NOTES ON INSECTS OF THE ORDER STREPSIPTERA, WITH DESCRIPTIONS OF NEW SPECIES.

By W. Dwight Pierce,
Of the Bureau of Entomology, U. S. Department of Agriculture.

INTRODUCTION.

The appearance of a considerable number of publications on the order Strepsiptera since the publication of the Monographic Revision in Bulletin 66 of the U. S. National Museum, calls forth this summary of the recent additions to our knowledge of the group. A number of corrections to the preceding paper must be noted and a considerable number of new or unpublished records are here to be added. In view of the approaching publication of the Genera Insectorum on this group a number of new species are here added. No attempt will be made at this time to indicate generic changes or arrangement, as these matters will all receive due attention in the forthcoming paper.

Special assistance in making the corrections to Bulletin 66 has been received from Mr. Karl Hofeneder of Innsbruck, Austria, and Prof. T. D. A. Cockerell of Boulder, Colorado. Material has been received from the former and also from H. L. Adams (Pennsylvania), W. L. McAtee (District of Columbia), J. D. Mitchell (Texas), V. I. Safro (Louisiana), Prof. L. Bruner (Nebraska), Charles Robertson (Illinois), Prof. Henry Comstock (New York), Dr. E. D. Ball (Utah), William Cockle (British Columbia), Dr. E. Zavattari (Italy), E. E. Green (Ceylon), and Lt. Col. C. G. Nurse (England). Considerable material has also been found in the collections of the U. S. National Museum. Determinations of the host insects have very kindly been made by Messrs. Cockerell, Crawford, Heidemann, Robertson, Rohwer, and Viereck.

BIOLOGY.

ACTUAL RELATIONSHIP OF PARASITE TO HOST.

POLISTES METRICUS Say.

Wheeler (1910*b*) records studies of 1,000 wasps collected at Colebrook, Connecticut, in August. On these wasps the following data were obtained, as tabulated:

137 male wasps;	112 unparasitized,	25 parasitized.
863 female wasps;	637 unparasitized,	226 parasitized.
1,000 wasps;	749 unparasitized,	251 parasitized.

13.7 per cent of the wasps were males, 86.3 per cent females.
9.9 per cent of the parasitized wasps were males, 90.1 per cent females.
81.7 per cent of the male wasps were unparasitized, 18.3 per cent parasitized.
73.8 per cent of the female wasps were unparasitized, 26.2 per cent parasitized.
74.9 per cent of all the wasps were unparasitized, 25.1 per cent parasitized.

The 251 parasitized wasps contained 443 male, 119 female = 562 parasites.

78.8 per cent of the parasites were males.
21.2 per cent of the parasites were females.

POLISTES VARIATUS Cresson.

Between November 20 and 30, 1909, W. L. McAtee collected all the wasps which came into his room on Church's Island, North Carolina. These wasps were 61 in number, and the data obtained from them can be tabulated as follows:

61 female wasps; 29 unparasitized, 32 parasitized.
0.0 per cent of the wasps were males, 100 per cent females.
0.0 per cent of the parasitized wasps were males, 100 per cent females.
47.5 per cent of the female wasps were unparasitized, 52.5 per cent parasitized.

The following data give more specifically the extent of parasitism found in these wasps, bringing out the percentage of the sexes of the parasites and their relations to each other:

1 wasp with 2 male parasites	= 2 parasites.
5 wasps with 1 male parasite	= 5 parasites.
6 wasps with	7 male parasites.

4 wasps with 3 female parasites	=12 parasites.
4 wasps with 2 female parasites	= 8 parasites.
6 wasps with 1 female parasite	= 6 parasites.
14 wasps with	26 female parasites.

1 wasp with 3 male, 1 female (4) parasites	= 3 male,	1 female	= 4 parasites.
1 wasp with 2 male, 2 female (4) parasites	= 2 male,	2 female	= 4 parasites.
1 wasp with 1 male, 3 female (4) parasites	= 1 male,	3 female	= 4 parasites.
3 wasps with 1 male, 2 female (3) parasites	= 3 male,	6 female	= 9 parasites.
6 wasps with 1 male, 1 female (2) parasites	= 6 male,	6 female	=12 parasites.
12 wasps with	15 male,	18 female	=33 parasites.

Summarizing this I find: 32 wasps with 22 male, 44 female = 66 parasites.

33.3 per cent of the parasites are males.
66.7 per cent of the parasites are females.

The location of the parasites may be summarized as follows:

15 males protruding from the third segment, dorsal
1 male protruding from the third segment, ventral } total, 16.
4 males protruding from the fourth segment, dorsal
3 males protruding from the fourth segment, ventral } total, 7.
2 females protruding from the third segment, dorsal, total, 2.
17 females protruding from the fourth segment, dorsal, total, 17.
23 females protruding from the fifth segment, dorsal
1 female protruding from the fifth segment ventral } total, 24.

The wasps were collected between November 20 and 30 and shipped to Dallas, Texas. Twenty-three wasps arrived dead, of which

9 were unparasitized.
7 contained one parasite.
1 contained two parasites.
4 contained three parasites.
2 contained four parasites.

Nine of the dead wasps contained empty male puparia, but none of them contained living male puparia.

The living wasps were fed sugared water. Of the 20 living unparasitized wasps only 6 lived until April 6, 1910, and the average length of life in captivity was 99 days. The parasitized wasps lived as follows:

1 wasp	with 3 females, 1 male exuvium	, lived	9 days.
3 wasps	with 1 female, 1 male exuvium	each, averaged	9 days.
1 wasp	with 1 male exuvium	, lived	11 days.
3 wasps	with 1 female, 1 male pupa	each, averaged	17 days.
4 wasps	with 2 females	each, averaged	26 days.
3 wasps	with 3 females	each, averaged	39 days.
2 wasps	with 1 female	each, averaged	62 days.
1 wasp	with 1 male pupa	, lived	84 days.

The maximum record was one wasp with 1 female, 125 days.

EFFECTS OF PARASITISM ON HOST.

In connection with the deformity of *Leionotus annulatus* (Bull. 66, p. 31) caused by parasitism it is interesting to note the occurrence of similar phenomena in *Polistes metricus* without the apparent intervention of parasitism (Wheeler, 1910, p. 389).

Wheeler (1910) finds very few external alterations in parasitized *Polistes metricus*.

On page 34 of Bulletin 66 several records of copulation of parasitized hosts are presented. To these Robertson (1910) has added the observation of copulation of two stylopized *Andrena salictaria* Robertson, of a parasitized female *Parandrena andrenoides* Cresson, and of a parasitized male *Pseudopanurgus rudbeckiae* Roberston.

The list of Andrenidæ occasionally lacking the second transverse cubital vein (Bull. 66, p. 35) should have been credited to Robertson, with but one exception. Robertson (1910) lists 18 species of Andrena, and 17 other species of Hymenoptera in which this abnormality is known to occur and states that he does not think the absence of this vein indicates parasitism or is a result of it. The list was presented in the Bulletin because it suggested some connection, and, in fact, the matter is still an open question.

