# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS

OF THE

## ENTOMOLOGICAL SECTION

OF

## THE ACADEMY OF NATURAL SCIENCES

OF

## PHILADELPHIA

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# ENTOMOLOGICAL NEWS

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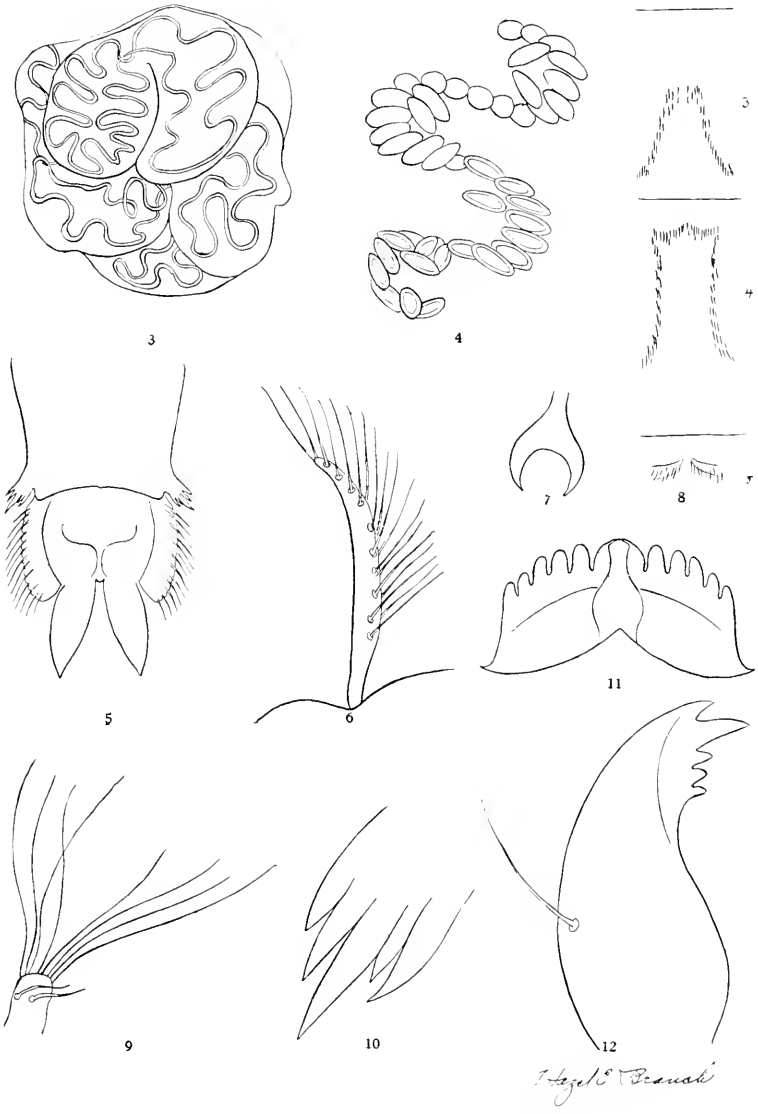


TANYTARSUS FATIGANS—BRANCH.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV JANUARY, 1923 No. 1


CONTENTS



## Description of the Early Stages of Tanytarsus fatigans Joh. (Dip.: Chironomidae).*


BY HAZEL ELISABETH BRANCH.


(Plate I)

Egg masses of a Chironomid, which later proved to be *Tanytarsus fatigans* Joh., were found in April upon the baffle board of a sluice at the Fish Hatchery of Cornell University.

As the early stages of this species are as yet undescribed, the following may be of interest to Entomologists.

The egg masses were found above the water level, but in situations where the spray of the flowing water kept them moist. Swarms of adults were seen about these places from April fifth to twenty-second and egg masses were numerous during this period.

Upon being floated in water, the masses freed themselves from each other and showed their individual size and shape. Each single mass is a disc of approximately 5 mm. in diameter.

*A contribution from the Limnological laboratories, Cornell University

(Pl. I, Figure 3). In the transparent gelatinous matrix of this mass is a rope of eggs about two eggs wide and two eggs deep. This rope curves back and forth, up and down in this shallow disc as illustrated in Figure 3, there being 435 to 450 eggs in one mass. The eggs are pale cream color and opaquely transparent. They measure 0.175 mm. to 0.182 mm. in length and 0.077 mm. to 0.105 mm. in width. No definite period of incubation can be given, as no egg laying was observed, but the period is at least three days, as those eggs taken on April 5th hatched April 8th.

The newly hatched larva is pale like the egg color and measures 0.49 mm. in length. The head capsule is 0.07 mm. in length and the antennae are 0.0875 mm. in length from the base of the first joint to the tip of the antennal filaments. The antennal length in this stage is greater in relation to the head than in the later stages. There are four anal gills present and the rounded caudal projections bear six hairs each. The anal prolegs bear bifid claws 0.01125 mm. in length. (Pl. I, Figure 7).

The little newly-hatched larvae crawled about the old egg mass for the first day and well in to the second, when they started the task of building their tubes, which were made of silt and particles of dirt. These were not individual as in the later stages but are branched and connected to each other. The tube in which a larva was living was open only at one end, the other end being filled with frass. As the tube became too short, the occupant either built up this identical tube ahead of itself or else cut a hole in the side and built a new tube from the side of the old one. These tubes measured about 1.5 mm. to 2 mm. in width and from 10 to 20 mm. in length.

When five days old the larva measured 0.84 mm. but the head had not changed, indicating that a molt had not taken place. During the next twelve days this took place as at the end of that time two sizes of heads were noticed, 0.175 mm. and 0.28 to 0.35 mm.

At the nineteenth day (April 27th) the third molt and fourth instar were evident. The head measured 0.42 mm. and the larva 5.74 mm.

On the twenty-eighth day a larva pupated and the following day the adult emerged, making twenty-nine days from hatching to emergence.

In a second rearing experiment the hatching occurred April

15th with a head size of 0.07 mm. On the eleventh day the head size changed to 0.157 mm., on the sixteenth day to 0.23625 mm., and on the twenty-seventh day to 0.385 mm., the fly emerging on the thirty-first day after hatching.

The older larvae (beyond the second instar) make tubes of mud and algae and these are more or less erect, the opening being in most cases brought near the surface of the water. The food of the larva is mainly *Scenedesmus caudata*, *Tetraspora sp.* and several species of *Ankistrodesmus*.

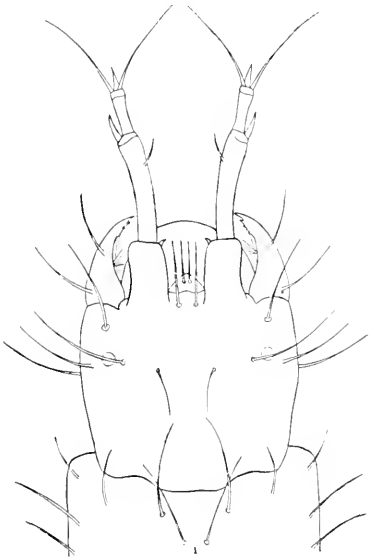

Fig. 1.—Dorsal view of the head.

Fig. 2.—Ventral view of the head.

Larva of *Tanytarsus fatigans* Joh.

The length of a *full grown larva* is about 5.74 mm. and the head about 0.40 mm. The antennae are shorter than the length of the head. The larva is pale red in color with the thorax green, due probably to food content, and the peripheral layer of fat is greenish. The penultimate segment does not bear a dorsal hump as in *T. dives* Joh. and the caudal projections are pale with fuscous tips and eight dark hairs each. Upon the dorsal side of these projections are two dark short hairs. (Pl I, Figure 9).

The larva belongs to Bause's *inermipes* group which is characterized by the elongate antennal filaments and the chitinous

point on the inner side of the antennal tubercles. (See Eberhard Bause, Archiv f. Hyrdobiolog. Stuttgart, Suppl.-Bd. II, 1914). The details of the head and appendages are best illustrated by reference to the text figures and Plate I.

The *pupa* is 5.74 mm. in length; with the thorax, head, wing pads and legs fuscous. The dorsum of the abdomen bears setae as illustrated in Pl. I, Figure 8. The respiratory tubercle is pale, transparent and haired (Pl. I. Figure 6). The eighth abdominal segment bears a lateral spur with five teeth, this spur being very dark (Pl. I, Figure 10).

EXPLANATION OF PLATE I.
*Tanytarsus* fatigans Joh.

Fig. 3. Egg Mass.
Fig. 4. Portion of the egg rope.
Fig. 5. Tip of the pupal case.
Fig. 6. Respiratory tubercle.
Fig. 7. Claw of anal proleg.
Fig. 8. Setae pattern on abdomen of pupal case.
Fig. 9. Caudal projection of full grown larva.
Fig. 10. Lateral tooth of pupal case.
Fig. 11. Labium of larva.
Fig. 12. Mandible of larva, ventral view.

## A New Species of Forcipomyia from the Eastern United States (Diptera, Ceratopogonidae).

By J. R. MALLOCH, U. S. Bureau of Biological Survey, Washington, D. C.

On August 14th, 1921, I went to Cabin John, Maryland, to collect insects and shortly after I reached the collecting ground a heavy thunderstorm broke. The rain was so exceptionally heavy and prolonged that the trees did not suffice as shelter more than a few minutes and very soon everything was supersaturated, including my clothes and collecting outfit. While trying to wring the water from my clothes to make things a little more comfortable if possible, I stood under a large beech tree upon the trunk of which there still remained a few dry spots and my attention was attracted to some minute white dots on these areas. A close scrutiny disclosed that they were small ceratopogonine flies and a series was bottled for a more detailed inspection later. This inspection disclosed the fact that the species is undescribed and one of the most strikingly

colored occurring in this country. It is so very small that it was not at any time seen in the net nor elsewhere during the summer though I collected at the same spot frequently.

**Forcipomyia pluvialis** sp. n.

♂ ♀.—Whitish yellow, subopaque. Thorax in male with a dark brown central vitta anteriorly, of female unicolorous yellow; scutellum with a brown spot on each side at base; metanotum brown; pleura darkened below. Abdomen dark on sides, sometimes with a blackish spot on sides of each tergite. Legs usually more or less brownish but sometimes entirely yellowish with tips of tarsal segments dark. Wings clear, with yellow hairs, two large black spots on costa, one at apex of first vein and the other between it and apex, the margin of wing sometimes with a faint dark spot at apex of each vein. Basal segment of hind tarsus subequal to second. Length, .75 mm.

*Type*, male, allotype and 11 paratypes, Glen Echo, Maryland, August 14th, 1921 (J. R. Malloch), in the author's collection.

## A New Empid from the Eastern United States (Diptera).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

The species described below is slightly different in venation from the genotype, but there are insufficient structural characters to warrant its generic separation.

**Coloboneura exquisita** sp. n.

♂.—Shining rufous yellow, head, disc of scutellum and of metanotum, and the abdomen fuscous. Antennae brownish yellow; palpi fuscous. Mesonotum with two brownish marks on anterior margin. Pleurae and legs whitish yellow. Wings with brownish clouds on each of the longitudinal veins preapically, two blacksh spots behind posterior basal cell, a similar spot in apex of latter close against the cross-vein and one in base of each cell against outer sides of the cross-vein.

Eyes contiguous for a short distance above antennae, third segment of the latter conical, the style thick and nearly as long as third segment. Mesonotum with short black hairs, the notopleural region with some fine setulae, posterior margin with 2 setulae; scutellum with 6 setulae, the apical pair longest. Abdomen tapered, hypopygium small. Legs moderately stout, the hind tibiae with short setulae. Cross veins closing basal cells forming a continuous oblique line; anal vein complete, very close to margin. Length, 1.5 mm.

*Type*, Glen Echo, Maryland, August 28th, 1921 (J. R. Malloch), in the author's collection.

## Odonatological Results of an Auto Trip Across Indiana, Kentucky and Tennessee.

By E. B. Williamson, Bluffton, Indiana.

In the summer of 1918, Arch L. Cook, of Bluffton, Indiana, and myself planned a trip by auto through Indiana and Kentucky to Tennessee, especially to look for Macromias. We selected the latter part of July and the early part of August as probably the most favorable season, realizing, at the same time, that this season would probably yield scanty returns in general dragonfly collecting. The expedition met with a series of mishaps during its eighteen days in the field and the number of dragonflies collected was small both in specimens and species. At the same time it seems worth while to record our captures and notes, though personally I have never been able to grow enthusiastic over things one doesn't find. Twenty species on a stream are more exciting than two, though the latter record may have some scientific value.

We fitted Mr. Cook's one-seated Ford with a truck body in which we carried two covered folding cots, bedding, some scanty personal effects, a few cooking utensils and some food and the necessary equipment for collecting and for caring for the auto. The load was covered with a heavy tarpaulin and roped down. The seat had no top or cover and we took the weather as it came without protection.

We left Bluffton early in the afternoon of July 21 and camped that night in a school house yard near Lafayette, where an inventory showed us the first day had cost us a burned out bearing and a broken windshield, and the loss of one coat and our water jug. This depletion of our supply was checked and eventually avoided entirely as we grew more proficient in loading and roping our equipment.

Early July 22 our machine hobbled into a Lafayette garage, where we abandoned it for a visit with friends at Purdue University. At 11 A. M. we were again on our way, passing through Wingate and Waynetown and eating our noonday lunch near the covered bridge over Turkey Run. Six to eight miles south of Waynetown a spermophile ran across the

road ahead of us. Along Turkey Run near the covered bridge, the dragonflies *Hetaerina americana* and *Argia apicalis* were common and one *Libellula luctuosa* was seen. After our lunch we visited the Shades,—a new and strange Indiana to a resident from the level portions of the northern part of the state We crossed Otter Creek at the mill north of Terre Haute about 6.45 P. M. and camped that night at Blue Hole, a washout of the Wabash below the level, and a fine place, resembling a large deep, abandoned gravel pit. Our cots were placed on the bank just above the water, and with a good supper, a good swim and clean pajamas life seemed really worth while.

In the morning about Blue Hole, we collected *Lestes rectangularis, Argia apicalis, Enallagma exsulans, Ischnura posita* and *Libellula luctuosa.* About 9 A. M. we reached Middletown (P. O., Prairie Creek), then south to Fairbanks, and then south and west along levees and sloughs to Merom.. About two miles west of Merom at a slough or bayou we took *Macromia taeniolata* and *Dromogomphus spoliatus.* From Merom we went to Carlisle, then to Vincennes and from there to Hazelton where we ferried White River and from there, by way of Princeton, arrived at Evansville about 7.15 P. M. That night we camped near Henderson Ferry, and in the morning, July 24th, ferried the Ohio River to Henderson, Kentucky.

Fives miles south of Henderson we saw our first mockingbird. Between Henderson and Madisonville, where we arrived about noon, we saw no ponds or streams except a very small creek two or three miles south of Henderson. Just south of Madisonville is a large lake-like pond, evidently artificial. About its shores grew large areas of *Nelumbo* in full bloom, with the magnificent flowers forming great patches of creamy white color. Sparganium was also abundant. We collected here about an hour and the following dragonflies were taken:

*Lestes rectangularis, Enallagma civile, Ischnura verticalis, I. posita, Anomalagrion hastatum, Anax junius, Epicordulia princeps, Perithemis tenera, Pachydiplax longipennis, Celithemis eponina, Libellula pulchella, L. luctuosa, Plathemis lydia,* and *Tramea lacerata.*

Enroute from Madisonville to Hopkinsville we missed our way

and wandered over atrocious stair-step hill roads and soft mud valley roads through Carbondale, St. Charles and Daniel Boone to Mannington, where we found a splendid road from that town to the fine little city of Hopkinsville. South of Hopkinsville to Clarksville, Tennessee, the pike was badly worn and the recent rains had left long pools of water covering the road in many places. We arrived at Clarksville about 6.30 P. M. and camped that night on the banks of a small creek about five miles west of Thomasville. The feature of our supper was coffee, prepared early that morning in Indiana, transported across western Kentucky and taken hot from the thermos bottle that evening in Tennessee.

