nor have I seen, any specimens which cause me to consider *albovenosa* and *henrici* strictly synonymous, though the relationship

is certainly very close indeed. Grote's note under *henrici* in his 1895 List—"an spec. europ.?"—is apparently intended to apply to "aberr. *fumosum* Morr." only.

596. *Merolonche lupini* Grt.—Three specimens taken at Banff. Two of them dated June 6th and 12th, 1910 (Sanson).

597. *Bryophila avirida* Smith.—(Journ. N.Y. Ent. Soc., XIV, p. 10, March, 1906).—Described from four specimens. The male type is from Cartwright, Man., and the female from Ft. Collins, Colo. I took several specimens on the Red Deer River on July 6th and 7th, 1905, and have a good series from Miniota and Cartwright, Man., dated from June 14th to July 8th. Mine were beaten from bushes in the daytime. As described it is darker and more obscurely marked than *lepidula*. It is also stated to have "all the green shading eliminated." Hampson mentions no green, and yet, to my eye, an olivaceous green tinge is evident both in the types and in every one of my series of thirteen specimens, and in some from Miniota it is very pronounced. Hampson, besides specimens from Manitoba and Alberta, lists a female from New York. The type of *lepidula* is catalogued as from Missouri, and has most of the pale areas pale green. A Columbus, Ohio, female in Smith's collection, seemed to me about intermediate, as, indeed, are some of my Miniota specimens. From what I have observed I feel bound to look upon the form as a variation of *lepidula*.

598. *Senta defecta* Grt.—Two at light at head of Pine Creek on August 15th and September 3rd, 1904. A third bred in August, 1905, from larva found in stem of a reed-like grass known locally as "red-top" in a slough on the prairie near Gleichen a few weeks previously. A number of larvæ were secured, the stems being cut off above and below them and placed upright in wet sand, but all the rest died. I have compared one of the specimens with the type, catalogued as merely from "U. S. A."

599. *Luperina extensa* Smith.—(Journ. N. Y. Ent. Soc., XIII, 203, Dec., 1905).—Type a male from Regina, Sask. Syn. *Perigea flavistriga* Smith (id. p. 204). Type a female from Lethbridge, Alta. The descriptions were made from single specimens, both taken by Mr. T. N. Willing. The synonymy has been published by Smith himself. I have a female taken at treacle by myself at

the Red Deer River locality—now known by the name of an adjacent post office, Dorothy—on July 23rd, 1907, which I have compared with both types in Smith's collection. In that collection also are a pair from Bozeman, Montana, Aug., 1908, and a female from Westbourne, Man., Aug. 3rd, 1908, from Mr. J. B. Wallis. Sir George Hampson gives figures from coloured drawings sent him of both types. That of *flavistriga* is most like my specimen, but shorter winged. That of *extensa* is in accordance with my notes on that type, which is browner than any of the rest I have seen, though when I saw it it was greasy and probably discoloured.

600. *Hadena castanea* Grt.—This name stands wrongly in our lists as a synonym of *pluviosa*. The type of the latter is in the British Museum and is a very badly worn specimen from Vancouver Island. It is, as Hampson lists it, the species well known as *arctica* Bdv., which I believe was described from Labrador. A type of *castanea* is in the British Museum from California, and, according to Smith's Catalogue, there is another in the Tepper collection. That of *cymosa* from Washington Territory is in the British Museum also, and is the same as the type of *castanea* there, and distinct from *arctica*. *Castanea* is sienna brown, and *cymosa* fuscous brown, whilst the "ab. 1" of Hampson is a variegated form with pale shades in the subterminal area. *Castanea* occurs on Vancouver Island, often apparently in considerable numbers. *Arctica* occurs there also, but less commonly. Whilst I think it improbable that the two are one species, the variegated form of *castanea* sometimes resembles *arctica* so very closely as to make separation a matter of the very greatest difficulty, if not occasionally impossible.

In the Kootenai List Dr. Dyar records under *pluviosa* three specimens from Banff, Alta., July 21st, Aug. 11th and Sept. 10th, 1904, adding: "Apparently distinct from *arctica* Bdv., but very close to it." I did not see the specimens when at Washington, but must assume that he took the variegated form of *castanea*, and therefore so record it. I have not found the species amongst specimens sent me from time to time by Mr. Sanson.

601. *H. loda* Strk., syn. *albiserrata* Sm. Mr. Sanson has taken two males of this species at light at Banff, on Sept. 2nd, 1908, and

Sept. 16th, 1910. I have published a note on this species in Ent. News XXIV, 356, Oct. 1913.

602. *H. maida* Dyar.—(Can. Ent., XXXVI, 30, Feb. 1904.)—Two females at Banff, Sept. 22nd, 1910 (Sanson). Described from Kaslo.

[168a. *H. illustra* Smith.—(Ann. N. Y. Acad. Sci., XVIII, 114, 1908.)—Described from a single female taken at High River by Mr. Baird. I have an unusually black, uniform female of *commoda* taken here, which I have compared with it, and labelled as undoubtedly identical. I should have referred to the form under that heading.]

(To be continued.)