BIOLOGY OF THE PARASITE.

TRIOZOCERA TEXANA Pierce.

The occurrence of this species at light at Victoria, Texas, July 4, 1908, is of interest.

MYRMECOLAX NIETNERI Westwood.

The male referred to by Green (1902) as *Elenchus tenuicornis* (see Bull. 66, p. 57) has been kindly loaned to the writer and identified as above. The slide bears the following data: "Caught at light, March, 1902, Yatujantota, Ceylon."

XENOS, species.

The proportion of sexes and location of the parasites found in the *Polistes variatus*, collected by W. L. McAtee at Church's Island, North Carolina, are discussed on another page. One observation, however, is of considerable importance. Three wasps were found hibernating with male pupæ, which probably only died because the hosts died. It is not known to the writer that hibernating male pupæ have ever before been found in *Polistes*.

INTERNAL STRUCTURE.

The admirable translation into German of Nassonov's works by Sipiagin, together with the recent notes on the same by Hofeneder (1910*c*), have placed this valuable series of papers on the internal structure of the Strepsiptera in a far more available form, especially for American students.

Correction: On page 60, Bulletin 66, next to last line, *Aecilius* was incorrectly spelled *Acilius*.

We find in Hofeneder's (1910*b*) description of the female *Stichotrema dallatorreanum*, a very peculiar arrangement of genital canals, which are described as being in three rows of 12 to 14 canals each.

Mr. Karl Strohm (1910) has pointed out that eyes of *Xenos* (*rossii*) *vesparum* are "ocelläre Komplexaugen," meaning that the lenses are continuous, but are interrupted on the surface by partitions.

DESCRIPTIONS OF STREPSIPTERA.

Correction: On page 84, Bulletin 66, the sentence on the second line reading "Alimentation probably osmotic," should be omitted.

Superfamily MENGEOIDEA Pierce.

Family MENGEIDÆ Pierce.

Genus TRIOZOCERA, emendation.

Trioxocera PIERCE, 1910 (typographical error).

By an inadvertent following of an error in a preceding paper (Pierce, 1908) the generic name *Triozocera* was spelled *Trioxocera*. Application has been made to the International Rules Committee for permission to amend the spelling to its proper form.

The genus contains two species.

KEY TO SPECIES—MALES.

Oedeagus very slender, sinuate; medius with two superior branches. 1. *mexicana* Pierce.
Oedeagus stouter, almost straight in basal two-thirds; medius with one superior branch..... 2. *texana*, new species.

TRIOZOCERA TEXANA, new species.

Described from one specimen collected by Mr. J. D. Mitchell at light, July 4, 1908, at Victoria, Texas.

Male.—Length, 2.2 mm.; wing expanse, 5 mm.; brown; wings clouded, veins dark and distinct. Head transverse; eyes prominent, normal; antennæ (missing in type). Wings with seven primary veins from base; the first two (costa +subcosta) strong, united, bracing the margin to beyond its middle; parallel to this and very close to it is the third (radius), which is much lighter, wavy, and not as long as the first two; about opposite the tips of the subcosta a short wavy line appears, which is evidently an interrupted continuation of the radius; the fourth primary (medius) arises contiguous to the radius but diverges rapidly; between the bases of these two veins is a short darkened area; the medius extends three-fourths of the distance to the margin of the wing, at about the middle of the wing there arises a strong branch detached from the main vein, which extends to the margin of the wing; behind the medius and somewhat nearer its base arises another strong branch, also detached at its base and extending to the margin of the wing; the fifth primary (cubitus) diverges from medius at the same angle as medius diverges from radius, and extends as a strong vein to the outer margin; the sixth vein (first anal) is halfway between the cubitus and second anal and very strong, but reaching only a little way beyond the middle of the wing; the seventh primary (second anal) is also strong and reaches the outer margin; in the region of the third anal there is a very broad infuscation which might possibly stand for that vein. Anterior and median coxæ transverse; trochanters arising at the sides, stout, almost as long as the femora; posterior coxæ prominent, conical; trochanters stout, clavate, one-half as long as femora; tibiæ all slightly shorter than femora; tarsi five-jointed, first joint two-thirds as long as the tibia, second almost half as long as first; third slightly shorter; fourth one-half as long, broadened at apex and cupped for reception of fifth; fifth slender, two-thirds as long as third and armed with two claws. Oedeagus long and slender, barely sinuate, acute at tip.

Type.—Cat. No. 13713, U.S.N.M.

Family MENGENILLIDÆ Hofeneder (1910*a*).

Type genus.—*Mengenilla* Hofeneder (1910*a*).

Antennæ six-jointed, with the third, fourth, and fifth joints laterally produced, and the sixth elongate; tarsi five-jointed.

Genus MENGENILLA Hofeneder (1910*a*).

Type of genus.—*M. chobautii* Hofeneder (1910*a*).

Name based on the generic name *Mengea*.

The habits of the genus are not known, and it is at present restricted to North Africa.

MENGENILLA CHOBAUTII Hofeneder (1910a).

Described from a male collected in Ain Sefra, Algeria, in 1896, in the collection of Dr. A. Chobaut, in whose possession it remains as type.

Male.—Length 4.5 mm., breadth between tips of expanded wings 6.5–7 mm. Color light brown, head darker; abdomen and legs light golden, wings milky, with the strongest veins brownish. Head approximately twice as wide as long; dorsally emarginate at base. Mandibles moderately long, acute. Maxillæ two-jointed, slender. Antennæ sensitive, pubescent, six-jointed, the first two joints goblet-form; third, fourth, and fifth laterally produced, lamellate; sixth elongate, lamellate. Eyes ellipsoidal, prominent, with about fifty ommatidia. Prothorax short. Mesothorax longer but shorter on the median line, and wider at the sides. Metathorax elongate, with præscutum more or less quadrate, causing emargination of mesothorax; scuti about twice as long as wide; scutellum ogival, elongate; postlumbium almost as long on middle line as it is wide at base; postscutellum broad, hardly more than twice as long as wide, rounded at apex, deeply emarginate at base of postlumbium. Elytra normal, pubescent. Wings normal. Anterior and middle trochanters elongate, posterior shorter; femora stout, cylindrical; tibiæ more slender; tarsi five-jointed, with two large claws. Œdeagus at base very large, but rapidly diminishing to a point, gently sinuate, but not angulate.

Superfamily XENOIDEA Pierce.

Family MYRMECOLACIDÆ Pierce.

Genus MYRMECOLAX Westwood.

MYRMECOLAX NIETNERI Westwood.

Elenchus tenuicornis GREEN (1902).

There is practically no doubt in my mind but that Mr. Green's Peradeniya (Ceylon) specimen is identical with the original Ramboddo (Ceylon) species described by Westwood. As this rare insect belongs to the collection of Mr. Green a full description will be presented in the forthcoming generic revision, with a colored illustration.