In crossing western Kentucky, as mentioned above, we crossed a very small stream two or three miles south of Henderson. The next running water seen was a small river between Mannington and Hopkinsville, and about four miles north of Clarksville we crossed Red River. No other streams were seen. Some creek beds crossed were dry and sandy.

On the morning of July 25 we collected along the creek near our camp of the night before. *Calopteryx maculata* was very common and we found nothing else. About noon we reached the old, familiar and always beautiful Sycamore Creek, at Sycamore, and were soon renewing our acquaintanceship with our old friends, the Jacksons, at whose home I had lived over seventeen years before when collecting on Sycamore Creek. Mr. Jackson kindly placed a log cabin situated in a grove of magnificent white oaks at our disposal, and we hurried through a belated noon lunch to again wade Sycamore Creek. *Calopteryx maculata* and *Hetaerina americana* were abundant, and the *Argias, apicalis tibialis, sedula* and *moesta* were common. A single male *Hagenius brevistylus*, a single male *Erpetogomphus designatus* and a single female *Dromogomphus spinosus* were seen—and all were captured.

July 26 we started in at the road bridge and followed down the creek to below the ford. The day was hazy, cool and windy. We were disappointed in finding no *Erpetogomphus*. During the day we saw possibly twenty *Dromogomphus spinosus* at ripples. Only two *Hagenius brevistylus* were seen, and one of

these, a female, was captured while eating an adult female *Calopteryx maculata*. *Calopteryx maculata*, to judge from its numbers in habitats frequented by cuckoos, vireos, several species of flycatchers, and probably other insectivorous birds, must be immune from attacks by these possible enemies: But its protective character, in the case of birds, seems ineffective against larger species in its own order.

It began raining about 11.30 P. M. and kept it up all night and all day Saturday, July 27. During the day my left eye became very sore and inflamed. Sunday we left Sycamore and went to Nashville and called on Professor C. S. Brown and family at Vanderbilt University. In the afternoon I visited an oculist and learned I had four corneal ulcers on my left eye. The Browns most kindly took us into their home and Monday and Tuesday were spent nursing the sore and throbbing eye, over which, during the entire remainder of the trip I was compelled to wear an eye patch, which prevented my doing any effective collecting.

(To be continued)

## Two New Aberrant Basilarchias from Northeastern United States (Lepid.: Nymphalidae).

By WARO NAKAHARA, New York City.

In the ENTOMOLOGICAL NEWS for June, 1922, I have reported on certain anomalies in wing markings of *Basilarchia astyanax* Fab. (=*Limenitis ursula* Godt.), and expressed the opinion that this butterfly and *B. arthemis* Drury are probably two local races of a single species. If this be true, *B. arthemis* f. *proserpina* Edw., once considered to be a hybrid between *B. arthemis* and *B. astyanax*, must represent a real transition from one to the other; also, one of the two aberrant forms of *B. astyanax* I mentioned in my previous note should be of significance as a further link between the two so-called species. For this reason I am persuaded to propose a name for that form of *B. astyanax*, and to redescribe it. Availing myself of the opportunity, I also commit to the record here an aberrant form of *B. misippus* Fab. (=*Limenitis archippus* Cr.), which I happened to catch during the last season.

**Basilarchia astyanax** ab. **atlantis,** nov. aberr.

Differs from the typical *astyanax* by the presence of a complete submarginal series of fulvous spots on the upper side of hindwing, exactly as in *B. arthemis.*

Length of body, 4/5 inch; expanse of wings, 2½ inches.

*Holotype*: ♂, Elmhurst, Long Island, August 5, 1921 (W. Nakahara). The specimen was found in company with numerous examples of typical *B. astyanax.* Type in my collection.

As far as the wing markings are concerned, *arthemis* and *astyanax* can be connected up by two principal types of intermediate forms, namely, *proserpina* and *atlantis,* as follows:

*arthemis*: the white band, as well as the submarginal series of fulvous spots on upper side of hind wing complete;

*proserpina*: the white band partly obsolete; the fulvous spots present;

*atlantis*: the white band totally absent; the series of fulvous spots complete;

*astyanax*: the white band as well as the fulvous spots absent.

**Basilarchis misippus** ab. **cayuga,** nov. aberr.

The narrow postdiscal black belt of hindwing, upper side, closely preceded by a more or less broken series of white crescents. The white crescents larger on underside and form an interrupted belt, which is as wide as the black one. The oblique black belt of fore wing, upper side, extends down across the second interspace to join the black hind margin, instead of stopping short and running into the outer border at the third interspace. Otherwise same as the typical *misippus.*

Length of body, 4/5 inch; expanse of wings, 2¾ inches.

*Holotype*: ♀, Ithaca, New York, August 6, 1922 (W. Nakahara). Paratopotype: ♀, August 10, 1922. Types in my collection.

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### Dr. Edwin C. Van Dyke in China.

During the year 1923 Dr. Edwin C. Van Dyke's address will be, College of Agriculture, Nanking, China, where he will carry on some of the work already started by Prof. Woodworth. He expects to do some traveling as well in North China and Japan.

## Pontedera's 1718 Paper on the Cicada (Homop.).

Introduction by HARRY B. WEISS and Translation by WILLIAM HAMILTON KIRK, Ph.D., New Brunswick, New Jersey.

### INTRODUCTION.

While engaged in writing a biographical sketch of the life of Professor Benedict Jaeger, one of New Jersey's early entomologists, Mr. W. T. Davis, called my attention to a statement made by Jaeger in his book *The Life of North American Insects* (p. 101, ed. 1854) on the authority of Pontedera, that some cicadas live two years in the immature condition. Jaeger applied this to our species and this statement, more or less modified but substantially the same, has appeared in American text books on entomology issued as recently as 1921. Mr. Davis says that as far as he is aware the only cicada life cycle which is known is that of the 17-year one.

In an effort to trace Jaeger's statement to its source reference was had to Pontedera's writings and the only cicada paper which could be located was found to be incorporated in Pontedera's "Compendium of Botanical Tables etc.," as a part of a letter to G. Sherard, occupying some seventeen pages at the end of the book. Through the kindness of Dr. John Barnhart of the New York Botanical Garden, photographs were taken of these pages and from the photographs the translation of the original Latin has been made.

According to the biographical dictionaries consulted (Rose's Biographical Dictionary vol. XI, p. 192, London 1853; Biographie Générale, Didot Fréres, vol. 4, p. 781) Pontedera, a learned botanist and antiquarian, was born at Vicenza, May 7th, 1688, and died September 3, 1757. He studied medicine and anatomy under the celebrated Morgagni at Padua where he afterward succeeded Viali in the botanical chair at the University of Padua. It is also stated that he neglected the practice of medicine and applied himself to the study of botany. According to Sachs' "History of Botany," Pontedera rejected the idea of sexuality in plants and thought that the nectar produced by the flowers was absorbed by the seeds that they might be longer preserved. He regarded the male flower in dioecious plants as a useless appendage.

In the translation which follows nothing definite can be found concerning the length of time which the cicada spends in the ground. However, as will be noted, Pontedera makes the following statement,—"for neither in the year in which it is born does it turn out a tettigometra, nor in that in which it exists as a tettigometra does it become a Cicada," and this may have been interpreted by Jaeger as indicating a subterranean period of two years regardless of the vague manner in which Pontedera wrote. However in spite of the fact that the origin of the "two year statement" is not to be definitely found in Pontedera's writings, it was thought desirable to present the translation of this hitherto inaccessible cicada paper in view of Pontedera's other statements and so that it would be available to American students.

TRANSLATION.

[The complete title of the book is "A Compendium of Botanical Tables by Giulio Pontedera, Philosopher and Physician, in which are enumerated two hundred and seventy-two Plants lately discovered by him in Italy. With a letter of the author to the distinguished William Sherard, Englishman, the foremost of the Botanists of our age, discussing these Tables and others to be published at another time. Padua, 1718," and the translation of the part of the Sherard letter dealing with the cicada follows:]

I have expounded to you briefly my opinion also regarding the second Tables, to which I will add as a conclusion a little work, which I have in hand, on the Cicada, in imitation of Fabius Columna, a most eminent man, who added accounts of some animals to his Plants. Furthermore, this little animal, than which we find none more celebrated and illustrious in the writings of ancient and modern Physicists, still lies, in this light of Philosophy, wrapped in much darkness. For although by fine discoveries the later age has shaken many opinions which the ancients arrived at concerning other animals, in the case of the Cicada there has not only been no progress, but even statements that were not altogether improbable have been made more obscure and uncertain. The cause of this, if you want

to know, was the Cicada itself; first the fact that they never caught it in the act of hollowing out its nest and depositing eggs; for as soon as anyone approaches it flies away before it can be seen; then in dissecting it not only is there great difficulty, but a previous knowledge of its nature is required; for my part I did not hit upon the real use of its parts, although I had dissected innumerable specimens, until I had studied the habits of the Cicadae in the fields. Besides most people are averse to this laborious method of study; not knowing that only those can grasp the nature of the Cicada who have followed it assiduously while it, as Hesiod says.

"All day from early morning on pours forth its song
In the fiercest heat, when Sirius parches the skin."

But all this was made easy to me by my investigation of Plants. Wherefore I intend to undertake a complete history of the Cicada; for the present, since I have found that you take pleasure in matters of this kind, I will let you have this brief description.

And first I will divide the Cicadae into two genera as Aristotle did, History of Animals, Book V, ch. XXV; "Of cicadae (tettiges) there are two genera; the small which appear first and die last; and the large, those that sing, which are born later and die earlier;" whom Ulysses Aldrovandus followed in his fifth book, entitled "On Insects." I too knowing no others, will divide them into greater and less; and first I will notice the greater, which the Philosopher calls *achetae;* then I will speak of the smaller, called *tettigoniae;* and will use these names. Of the greater there are two forms namely male and female; of the lesser, the same number. In both genera only the males chirp, the females being mute; since they are destitute of musical organs. But what Aristotle said of the male *tettigoniae* "those which have the division sing somewhat," I have found not to be true; for these *tettigoniae* sing just as much and are *achetae* except for the difference in size. But what the organs are, with which the Cicadae make their noise, has not been made clear by our authorities. Some assert that the song of the Cicadae is made by the motion of their wing, the air struck by this communicating to our senses the vibrations and tremors;

one saying "From its wings it pours a clear song;" another, "the Cicada sending forth its song by rubbing itself under the wings." This is the general opinion, people being deceived by the likeness to the Grylli and to some Locusts. I have heard others affirm that the Cicadae make the sound ti-ti by the lowest part of the belly approching the breast and retreating from it with varying rapidity. But all those who have studied the formation of the Cicadae with more care refer these trillings to the membrane which the males in both classes possess. Aristotle, from whom others have borrowed, says in Hist. Anim. Bk. IV. ch. VII: "Those which are called *achetae* are divided at the waist and have a visible membrane; but the *tettigonia* have not;" and in ch. IX: "Some (insects) are said to sing, as the Cicadae; all which make the sound by means of the membrane, which is stretched at the incision of the waist, as the Cicada, by the friction of the respiration." And in Bk. V. ch. XXV, "those which sing, whether they are of the class of the larger or of the smaller, have an incision at the waist; but those in which that part is unbroken do not sing." This is about all that Aristotle has written about this organ; from which I will show that he was ignorant of the true instrument of the sound; first because he affirms that there is one membrane; for in each Cicada there are two, one on each side; then because he calls this "apparent" and (in Scaliger's interpretation) "such that it can be seen." Which is not at all the case; for in the *achetae* (of whom he is chiefly thinking, since he hardly admits the *tettigoniae* among the singing Cicadae, as I have indicated above) these membranes are covered with scales and are not visible unless you remove the scales; only in the *tettigoniae* are they uncovered. Finally as to the fact that he places this membrane under the part between the thorax and abdomen and allows it to other insects, for I have always found it, or rather them, in the thorax and only in the Cicadae. But what Aristotle understands by this membrane, I will show by representations; meanwhile I will put here for your benefit, the description of Ulysses Aldrovandus. "For" (says he, in Bk. II On Insects. ch. XIII, On the Cicada) "I have found from a careful inspection of both sexes that all the males have a mem-

brane outside" (note outside) "in the neighborhood of the waist, split in the middle; the form of which corresponds to the fruit of *Thlaspus parvus Hieracifolius* depicted by Lobelius; and that the females lack this membrane; this is known to the peasants, who also all affirm that the Cicadae lacking such a membrane are silent; but that those which have it sing." John Jonston, Bk. I, ch. V, On Insects, repeats this but more plainly: "This" he says "is to be ascribed to the reverberation of the membrane under the *flabellae* (so they call the coverings adhering to the belly behind the hindmost legs)." But this membrane of which they speak has nothing to do with the chirping; for, when it is pierced, the Cicada still chirps; but when those I mean are lacerated it becomes mute. This is the opinion as to the song of the Cicadae, shared by all others, whether Philosophers or Poets as Aelian, de Animalibus Bk. I; "the Cicadae are most talkative at the waist." He is followed by Phile in his Book on the properties of Animals who says, "The bridge (constriction) of the waist makes the males of the race of Cicadae song-loving." Also Joachim Camerarius (to name one of our learned men also) in the book, which begins *"on Cicadae,"* speaks thus; "A thin membrane is the organ of song." I shall take care to have these membranes carefully delineated in the Tables, and shall call them drums, not only from a certain resemblance of the parts, but also from the not different use; for as the spirits of soldiers are fired to fight more boldly by those warlike instruments, so the Cicadae, when "The places are excited and swell with seed, and the inclination arises to emit the seed towards that to which the fell desire all tends" (Lucretius, IV, 1045, 1046), conceive greater madness from these concussions, and rage more greedily for sexual intercourse. And the females, which lack these organs, are solicited by the song of the males to come to intercourse with no less alacrity, and are also carried away by the internal madness, by which the genital parts are stimulated. For I think that this organ was created in the Cicadae for no other purpose, than that there might be a fixed signal for their coming together for the act of generation. In other animals nature, which is intent chiefly on this end, has placed something

not dissimilar. The males of the Grylli and of some Locusts invite the females by making a noise with their wings, the Bombyces also enter into intercourse with a clapping of their wings; but more remarkable is what I noticed not long ago in the Cicindelae. They are brought together not by song or rubbing of the wings, but by the vibration of light. It was by mere chance that I observed this; for when I was collecting the females at night, and, placing them in the hollow of my hand, was inspecting their bright part, a male attracted by their light flew up, and gave the desired embraces (Virgil, Aeneid, VIII, 405), and when he was removed, others came. In short, it often happened to me to have this experience. And there is a reason for it; for since the females lack wings and therefore belong to the earth, and the males are winged and wander through the air, they would not be so easily called to intercourse, if a signal were not given on both sides. Wherefore a light was invented by the wonderful artificery of nature, than which nothing could be perceived at a greater distance or more clearly by the little animals of the night. Perhaps the same nature belongs to the Indian Cucujus, which can in a way be put in the class of the Cicindelae; for weighty authors testify that it glows at night. But I see that natural historians are not agreed as to why the Cucuji come to the torch, when it is displayed. Peter Martyr has this to say about the nature of the Cucujus: "A man who wants Cucuji goes out at twilight, in his hands he carries a lighted brand, he ascends a near height, from which he can be seen by the Cucuji; calling the Cucujus in loud tones, he whirls the brand around, crying 'Cucujus, Cucujus.' Some simple people think that the Cucuji fly up delighted at his shouting, for they come in haste," etc. I suspect that they come to the light in the way in which the Cicindelae are called to the Cicindelae. And let this have been said by the way concerning the uses, which I think the song of the Cicadae serves, and I could show something not dissimilar in birds, in animals, which are called perfect, and also in snakes, which for the same reason nature has implanted in all these, but enough of this.