NEW SOUTH AMERICAN MEMBRACIDÆ.

BY W. D. FUNKHOUSER, ITHACA, N. Y.

(Continued from p. 363.)

7. Ennya pulchella, sp. nov. (Pl. XXIV, fig. 7).

A very remarkable and beautiful little species, apparently quite different from any hitherto described, although it may be somewhat near *E. rufipes* Fairm., a species which I have never seen. Superficially it much resembles a small, deeply-ridged *Telamona*. It should be easily recognized by the characteristic dorsal crest and the two bright nile-green spots on each side.

Golden brown with green spots. Pronotum extended dorsally into a thin squarish crest, slightly step-like posteriorly. Entire dorsal surface deeply ridged and punctate. Head yellowish; much broader than long, finely punctate, apex rectangular; ocelli transparent, equidistant from each other and from the eyes; eyes brown. Pronotum deeply and roughly punctate: light green in front, brown on dorsal and lateral surfaces, except for two bright green spots on each side near lateral margin; high, thin, squarish crest above and somewhat behind lateral angles, anterior margin sloping, posterior margin with angle near base of declivity, marked on each side with three perpendicular ridges, the first short, the second long and slightly curved, the third bifurcate at the tip; lateral surfaces of pronotum with four prominent ridges on each side, and two bright green spots, the first extending from the mar-

gin to the second ridge, the other extending from the margin to the third ridge; humeral angles greatly produced, triangular; posterior process gradually acute, sharply depressed at apex, extending just to the tip of the tegmina. Tegmina more than half covered by the pronotum, brown and punctate on its dorsal two-thirds, apical third hyaline, extreme tip black. Legs and under surface of body concolorous yellow brown.

Type.—Female.

Length 6 mm.; width at humeral angles 4 mm.

Locality.—Peru.

Described from one specimen.

8. **Antonea nodosa,** sp. nov. (Fig. 8).

Clear, shining lemon-yellow throughout, with tiny black spots on head, legs and abdomen. Pronotum swollen into large globular nodules and terminating in a sharp spine. Entire pronotum more or less translucent in dried specimens. Near *A. flaccida* Fairmaire, but smaller and differing in number of nodules and in colour.

Head smooth, yellow; a deep longitudinal depression laterad of each ocellus; ocelli yellow with orange border, much closer to each other than to the eyes; eyes very large, black with orange border; small black spot just below each eye. Prothorax smooth, shining, with six globular swellings set off from each other by punctate depressions. These swellings are located as follows: One above the head on each side, very large, bearing short, sharp horn and many long bristly hairs; one in middle of dorsum just behind these two bearing a few scattered hairs; one on each side below this middle bulb, smooth; one just before posterior process very large and almost spherical. Posterior process long and sharp, extending to a point half way between internal angle and tip of tegmina. Tegmina perfectly hyaline throughout; veins yellow and prominent. Abdomen yellow; second segment with black spot on each side. Legs yellow; a black spot at tip and a black ring near the base of each tibiæ and at the base of each femur; tarsi yellow; claws flavous.

Type.—Female.

Length 7 mm.; width between extremities of horns 4 mm.

Locality.—Bolivia.

Described from three females and two males. The males are neither smaller nor darker than the females.

Subfamily *HOPLOPHORINÆ.*

9. **Aconophoroides rectispina,** sp. nov. (Fig. 9).

This species suggests at once an *Aconophora*, but the very short hind tarsi removes it from the subfamily to which that genus belongs. It may be recognized by the erect pronotal process, black with yellow tip. The four apical cells of the hind wing are characteristic of the genus.

Yellow, deeply and coarsely punctured with black; pronotal horn straight and nearly upright, black, tip yellow. Head rough, striated, wider than long; clypeus short, inflexed, with median translucent ridge; ocelli transparent, nearer to each other than to the eyes, a black spot under each; eyes prominent and brown. Pronotum coarsely punctured, not pubescent; dorsal horn projecting upward and slightly forward, anterior and posterior margins flattened, black, except at tip, which is smooth and yellow; humeral angles obtusely prominent; posterior process long, narrow, lightly punctured, slightly pilose, extending far beyond abdomen and almost reaching tips of tegmina. Tegmina yellow, subhyaline, much wrinkled between veins; veins brownish and slightly raised. Legs and under surface of the body ferruginous. First and second pairs of tarsi very long and black; hind tarsi short and yellow.

Type.—Female.

Length 10 mm.; width 4.8 mm.

Locality.—Bolivia.

10. **Aconophoroides projecta,** sp. nov. (Fig. 10).

Superficially recalling a large *Aconophora*, but, like the preceding species, easily distinguished by the very short posterior tarsi and the four apical areas of the hind wings.