Family STYLOPIDÆ Kirby.

Genus STYLOPS Kirby.

The genus *Stylops* still contains mainly species described from females. In addition to the species described herewith the writer has just received a number of other species which must be treated later. The host genus *Andrena* is an immense complex which has been divided into many subgenera or species groups. It seems to

be a matter of considerable difficulty to secure a satisfactory arrangement of the species. The females of *Stylops* show also many small groups, and it is probable that when we know the males we will be able to more definitely arrange them. It is, however, of interest to note the coordination of the parasite and host classifications. *Pterandrena asteris* and *P. solidaginis* are grouped together, and so may their parasites *Stylops asteridis* and *S. swenki* be grouped. The same is true of *Andrena solidula* and *A. vicina* and their parasites *S. solidulæ* and *S. vicinæ;* of *A. multiplicata* and *A. nivalis* and their parasites *S. multiplicatæ* and *S. grænicheri;* of *A. sparsipilosa* and *A. subcandida* and their parasites *S. sparsipilosæ* and *S. subcandidæ.*

In the following table the species known to the writer are arranged according to their relative forms as nearly as is possible.

The first column of figures represents the ratio of the breadth of the cephalothorax between the spiracles to the distance between the mandibles; the second represents the ratio of the breadth of the head to the distance between the mandibles; the third the ratio of the breadth between the spiracles to the breadth of the head; the fourth the ratio of the breadth between the spiracles to the distance from spiracles to apex.

Stylops species.	Andrena species.	Cephalothorax to mandibles : :—: 1.	Head to mandibles : :—: 1.	Cephalothorax to head : :—: 1.	Breadth to length : :—: 1.
advarians	*advarians*	6.06	3.46	1.75	1.41
hartfordensis	*hartfordensis*	6.14	3.90	1.57	1.40
asteridis	*asteris*	6.23	4.84	1.28	1.35
swenki	*solidaginis*	6.27	3.93	1.59	1.65
hippotes	*hippotes*	6.28	4.00	1.77	1.77
bipunctatæ	*bipunctata*	6.45	3.90	1.65	1.37
solidulæ	*solidula*	6.61	3.66	1.80	1.32
vicinæ	*vicina*	6.68	3.81	1.75	1.40
bruneri	*illinoiensis*	6.63	4.84	1.36	1.79
viereckі	*texana*	6.75	4.16	1.62	1.50
salicifloris	*salicifloris*	7.00	4.35	1.60	1.42
polemonii	*polemonii*	7.00	3.91	1.66	1.32
multiplicatæ	*multiplicata*	7.12	4.08	1.74	1.52
grænicheri	*nivalis*	7.12	4.34	1.88	1.56
crawfordi	*crawfordi*	7.13	3.93	1.81	1.55
cressoni	*cressoni*	7.16	3.87	1.84	1.53
sparsipilosæ	*sparsipilosa*	7.30	4.40	1.65	1.53
subcandidæ	*subcandida*	7.30	4.50	1.62	1.58
nubeculæ	*nubecula*	7.41	4.00	1.85	1.57
cornii	*commoda*	7.50–7.66	4.07–4.60	1.66–1.84	1.34–1.35
californica	*subtilis*	7.58	4.83	1.56	1.51
nudæ	*nuda*	7.50	4.00	1.87	1.34
imitatrix	*imitatrix*	7.63	4.45	1.71	1.55
claytoniæ	*claytoniæ*	7.70	4.50	1.71	1.49
nasoni	*nasoni*	7.77	4.33	1.78	1.45
andrenoides	*andrenoides*	8.35	4.35	1.91	1.34
mandibularis	*mandibularis*	9.10	5.90	1.54	1.51
oklahomæ	*flavoclypeata*	9.57	5.52	1.73	1.43

STYLOPS ANDRENOIDES, new species.

Host.—Andrena andrenoides Cresson (det. Robertson), Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.69 mm., breadth at spiracles 0.69 mm., breadth at base of head 0.39 mm., distance between

mandibles 0.09 mm. Cephalothorax orange yellow, with disk lighter, and with a dark brown band behind the spiracles; cephalothorax as long as broad, rather narrowly truncate at apex, truncation less than one-third the breadth at the spiracles. Lateral margin almost straight from spiracles to apical truncation. Mandibles obtusely rounded, with a small blunt tooth at apex. Spiracles visible at margin but not prominent. Cephalothorax very slightly constricted behind spiracles.

Type.—Cat. No. 13689, U.S.N.M.

STYLOPS ASTERIDIS, new species.

Host.—*Andrena asteris* Robertson (det. Robertson), Carlinville, Illinois. Described from one female collected September 8 by Charles Robertson.

Female.—Length of cephalothorax, 0.76 mm., breadth at spiracles 0.79 mm., breadth at base of head 0.54 mm., distance between mandibles 0.14 mm. Cephalothorax orange yellow, lighter on disk, with brown band at base; cephalothorax almost as long as broad, truncate at apex, truncation less than one-fourth the width at the spiracles. Lateral margin slightly convex from spiracles to truncation. Mandibles obtuse, with a rather acute outwardly curved tooth on the inner apical angle. Spiracles lateral, but not prominent. Cephalothorax broader behind spiracles and then very strongly constricted.

Type.—Cat. No. 13690, U.S.N.M.

STYLOPS CLAYTONIÆ Pierce.

Stylops claytoniæ PIERCE.
Stylops imitatrix PIERCE.
Var. *S. claytoniæ viereckl* PIERCE.

Mr. Viereck considers that the host bees *Andrena claytoniæ* and *A. imitatrix* are synonymous and that he considers *A. texana* as a variety of *claytoniæ*. Following his lead the writer finds the parasites of the first sufficiently close to be considered identical, but the parasite of *texana* is quite different, as is shown by the preceding table. For this reason *vierecki* is now to be construed as a variety.

STYLOPS HARTFORDENSIS Pierce.

Mr. Viereck now considers *Andrena hartfordensis* a synonym of *A. nasoni*, but the writer has concluded that the parasites are sufficiently different to retain their specific rank.

STYLOPS MANDIBULARIS, new species.

Host.—*Andrena mandibularis* Robertson (det. Robertson), Carlinville, Illinois. Described from one female collected April 10, by Charles Robertson.

Female.—Length of cephalothorax 0.88 mm., breadth at spiracles 0.88 mm., breadth at base of head 0.52 mm., distance between mandibles 0.10 mm. Cephalothorax orange yellow, with disk lighter, and with a wide sharply marked dark brown band at base, half on the thorax and half on the abdomen, and not reaching the sides of the thorax in front of the constriction. Cephalothorax as long as broad, truncate at apex, the truncation slightly more than one-fourth the breadth at the spiracles. Lateral margin almost straight from spiracles to apex, having a slight sinuation at base of head and also just before apex. Mandibles obtusely rounded, not toothed. Cephalothorax with sides parallel for a short distance behind the spiracles and then strongly constricted. Spiracles slightly prominent on margin.