(To be continued)

## Undescribed Species of Eriocera and Penthoptera from Tropical America (Tipulidae, Diptera).

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The new species described in this paper were collected by E. B. and J. H. Williamson and W. H. Ditzler, in Venezuela, and by J. H. Williamson in Peru. Through the kindness of the collectors, the author has been permitted to retain the types in his collection.

**Eriocera longipennis** sp. n.

Antennae short in both sexes; general coloration reddish fulvous; wings long and narrow, brown; stigma very small; abdomen and legs dark brown.

♂.—Length 9.5 mm.; wing 15.5 mm. Rostrum brown, the palpi dark brown. Antennae short, dark brown. Head fulvous, the anterior part of the vertex more suffused with brown.

Mesonotum reddish fulvous, the praescutum with a narrow and indistinct brown line. Pleura brownish fulvous, the dorso-pleural membrane dark brown. Halteres dark brown, the base of the stem paler. Legs with the coxae and trochanters testaceous; remainder of the legs black, the bases of the femora paler. Wings long and narrow, strongly tinged with brown; stigma very small, faintly indicated, dark brown; veins dark brown. Venation: *Sc* extending a short distance beyond the fork of *Rs*, *Sc2* about opposite the fork of *Rs*; *Rs* very long, much longer than *R*4+5; basal deflection of the latter very short; cell *M*1 lacking; veins issuing from cell 1*st M*2 long and slender; basal deflection of *Cu*1 just beyond the fork of *M*; *Cu*2 a little shorter than the basal deflection of *Cu*1; cell 2*nd A* very narrow; anal angle lacking.

Abdomen dark brown, the hypopygium a little brighter.

*Habitat.*—Venezuela. *Holotype*, ♂, Macuto, January 29, 1920 (Williamson).

It is possible that *Eriocera longipennis* may more properly be considered a species of *Penthoptera*.

**Eriocera dimidiata** sp. n.

Antennae short in both sexes; general coloration black, the mesonotal scutellum and postnotum reddish; pleura reddish, marked with black; wings with a strong brownish suffusion.

♂.—Length 10 mm.; wing 13 mm. ♀.—Length 12 mm.; wing 11.6 mm.

Rostrum and palpi dark brown. Antennae short in both sexes, black. Head brownish black, the occiput more brownish; vertical tubercle very conspicuous, each lateral angle produced into a conical knob.

Mesonotal praescutum and scutum black, the scutellum and postnotum abruptly reddish. Pleura reddish, the dorso-pleural membrane and a spot on the mesepisternum dark brown. Halteres dark brown. Legs entirely black, including the coxae. Wings with a strong brown suffusion, darkest in the costal and subcostal cells; basal and anal cells slightly paler medially; veins dark brown. Venation: Cell *M*1 lacking; cell 1*st M*2 irregularly pentagonal; basal deflection of *Cu*1 beyond the fork of *M*, longer than *Cu*2.

Abdomen black.

*Habitat.*—Venezuela. *Holotype*, ♂, Tachira, Tachira, April 8, 1920 (J. H. and E. B. Williamson and W. H. Ditzler). *Allotopotype*, ♀, April 11, 1920. *Paratopotype*, ♂, April 4, 1920.

The paratype is in the collection of the University of Michigan.

Erioptera perenensis sp. n.

General coloration yellow; mesonotal praescutum with four conspicuous dark brown stripes; a conspicuous basal pit on mesonotal postnotum; wings faintly tinged with brown, the stigma only faintly darker; abdomen with a broad black subterminal ring.

♂.—Length 15 mm.; wing 13.3 mm. Rostrum brown; palpi black. Antennae short; scape obscure yellow; remainder of antennae brownish black, the base of the first flagellar segment pale. Head obscure yellow; vertical tubercle inconspicuous, dorsally with two rows of black setae; a small shiny cicatrice on antero-lateral portion of tubercle.

Pronotum brown, blackened laterally. Mesonotal praescutum with four conspicuous, dark brown stripes, the median pair but narrowly separated; scutum yellow, the lobes largely dark brown; scutellum testaceous medially, dark laterally; postnotum obscure yellow, darker posteriorly; on either side between the median and lateral sclerites at base a large, conspicuous, circular pit. Pleura yellow, the dorso-pleural region narrowly dark brown. Halteres dark brown, the base of the stem conspicuously yellow. Legs with the coxae pale, the base narrowly and indistinctly darkened; trochanters obscure yellow; femora brownish yellow, the bases clearer, the apices darker brown; tibiae and tarsi dark brown.

Wings faintly tinged with brown; stigma and broad seams along the longitudinal veins indistinctly darker; veins dark brown. Venation: *Sc*2 close to tip of *Sc*1, the latter a little the longer; *r* on *R*2 less than its length beyond the fork and on *R*1 about three to four times its length from the tip, *R*1 being bent strongly caudad at *r*; deflection of *R*4+5 subequal to *r-m*; cell 1*st M*2 a little narrowed distally, *m* less than one-half the outer deflection of *M*3; cell *M*1 lacking; basal deflection of *Cu*1 just beyond the fork of *M*, *Cu*2 and the deflection of *Cu*1 subequal.

Abdomen with the first tergite brown basally; remainder of the abdomen yellow except a broad black subterminal ring which includes all of segments six and seven, and all of five except the narrow base.

*Habitat.*—Peru. *Holotype*, ♂, Colonia del Perené, Campamiento, June 5, 1920 (J. H. Williamson).

*Eriocera perenensis* is related to *E. cornigera* Alexander, differing in the lack of slender curved horns on the vertical tubercle and the details of coloration.

**Eriocera williamsoni** sp. n.

General coloration dark brown, the ventral sclerites of the thorax and abdomen yellow; legs black; wings with a pale brown tinge, the stigma and indistinct seams along the cord pale brown; *Sc* comparatively short, *Sc*1 ending just beyond the fork of *Rs;* cell *M*1 lacking; cell 1*st M*2 very long and narrow.

♂.—Length 9.8 mm.; wing 9.7 mm. Rostrum and palpi brownish black. Antennae with the first scapal segment brownish black; second segment brown; flagellum broken. Head blackish, gray pruinose; vertical tubercle inconspicuous.

Mesonotum dark velvety brown, the praescutal stripes a trifle paler than the ground-color, the broad median stripe split by a capillary dark line. Dorsal pleurites dark brown, including the lateral sclerite of the postnotum; ventral pleurites and sternites yellow. Halteres relatively long and slender, the base broadly dark brown, the distal half of the stem paler brown; knobs dark brown. Legs with the coxae and trochanters obscure brownish yellow; remainder of the legs black, the femoral bases very little paler.

Wings with a pale brown tinge, more suffused in cells *C* and *Sc* and at the wing-tip; stigma and indistinct seams along the cord and outer end of cell 1*st M*2 slightly darker brown. Venation: *Rs* only a little longer than *R;* *Sc* comparatively short, *Sc*1 ending just beyond the fork of *Rs*, *Sc*2 a short distance before the fork; *r* on *R*2 about one and one-half times its length beyond the fork and on *R*1 about two and one-half times its length from the tip; *R*2 more than twice *R*2+3; deflection of *R*4+5 shorter than *r-m;* cell 1*st M*2 very long and narrow, rectangular, longer than any of the veins beyond it; cell *M*1 lacking; basal deflection of *Cu*1 at about two-fifths its length beyond the fork of *M*, longer than *Cu*2 alone.

Abdominal tergites dark brownish black, the base of tergite two paler; sternites obscure brownish yellow.

*Habitat.*—Peru. *Holotype*, ♂, Colonia del Perené, Campamiento, June 6, 1920 (J. H. Williamson).

This interesting species is named in honor of the collector, Mr. Jesse H. Williamson, to whom I am indebted for several

interesting Neotropical Tipulidae. The fly much resembles a *Penthoptera* and it is probable that the two genera will need to be united, a course already followed by Mr. Edwards.

**Penthoptera candidipes** sp. n.

Mesonotum reddish brown, unmarked; pleura yellow with a broad brownish, dorsal, longitudinal stripe; legs brown, the tarsi white; on the posterior legs, the metatarsi entirely white; wings with a yellowish tinge; distal section of *R*1 about three times *r*; *r-m* connecting with *Rs* at its tip, obliterating the basal deflection of *R*4+5.

♀.—Length 10.5 mm.; wing 10.3 mm. Rostrum and palpi brown. Antennal scape yellow, flagellum dark brown. Head dark brown, sparsely gray pruinose.

Mesonotal praescutum reddish brown, without stripes, the extreme lateral margin narrowly yellowish; remainder of the mesonotum reddish brown, the postnotum more plumbeous. Pleura yellowish, the dorsal sclerites with a broad brownish longitudinal stripe. Halteres dark brown. Legs with the coxae and trochanters obscure yellow; remainder of the legs dark brown, the femoral bases indistinctly paler; terminal tarsal segments snowy white, on the fore and middle legs the white includes a little more than the distal half of the metatarsi; on the hind legs the metatarsi are entirely white; fore metatarsi much longer than the posterior metatarsi; fore metatarsi about three and one-half times the remaining tarsal segments; posterior metatarsi less than twice the remaining tarsal segments; inner apical angles of the tarsal segments slightly produced and armed with bristles, those of the metatarsi stronger than the others.

Wings with a yellowish tinge; stigma lacking; wing-tip indistinctly darkened; veins dark brown. Venation: *Sc*1 ending about opposite one-third the length of *R*2+3, *Sc*2 some distance from the tip of *Sc*1, the latter alone being longer than *r-m*; *Rs* long, strongly arcuated at origin; *r* on *R*2 a little more than its length beyond the fork of *R*2+3; distal section of *R*1 about three times *r*; deflection of *R*4+5 lacking, *r-m* connecting directly with the end of *Rs*; cell 1*st M*2 elongate-rectangular, a little shorter than vein *M*1+2 beyond it; cell *M*1 lacking; basal deflection of *Cu*1 a little more than one-half its length beyond the fork of *M*.

Abdominal tergites dark brown; sternites obscure yellow; Ovipositor with the basal shield obscure yellow; tergal valves reddish horn color, acicular.

*Habitat.*—Venezuela. *Holotype*, ♀, Tachira, Tachira, April 9, 1920 (J. H. and E. B. Williamson and W. H. Ditzler).

The only close ally of the present species is *Penthoptera batesi* Alexander of the Upper Amazons. The present species is readily told by the diagnostic characters as given above.

# Hemipterological Notices.—III. (Miridae, Lygaeidae.)[1]

By H. M. Parshley, Northampton, Massachusetts.

**Dicyphus gracilentus** sp. nov.

General coloration pale yellow, marked with brown and black, polished. Head black, marked at base with a yellow area slightly wider than distance between eyes and extending from the postocular transverse impression posteriorly beneath pronotal collar. Pronotum yellow, with large pleural black areas barely visible from above; translucent, the inferior dark coloration showing through to some extent; scutellum black, opaque, with two very small triangular yellow spots at basal angles of apical lobe. Hemelytra pale yellowish, nearly opaque, marked with reddish brown; clavus reddish brown with pale streaks along vein and on basal half of commissure, and a faint pale dot at apex; corium with vague reddish areas inwardly on disc and two dark brown spots at apex; cuneus pale yellow, with a brown spot at apex; membrane largely brown, paler at sides. Antennae black, the basal segment variably paler except toward apex. Rostrum pale yellow, dark at apex. Legs pale yellow, the femora inconspicuously dotted, the tarsi black apically. Ventral surface polished; thorax black except prosternum and area of scent gland; abdomen yellow, with variable dark markings often confined to genital segments.

Head slightly wider than long (30-25), the vertex prominently swollen anteriorly, the eyes decidedly prominent and large; viewed from above the distance between eyes is about equal to the width of one eye, and length of eye much greater than width (15-10); sides of head behind eyes moderately convergent, the postocular distance much less than distance between eyes. Antennae about twice as long as head, pronotum, and scutellum together; first segment twice as long as distance between eyes; proportions of segments: 1st, 20; 2nd, 56; 3rd, 46; 4th, 20. Rostrum extending between posterior coxae, the first segment somewhat beyond posterior margin of eyes. Pronotum twice as broad at base as long on median line; apical stricture and transverse depression very deep and distinct, strongly curved, concentric; the anterior lobe strongly convex; posterior lobe shorter than anterior with collar (5-7), very obsoletely and sparsely punctate. Scutellum about as broad as long, not carinate, the anterior lobe shorter than the posterior (12-17). Hemelytra very obsoletely punctate, a little more than three times as long as wide (85-27), slightly broadened at middle in both sexes; apex of cuneus extending well beyond apex of abdomen in both sexes. Head, pronotum, and scutellum with a few sparse setae; hemelytra with very fine and sparse pale pubescence; femora and tibiae minutely spinulose. Apical segments of male abdomen slightly enlarged, the claspers very small.

Length 4.5-5 mm.

[1]Contributions from the Department of Zoology, Smith College, No. 90.

*Holotype* ♂ and *allotype*: Urbana, Illinois, 14 July, 1922 (P. A. Glick) in my collection. *Paratypes* ♂ ♀: numerous specimens with same data, and, from the same locality: 8 July, 1887 (C. A. Hart); 2 July, 26 September, 1921 (A. O. Weese) in collections of H. H. Knight, P. A. Glick, A. O. Weese, etc.

This species seems most closely related to *D. famelicus* Uhler, from which it is readily distinguished by coloration, less exserted head, slightly broader form, etc. In *agilis* Uhler the pronotal groove is scarcely developed and the first antennal segment is shorter. Mr. Glick, who intends to figure the insect in his forthcoming work on insects affecting weeds, found it in great abundance on *Polymnia canadensis* Linn., the leafcup. Dr. H. H. Knight independently established the novelty of this form from the Hart material mentioned above among the paratypes.

I take this opportunity of recording the second locality for *Dicyphus notatus*, which I recently described from South Dakota; Knight has sent me two specimens collected by C. A. Hart, labeled respectively, Fountain Bluff, Illinois, 8 July, 1887 and Urbana, Illinois, 18 March, 1888.

### New Records of Lygaeidae.

**Orthaea fracticollis** Schilling. Montreal, Quebec, 16 May, 1915 (J. I. Beaulne).

**Orthaea lurida** Hahn. Montreal, Quebec, 17 May, 1915 (J. I. Beaulne).

These European species, now recorded for the first time from North America, are described and figured (under the genus *Plociomerus*, later corrected to *Pamera*) in Saunders' "Hemiptera Heteroptera of the British Islands." My friend H. G. Barber was the first to detect *fracticollis*, and he has confirmed my determination of *lurida*. The following key will aid in distinguishing these species from one another and from their only congener found in the northeastern states.

1. Pronotum moderately constricted slightly behind middle, the sides of the anterior lobe but slightly curved, convergent; length 4.7-5 mm.....*Orthaea fracticollis* Schilling.
   Pronotum strongly and sharply constricted well behind middle, the sides of the anterior lobe strongly curved.....2
2. Anterior lobe of pronotum transverse, widest at middle, with fine erect pubescence; scutellum black or brown; pale markings of dorsal surface indistinct; length 4.5 mm.....*Orthaea lurida* Hahn.
   Anterior lobe of pronotum more elongate, widest behind middle, with sparse decumbent pubescence; scutellum bicolored; pale markings very distinct; length 4-4.5 mm.....*Orthaea basalis* Dallas.