Uniform ferruginous brown; pronotal horn short, sharp and projecting forward; thickly covered witn more or less obsolete longitudinal carinæ and densely punctate. Head much wider than long, rough and sculptured; clypeus short and reflexed, sparingly pilose; ocelli brown, equidistant from each other and from the

eyes; eyes very prominent, round and black. Pronotum densely and roughly punctured and lightly ridged with faint percurrent median carina and bearing short porrect horn; this horn sharp, subconical, anterior and posterior margins flattened, three or more longitudinal ridges on each side, the middle one sharp and distinct; posterior process long and narrow, gradually acuminate, slightly depressed, extending just to tips of tegmina; humeral angles obtuse, not prominent. Tegmina brown and wrinkled, veins broad and distinct, base and costal area slightly punctate, apical border blackish. Under surface of body black-brown. Legs thick, strong, concolorous ferruginous, slightly pilose; hind tibiæ broadly spatulate; hind tarsi very short.

Type.—Female.

Length 10 mm., cum corn. 13 mm., width 5 mm.

Locality.—Bartica, British Guiana.

Collected Feb. 15, 1913, by Mr. H. S. Parish.

Subfamily *TRAGOPINÆ*.

11. **Tragopa luteimaculata** sp. nov. (Fig. 11).

Near *T. humeralis* Fairm., but much smaller and differing in colour and in the markings of the prothorax. Easily recognised by the fourteen bright yellow spots which stand out in striking contrast to the beautiful shining black-brown pronotum.

Nearly twice as long as wide; black-brown with yellow spots; humeral angles rounded; posterior process acute. Head twice as wide as long; smooth, deep brown with median longitudinal yellow stripe starting between the ocelli and extending to the clypeus; ocelli white, farther from each other than from the eyes; eyes black, narrowly bordered with yellow. Pronotum black-brown; very finely punctured, not pubescent; gradually sloping above head; marked on each side with seven irregular yellow spots, each spot faintly bordered with crimson. These spots are arranged on each side as follows: one between humeral angle and eye; one behind humeral angle; two on lateral margin; two in middle of dorsum nearly touching median line; one very large spot covering entire posterior apex. Posterior process subacute, reaching beyond tips of tegmina. Tegmina black and opaque, more than

half concealed by the pronotum; apical limbus very broad and corrugated. Abdomen black; legs yellow.

Type.—Female.

Length 3.4 mm.; width between humeral angles 2.2 mm.

Locality.—Peru.

12. **Tragopa decorata** sp. nov. (Figs. 12 and 13).

About the size of the preceding. Apparently near *T. fulvovaria* Fairm., in its decorations; but smaller, not black, and without the large posterior spot of Fairmaire's species. The head shows no markings.

Decidedly longer than wide; beautiful rich chocolate brown shading to light brown on shoulders and head; decorated with numerous irregular yellow dots and bars bordered with dark brown. Head slightly wider than long; uniform light brown; front convex; ocelli yellow, farther from each other than from the eyes; eyes black bordered with yellow. Pronotum chocolate brown, shining, very finely and faintly punctured; humeral angles rounding; apex obtuse; a crescent-shaped row of yellow dots connecting the humeral angles, these dots joined together near shoulders to make a short stripe; behind this row a transverse area filled with very small dots which in the same manner join to form a stripe at the margin; apex concolorous yellow-brown. These dots and fascia are bordered by bands of dark brown and are not symmetrically arranged bilaterally. Tegmina very dark brown, opaque, more than half covered by the pronotum, border wide and wrinkled. Legs and undersurface of body yellow. Tarsi and tips of tibiæ fuscous-brown.

Type.—Female.

Length 3.6 mm.; width 2.4 mm.

Locality.—Bolivia.

The fore-wings of the genus *Tragopa* are most peculiar and are entirely different from the wings of other Membracidæ. The wing of *T. decorata* figured is a good example of this interesting wing structure and is remarkable not only for the venation but also for the broad, corrugated limbus.

Explanation of Plate XXIV.

Fig. 1. *Tropidoscyta brunneidorsata*, sp. nov.

Fig. 2. *Tropidoscyta binotata*, sp. nov.

Fig. 3. *Tropidoscyta maculata*, sp. nov.

Fig. 4. *Bolbonota lutea*, sp. nov.

Fig. 5. *Bolbonota nigrata*, sp. nov.

Fig. 6. *Metheisa sinuata*, sp. nov.

Fig. 7. *Enna pulchella*, sp. nov.

Fig. 8. *Antonea nodosa*, sp. nov.

Fig. 9. *Aconophoroides rectispina*, sp. nov.

Fig. 10. *Aconophoroides projecta*, sp, nov.

Fig. 11. *Tragopa luteimaculata*, sp. nov. Dorsal view.

Fig. 12. *Tragopa decorata*, sp. nov. Dorsal view.

Fig. 13. Fore-wing of *Tragopa decorata*.

MR. LYMAN'S COLLECTIONS.

The late Mr. Henry H. Lyman, a former President of the Entomological Society of Ontario, of whom a portrait and obituary notice were given in the July number of this magazine, left an estate valued at $1,268,315. By the terms of his will his entomological collections and library are left to McGill University, together with the sum of $40,000 for their preservation and augmentation. He added: "It is my desire that so long as there may be maintained in Montreal an active Branch of the Entomological Society of Ontario, the President and Secretary of such Branch should be associated with the Professor of Zoology." It is stated that the University has accepted the legacy on these terms.

Mailed November 10th, 1914.