Type.—Cat. No. 13691, U.S.N.M.

STYLOPS NUDÆ, new species.

Host.—*Andrena nuda* Robertson (det. Robertson), Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.80 mm., breadth at spiracles 0.81 mm., breadth at base of head 0.42 mm., distance between mandibles 0.10 mm. Cephalothorax orange yellow, with disk lighter, and with a dark brown band at base, extending equally onto the abdomen, irregular in outline and fading out on the edges. Cephalothorax as long as broad, truncate at apex, the truncation about one-fourth the breadth at the spiracles. Lateral margin almost imperceptibly convex from spiracles to apical truncation. Mandibles small, apically toothed. Spiracles laterally prominent. Cephalothorax with sides convexly narrowed behind the spiracles to a strong constriction.

Type.—Cat. No. 13692, U.S.N.M.

STYLOPS PILIPEDIS, new species.

Host.—*Andrena pilipes* Fabricius (det. Cockerell), Pekin, China. Described from one specimen collected by M. L. Robb, April 21, 1901.

Female.—Length of cephalothorax 1.30 mm., breadth at spiracles 1.26 mm., breadth at base of head 0.83 mm., distance between mandibles 0.14 mm. Cephalothorax reddish orange, with disk lighter, and with a dark brown band at base, equally on thorax and abdomen. Cephalothorax slightly longer than broad, rounding truncate at apex, the truncation less than one-fourth the breadth at the spiracles. Lateral margin strongly convex with several very slight indentations. Mandibles obtuse, not toothed. Spiracles touching lateral margin but not prominent. Cephalothorax with sides almost parallel for a short distance behind the spiracles and then very strongly constricted.

Type.—Cat. No. 13693, U.S.N.M.

This is the largest female *Stylops* yet known to the writer.

Family XENIDÆ Semenov.

Genus HALICTOXENOS Pierce.

HALICTOXENOS GRÆNICHERI Pierce.

Correction: This specific name was wrongly spelled on page 150 of Bulletin 66, but correctly on pages 147 and 148, where it was also defined; hence the correct spelling holds and not *græincheri*.

HALICTOXENOS NYMPHÆARI, new species.

Host.—*Chloralictus nymphæarum* Robertson (det. Robertson), Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.55 mm., breadth at spiracles 0.52 mm., breadth at base of head 0.26 mm., distance between mandibles 0.07 mm. Cephalothorax yellow, with an orange brown band at base, which has its posterior margin on the abdomen semicircular. Cephalothorax longer than broad, convexly truncate at apex, constricted at base of head, and also behind spiracles. Apical truncation less than one-third the breadth at the spiracles. Lateral margin obliquely convex from spiracles to base of head, thence convex and almost parallel, rounding evenly into the convex apex. Spiracles lateral but not prominent. Mandibles small, obtuse, apically emarginate.

Type.—Cat. No. 13694, U.S.N.M.

HALICTOXENOS VIRIDULÆ, new species.

Host.—*Augochlora viridula* Smith (det. Robertson), Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.73 mm., breadth at spiracles 0.85 mm., breadth at base of head 0.33 mm., distance between mandibles 0.08 mm. Cephalothorax light yellow, with a small semielliptical brown spot at the center of the base which extends on the base of the abdomen as a broad band from one side to the other. Cephalothorax considerably wider than long, truncate at apex, constricted at base of head, strongly constricted behind spiracles. Lateral margin strongly sinuate, with the depressions at the base of the head and a little in front of the spiracles. Mandibles set obliquely, narrowed toward apex, which is squarely truncate but with a minute denticle on the inner apical angle. Spiracles marginal, but not prominent. Abdomen with five genital tubes.

Type.—Cat. No. 13695, U.S.N.M.

Genus CRAWFORDIA Pierce.

CRAWFORDIA COCKERELLI Pierce.

Host.—Panurginus boylei Cockerell (auth. Cockerell).

CRAWFORDIA LABROSI, new species.

Host.—Pseudopanurgus labrosus Robertson, Carlinville, Illinois. Described from one female collected July 3 by Charles Robertson.

Female.—Length of cephalothorax 0.47 mm., breadth at spiracles 0.48 mm., breadth at base of head 0.45 mm., distance between mandibles 0.11 mm. Cephalothorax light yellow, with anterior half of margin clouded with brown. Abdomen with a very broad dark brown band bordering the cephalothorax. Cephalothorax as long as broad, subquadrangular, very broadly truncate at apex, which is very little narrower than the width of the spiracles, strongly constricted behind spiracles. Lateral margins from spiracles almost parallel to a line through the bases of the mandibles, thence curving and regularly convex with apex. Head with sides produced almost to spiracles, mouth almost apical, mandibles broad, blunt, and armed on inner apical angle with a short curved tooth. Spiracles lateral, slightly prominent.

Type.—Cat. No. 13696, U.S.N.M.

CRAWFORDIA RUDBECKIÆ, new species.

Host.—Pseudopanurgus rudbeckiæ Robertson, Carlinville, Illinois. Described from one female collected August 29 by Charles Robertson.

Female.—Length of cephalothorax 0.49 mm., breadth at spiracles 0.51, breadth at base of head 0.49 mm., distance between mandibles 0.10. Cephalothorax light yellow, with margins tinged with orange. Abdomen with a dark band bordering thorax. Cephalothorax almost as long as broad, broadest behind spiracles, thence almost evenly convex on sides and apex, but not subquadrangular as in the preceding species, strongly constricted behind spiracles. Spiracles lateral, but not prominent. Head as in the preceding species, broad, blunt, and armed on inner apical angle.

Type.—Cat. No. 13697, U.S.N.M.

Genus XENOS Rossi.

Acroschismus PIERCE.
Schistosiphon PIERCE.

After receiving considerable new material the writer has come to the conclusion that the wing venation can not be used to separate *Xenos* and *Acroschismus*, and has therefore combined all three genera, which are parasites of *Polistes*.

XENOS AURIFERI, new species.

Host.—Polistes aurifer Saussure, Palo Alto, California. Described from one female collected in February, 1892, by W. G. Johnson, and received from Prof. Henry Comstock.

Female.—Length of cephalothorax 1.24 mm., breadth at spiracles 1.41 mm., breadth at base of head 1.08 mm., distance between mandibles 0.29 mm. Cephalothorax dark brown on basal half, light yellowish brown on apical portion, the lighter shades run back on the margins in a narrow line almost to the spiracles, and also cause a semicircular emargination of the dark area on the middle of the disk. Cephalothorax broader than long, constricted at base, margin almost perfectly convex, with only two long shallow emarginations in front of the mandibles; spiracles not reaching lateral margin; mandibles quadrate, emarginate at apex.

Type.—Cat. No. 13699, U.S.N.M.