## Immunity to Parasitism in Samia cecropia Linn. (Lep.: Saturniidae; Dip.: Tachinidae.)

By L. S. West, Instructor in Parasitology, Dept. of Entomology, Cornell University, Ithaca, New York.

The possession of immunity on the part of certain hosts to parasitic invasion is a recognized fact, but our knowledge of this whole subject is so meagre, that any illustration of the phenomenon is worthy of note. The following striking example in our common Cecropia moth, came under the observation of the writer, who is conducting investigations on the life-habits of "Tachinidae" (Diptera), and who has in progress a systematic revision of this group of parasitic flies, as occurring in the State of New York.

On August 1, 1921, there was brought into this laboratory by a student, a fully grown Cecropia larva, bearing along its back and sides thirty-five or forty white, "macrotype" Tachinid eggs. Examination revealed the fact that the eggs had already hatched, and a tiny puncture in the integument of the host near each egg indicated the point where the little maggot had gained entrance. The caterpillar was accordingly confined in a suitable rearing cage and kept supplied with food until August 5, 1921, when pupation took place. It was of course supposed that a rearing record would be secured, and the cage and contents were placed outdoors and kept under observation during the winter.*

On June 25, 1922, no parasites had emerged and it was considered probable that severe weather conditions had destroyed them. On July 14 however, the writer was exceedingly astonished to find a normal female Cecropia, emerged from the cocoon. She was dead, but a considerable mass of eggs testified that she had lived long enough for oviposition. Dr. W. T. M.

*A few of the recorded parasites of Samia cecropia might be mentioned. Hymenoptera: Ophion macrurum Linn., Ophion bilineatus Say, Bracon flavator Fabr., Cryptus extrematis Cr., Cryptus nuncius Say, Diglochis omnivorus Walk., Spilochalcis mariae Riley, Theronia fulvescens Cr. Diptera: Frontina frenchii Will., and Winthemia quadripustulata Fabr. Both these flies are parasitic on a great variety of hosts.

Forbes, of this laboratory, specialist in Lepidoptera, examined the specimen and asserted that the moth had apparently laid a full complement of eggs and had died of old age. The eggs were shrunken in the manner characteristic of Cecropia eggs that have not been fertilized.

Careful dissection and examination of the cocoon revealed no evidences of parasitic invasion beyond the old hatched eggs, which were still to be seen, attached to the remains of the last larval skin. The interim of five days between observation of parasitism and the spinning of the cocoon would seem to exclude all possibility of the parasites being "molted" at the time of pupation, hence the possession of "complete immunity" in this case must perforce be acknowledged. But when we consider the tremendous power of resistance, necessary, on the part of the host, to destroy and absorb such a large number of parasites, and then to mature normally, as though nothing of a disturbing nature had taken place, the phenomenon acquires added significance.

The question first arises as to whether we have illustrated a case of "specific immunity" or, more remarkable still, of "individual immunity." That is to say, would another Cecropia moth have been able to resist this particular parasite in the same way, or was this particular individual immune, just as individuals among us are immune to the invasion of certain disease organisms? In the absence of conclusive evidence, and in consideration of the complete failure of the parasites to mature, we are forced to take the former view, as the more conservative, but the other possibility is worthy of consideration, and the accumulation of a certain amount of careful data, in connection with several rearing records, might go far toward clearing up this particular question.

Also, in touching upon the problems of immunity, we find ourselves confronting the old question, as to just how immunity reactions take place. Is the resistant action phagocytic or are there toxins produced which act as destructive agents? This is a problem affecting workers in fields far beyond the realm of Entomology, but the writer, who is keenly interested in this subject, is of the opinion that insect parasites and their hosts

furnish excellent material for the solution of this very problem. Some work of this type has already been done,* but the problem, as everyone knows, is an open one. Who can say but that one phase of Entomology may be thus brought to serve workers in other fields of scientific endeavor?

### Scarites subterraneus Fabr., an Interesting Malformation (Col.: Carabidae).

There is in the New York State collection of insects a specimen of this beetle having two nearly equally developed and almost normal prothoracic segments, each with normal or nearly normal prothoracic legs. The anterior prothoracic segment is a little narrower, a little shorter, and inserted somewhat like the head usually is in the presumably normal segment. The mesothoracic legs are represented only by normal coxae and slightly modified trochanters, the remaining segments having disappeared. The specimen, therefore, has the normal six legs, though it is what might be characterized as an unusually "chesty" individual with its two pairs of prothoracic legs.—E. P. Felt, Albany, New York.

### Additions to the Collections of Insects at Iowa State College.

Dear Doctor Skinner: It may interest you to know that the best part of my collection of Mexican Lepidoptera is now at the State College, at Ames, Iowa, and is known as the "Dr. Skinner Collection." This is out of courtesy to you for the work done in identifying and naming most of the rarer specimens.

Enclosed you will also find a clipping from a local paper that will interest collectors. I have never seen this collection so do not know just what it is but presume it is good.—M. E. Hoag, Wapello, Iowa.

Ames, Nov. 3—A collection of 17,000 butterflies from all parts of the world has been added to the entomological collection at Iowa State College, according to an announcement made by Dr. C. J. Drake, head of that department.

This collection, which was made up by J. S. Faaborg, of Clinton, includes 8,000 different varieties of butterflies.

Mr. Faaborg began his collection of insects while he was a school teacher in Denmark, nearly fifty years ago, and has continued it along with his other business. In disposing of the collection to the college at small price, scarcely enough to pay for the cases containing the collection, he desired to place his life work where it would be of use to the public and receive good care. (*Nevada [Iowa] Evening Journal*, Nov. 3, 1922.)

*Thompson, W. R. The relation of Phagocytes to the parasites of Arthropoda. Thesis submitted to the faculty of the Graduate School, Cornell University, Ithaca, N. Y., for the degree of Master of Science in Agriculture. 1912. (Gives excellent bibliography.)

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JANUARY, 1923.

### "Kindness to Butterflies."

The following letter from C. W. Bigler, of Wayne, Mich., was published in *The Christian Science Monitor*:—

"It is a wonder to me why a free, life-loving people will allow the wholesale slaughter of butterflies. The Humane Society has endeavored to cultivate humaneness and as a result there is a greater amount of kindness shown toward animals.

"Because someone started the fad of putting butterflies in trays is no reason why we should follow this system of cruelty. If this practice continues, what will become of the beautiful experience that is ours every spring—the first appearing of the butterfly, a sign that spring is here with its manifestation of life, and activity. Let us have a 'drive' to put this fad out of business. Have it start today."—(*Our Dumb Animals,* 1922, 55, p. 93.)

There may be some reasons advanced for not putting butterflies into trays and jewelry, but that it is a "system of cruelty" is not true. There are a number of experiments that may be performed showing that insects do not suffer pain. We will refer to only one. If the end of the abdomen of one of the large dragonflies be turned to the mouth of the insect, it will eat the abdomen as far as it can reach, with apparently great enjoyment. Moreover, butterflies are collected in nets and then killed in cyanide bottles, which give off the fumes of hydrocyanic (prussic) acid which acts quickly. The butterflies that are used in trays are nearly all tropical species and we need hardly fear not seeing the butterflies appear here in the spring as usual.—HENRY SKINNER.

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The NEWS will be glad to receive articles of general entomological interest, such as accounts of collecting trips, of the length of two to three of our printed pages.—*Editors.*

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### Seitz: Macrolepidoptera of the World.

We are informed that the Palaearctic part of this work has long since been concluded and of the exotic part there have appeared 108 "hefts" on the American fauna, 117 on the Indian and 34 on the African. The publisher is Alfred Kernen, Poststrasse 7, Stuttgart.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## The Proper Spelling of Ornithodoros talaje Guérin-Méneville (Acar.: Ixodoidea).

This tick species was described by the French author in the *Revue et Magasin de Zoologie*, Second Series, Volume I, 1849, pages 342-344, from specimens received from Sallé which he collected in Guatemala. In his description he quotes from Sallé's notes concerning the bite of the creature, and states that the local people call the biter *talaje*. Guérin-Méneville very properly adopted this native name.

It seems, however, from information just received from Señor Sam. Marcias Valadez, of Mexico City, that Sallé should have spelled the name t-l-a-l-a-j-e, the word being of Aztec origin, *tlalli* meaning earth. Señor Valadez also states that Doctor Brumpt is mistaken in saying that in Colombia they call ticks *talajas*.

Of course, according to the rules of zoological nomenclature, Guérin-Méneville's name must stand as originally spelled, but Señor Valadez' statement is of interest.—L. O. Howard, Washington, D. C.

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## Indian Massacres of Early Days Outdone! Wholesale Slaughter of Peaceful *Pawnees by Whites!

On Saturday, September 2nd, another chapter was added to the tale of atrocities growing out of the warfare between white settlers and the Indians. On that date two whites, R. A. and Paul H. Leussler, made a raid on the tribal stronghold of the Pawnees two miles south of Pilger, Nebraska.

The attack, which was entirely unprovoked, was so sudden and unexpected that the Pawnees were wholly unprepared and the slaughter was appalling. Thirty braves and twenty-three squaws were slain in the battle, which lasted about four hours.

From meager details obtainable at this writing, it appears that the white wretches left Omaha in the early hours of the morning and covered the hundred miles to Pilger in a motor car, stopped in the village for a hurried lunch and then hastened southward on the state highway. Two miles from town they encountered the Pawnees on the high, rolling prairie in a blazing, scorching sun, and the fight was on.

What makes this butchery all the more horrible is that most of the braves captured or slain were already mutilated, as were also some of the squaws.

When interviewed, the elder Leussler, who is said to have organized and led the raid, stated that he had suffered from hay fever for many years in his pursuit of the Pawnees and therefore when he finally met up with them he was determined not to spare a single one.

The scalps are now drying on the spreading boards. They are *not* first class specimens but are from the approximate type locality and are

the real *pawnee*.* Dodge in his original description says they are on the wing from the first to the fifteenth of September. The condition of the specimens taken by me September 2nd indicates that the species is in its prime about August 25th.—R. A. LEUSSLER.

**Notes on Variation in 53 Specimens Pamphila pawnee Collected at Pilger, Nebraska, September 2, 1922 (Lep., Hesperidae).**

There appears a great deal of variation in the above specimens. In the males there is variation in the ground color of the upper side from yellow to reddish-yellow or tawny, and in markings from lightly marked to very heavy fuscous. The ground color of the under side of secondaries varies from pale ochreous to dull orange.

Of 30 males, 16 had pale spots on under side of secondaries, varying from very faint to quite distinct, while the remaining 14 had the underside of secondaries immaculate.

In nearly all the males the shaded area or patch under the stigma is pronounced and heavy, but in a few it is so light as to be almost wholly wanting.

In the females the upper side varies from light fulvous with white spots to dark fuscous with creamy white spots on primaries and fulvous spots on secondaries. The ground color of the under side of secondaries varies from pale golden yellow to a darker greenish yellow. Eighteen had pronounced spots on under side of secondaries, varying considerably in size and distinctness, 2 had faint, rather indistinct spots, and 3 were entirely without spots.—R. A. LEUSSLER, Omaha, Nebraska.

**Ceuthophilus Infesting a Well (Orth.: Locustidae or Tettigoniidae)**

A correspondent of the Federal Bureau of Entomology writing from Denver, Colorado, records the occurrence in a well of large numbers of a species of the orthopterous genus *Ceuthophilus*. This well, which is situated near Palmer Lake, Colorado, at the base of the mountains, is about eighty feet in depth, was dug some twenty-five years ago and is walled with brick. It is in use for a month or so in the summer and at irregular intervals during the rest of the year. Access to the well was probably through cracks in the curbing, though it is possible that the insects got in through crevices beneath the surface of the ground, as the well is situated in a rocky location near a ravine. The insects appear to prefer life near the top of the well, provided the cover remains closed. The correspondent writes that when one opens the well for the first time, after a considerable absence from the premises, some twenty-five or thirty of the insects will be seen, mostly on the cement of the well-curb. At such times one or two dead specimens are apt to be found in each bucket of water drawn, often partially decomposed and therefore a potent source of contamination. But when in constant use the water is generally free from the insects.—A. N. CAUDELL, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

**Pamphila pawnee* Dodge.

**Symphoromyia hirta Johnson Annoying in Colorado (Dipt.; Leptidae)**

When recently (July) collecting Eocene fossil insects and plants on the top of the Roan Mountains, Colorado, immediately south of the upper part of Roan Creek, I was persistently attacked by *S. hirta*, inflicting painful bites throughout the day in sunny weather, and occurring in prodigious numbers. The flies usually settled on the hands, but often on the back of the neck, and sometimes on the face. They are not easily frightened away, and can usually be captured by the fingers. I must have destroyed hundreds in this way, pinching or slapping them and throwing them down. They seem equally common near streams and on the dry sage brush (*Artemisia tridentata*) mesas, but they are absent from the valleys between the mountains.

I am able to confirm my determination by comparison with a specimen I collected on Twin Sisters Mountain, Colorado, in the Canadian zone, July 23, kindly identified by Dr. J. M. Aldrich. (*S. atripes* Bigot was also taken on Twin Sisters at the same time). In the key given by Aldrich (Proc. U. S. Nat. Mus., 49, p. 118) my specimens run out, because the tibiae are dark brown, not at all yellow. In the descriptive account, p. 125, it is stated that the tibiae may be dark, and in Johnson's original description we read "tibiae dark brown." The proboscis of the female in the Colorado specimens is clear ferruginous, not dark brown as given by Johnson. *S. hirta* was described from Pennsylvania. Possibly the Rocky Mtn. form may prove separable when better known, in which case it will take the name *flavipalpis* Adams.

Although the bites were painful at the moment, they seemed to produce no lasting effect.—T. D. A. Cockerell, Boulder, Colorado.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological

Society. **23**—Bollettino del Laboratoria di Zoologia Generale e Agraria, Portici, Italy. **31**—Proceedings of the Acadian Entomological Society, Truro, N. S. **39**—The Florida Entomologist, Gainesville, Florida. **68**—Science, Garrison on the Hudson, N. Y. **85**—The Journal of Experimental Zoology, Philadelphia. **87**—Arkiv for Zoologi, K. Svenska Vetenskapsakademien, Stockholm. **91**—The Scientific Monthly, Lancaster, Pa. **102**—Broteria, Revista Lusco Brazileira. Serie Zoologica, Braga. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **114**—Entomologische Rundschau, Stuttgart. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **144**—Proceedings of the Pacific Coast Entomological Society, San Francisco.

**GENERAL. Crampton, G. C.**—Notes on the relationships indicated by the venation of the wings of insects. **4,** liv, 206-16 (cont.). **Crutchley, G. W.**—Henri Fabre and the microgaster. **9,** 1922, 245-6. **Cuscianna, N.**—Osservazioni sull 'attrazione esercitata dagli odori sugli insetti. **23,** xv, 226-53. **Hoffmann, A.**—Nachtrage und richtigstellungen zu Entomologen adressbuch. **124,** ii, 115-17; 126-8 (cont.). **Janse, A. J. T.**—How to collect, preserve and study insects in S. Africa. (So. Africa Jour. N. H., ii, 230-40.) **Littlewood, F.**—Killing with cyanide. **9,** 1922, 260. **Rich, S. G.**—The collection of aquatic insect larvae. (So. African Jour. N. H., ii, 72-5.) **Seitz, A.**—Das aufsuchen der sammelplatze. **114,** xxxix, 43-4. **de la Torre Bueno, J. R.**—The inalienable right of authors to say what they please. **19,** xvii, 124-5. **Walton, W. R.**—The entomology of English poetry. **10,** xxiv, 159-203. **Weiss, H. B.**—The evening primrose in relation to insects. **4,** liv, 193-5. **Weiss & West.**—Notes on fungous insects. **4,** liv, 198-9. **Wellhouse, W. H.**—The insect fauna of the genus Crataegus. (Cornell Univ. Agr. Exp. Sta., Mem. 56.) **Wheat, S. C.**—Obituary notice of Silas C. Wheat. **19,** xvii, 125. **Willis, J. C.**—Age and area: a study in geographical distribution and origin of species. (Cambridge University Press. 1922. 259 pp.)