Genus BELONOGASTECHTHRUS, new genus..

Name derived from *Belonogaster* (the host genus) + ἐχθρός (enemy), meaning a parasite of the genus *Belonogaster.*

Type of genus—B. zavattarii, new species.

The genus is restricted to parasites of *Belonogaster* and is at present confined to Africa.

Male unknown.

Female.—Based on the figure by Zavattari (1909).

Triungulinid.—Length 0.32 mm. Head large, dark, eye spot dark. Head not half as long as thorax. Coxæ large, femora and tibiæ slender, tarsus a broad one-jointed transverse pulvillus, three times as broad as the tibiæ. First eight abdominal segments normal, ninth elongate and emarginate for tenth which bears two long stylets, and the lateral lobes of the ninth bear each a more slender stylet.

BELONOGASTECHTHRUS ZAVATTARII, new species.

Host.—Belonogaster elegans Gerstaecker; Butiti, Congo Free State, collected by the expedition of Duc d'Abruzzi, and figured by E. Zavattari (1909). Triungulinids were kindly presented the writer by Doctor Zavattari.

Female.—Cephalothorax about as long as broad; sides convex, margin of head sinuate, apex lobately rounded.

Genus PSEUDOXENOS Saunders.

Leionotoxenos PIERCE.

On account of a decision by Mr. S. A. Rohwer, of the U. S. National Museum, to consider *Leionotus, Ancistrocerus,* etc., as merely species groups of *Odynerus,* as was done by Saussure, it is expedient for the present to combine the genus *Leionotoxenos* with *Pseudoxenos,* espe-

cially as females are now at hand from several of the so-called genera recognized by Ashmead. These parasites are too closely allied to warrant even subgeneric separation.

PSEUDOXENOS ARVENSIDIS, new species.

Host.—*Odynerus* (*Leionotus*) *arvensis* Saussure, Carlinville, Illinois, Described from one female collected August 2 by Charles Robertson.

Female.—Length of cephalothorax 1.16 mm., breadth 1.25 mm., breadth of head 1.05 mm., distance between mandibles 0.23 mm. Cephalothorax orange brown, the margins very dark, and the anterior half, except in front of opening of brood canal, dark; posterior half of disk lighter. Cephalothorax broader than long, constricted at base, broadest behind spiracles, thence more or less evenly convex on sides and apex, apex almost imperceptibly truncate; spiracles lateral and barely prominent; mandibles oblique, emarginate at apex with curved tooth on inner angle.

Type.—Cat. No. 13700, U.S.N.M.

PSEUDOXENOS ERYNNIDIS, new species.

Host.—*Odynerus erynnys* Lepeletier, Inverness, Florida. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 1.32 mm., breadth 1.39 mm., breadth of head 1.08 mm., distance between mandibles 0.26 mm. Cephalothorax orange brown, with apex yellow, behind which is a quadrate dark spot as wide as the opening of the brood canal, marginal area from here back darker than disk, and margin from base of head very dark to base of cephalothorax. Cephalothorax broader than long, constricted at base, broadest immediately behind the spiracles, lateral margins between base of head and spiracles not very oblique, but at base of head strongly angled and thence oblique, slightly sinuate; apex strongly convex; spiracles lateral, barely prominent; mandibles distant, very oblique, deeply emarginate at apex, forming an acute tooth on inner angle, and a rounded lobe on outer angle.

Type.—Cat. No. 13701, U.S.N.M.

This species differs considerably in form from the others so far described.

PSEUDOXENOS FORAMINATI, new species.

Host.—*Odynerus foraminatus* Saussure, Trenton, New Jersey. Described from one female collected July 5, 1907.

Female.—Length of cephalothorax 1.02 mm., breadth 1.04 mm., breadth of head 0.85 mm., distance between mandibles 0.17 mm. Cephalothorax dark brown, with part of head between mandibles yellow, and a small area at base of disk lighter brown, margins very dark, but a lighter round area indicates location of spiracles. Cephalothorax almost as long as broad, convexly narrowed to base from

widest point, which is just behind the spiracles; spiracles barely reaching lateral margin; sides convex, slightly wavy, apex narrowly truncate; mandibles oblique with a strong tooth on the inner apical angle.

Type.—Cat. No. 13702, U.S.N.M.

PSEUDOXENOS FUNDATI, new species.

Host.—*Odynerus* (*Leionotus*) *fundatus* Cresson, Carlinville, Illinois. Described from one female collected June 25, by Charles Robertson.

Female.—Length of cephalothorax 0.99 mm., breadth 1.18 mm., breadth of head 0.91 mm., distance between mandibles 0.19 mm. Cephalothorax light brown, with area in front of opening of brood canal yellowish, and posterior fourth of disk lighter, margins especially near middle very dark, but with a lighter round area indicating the location of the spiracles. Cephalothorax convex from base, evenly rounded at widest point behind spiracles; spiracles not attaining lateral margin; sides sinuately oblique to the narrowly rounded apex; mandibles oblique, with a sharp tooth on inner apical angle.

Type.—Cat. No. 13703, U.S.N.M.

PSEUDOXENOS HISTRIONIS, new species.

Host.—*Odynerus* (*Ancistrocerus*) *histrio* Lepeletier, Inverness, Florida. Described from one female collected March 20, by Charles Robertson.

Female.—Length of cephalothorax 0.86 mm., breadth 0.89 mm., breadth of head 0.76 mm., distance between mandibles 0.17 mm. Cephalothorax light orange brown, with area in front of mouth yellow, a brown transverse band behind the opening of the brood canal, margins very dark, and remainder of disk lighter in color. Cephalothorax rather strongly constricted at base; broadest at spiracles which are laterally prominent; thence angulately convex, apex evenly convex; mandibles very oblique, apically emarginate and toothed on inner angle.

Type.—Cat. No. 13704, U.S.N.M.

PSEUDOXENOS PEDESTRIDIS, new species.

Host.—*Odynerus* (*Leionotus*) *pedestris* Saussure, Carlinville, Illinois. Described from one female collected July 6, by Charles Robertson.

Female.—Length of cephalothorax 0.80 mm., breadth 0.80 mm., breadth of head 0.67 mm., distance between mandibles 0.15 mm. Cephalothorax light orange brown, darkest on margins and across disk behind mouth in basal third, apex yellow, remainder of disk orange colored. Cephalothorax not strongly constricted behind, more or less evenly convex from base to apex, apex narrowly truncate; spiracles just reaching lateral margin; mandibles oblique, toothed.

Type.—Cat. No. 13705, U.S.N.M.

PSEUDOXENOS ROBERTSONI, new species.

Host.—Odynerus (*Ancistrocerus*) *histrionalis* Robertson, Carlinville, Illinois. Described from one female collected August 27, by Charles Robertson.