**NOTE.** We note that the Nova Scotia Entomological Society has changed its name to "The Acadian Entomological Society, and has thus broadened out its scope to include members from the three Maritime Provinces."

**ANATOMY, PHYSIOLOGY, etc. Bowen, R. H.**—Studies on insect spermatogensis. (Proc. Am. Ac. A. & Sc., lvii, 391-422.) **Kopec, S.**—Mutual relationship in the development of the brain and eyes of Lepidoptera. Physiological self-differential of the wing-germs grafted on caterpillars of the opposite sex. **85,** xxxvi, 459-65; 469-75. **Martini, E.**—Bemerkungen zu Feuerborns neuer theorie uber den thoraxbau der insekten. **52,** lv, 176-80. **Minnich, D. E.**—A quanti-

tative study of tarsal sensitivity to solutions of saccharose, in the red admiral butterfly. **85,** xxxvi, 445-57.

**THE SMALLER ORDERS OF INSECTA. Ferris, G. F.**—De Anopluris. **91,** xv, 551-6. **Longinos Navas, R. P.**—Algunos insectos del Museo entomologico de Berlin "Deutsches entomologisches museums." **102,** xx, 87-92. **Tillyard, R. J.**—The wing-venation of the Leptoperlidae. (Trans. R. Soc. So. Australia, xlv, 270.)

**Davis, W. T.**—The dragonfly Epicordulia regina. **19,** xvii, 111-3. **Watson, J. R.**—Another camphor thrips. Additions to the Thysanoptera of Florida. **39,** vi, 6-7; 21-23.

**HEMIPTERA. Baker, A. C.**—Tingitidae or tingidae. **68,** lvi, 603. **Bergroth, E.**—New Neotropical Miridae. On the South American Miridae described by C. Stal. **87,** xiv, No. 21-22. **Brittain, W. H.**—Some factors influencing the occurrence of alate forms in certain Aphididae. **31,** 1921, 7-29. **Holland, W. J.**—Tingitidae or Tingidae again. 68, lvi, 535-6. **La Face, L.**—Osservazioni morfologiche e biologiche sull Antonina phragmitis. **23,** xv, 254-67. **Laing, F.**—Aleyrodidae: correction of generic nomenclature. **8,** 1922, 255. **Mason, A. C.**—Relation of environmental factors to wing development in aphids. **39,** vi, 25-32. **Milliken & Wadley.**—Geocoris pallens, decoratus, a predaceous enemy of the false chinch bug. **19,** xvii, 143-46. **Parshley, H. M.**—A note on the migration of certain waterstriders. **19,** xvii, 136-7. **de la Torre Bueno, J. R.**—Distributional records of aquatic Hemiptera. **19,** xvii, 120-1. **Vogel, R.**—Aus der naturgeschichte der singzikaden. (Aus der Natur, Leipzig, xviii, 264-7.)

**Olsen, C. E.**—A new species of Agallia, with notes on certain other Cicadellidae. **19,** xvii, 127-31. **Osborn, H.**—New sps. of Cicadellidae from the southern U. S. **39,** vi, 17-20. **Parshley, H. M.**—A change of name in Ischnodemus. **19,** xvii, 123.

**LEPIDOPTERA. Beutenmuller, W.**—Larva of Adelocephala bisecta. **16,** iii, 187-8. **Detwiler, J. D.**—The ventral prothoracic gland of the red-humped apple caterpillar (Schizura concinna). **4,** liv, 176-91. **Dukes, W. C.**—Isoparce cupressi. **19,** xvii, 110. **Kruger, E.**—Catoblepia orgetorix und verwandte arten in Columbien. **114,** xxxix, 42-3. **Seitz, A.**—The Macrolepidoptera of the World. Fauna americana. Parts 258-261. **Sturmhoefel, Dr.**—Zum hausbau der perophoriden. **114,** xxxix, 41-2.

**Barnes & Lindsey.**—Descriptions of two n. sps. of Aegeriidae. **19,** xvii, 122-3. **Benjamin, F. H.**—A new form of Saturnid from Mississippi and Florida. Notes on N. J. Heterocera with descriptions of one new sps. and two new forms. **4,** liv, 192; 195-7. **Cassino, S. E.**—Some new Geometridae. **16,** iii, 183-7. **Cassino & Swett.**—Some

new Geometridae. **16**, 188-90. **Comstock, J. A.**—Studies in Pacific coast L. (Bul. So. Cal. Ac. Sc., xxi, 43-8.) **Dyar, H. G.**—New American moths. New forms of Cerura. **15**, x, 166-74. **Mayfield, T. D.**—Notes on the life histories of N. A. Catocalae, with description of two new forms. **19**, xvii, 114-20 (cont.)

**DIPTERA.** **Bequaert, J.**—Dolichopodidae from the source of the Hudson River. **19**, xvii, 149. **Brooke, G. E.**—Mosquito diagnosis: a suggestion to describe wing-spots, fork-cells and palp-markings by means of written formulae. **9**, 1922, 247-50. **Dyar, H. G.**—The species of Psorophora of the ciliata group. The American Aedes of the serratus group. **15**, x, 113-17; 157-66. **Enderlein, G.**—Ein neues Tabanidensystems. (Mitt. Zool. Mus., Berlin, x, 333-51.)

**Aldrich, J. M.**—A new genus of Helomyzidae. **19**, xvii, 108-9. **Curran, C. H.**—Notes and corrections (Syrphidae). **4**, liv, 191. **Felt, E. P.**—A new and remarkable fig midge. **39**, vi, 5-6. **Malloch, J. R.**—Notes on Clusiodidae. (Oc. Pap. Boston Soc. N. H., v, 47-50.) **Shannon, R. C.**—A revision of the Chilisini. (Syrphidae). **15**, x, 117-45.

**COLEOPTERA.** **Aurivillius, C.**—Neue oder wenig bekannte Coleoptera Longicornia. **87**, xiv, No. 18. **Benick, L.**—Ueber Bohemian'sche typen der Staphylinidenunterfamilien Megalopsidiinae und Steninae nebst einer neubeschreibung. **87**, xiv, No. 14. **Casey, T. L.**—Studies in the rhynchophorous subfamily Barinae of the Brazilian fauna. (Mem. of the Coleoptera x, 1922, 520 pp.) **McColloch & Hayes.**—The Phyllophaga of Hawthorn. **19**, xvii, 131-35.

**Calder, E. E.**—Change of names in Cicindela. **4**, liv, 191. **Fall, H. C.**—New Coleoptera, X. **4**, liv, 170-73. New species of Coleoptera from Humbolt County, Cal. **144**, ii, 12-14. **Notman, H.**—New sps. of Carabidae, Staphylinidae, and Elateridae. **19**, xvii, 99-108.

**HYMENOPTERA.** **Baird, A. B.**—Some notes on the female reproductive organs in the Hymenoptera. **31**, 1921, 73-88. **Ford, N.**—An undescribed planidium of Perilampus from Conocephalus. **4**, liv, 199-204. **Grandi, G.**—Ricerche sul gen. Philotrypesis. **23**, xv, 33-190. **Kieffer, J. J.**—Trois nouveaux hymenopteres d'Argentine. **106**, xciv, 205-8.

**Bradley, J. C.**—The taxonomy of the Masarid wasps, including a monograph on the N. A. species. (Univ. Cal. Pub., Ent., i, 369-464.) **Cockerell, T. D. A.**—Descriptions and records of bees. **11**, x, 544-50. **McCracken & Egbert.**—California gall-making Cynipidae with descriptions of new sps. (Stanford Univ. Pub. Biol. Sc., iii, No. 1.) **Viereck, H. L.**—New bees of the genus Andrena. (Oc. Pap. Boston Soc. N. H., v, 35-15.)

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From Colombia, South America:

**OVER 10,000 BUTTERFLIES, INCLUDING**

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

**1500 BUTTERFLIES AND MOTHS, INCLUDING**

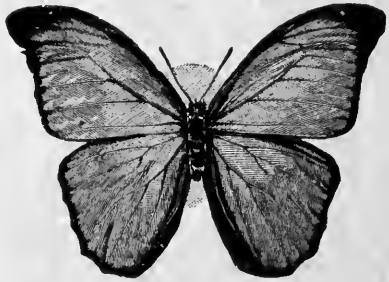
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera



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" philoxenus
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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV FEBRUARY, 1923 No. 2

CONTENTS



## The Wings of Bombyx mori (Lepid.: Bombycidae).

By C. W. WOODWORTH, Nanking, China.

The comparison of the wild species of mulberry silkworm, *Bombyx mandarina,* and its domesticated descendant, *Bombyx mori,* is of particular interest as showing the effect which selection and forcing (which have increased the size of the body till the wings are well nigh functionless) may have on the structure of the wing.

The size of the wing of the domesticated silkworm is larger than that of the wild form, but very much less proportionately than the size of the body. The difference in size of either body or wing between the largest and smallest domesticated race is greater than between the latter and the wild species.

The shape of the front wing of the wild species differs from the domesticated species in the much greater prolongation of the apical portion, making a very much more pronounced excavation in the margin just behind the tip. This, however, is a matter subject to much variation in the domesticated silkworm, the variation being decidedly greater than the difference between the nearest specimens of the two species. The hind wing of the domesticated species is larger in comparison with the front wing than in the wild species and it has lost some of the sharpness of the anal angle, but varies enough to render it impossible to sort the wings with certainty by this character.

In discussing the venation it will be convenient to name the non-terminal elements of the venation by the numerals used in the English system of notation, whereby the cell of the front wing will be bounded, beginning in the rear, by the vein segments bearing the numbers 2, 3, 4, 5, 6, 10, 11, and the stalks beginning near the tip 7, 8, 9. In the hind wing the cell boundary is 2, 3, 4, 5, 6. 8, 9, with the stalk numbered 7.

Segments numbered 2 and 3 of the front wing are more nearly equal and 4 is shorter in the wild species, but in both there is more variation than the difference between the species, so much so that it is probable that with a sufficient series the gap would be bridged. The domesticated species shows greater variation in this particular than the wild species. Numbers 4, 5, 6 are subequal in some specimens of both the wild and domesticated species, but with 4 always the smallest and 6 always the largest. In some wild forms 4 is decidedly the shortest. The greater variation seems to be in the wild species in this respect. Number 10 reduces almost to zero in some specimens of the wild species. It is always the smallest element in the venation of the front wing, but may be larger even in the wild species than shown in Comstock's figure* of the venation of *Bombyx mori*. This segment averages longer in the domesticated species than in the wild form. The stalks 7, 8, 9 may be subequal in both the wild and domesticated species and any may be longer when thus about equal. When

*Manual, p. 202, Wings of Insects, p. 332.

one is decidedly longer than the others then it is number 7 in the wild species and number 9 in the tame species.

In the hind wing the only differences noticed are the shortness of 4 in the wild species, which often reduces to zero, and the shortness of 7 in the domesticated forms, which may become equal or shorter than 6 though not commonly as short as shown in Comstock's figure. In the wild form it is at least as long and may be nearly or quite twice as long.

The tracheation of the veins can be quite readily followed if the wing is sufficiently decolorized with Labarraque solution. It is not as easy to see as when the tracheae retain air in their lumen, but is equally definite because of the characteristic appearance of the taenidia. The normal tracheation of the front wing is one trachea in vein 1, another branching to serve veins 2 to 4, a third trachea branching for veins 5 to 11, and a fourth trachea in vein 12. In the hind wing both veins 1a and 1c have tracheae, the branching of the third trachea serves veins 2 to 4, the next trachea serves all the remaining veins, but vein 8 has its own trachea also. The presence of two tracheae in the same vein cavity also occurs occasionally in vein 2 of the front wing, both being of about equal size in the basal segment, one going entirely into vein 2, the other branching to also serve veins 3 and 4.

An abnormality was noticed in one specimen of the wild species similar to what is occasionally observed in the domesticated species. This consists of a trachea extending directly across the membrane of the cell and appearing as the basal portion of vein 5. The specimen was clear enough to trace this trachea the whole length, and the abnormality proved to be simply a case where the trachea had become detached during the final molt and swung out of place before the fluid had been withdrawn into the body and the membranes became cemented together. In this case the trachea floated into the cell region at the extreme base and then returned to the vein cavity, abruptly swinging out again and following the fold of the membrane in almost a straight line till nearing the crossvein, when it turned forward to the anterior "vestige," half entering the

crossvein and proceeding partly in and partly out almost to the longitudinal vein. It then took a short cut across the corner of the cell and after entering this vein gave off a branch for vein 11 and then another for the crossvein and continued in a perfectly normal course. The branch into the crossvein also proceeded normally, finally entering vein 5.

One of the most notable features of the wing of the domesticated silkworm is the prominence of the marginal vein. In Comstock's figure this is indicated by the heavy lines used, heavier than any of the veins meeting it. He did not show the broadening of the ends of the veins as they approached this vein. It seems to be an undoubted vein comparable with those found in Diptera. Some wings show it very much more distinctly than others. The wild species shows this same peculiarity, but never in the same degree seen in some examples of the domesticated species, though often more evident than in those tame moths that show it least. The most extreme case I have seen is where the tips of veins 8 and 9 are connected with the margin, with a distinct reticulation as evident as in the tegmina of a grasshopper with two and three cells respectively. As far as I know such cells have not previously been noted in Lepidoptera.

There can be, I think, no doubt as to the ancestral character of *Bombyx mandarina,* though Kellogg* says that it is "not known in wild condition." The caterpillar looks, when feeding, exactly like the darker individuals of the domesticated worm but when at rest flattens itself out against a twig almost as much as a *Catocala* larva. One can sometimes observe a domesticated silkworm doing almost the same thing just after a molt. The prolegs are relatively longer, corresponding with its resting habits. The cocoon is firm and white like the common Chinese white race, but very much smaller.

The changes noted above resulting from domestication are: (1) slightly greater variability, (2) loss of distinctive peculiarities, and (3) a tendency towards extremely primitive conditions of structure.

*American Insects, p. 429.

## Odonatological Results of an Auto Trip Across Indiana, Kentucky and Tennessee.

By E. B. Williamson, Bluffton, Indiana.

(Continued from page 9)

Wednesday morning, July 31, we left Nashville, ate dinner at Murfreesboro, and supper at Manchester. Near Murfreesboro, at road-side wet weather pools we saw a number of *Pantala hymenaea*, and caught a few of them. At a road-side pond about seven miles northwest of Manchester, along the Murfreesboro pike, we collected *Lestes rectangularis, L. vigilax, Pachydiplax longipennis, Libellula incesta, L. luctuosa*, and *Plathemis lydia*, and saw, but did not capture, what we thought was *Epiaeschna heros. Libellula incesta* was numerous and this species and *Lestes vigilax*, which we had hitherto associated with clean glacial lakes, seemed out of place about the shallow muddy pool. In the afternoon a dragonfly was seen patrolling the edge of a woods along the road and, when Cook caught it, it proved to be a fine male of *Somatochlora tenebrosa*.