Female.—Length of cephalothorax 1.04 mm., breadth 1.05 mm., breadth of head 0.85 mm., distance between mandibles 0.20 mm. Cephalothorax light orange brown, with a very dark narrow marginal line and a dark line behind the opening of the brood canal, the color shading off from these dark lines to a very light disk, apex light, area of spiracles light on the dark rim. Cephalothorax constricted at base convex at widest point behind spiracles, convex with slight sinuations to apex which is evenly rounded; spiracles barely attaining the margin; mandibles with a very acute tooth on the inner apical angle.

Type.—Cat. No. 13706, U.S.N.M.

PSEUDOXENOS TIGRIDIS, new species.

Host.—Odynerus (*Ancistrocerus*) *tigris* Saussure, Carlinville, Illinois. Described from one female collected by Charles Robertson on September 23.

Female.—Length of cephalothorax 0.76 mm., breadth 0.70 mm., breadth of head 0.58 mm., distance between mandibles 0.16 mm. Cephalothorax light brown, darkest on margins, apex light, disk light orange brown. Cephalothorax oval, constricted at apex, broadest behind spiracles, sides convex from base to apex, very even, apex evenly convex; spiracles barely reaching margins, indicated by clear round area; mandibles small, oblique with a small outward curved tooth on inner apical angle.

Type.—Cat. No. 13707, U.S.N.M.

Genus TACHYTIXENOS, new genus.

Type of genus.—T. indicus, new species.

The only species of this genus is a parasite of *Tachytes* and the genus is at present confined to Asia.

Male.—Head transverse, broadly produced over antennæ. Mandibles curved, stout, ensiform, apically acute, maxillæ two-jointed, the first joint stout subclavate, the second longer, tapering but not acute at apex. Eyes large, many-faceted. Antennæ normally xeniform, rami flattened. Prothorax transverse, slightly arched forward. Mesothorax shorter, emarginate by præscutum; elytra slender, clavate. Metathoracic præscutum keystone-shape; scuti broad, angularly produced over base of wings, narrowly separated by peduncle of scutellum; scutellum reaching præscutum in a pedunculate process which widens to the main body in a sinuate curve, posterior angles laterally produced, posterior edge bisinuate; postlumbium of different consistency from other parts, with both anterior and pos-

terior edges bisinuate; postscutellum broad, strongly convex. Wing venation light. Legs moderate, posterior femora inflated behind. Oedeagus with almost no curve beneath at base and with the first outer bend very near base, reflexed at the apical fourth at about a right angle, apex very acute.

TACHYTIXENOS INDICUS, new species.

Host.—*Tachytes xenoferus* Rohwer, Deesa, India. Described from one male and one female collected by Lt. Col. C. G. Nurse in June, 1898. Four wasps contained four empty puparia, one male puparium, one female. The male puparium contained a fully developed male.

Male.—Length 2.5 mm. Dark brown, antennæ and palpi a little lighter, mandibles and oedeagus transparent yellow, postlumbium light brown, abdomen brown strongly tinged with yellow, elytra and legs yellowish brown, wings pale with venation yellow.

Female.—Length of cephalothorax 0.83 mm., breadth 0.97 mm., breadth of head 0.82 mm., distance between mandibles 0.18 mm. Cephalothorax reddish brown, darkest on edges, orange colored on disk; slightly constricted at base, widest behind spiracles which barely reach the edge, thence convex to apex; apex broadly rounded, sinuate in front of mandibles; mandibles diagonal, quadrate truncate, with a small tooth on the inner apical angle.

Type.—Cat. No. 13729, U.S.N.M.

Genus EUPATHOCERA Pierce.

EUPATHOCERA LUCTUOSAE, new species.

Host.—*Sphex* (*Psammophila*) *luctuosa* Smith; Colorado Springs, Colorado. Described from one female from the collection of University of Nebraska.

Female.—Length of cephalothorax 0.98 mm., breadth at spiracles 1.22 mm., breadth of head 0.95 mm., distance between mandibles 0.20 mm. Cephalothorax brown, becoming lighter orange brown on posterior half of disk; widest behind spiracles, evenly convex throughout; mandibles oblique, subquadrate, concavely emarginate at apex, with a small acute tooth near inner angle; spiracles not reaching margin.

Type.—Cat. No. 13708, U.S.N.M.

EUPATHOCERA PICTIPENNIDIS, new species.

Host.—*Sphex* (*Ammophila*) *pictipennis* Walsh, Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.92 mm., breadth at spiracles 1.11 mm., breadth of head 0.88 mm., distance between mandibles 0.19 mm. Cephalothorax dark reddish-brown, with a small lighter basal area; widest behind the spiracles, constricted at base, evenly

convex throughout; spiracles laterally prominent; mandibles oblique, quadrate with a large sharp tooth on the inner apical angle.

Type.—Cat. No. 13709, U.S.N.M.

EUPATHOCERA VULGARIDIS, new species.

Host.—*Sphex* (*Ammophila*) *vulgaris* Cresson, Carlinville, Illinois. Described from one female collected by Charles Robertson.

Female.—Length of cephalothorax 0.91 mm., breadth at spiracles 0.99 mm., breadth of head 0.54 mm. Cephalothorax brown, with basal area of disk lighter; widest just behind spiracles, which are located one-third of the distance from the base, sides behind spiracles almost parallel, but suddenly constricted at base, sides in front of spiracles convex, apex truncate; spiracles laterally prominent; mandibles oblique, emarginate, with an acute tooth on the inner apical angle.

Type.—Cat. No. 13710, U.S.N.M.

Genus OPHTHALMOCHLUS Pierce.

OPHTHALMOCHLUS AURIPEDIS, new species.

Host.—*Chlorion* (*Isodontia*) *auripes* Fernald, Plummers Island, Maryland. Described from one female collected July 10, 1910, by J. C. Crawford.

Female.—Length 1.55 mm., breadth 1.80 mm., breadth of head 1.44 mm., distance between mandibles 0.26 mm. Cephalothorax dark brown, with posterior third of disk lighter; widest at spiracles; obliquely widening from base to spiracles, thence convexly obliquely narrowing to apex, outline of head sinuate; spiracles not reaching margins; mandibles oblique, quadrate, truncate, but with a long acute tooth projecting from the inner apical angle.

Tpye.—Cat. No. 13711, U.S.N.M.

Superfamily STICHOTREMATOIDEA Hofeneder, 1910*b*.

This superfamily has been erected by Hofeneder because of the extremely peculiar arrangement of the female genital pores, which are arranged in three transverse series of twelve to fourteen each.

Family STICHOTREMATIDÆ Hofeneder, 1910 *b*.

Type genus.—*Stichotrema* Hofeneder (1910 *b*).

Parasites of Locustidæ.

The male is unknown. The triungulinid is similar to those of the preceding and following families.

Genus STICHOTREMA Hofeneder (1910 *b*).

Type of genus.—*Stichotrema dallatorreanum* Hofeneder.

Name derived from *στίχος* (row) + *τρῆμα* (aperture), referring to the arrangement of the genital pores in rows.

STICHOTREMA DALLATORREANUM Hofeneder (1910 *b*).

Host.—*Sexava nubila* Stål; Pack Island, Admiralty Islands, September 10, 1909, Dr. E. Wolf, collector.

Female.—Dorsal side outward, and not as in other Strepsiptera. Genital canals arranged in three parallel rows on the first or second abdominal segment, with twelve to fourteen in each row. Cephalothorax with lateral projections behind the spiracles. Head with two small projections, probably rudimentary maxillæ.

Triungulinid.—Length 0.22 mm. Elongate, head obtusely rounded, with a deep narrow emargination at the center of the apex. Head and thorax together shorter than abdomen. Head over half as long as thorax. Eyes large crystalline. Legs with coxæ, large, toothed; femora slender and apically mucronate, tibia longer and more slender, tarsus minute, hairlike. First eight abdominal segments transverse, short, ninth elongate, deeply emarginate, bearing the tenth segment in the emargination, and on the apices of the lateral lobes armed with two pair of short hairs; tenth segment bearing two very long stylets, which are approximate at base.

Above description is original from specimens of the triungulinids given the writer by Mr. Hofeneder.

Superfamily HALICTOPHAGOIDEA Pierce.

Family DIOZOCERIDÆ, new name.

Dioxoceridæ, Pierce (1908).

Genus DIOZOCERA, emendation.

Dioxocera, Pierce (1908), (typographical error).

The original spelling was due to an error in copying and is absolutely meaningless. Application has been made to the International Rules Committee for privilege to emend the spelling to its proper form.

Family HALICTOPHAGIDÆ Pierce.

Genus PENTOZOCERA, emendation.

Pentoxocera Pierce (1908), (typographical error).

The same remarks as above hold for this generic name.

PENTOZOE,[1] new genus.

Type of genus.—*P. peradeniya*, new species.

Male.—Head excavated behind, produced over antennæ. Eyes many facetted. Antennæ with flabelli short, flat and broad. Mandibles short and acute, slightly passing each other; maxillæ long,

second joint long. Prothorax and mesothorax arched far forward into head, the former appearing only as a disk. Elytra moderately long. Praescutum elongate triangular, narrowly truncate by scutellum; scuti quadrate, diagonal, approximate at apex of praescutum, not reaching to lateral processes of scutellum; scutellum with median anterior lobe separating scuti, behind which it is more or less quadrate with posterolateral prolongations; postlumbium of different consistency from the other parts, and almost as long as the scutellum; postscutellum convex, broad and about as long as praescutum and scutellum together. Wings with seven primary veins, the costa and subcosta strong, the area between these and medius darkened; a very wide detached vein arising just beyond the darkened area; medius extending to margin with long detached branch in front of it; the two anal veins straight. Legs normal; tarsi three-jointed. Ninth abdominal segment elongate; œdeagus slender, inflated at basal third and strongly arched, thence very slender and at apical fourth bent back in an acute angle.

Female.—Cephalothorax quadrate, bi-emarginate at apex, with the lobe thus formed very prominent; mandibles oblique and with a long tooth; spiracles not laterally prominent; surface radiately wrinkled from base; opening of brood canal transverse; abdomen with a long, darkened area of the same shape as the cephalothorax.

PENTOZOE PERADENIYA, new species.

Host.—*Thompsoniella arcuata* Motschulsky, Peradeniya, Ceylon. Described from one male and one female collected by E. E. Green.

Male.—Length 1.25 mm. Dark brown, eyes black, antennæ and legs lighter.

Female.—Color light brown. Length of cephalothorax 0.26 mm., breadth 0.22 mm.

Type.—Cat. No. 13712, U.S.N.M.

HOST LIST.

The following additions to the host list of the Strepsiptera may be made:

ORTHOPTERA.

Superfamily LOCUSTOIDEA.

Family LOCUSTIDÆ.

Sexava Stål.

nubila Stål, Pack Island, Admiralty Islands, September 10 (E. Wolf), (female) *Stichotrema dallatorreanum* Hofeneder (Hofeneder 1910*b*).

species, Wogeo, Schouten Island, Admiralty Islands, September 13 (E. Wolf) (Hofeneder 1910*b*).

[1] Name derived from πέντε (five) + ὄζος, (branches).

HOMOPTERA.

Superfamily CICADOIDEA.

Family TETIGONIIDÆ.

Tribe PHRYNOMORPHINI.

Thompsoniella Signoret.

arcuata Motschulsky, Peradeniya, Ceylon, July (E. E. Green) (males, females), (*Pentozoe peradeniya* Pierce).

Deltocephalus Burmeister.

labiatus Gillette, Colorado (male pupa), (received from E. D. Ball).

HYMENOPTERA.

Superfamily VESPOIDEA.

Family EUMENIDÆ.

Odynerus Latreille (including *Leionotus* and *Ancistrocerus*).

anormis Say (*Leionotus*), Carlinville, Illinois, May 31, October 29 (Robertson 1910).

arvensis Saussure (*Leionotus*), Carlinville, Illinois, August 2 (Robertson 1910), (female) (*Pseudoxenos arvensidis* Pierce).

bifurcus Robertson (*Leionotus*), Inverness, Florida, March 3 (Robertson 1910).

capra Saussure (*Ancistrocerus*), Washington State (male exuvium) (U. S. National Museum collection).

clypeatus Robertson (*Ancistrocerus*), Carlinville, Illinois, May 24, 31 (Robertson 1910).

erynnys Lepeletier, Inverness, Florida, February 10, March 10, 25 (Robertson 1910), (female) (*Pseudoxenos erynnidis* Pierce).

foraminatus Saussure (*Leionotus*).

2. Carlinville, Illinois, August 13 (Robertson 1910).

3. Trenton, New Jersey, July 5, 1907 (female), (*Pseudoxenos foraminati* Pierce), (U. S. National Museum collection).

fundatiformis Robertson (*Leionotus*), Orlando, Florida, February 17 (Robertson 1910).

fundatus Cresson (*Leionotus*), Carlinville, Illinois, June, July (Robertson 1910), (female) (*Pseudoxenos fundati* Pierce).

histrio Lepeletier (*Ancistrocerus*), Inverness, Florida, March 20, 24 (Robertson 1910), (female) (*Pseudoxenos histrionis* Pierce).

histrionalis Robertson (*Ancistrocerus*), Carlinville, Illinois, August 5, 27 (Robertson 1910), (female) *Pseudoxenos robertsoni* Pierce).

pedestris Saussure (*Leionotus*), Carlinville, Illinois, July 6 (Robertson 1910), (female) (*Pseudoxenos pedestridis* Pierce).

sexcingulati Ashmead (*Ancistrocerus*), Florissant, Colorado, June 26, 1907, S. A. Rohwer, on *Salix brachycarpa* (U. S. National Museum collection).

tigris Saussure (*Ancistrocerus*), Carlinville, Illinois, September 23 (Robertson 1910), (female) (*Pseudoxenos tigridis* Pierce).

turpis Saussure (*Leionotus*), Inverness, Florida, March 19 (Robertson 1910).