The Murfreesboro-Manchester pike, a mile or two out of Manchester crosses Duck River, a fine little stream, largely on rock, with ripples and pools, and much vegetation to and overhanging the water. We collected here Thursday forenoon, hoping to find Macromias, but only one, and that doubtfully determined as a *Macromia*, was seen and it was not captured. *Calopteryx maculata* and *Hetaerina americana* were common and one *H. titia* was taken. Other species collected were: *Lestes vigilax, Argia violacea, A. apicalis, A. translata, A. moesta, Enallagma exsulans, Hagenius brevistylus, Dromogomphus spinosus, Pachydiplax longipennis, Libellula incesta, L. pulchella*, and *Plathemis lydia*. *Argia translata* was the most abundant of the four species of Argias seen.

We left Manchester about 3 P. M. and, passing Wonder Cave, climbed a steep winding road from the lower land and camped that night near Monteagle on the Cumberland highlands. Some small streams crossed during the afternoon contained nothing of interest, though *Calopteryx maculata* was present, literally by hundreds. In the lower country, adjacent

to the bluff which marks the termination of the Cumberland highlands, the soil is largely sandy and there are many oaks in great variety.

We awoke early on August 2 to find our entire equipment soaked with a heavy dew, and airing and drying occupied our time till about 10 A. M. In the bushes near our camp we saw and caught a single teneral male *Libellula auripennis,* thus establishing the occurrence of this species in Tennessee.

We reached Tracy City about 3 P. M. Along the road during the ride from Monteagle we saw many Somatochloras, apparently all one species, and all captured were *tenebrosa.* A mile or two west of Tracy City a long stone bridge crosses a fine little stream, eight to twelve feet wide, with a rocky bed and clear water, the banks steep but seldom broken into cliffs and then only small ones. But the only dragonfly we found there was *Calopteryx maculata.* The vegetation here was entirely different from the deciduous forest through which we had been passing. Laurel and holly, and hemlock and pine were abundant. In a little stream near Tracy City we found a dead female *Epiaeschna heros* floating in the water. No live ones were seen.

On both sides of Tracy City were some small streams similar to a small stream near a saw mill a short distance east of Monteagle, These streams are slow flowing in sandy beds and are overgrown with brush. Adjacent to them are frequent low swampy spots. At one of these streams a female *Somatochlora tenebrosa* was ovipositing in shallow water by dipping the abdomen. Many other Somatochloras were seen here and an Aeschnine, which I think was *Nasiaeschna pentacantha,* flew back and forth at too great a height for our nets. Nearby was a glorious stalk of the orchid, *Blethariglottis ciliaris,* the only one seen. It was preserved and determined by Chas. C. Deam. Just beyond Tracy City, enroute to Jasper, we saw a dragonfly, probably a Corduline, with a dilated abdomen, flying over a field, but it disappeared and a prolonged search in several directions failed to rediscover it. That night we camped near the toll gate about three miles west of Sequatchie.

On the morning of August 3, we left camp about 9 A. M.

and descended from the Cumberland highlands to Sequatchie. About a mile north of Sequatchie, in the lowlands, we collected carefully along a small stream, fifteen to thirty feet wide, with disappointing results, the three Argias, *violacea*, *translata*, and *moesta*, *Hagenius brevistylus*, *Dromogomphus spinosus*, and *Pachydiplax longipennis* only being seen. The country from Sequatchie to the Tennessee River ferry was without interest. The Somatochloras, which we had observed continuously across the Cumberland highlands, disappeared when we left the highlands and descended to Sequatchie. Road side ponds in the lower country as in the highlands were frequented by the common *Plathemis lydia*.

At the Tennessee River ferry numbers of *Macromia taeniolata* were flying and a smaller number of individuals of *Dromogomphus spinosus* were seen. From the ferry to Chattanooga we came around the foot of Lookout Mountain on a wide concrete road with a beautiful view of the city.

August 4 we drove over the Dixie Highway to Rockwood where we ate dinner, having seen nothing of interest odonatologically enroute. Leaving Rockwood for Crossville we immediately climbed by three great loops over a well improved road again into the Cumberland highlands. The view over Rockwood and its environs from this point is superb. From here to Crossville, where we arrived at 4 P. M., *Somatochlora tenebrosa* again put in its appearance, and a number were seen as we drove along. The only other dragonflies seen were *Calopteryx maculata* and *Plathemis lydia*. We left Crossville at once for Jamestown, thirty-six miles to the north. Enroute the country is largely yellow pine. We saw our last *Somatochlora* at 7.30 P. M., arrived at Jamestown about 8 P. M., and put up for the night at the Mark Twain Hotel.

The next day we drove from Jamestown through Forbes, to Monticello, where we arrived about 6 P. M. During the day we crossed several good small streams but we found only Argias and *Calopteryx maculata*. For some reason no Somatochloras were seen but a *Pantala flavescens* was captured patrolling the road. Monticello is a busy little town of about 1600 people. There is no railroad. In fact, after leaving Crossville, we did not see a railroad till we reached Somer-

set, Kentucky. For this reason a brief note on the roads may be of interest. From Chattanooga to Rockwood and from Rockwood to the top of the highlands the road is good. From there to Crossville and from Crossville to Jamestown the road is poor to fair. From Jamestown to Forbes the road is very bad, and from Forbes to Albany bad. From Albany to Monticello the road is very rocky and there are many bad grades, one hill on the bank toward Monticello above the oil station being the steepest hill seen on the trip. From Monticello to Somerset the road is fair with some steep hills.

August 6 we left Monticello on the Burnside Pike for Somerset. At a small muddy roadside pond at the edge of a barnyard and near a house, about seventeen miles out of Monticello, we found a remarkable assemblage of dragonflies. A single *Lestes* was seen and when captured proved to be *curinus*. *Enallagma aspersum* flew by hundreds or possibly thousands, while *E. civile* was comparatively rare. *Ischnura posita* and *I. verticalis* were both taken. Numbers of *Anax junius* circled the pond with frequent ovipositing females. *Plathemis lydia* was the most conspicuous larger dragonfly present and other Libellulines were *Libellula luctuosa, L. pulchella, Erythemis simplicicollis, Tramea onusta* and *T. lacerata*, the last frequently ovipositing.

After leaving this pond we soon came out on the hill tops overlooking the Cumberland valley, a beautiful and impressive view. We ferried the Cumberland and started to climb the steep grade up from the river. Near the top of this hard pull something went wrong with the Ford and we started to coast backward down the narrow and dangerous road. We rapidly gained speed in our unfortunate predicament and in a moment the Ford turned squarely upside down, fortunately in the road. I jumped and escaped without a scratch but Cook was caught under the machine and was scratched and bruised. Our equipment was badly scrambled but not much damaged. We got aid from Somerset and in a few hours were again on our way. But the collecting, for want of time, was discontinued and we hurried across Kentucky to Cincinnati, Ohio, and thence, through southeastern Indiana, back to Bluffton. So far as I am concerned a wide flung sight-seeing trip and dragonfly collecting are not a successful combination.

## Pontedera's 1718 Paper on the Cicada (Homop.).

Introduction by HARRY B. WEISS and Translation by WILLIAM HAMILTON KIRK, Ph.D., New Brunswick, New Jersey.

(Continued from page 16)

I will exhibit in the Tables the instruments of generation, with which the male and female in both classes are equipped. Then I will consider the pregnant female. For although nature has denied her the harmonic drums, yet it has compensated for this by a greater and, so to speak, extraordinary gift, giving her a wise wit and a skill out of proportion to her body. For it has hidden about the middle of the abdomen a sting as long as the fourth part of a thumb, and has hidden this in a sheath hollowed out in a little furrow and extending as far as the genital organ. This sting is rounded, firm, and equipped at the end with saws, and no art has ever invented a fitter instrument for boring; through its interior runs an open channel, the outer mouth of which ends at the saws, while the inner opens into the womb.

As soon as the Cicada has received the genital seed, she begins to look around for a place in which to deposit the already developed eggs. And having found the dry wood of some small tree, drawing her borer, she immediately sets about the work. She bores the wood and hollows out a nest, going down as deep as the length to which the sting projects beyond the belly. Then there is a great exertion in the abdomen and, the muscles pressing on all sides, the eggs are pushed out through the channel into the hole, in form they are round, pointed at both ends, and white. They are laid close, parallel to each other, but obliquely to the diameter of the wood, and in each little hollow 8 or 9 or 10 or more or fewer. Lastly the receptacle is smeared over with a kind of gummy juice, and so is protected against the inclemency of the weather. Having thus finished her first nest, she proceeds to a second, then to a third, to a fourth, until she has got rid of all her eggs. They are very productive of eggs, and have the lowest part of the belly all full of them, and for this reason, in order that they may have a belly more capable of holding so many eggs, nature has not divided them at the

waist, as it has the males. Individuals produce sometimes five hundred, sometimes six hundred eggs and sometimes I have found them to contain seven hundred.

All this which I write here for you in brief, I shall explain more fully in the Tables, adding likenesses of all these parts; for if I have shown that the organ producing the chirping is uncertain and variously explained by naturalists, more uncertain, and for the most part also false do those explanations seem to me which we have of the generation of the Cicadae. For Aristotle (who I see had no slight acquaintance with the history of the Cicada, since his account is more probable than those of the other writers) also mentions the sting, with which he says the Cicadae hollow out a place for their offspring, saying in Bk. V, ch. XXV; "They bring forth in fallow fields, boring with the sharp (point) which they have behind, like the Bruci, which also bring forth in fallows." But what this point, or (as Gaza translates it) roughness sharp at the end, which he describes in the words, "the sharp (point) which they have behind," is I do not know; certainly it is not the sting which I have found, which is placed in the region of the abdomen; this roughness of the Philosopher is placed behind, a word which Pliny, Nat. Hist. Bk. XI, ch. XXVI, copying this passage of Aristotle, explains by *in dorso* "on the back," saying; "A roughness sharp at the end on the back, with which they hollow out in the earth a place for their offspring." Theodore Gaza also in his translation uses about the same Latin words to express Aristotle's meaning; "They bring forth," he says, "in fallows, hollowing out with a roughness sharp at the end, which they have at the hinder part; as the Bruci also bring forth in soil of this kind." For which reason I am easily brought to agree with Julius Scaliger, who explains this point as situated at the buttocks; adding "The Cicadae have at their buttocks a point not unlike the sort of beak that the Gammari have." Further the extremity at the buttocks is longer in females than in males; which is common also to some Bruci. Unless the Philosopher meant this, he wrongly added the phrase "just as the Bruci," for I have never seen or read of, either in the Bruci or in any other insect, an instrument like that of the Cicadae, except

in the Fly *de'Rosai* recently discovered by the illustrious Antonius Vallisnerius, of which Aristotle had no knowledge. But as to the place for the offspring, the Philosopher himself saw that eggs were deposited in the Reeds which are used to prop vines and in the stalks of Squills; for in the same book and chapter he added "They bring forth also in Reeds with which vines are propped, hollowing out the place for the offspring in the Reeds; and in the stalks of Squills." But having in the beginning laid down that the Cicadae bring forth in fallows, he immediately added that eggs of this sort, namely those which they deposit in Reeds and in the stalks of Squills, fall into the earth. Both of which statements are false; for the eggs are not committed to the earth, nor do those which are committed to wood or Reeds (for in these I also have found the eggs of the Cicadae, but very rarely, because usually shrubs which are not empty are chosen) slip into the earth. On the contrary the Cicadae are born in these and remain in them throughout the winter. Add that nature so provided, which so arranged the articulation of the sting of the Cicadae, that not only could they not, going upwards, raise it to hollow out a nest, but could not even bend it horizontally, therefore they are compelled to bore the little hollow for their offspring by directing it downwards. Besides what is the purpose of the gumming? Certainly it keeps the little worm from getting out of the nest by creeping up and going through the open mouth. This is about what the Philosopher says about the generation of the Cicadae, which I will make plain and open by treating it more fully in the Tables. But what is said by other Philosophers is either the same or inferior, as the remarks of Baldus Angelus, Bk. VIII, ch. VII: "I," he says "can testify truly, that in earth not ploughed, or cultivated, looking toward the East, when it is dug up under scattered oaks, immediately Cicadae are dug up, not perfect but of the usual form, and many white, without wings, which were in hiding under the earth. For that reason I do not know whether they all arise from seed, as Aristotle says, or some from decayed matter. I am of the opinion that it is not repugnant to nature that these animals

should arise both spontaneously and from seed, etc." See the acuteness of the man; he had found *tettigometrae* which of necessity have wings not yet unfolded, from this he immediately excogitated very fine reasoning. But, to leave him in his rotten matter; I, rejecting these fables, shall review in the last part of the work first the origin of the Cicadae, then at what time it comes out of the nest, on what nourishment it lives, until it is hidden under the earth, and becomes a *tettigometra;* for neither in the year in which it is born does it turn out a *tettigometra,* nor in that in which it exists as a *tettigometra* does it become a Cicada. Having disposed of which matters, I shall close my book with the Aristotelian problem, "Why Cicadae are not found in places bare of trees and shrubs." I shall show that it is for this reason; first because they are deprived of the supports, on which they are accustomed to sing their marriages, and to celebrate them, then because the females seeking in vain a place proper for depositing their eggs, the race quickly perishes. And this is the meaning of the threat Dionysius of Syracuse once made against the people of Locri in Italy in the words "that for them the Cicadae shall sing on the ground," obscurely hinting that he would not only devastate their land but would so destroy it, that the Cicadae, if they wished to sing, should sing on the ground. For he intended to leave nothing standing out from the earth, not even the Cicadae; since it is not possible for them to survive when the trees are destroyed.

This, most Excellent man, I have to write to you concerning the Cicadae, and also concerning my Tables, and wish that you would as soon as possible in accordance with your friendliness and kindness write me what you think of these points, also let me know whether something should be added or omitted; conceal nothing from me. For the work will be most complete which I publish strengthened by your counsel and authority. Wherefore, whatever your reply may be, I shall follow it; if you say that there must be any addition, it shall be made; I will discard whatever you say is to be discarded; and shall even willingly suppress and delete the whole, if I understand that to be your wish.

## A Bee-Collecting Trip Across the Plains (Hym. : Apoidea, Sphecoidea).

By T. D. A. Cockerell, Boulder, Colorado.

Dr. Frank E. Lutz had spent the summer in Colorado, collecting and observing insects, and was returning home in the American Museum car during the latter half of August. As he had no companion, he kindly invited me to go as far as Lincoln, Nebraska, in order to investigate the bee-fauna along the route. I was glad to accept, as I had never collected far out on the plains, with the exception of a few hours at Sterling years ago. Dr. Lutz himself had demonstrated in former years that the bee-fauna of the eastern part of Colorado was rich in species not observed in the mountains, many of them extending northward from New Mexico or Texas. The visitor who comes out in the summer naturally collects in the higher elevations, with the result that the plains fauna remains comparatively unknown.

According to existing records, Colorado has 697 species of bees, and in addition a considerable series of forms treated as varieties or races. Certainly no other state has so large a list, but California may prove to possess more species than Colorado when it has been thoroughly explored. The Colorado list will be eventually reduced by a certain amount of synonymy, principally resulting from the matching of sexes described as different species. This reduction will, however, probably fail to balance the additions which are even yet being made at frequent intervals. It was a striking demonstration of the imperfection of our knowledge when during the past summer Mr. L. O. Jackson found *Macropis morsei* Rob. in numbers a short distance east of Boulder, adding a family (Ctenoplectridae) to the Colorado fauna.