Family VESPIDÆ.

Polistes Latreille.

aurifer Saussure, Palo Alto, California, February, 1892 (W. G. Johnston), (female, male exuvium) (*Xenos auriferi* Pierce) (from Cornell University collection).

hebræus Fabricius, India (Maxwell-Lefroy and Howlett 1909).

metricus Say.

7. Cornell University (female), (Cornell University collection).

rubiginosus Lepeletier.

10. Arlington, Texas, September 30 (exuvium).

11. Tallulah, Louisiana, January 29 (exuvium) (V. I. Safro); February 16 (female), (V. I. Safro).

variatus Cresson.

3. Carlinville, Illinois, September 30 (Robertson 1910).

4. Church's Island, Maryland, November 3 (W. L. McAtee), (males, females).

Belonogaster Saussure.

elegans Gerstaecker, Butiti, Congo Free State (female), (Zavattari 1909) (*Belonogastechthrus zavattarii* Pierce).

Superfamily SPHECOIDEA.

Family SPHECIDÆ.

Chlorion Latreille.

auripes Fernald (*Isodontia*) 1. Plummer's Island, Maryland, July 10, 1910, (J. C. Crawford) (female) (*Ophthalmochlus auripedis* Pierce).

2. Harrisburg, Pennsylvania (H. L. Adams) (female).

ichneumoneus Linnæus.

5. Carlinville, Illinois (Robertson, 1910).

pollens Kohl, Ain Sefra, Algeria (Hofeneder 1910*a*).

Sceliphron.

lætum F. Smith, Sandgate, Queensland, February 19, 1905. (Dr. J. Turner), (in U. S. National Museum collection).

Sphex Linnæus.

campestris Latreille, Germany (Scholz, 1909).

luctuosa Smith. 1. Idaho, (female) (University of Nebraska collection); 2. Colorado Springs, Colorado (male pupa, female) (*Eupathocera luctuosæ* Pierce) (University of Nebraska collection).

Family LARRIDÆ.

Tachytes Panzer.

xenoferus Rohwer. Deesa, India (males, females) (C. G. Nurse) (*Tachytixenos indicus* Pierce).

Superfamily APOIDEA.

Family ANDRENIDÆ.

Subfamily HALICTINÆ.

Augochlora F. Smith.

viridula F. Smith, Carlinville, Illinois, September 17 (Robertson 1910), (female) (*Halictoxenos viridulæ* Pierce).

Halictus Latreille.

nymphæarum Robertson, Carlinville, Illinois (Robertson 1910) (female), (*Halictoxenos nymphæari* Pierce).

sparsus Robertson 2. Carlinville, Illinois, April, May, July, September, October (Robertson, 1910).

versatus Robertson 2. Carlinville, Illinois, April 11, November 3 (Robertson, 1910).

zephyrus Smith 2. Carlinville, Illinois, April, July (Robertson, 1910).

Subfamily ANDRENINÆ.

Andrena Fabricius.

andrenoides Cresson, Carlinville, Illinois, April 1–29 (Robertson, 1910), (female), (*Stylops andrenoides* Pierce).

asteris Robertson, Carlinville, Illinois, September 8 (Robertson, 1910) (female), (*Stylops asteridis* Pierce).

crawfordi Viereck, Dallas, Texas (Viereck, 1909).

cressoni Robertson, Falls Church, Virginia, June 14 on *Ceanothus* (female), (in U. S. National Museum collection).

desponsa Smith (*victima* Smith), Nova Scotia (male, female) (*Stylops childreni* Gray) (Latreille, 1845, Smith, 1853, Cockerell, 1906*b*).

didelta Viereck, Florissant, Colorado, July 17, 1907 (S. A. Rohwer) (female), (in U. S. National Museum collection).

erigeniæ Robertson, 1. Carlinville, Illinois, April 11 (Robertson, 1891, 1910), (female). 2. Castle Rock, Pennsylvania, April 17, 1908 (females), (in U. S. National Museum collection).

hemileuca Viereck, Florissant, Colorado, June 19, 1907 (S. A. Rohwer), (females), (in U. S. National Museum collection).

hilaris Smith, Georgia (female), (in U. S. National Museum collection).

hippotes Robertson, 2. Carlinville, Illinois, April 10 (Robertson, 1910).

illinoiensis Robertson, 2. Carlinville, Illinois, April 17 (Robertson, 1891, 1910).

imitatrix Cresson race *claytoniæ* Robertson, *Stylops claytoniæ* Pierce.

var. *texana* Cresson *Stylops claytoniæ viereckı* Pierce.

var. *profunda* Viereck.

The above synonymy will change the location of the references in Bulletin 66.

lewisii Cockerell, Florissant, Colorado, July 8, 1907 (S. A. Rohwer), (females) (in U. S. National Museum collection).

mandibularis Robertson, Carlinville, Illinois, March 21, 29, April 10 (Robertson, 1910), (female) (*Stylops mandibularidis* Pierce).

nasoni Robertson (*hartfordensis* Cockerell).

Stylops hartfordensis is, however, not a synonym of *Stylops nasoni.*

nuda Robertson, Carlinville, Illinois, March 17 (Robertson, 1910), (female), (*Stylops nudæ* Pierce).

pilipes Fabricius, Pekin, China, April 21, 1901 (M. L. Robb) (female), (*Stylops pilipedis* Pierce) (in U. S. National Museum collection).

polygoni Viereck (paratype), Florissant, Colorado, July, 1907 (T. D. A. Cockerell) (females), (in U. S. National Museum collection).

ribesina Cockerell, Florissant, Colorado (Cockerell, 1906*a*).

salictaria Robertson, Carlinville, Illinois, April 2–17 (Robertson, 1910).

sitiliæ Viereck, Dallas, Texas (Viereck, 1909).

verecunda Cresson types (Robertson, 1910).

Biareolina Dufour.

neglecta Dufour (Perez, 1886; Pierce, 1909).

Family PANURGIDÆ.

Panurginus Nylander.

boylei Cockerell, Las Vegas, New Mexico, August 3 (W. Porter) (female), (*Crawfordia cockerelli* Pierce), (Pierce, 1909).

Pseudopanurgus Cockerell.

labrosiformis Robertson, Carlinville, Illinois, August 3 (Robertson, 1910), (female).

labrosus Robertson, Carlinville, Illinois, July 3 (Robertson, 1910), (female) (*Crawfordia labrosi* Pierce).

rudbeckiæ Robertson, Carlinville, Illinois, August 1, 29 (Robertson, 1910), (female) (*Crawfordia rudbeckiæ* Pierce).

solidaginis Robertson, Carlinville, Illinois, August 11, 12 (Robertson, 1910), (female).

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