Dr. Lutz and the writer are collecting data on the Colorado bees, and hope in due course to issue a manual or monograph which will enable the student to determine his species. Few insects are more interesting to collect and study, but at present it is practically impossible for the beginner to determine many of his species. He cannot do it efficiently even if he has access

to a good named collection, because in several genera the characters are likely to be overlooked unless special attention is drawn to them, quite distinct species being superficially almost alike. The genera, on the other hand, are usually to be recognized without much difficulty, although eminent authorities have not infrequently described species in the wrong genus.

We started from Boulder on Aug. 15, and made the first stop near Canfield, in Boulder County, alt. 5,052 feet. Collections were made at the same place from two species of plants.

(1). On *Peritoma serrulatum.—Bombus fervidus* Fab., *Spinoliella australior* Ckll. ♀ (one had no light median stripe on clypeus), *Perdita zebrata* Cress. ♂, ♀, *Tetraloniella excurrens* Ckll. ♀ (genus and species new to Colo.), *Anthophora occidentalis* Cress. ♀

(2) On *Grindelia decumbens.—Nomia bakeri* Ckll. ♀ (abundant), *Melissodes agilis subagilis* Ckll. ♂, *Halictus pectoraloides* Ckll. ♀ (new to Colo.; antennae much darker than usual).

The two additions to the fauna were known from New Mexico.

At noon we were at Wiggins, Morgan County. It was extremely hot and dusty, and the dry season had resulted in the failure of most of the crops from here on to the eastern border of the state. A small collection at Wiggins from *Peritoma serrulatum* consisted of *Megachile brevis* Say, ♀, *Spinoliella australior* Ckll. ♀, and *Perdita zebrata* Cress., ♂, ♀. *

About six miles east of Wiggins we found the small sunflower *Helianthus petiolaris* in quantity. It is not nearly so attractive to bees as the large species, and I was led to wonder whether it might differ from that in being self-fertile. This was also suggested by the failure to find hybrids, although the two readily hybridize when crossed by hand in the garden. Nevertheless, what *H. petiolaris* lacked in the quantity of its visitors, it made up in quality, as we got the following:

*Triepeolus cyclurus* n. sp., *Andrena pulchella* Rob. ♂ (new to Colo.), *Perdita laticincta* Swenk & Ckll. ♂ (new to Colo.) and *Halictus*

*Mr. S. A. Rohwer has kindly identified two wasps I obtained, and the records are of some interest. *Larropsis conferta* (Fox) ♂. At flowers of *Peritoma serrulatum*, Wiggins, Aug. 15. New to U. S. N. M. *Tachysphex propinquus* Vier. Six miles east of Wiggins, Aug. 15, dragging its prey, which Mr. Caudell identifies as *Phlibostroma quadrimaculatum* var. *pictum* Scudd.

*pruinosiformis* Crawf. ♀. Viereck has published a new name for *Andrena pulchella,* but according to my understanding of the matter, this is not necessary.

In the evening we put up at the auto camp at Fort Morgan, 4,338 ft., and before sunset I captured males of *Melissodes agilis aurigena* Cress. at *Helianthus annuus lenticularis.* The next day, Aug. 16, we found quantities of *Helianthus petiolaris* about 7½ miles west of Xenia, and collected from the flowers *Andrena haynesi* Vier. & Ckll., ♀ (new to Colo.), *Halictus pruinosiformis* Crawf., ♀, *Panurginus leucopterus* n. sp., *Perdita laticincta* Swenk & Ckll., ♂, and *P. lacteipennis* Swenk & Ckll., ♂. The *Andrena* was described from Nebraska.

Wray, reached at noon, was a disappointment. In a former year Dr. Lutz had collected a very fine and interesting series of bees here, but although there were plenty of flowers, I only got a ♀ *Melissodes confusiformis* Ckll., visiting *Helianthus annuus lenticularis.* The reason was an exceedingly hot dry wind, blowing from the south. The butterfly *Nathalis iole* was seen. We accordingly went on into Nebraska, and near Sanborn, a short distance over the line, Dr. Lutz picked up our first specimen of the so-called Colorado potato beetle, *Leptinotarsa decemlineata.* Later, at Oxford, Nebr., it was found on the traditional food-plant, *Solanum rostratum.* We camped at Benkelman, Nebr., close to the race-course. There were few flowers, but early next morning, while Dr. Lutz was ministering to the machine, I collected successfully as follows:

(1.) On *Helianthus annuus lenticularis.—Bombus americanorum* Fabr., worker (it was seen to go first to prickly lettuce, then to sunflower), *Halictus armaticeps* Cress. ♀, *Panurginus stigmalis* Swenk & Ckll. ♀, ♂ (form with nervures paler than in type), *Perdita albipennis* Cress. ♀, *P. lacteipennis* Swenk & Ckll. ♀.

(2.) On *Peritoma serrulatum.—Halictus politissimus* Ckll. ♀ (new to Nebr., described from Texas), *H. tegularis* Rob. ♀, *H. pruinosus* Rob. ♀, *H. pruinosiformis* Crawf. ♀. It seems probable that the original range of certain plants may be determined by the presence of oligotropic bees. The absence of *Perdita zebrata* on the *Peritoma* at Benkelman suggests that the plant may have spread out of its range as a weed. It was extremely interesting to note that the species of *Halictus* (subg. *Chloralictus*) had completely taken the place of the *Perdita,* climbing the long stamens and collecting the green pollen in

exactly the same manner. The species principally concerned in this, and very abundant, was *H. tegularis* Rob., described from Illinois, but known to extend westward. Possibly the competition of the *Halictus* was the true cause of the absence of *Perdita*.

After traveling over some very bad roads, we camped at Oxford, Nebr., early enough to do some collecting.

*Halictus sparsus* Rob. (described from Illinois) was taken on *Solanum rostratum*, and the following occurred on *Helianthus annuus lenticularis*: *Agapostemon texanus* Cress. ♂, *Melissodes agilis aurigenia* Cress. ♂, ♀, *Triepeolus helianthi* Rob. ♂, ♀, *Perdita albipennis* Cress, ♂.

The last collecting was done the next day, Aug. 18, at Friend, Nebr., a place which lives up to its name, providing excellent accommodations. The following were all at *Helianthus annuus lenticularis*:

*Bombus americanorum* Fabr., *Melissodes agilis aurigenia* Cress. ♂, *M. obliqua* Say, ♂ (much worn), *Triepeolus helianthi* Rob. ♂, *T. remigatus* Fabr. ♀, *Megachile parallela* Sm. ♀ (form with hair of head and sides of thorax yellowish). This is an eastern (or Mississippi valley) series of bees, and the character of the fauna was further emphasized by finding on the sunflowers numbers of the green beetle *Diabrotica longicornis* Say, which we do not find in Colorado. We also saw a Baltimore Oriole.

Arriving at Lincoln, I had my first sight of the very rich bee-collection of the University of Nebraska, and was surprised to find that there were still many species in Professor Bruner's Argentine series which I had not studied. Professor Swenk's materials of *Colletes*, including many specimens borrowed from various people and institutions, constitute the largest assemblage of this genus in the country, and it is greatly to be hoped that he will shortly continue his excellent publications on the genus. I was much pleased to meet Mr. R. W. Dawson, and to hear all about his wonderful work on *Serica*. Dr. Lutz hastened on eastward, while I spent the night in the hospitable home of Professor and Mrs. Swenk, returning to Colorado by train the following day.

The results of the trip are not extraordinary, for our day and generation, but the time will come when the story will be read with something of the feeling I had when Dr. Coues described to me the early work in Arizona, when one "shot a new bird before breakfast each morning."

The new species described below are in the writer's collection.

**Panurginus leucopterus** n. sp.

♂. Length about 5.5 mm., but the abdomen is curved like the letter J; slender, black, with scanty white hair, the face not conspicuously hairy; eyes black; face below level of antennae very pale yellow; supraclypeal mark quadrate, broader than long; lateral face marks ending at right angles to orbits, but presenting a rounded extension or lobe below the antennae; process of labrum and large mark on mandibles yellowish-white; process of labrum with strongly converging concave sides, the apex distinctly emarginate; clypeus with strong punctures, and no median groove; antennae long, entirely black; mesothorax shining, but well punctured; base of metathorax rugulose, with a broad, somewhat lustrous rim; tegulae piceous; wings milky hyaline; stigma large, rather dilute brown, the costa before it white; nervures colorless; basal nervure falling considerably short of nervulus; first recurrent joining second submarginal cell about twice as far from base as second recurrent from apex; legs black with small light spot on knees, anterior tibiae yellow in front, tarsi pale yellow, the last three joints black except anterior pair; abdomen shining, finely punctured, except the usual smooth parts.

About 7½ miles west of Xenia, Colorado, Aug. 16, at flowers of *Helianthus petiolaris*, 6 ♂. In my key in Amer. Museum Novitates, No. 36, this runs to *P. piercei*, Crawf., which is considerably larger and has dusky wings. By the milky wings it resembles *P. lactipennis* Friese, from Russia. The process of labrum is rather like that of *P. labrosiformis distractus* Ckll., but there is little resemblance otherwise.

**Triepeolus cyclurus** n. sp.

♀ Length about 10 mm.; black, the pubescent ornaments very pale yellowish, on ventral surface white; labrum, clypeus, antennae (except third joint red on outer side), scutellum and axillae black; mandibles mainly red; legs bright ferruginous, with black spurs; tegulae clear ferruginous; wings with apical margin broadly dusky, stigma and nervures black. Eyes purplish-grey; clypeus dullish, minutely granular; mesothorax with pale border at sides and behind, but not in front; a pair of broad discal stripes, pointed at each end, not quite reaching anterior margin; scutellum bigibbous; axillary spines well-developed; basal area of metathorax tensely hairy; inner side of hind basitarsi with very pale orange hair; pleura with a large space partly free from hair, dull and densely granular; abdominal markings sharply defined; first segment with a black area on each side, shaped like a bird's head, and a very broad transverse black band, subtruncate at each end, its

upper side straight and not interrupted, but the posterior pale band interrupted in middle; segments 2 to 4 with entire bands, that on 2 with a large hook-shaped extension (pointing mesad) on each side above, and at extreme sides an angular lobe; venter with white bands, that on fourth segment interrupted; pygidial area circular, shining; last ventral segment curved downward at end.

Six miles east of Wiggins, Colorado, Aug. 15, at flowers of *Helianthus petiolaris,* 1 ♀. By the curved last ventral segment this resembles the much larger and otherwise different *T. concavus* Cress. and *T. penicilliferus* Brues. In the key in Amer. Mus. Novitates, No. 23, it runs to *T. laticaudus* Ckll., which is not closely allied.

Tetraloniella excurrens (Ckll.).

The female from near Canfield is evidently conspecific with the type from Roswell, New Mexico; in my table in Trans. Am. Ent. Soc., xxxii, it runs nearest to *Melissodes spissa* Cress., but is easily separated by the dark tegulae and other characters. It should be noted that the clypeus is hairy all over, except a narrow line in middle, there is a fulvous tuft at tip of labrum, and the bare posterior part of first abdominal segment is extended anteriorly on each side by a rounded area.

The form *verbesinarum* (Ckll.), which I have treated as a synonym of *excurrens*, may stand as a subspecies, *T. excurrens verbesinarum*. It differs by the narrower bands on the third and fourth abdominal segments, that on the third lacking the basal thinner portion. This is probably not an individual peculiarity. The genus *Xenoglossodes*, to which the species has been referred, is a synonym of *Tetraloniella* Ashmead.

## A New Peritropis from the Eastern United States (Heteroptera-Miridae).[1]

By Harry H. Knight, University of Minnesota, St. Paul.

Peritropis husseyi new species.

Brownish black, dorsum alutaceous and rather closely spotted with pale; basal margin of pronotum broadly sulcate in outline, rounding laterally to the basal angles, devoid of tubercles, practically transverse

[1] Published, with the approval of the Director, as Paper No. 344 of the Journal Series of the Minnesota Agricultural Experiment Station.

on the middle one-third. Thus differing from *saldiformis* in which the basal margin is concavely sinuate, and forming three small marginal tubercles, one at the median line and a larger one at each side.

♀.—Length 3.2 mm. *Head*: width .62 mm., vertex .31 mm., length .57 mm., from front margin of eyes to tip of tylus .31 mm.; front of head more porrect and cone-shaped than in *saldiformis;* brownish black, irregularly marked with small pale spots, three or four larger spots on the strongly flattened tylus, bucculae tinged with reddish. *Rostrum*: length 2.22 mm., nearly attaining the hind margin of the first genital segment, brownish black.

*Antennae*: segment I, length .28 mm., black; II, 1 mm., nearly cylindrical but slightly thickened toward apex, not attaining the thickness of segment I, black, a small pale spot on dorsal side near middle, the extreme tip slightly pale, clothed with very fine, short pale pubescence; III, .29 mm.; IV, .34 mm.; last two segments slender, black.

*Pronotum*: length along median line .51 mm., width at base 1.17 mm., anterior angles .61 mm., lateral margins practically straight, slenderly but distinctly reflexed, anterior angles prominent, forming right angles; basal margin broadly sulcate, rounding distally to the basal angles, devoid of marginal tubercles, practically transverse on the middle one-third; calli less prominent and not so abruptly convex as in *saldiformis*, separated by a foveate groove at the median line of disk; brownish black, disk rather closely dotted with pale, spots frequently confluent, slender lower margin of propleura and a line extending distad from dorsal extremity of coxal cleft, pale. *Scutellum* nearly as in *saldiformis*, more broadly pale at apex, a few pale dots adjoining; mesoscutum exposed for a longitudinal space equal to two-thirds the length of scutellum, a curved pale mark near each basal angle. *Sternum* and pleura brownish black, basalar plate, posterior and ventral margins of epimera, pale; ostiolar peritreme pale, ostiole dusky.

*Hemelytra*: width 1.54 mm., embolar margins arcuate, somewhat reflexed basally; brownish black, rather closely spotted with pale, the spots frequently elongate or confluent, each pale point with a minute, short, scale-like pubescent hair; tip of clavus and spot at inner basal angle of cuneus pale by the fusion of several small points; cuneus blackish, a few pale points near base. *Membrane* uniformly pale fuscous, the veins scarcely darker, slightly paler bordering margin of cuneus.

*Legs*: uniformly brownish black, coxae scarcely paler at the apices; intermediate and hind tibiae paler apically, a narrow pale annulus near middle; tarsi pale fuscous, hind pair more nearly pale.

*Venter*: brownish black, pale yellowish pubescent, longest near base of ovipositor.

♂.—Length 3 mm., width 1.4 mm.; slightly smaller than the female but very similar in structure and color; genital claspers prominent and distinctive.

*Holotype*: ♀ August 11th, 1920, Washtenaw County, Michigan (R. F. Hussey); author's collection. *Allotype*: ♂ June 9th, 1917, Tuskeegee, Alabama (H. H. Knight), collected at light; Cornell University collection. *Paratype*: ♀, taken with the holotype; collection of R. F. Hussey.

Since drawing up the description of the female, the writer discovered a male specimen among some unmounted material, taken near Tuskeegee, Alabama, while collecting on a tent trap-light.

In addition to the structural difference found in the pronotum, *saldiformis* differs from *husseyi* in being more brownish than black, clavus and corium devoid of pale points, coxae white, and the first antennal segment with a white annulus on the basal half. The writer has for study, cotypes of *saldiformis* from the Heidemann collection; a multilated female "Washington, D. C."; nymph, 2 ♀ July 20, and a nymph July 28, 1890. Also a female specimen, April 24, Brownsville, Texas, which does not differ appreciably from the type specimens.

Mr. Hussey sends the following notes on the capture of the new *Peritropis*:

The two specimens taken August 11 were collected about three miles west of Ann Arbor, at the edge of the University Forestry Farm. I had worked around the pine plantations, with moderate luck, and decided to try for some Aradids in the thin oak and hickory woods across the fence. At the very edge of the woods I found a pile of white oak logs, apparently cut for fence-posts, some of them with the bark loosened, others with the bark still tight. I found a lot of Aradid nymphs and one adult, and while I was picking up some of them I saw this Mirid run out from under the bark where it was still untouched. Remembering my experience with *Fulvius imbecilis* (which I suspected this to be, since I had seen it only from the corner of my eye), and the extreme agility of that species, I was a bit too anxious and caught the bug under the edge of the bottle which accounts for the mutilated condition of the specimen. A minute or so afterward I turned up two more, of which I got one; the other escaped while I was busy. I saw no more of them that afternoon, nor was I able to find any on August 15, September 1, and September 3, when I revisited the place. I examined not only this one log-pile, but all the other stacks of wood that I ran across on the University Farm. This *Peritropis* is a moderately active form, but by no means as quick and agile as *Fulvius*.

## A New Tachinid Parasite of the Codling Moth (Dip.).

By J. M. Aldrich, Associate Curator, U. S. National Museum, Washington, D. C.

The new species belongs to the genus *Anachaetopsis*, heretofore known only in two European species. Our American species is so much like *ocypterina* Zett., the genotype (as represented in the National Museum by specimens received from Dr. Villeneuve), that except for a few characters a description may be drawn to cover both. We have, however, only females of the new species.

**ANACHAETOPSIS** Brauer and Bergenstamm.

Brauer and Bergenstamm, Zweifl. Kais. Mus., IV, 1889, p. 106; VI, 1893, p. 148.—Brauer, Verh. k. k. Z. B. Ges. Wien, 1893, 490.—Baer, Die Tachinen, Berlin, 1921, pp. 82, 146.

With distinct macrochaetae on head, thorax and abdomen; both sexes with orbitals and wide front; antennae long, reaching edge of mouth, third joint more than twice as long as second; arista with penultimate joint variable, sometimes more than twice as long as thick; vibrissae well developed, at oral margin, not approximated; facial ridges bristly almost to the level of the arista, the frontal rows descending nearly as far; parafacials narrow, bare; palpi normal; proboscis small; eyes bare.

Wings of normal shape, veins bare except base of third, apical cell petiolate, the petiole a little less than one-half as long as hind cross-vein; costal segment before tip of first vein less than one-third the following one; costal spine distinct; apical cross-vein more oblique than the hind; third vein ending only a little before the tip.

Chaetotaxy: ocellars normal; verticals 2, the inner large; frontals about 6, the second from above large and reclinate, the lowest almost at the level of the arista; orbitals two in both sexes; vibrissae large, at oral margin; facial ridges with row of bristles almost meeting frontals. (Thorax) Acrostichals 3, 3; dorsocentrals 3, 3, the hindmost large; humerals 3; posthumerals 2-3, including the "anterior intraalar;" notopleurals 2; supraalars 3, the middle large; intraalars 3; postalars 2, one large; scutellum with two large lateral pairs, and sometimes a very minute hairlike pair of apicals, disk with a few tall, straight spines; mesopleura with one large anterior, a row at hind edge, and a partial row beginning just behind the humerus and extending downward; sternopleurals 2, 1; pteropleural 1, smallish; hypopleurals, the usual row. (Abdomen) First segment with one lateral and one median marginal; second segment with one discal, one lateral and one median marginal; third with one discal and a marginal row of four pairs; fourth with a discal row of four pairs and a few smaller marginals.

All the discals are large and erect. (Legs) Front tibiae with one bristle on outer hind side below middle, and a row on front side; middle tibiae with one bristle on outer front side, one inner, and two on outer hind. (Wing) Costal spine distinct; third vein with 2-3 quite large setules at base.

**Anachaetopsis vagans** new species.

♀. Wholly black in ground color, including palpi; front shining on upper half, then becoming silvery, which extends down the parafacials; third antennal joint about two and one-half times the second; mesonotum and pleurae subshining black with distinct white pruinosity; abdomen shining black, not quite polished, with faint but visible narrow anterior border of white pruinosity on second and third segments. Hind tibia with 10-12 small rather regular bristles on outer hind side.

Length 3.7 to 4.2 mm.

Three females, reared at Medford, Oregon, September 6, 1922, from the Codling Moth, *Carpocapsa pomonella* Linn. (Quaintance No. 9305).

*Type.—Female,* No. 25798 U. S. Nat. Mus.

The European type species, *ocypterina* Zett., differs only in having the abdomen highly polished, without any pruinose bands; and in having on the outer side of the hind tibia a row of only about six irregular bristles, some of which are quite large; the third antennal joint appears to be slightly longer. In the male of *ocypterina* (and presumably in the unknown males of *vagans*), the third antennal joint is five times as long as the second.

*Ocypterina* has been reared from Pterophorid moths in Europe (Baer). No particulars regarding the reproductive physiology have been made known; one female shows a blunt point in the terminal abdominal segment, about as in *Phorocera claripennis,* from which macrotype eggs might be surmised.

In regard to the relationships of the genus, the type species was described as *Tachina* (Zetterstedt, Dipt. Scand., iii, 1844, 1077); but the author in his analysis of the species, p. 1007, indicated that it would go in *Degeeria* Mg. Brauer and Bergenstamm place it next to *Phorichaeta* Rond., which, however, has a row of bristles down the parafacials. Townsend has placed the specimens in the National Museum next to *Chaetophleps polita* Coq., which he makes the type of *Euchaetophleps* new genus; but this species is a synonym of *Hypostena nitens* Coq., which Townsend makes type of the new genus *Oxynops*, in an entirely different tribe some distance away. This species *nitens,* under whatever genus, seems to be the nearest American relative; it has the apical cell narrowly open.

There is a second European species, *morio* Fall., which has yellow palpi, facial ridges less bristly, and apical cell open or barely closed.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1923.

## Entomology at the Convocation Week Meetings, December, 1922.

The meetings of the American Association for the Advancement of Science and of the Associated Scientific Societies were held December 26 to 30, 1922, nominally in Boston, Massachusetts, but for the most part actually in Cambridge, which is a separate municipality with its own mayor. All of the sessions concerning entomology, as well as most other biological sciences, found place in the magnificent new (1916) buildings of the Massachusetts Institute of Technology, on the Cambridge side of the Charles River (Back Bay) at Massachusetts Avenue. The great extent of these structures made it possible to pass from the meeting of one society to another without going out of doors, a very comfortable condition during the snow storm, which lasted all day on December 28 and for a part of the 29th. It was necessary, to be sure, to go out to nearby Walker Memorial Hall, where tasty luncheons were served on the cafeteria plan, but no complaint can justly be made of this arrangement. We are grateful for all the conveniences and dispositions which made the whole series of meetings very agreeable and profitable.

Papers relating, in whole or in part, to the tracheate Arthropods were listed on the programs of

| | |
|---|---|
| American Association for the Advancement of Science, general sessions | 1 |
| The same, Section E, Geology and Geography | 1 |
| American Society of Zoologists (alone) | 10 |
| The same with the Ecological Society of America | 1 |
| The same with the Botanical Society of America (joint Genetics section) | 7 |
| The same with the Ecological Society and the American Society of Naturalists | 2 |
| Entomological Society of America (alone) | 40 |
| American Association of Economic Entomologists (alone, but including its sections on Apiculture and Horticultural Inspection) | 76 |
| The same with the American Phytopathological Society | 2 |
| Ecological Society of America (alone) | 6 |
| American Nature Study Society | 1 |
| Society of American Foresters with Section K (Social and Economic Sciences), A. A. A. S., and New England Forestry Congress | 2 |
| A. A. A. S., Section N, Medical Sciences | 2 |
| Total | 151 |

These 151 papers were concerned with the following subjects:

| | |
|---|---|
| General Entomology 11 | Ecology 28 |
| Methods 1 | Evolution 2 |
| Cytology 1 | Parasites of Animals 4 |
| Anatomy 8 | Relations to Man 3 |
| Physiology 9 | General Economic Entomology 12 |
| Ontogeny 5 | Insects injurious to Plants 25 |
| Genetics 7 | Insecticides and Fumigants 15 |
| Geographical Distribution 8 | Apiculture 8 |
| Taxonomy 4 | Other Special Insects 1 |

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| | |
|---|---|
| Onychophora 1 | Heteroptera 5 |
| Araneina 1 | Coleoptera 12 |
| Acarina 2 | Hymenoptera (exclusive of *Apis*) 5 |
| Insects (more than one Order) 9 | *Apis* 5 |
| Orthoptera 2 | Trichoptera 2 |
| Isoptera 2 | Lepidoptera 14 |
| Plecoptera 1 | Diptera (exclusive of *Drosophila*) 14 |
| Ephemerida 2 | *Drosophila* 3 |
| Odonata 2 | |
| Neuroptera 1 | |
| Homoptera 13 | |

Many of the figures in this second list are duplicated; thus a paper on the Genetics of *Drosophila* appears under both of these headings.

Among the more pretentious events were:

The First William Thompson Sedgwick Memorial Lecture by Prof. Edmund B. Wilson, of Columbia University, on *The Physical Basis of Life*.

The annual address of the Entomological Society of America by Prof. W. M. Wheeler on *The Physiognomy of Insects*, dealing largely, but not exclusively, with the shapes of the heads of ants, as conditioned chiefly by the size and position of the flexor muscles of the mandibles.

The annual presidential address to the American Association of Economic Entomologists by Prof. J. G. Sanders, Director of the Bureau of Plant Industry, Pennsylvania Dept. of Agriculture, on *Whither is Entomology?*

The symposia of the Entomological Society of America on *Adaptations of Insects to Special Environments* (21 speakers); of the Economic Entomologists on *Standards for the Training of Men who are to enter Professional Entomology* (7 speakers), and with the American Phytopathological Society on *Plant Quarantines* (5 speakers, 2 of them for entomology); of the Zoologists, Ecologists and Naturalists on *Geographical Distribution* (9 speakers, 1 of them on Insects, 1 on Onychophora).

The dinner of the American Nature Study Society in honor of Mrs. Anna Botsford Comstock, who is retiring as Professor of Nature Study at Cornell University, on December 28.

The annual dinner of the Entomologists on December 29.

The total of 151 papers is almost exactly the same as that recorded (152) in the NEWS for February, 1922 (pages 53-55), as having been listed on the corresponding programs at Toronto, in December, 1921.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## Paradichlorobenzene as a Fumigant in the Entomological Museum.

During the past year the writer has made tests with paradichlorobenzine to determine its value as a fumigant and deterrent of insect pests in the entomological museum. This material was introduced into boxes and drawers which were infested with the confused flour beetle (*Tribolium confusum*). It was found that the beetles were killed in from one to six hours, the time depending upon the amount of crystals introduced. Tests were also made on the effectiveness of paradichlorobenzine in killing dermestid larvae which commonly infest neglected museum drawers. A few crystals of this chemical, when placed in a tight drawer, were found to kill dermestid larvae in from one to four hours. This chemical not only acts as a deterrent of pests which would enter insect cases, but will actually kill those that cannot retreat within a limited time. Paradichlorobenzene, which is now readily obtained in the market, comes in crystalline form and can be handled much as napthalene, but when used in the insect cabinet has the advantage of killing the pests which are confined in the cases. Paradichlorobenzene evaporates somewhat more rapidly than napthalene, still a half ounce placed in a tight case will last from five to eight weeks, and the gas may still be effective for three or four months in unopened cases. This material is the most convenient and satisfactory fumigant for insect cases that the writer has used, in fact, proving so successful that carbon disulphide fumigation has been discontinued in the care of the insect collections at the University of Minnesota.—HARRY H. KNIGHT, University of Minnesota.

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## A New Character for Differentiating the Families of Muscoidea (Dipt.).

Every beginner in the study of the Muscoidea has found it difficult to distinguish with certainty what family some forms belong to and there has long been much uncertainty as to the validity of the distinction between the Dexiidae and the Sarcophagidae. Two or three years ago I had occasion to make an exhaustive examination of the Tachinidae and related forms to discover if there were present some hitherto unconsidered character which would enable any entomologist to recognize the different families with more certainty than is at present possible. After some careful comparative work I finally decided that it is invariably possible to distinguish between the Sarcophagidae, Muscidae, and Calliphoridae on one hand, and the Tachinidae and Dexiidae

on the other by the shape of the metanotum. In the last two this is biconvex in profile, there being a small but distinct convexity just below the scutellum which is absent in the members of the other three families known to me.

This character is so constant that it must have a fundamental significance and it is remarkable that in the group which we in this country consider as the Tachinidae practically all the species which are inquilines or parasites in the nests of bees, such as the genera *Metopia*, *Senotania*, etc., lack the basal convexity and are definitely allied in this respect with Sarcophagidae. I consider, however, that they are entitled to separate family rank, being more readily separable from Sarcophagidae than are the Muscidae from the Anthomyiidae. Some European workers have lumped these genera with the Sarcophagidae.

I make this character known at this time to enable other workers to try it out as fully as possible.—J. R. Malloch, Biological Survey, Washington, D. C.

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### Let Us Try to Help Each Other (Dip.: Borboridae).

In the Tijdschrift voor Entomologie, lxiv, p. 120, Dr. Duda (I suppose we all know his, the learned doctor's, individual name) has a paper entitled "Fiebrigella und Archiborborus, zwei neue sudamerikanische Borboridengattungen," in which two new genera of the dipterous family Borboridae are proposed. In spite of the numerous published articles and recommendations on the publication of scientific papers, and the recommendations of the International Committee on Nomenclature, as to the designation of types, we have here an instance of either indifference, ignorance or carelessness in the preparation of the paper. It is regrettable that this is true of so many valuable contributions.

*Archiborborus* is proposed for *Borborus hirtipes* Macq. and the following new species: *submaculatus* (Chile), *maculipennis* (Chile), *setosus* (Bolivia), *calceatus* (Colombia), *orbitalis* (Peru and Bolivia) and var. *latifrons* (Peru). No mention of a genotype or even type specimens for the species (this latter a common omission of authors). There should have been a genotype designated for *Archiborborus*, but apparently there is none. I therefore designate *Archiborborus submaculatus* Duda the type of *Archiborborus*.

For the habitat of *Fiebrigella verrucosa* n. g., n. sp., one must refer to the general discussion of the genera in the beginning of the paper. None is given in the proper place under the description of the genus and species. This is very tantalizing.

A table of the genera of the Borboridae is included in the paper, which will no doubt prove useful to students of that family.—E. T. Cresson, Jr.

### A Remarkable Butterfly (Lep.: Papilionidae).

As far as is certainly known at present, the *Ornithoptera* group of Papilios is unrepresented in Africa, but from reports that reach England from time to time it is thought that this group may be represented or that a third species of giant Papilios exists, similar to the *antimachus* and *zalmoxis*, or even perhaps a hybrid between the two. There is, for instance, an authenticated report of such an insect having been seen in Liberia which rather bears out my own experience when crossing the higher Lindi River in the Stanleyville district of the Belgian Congo. I was on my way to Stanleyville from a place named Irumu, near Lake Albert, and having arrived at the Lindi River, which at this point is a good two hundred yards wide, I was crossing it in a canoe when from the opposite bank came flying towards me a large insect of the *antimachus* type but of heavier build and flight. It circled over the water and round and above the canoe, where I got a good look at it. The hind wings appeared to me to be a rich brown, spotted and barred with black at the edges, the fore wings having each a broad transverse bar across them of a vivid blue-green on a ground color of black. The insect eventually flew away over the trees, and although I waited there for the rest of the day it never returned. Some five or six miles farther on, and in the forest, I thought I saw a similar insect, but I could not be sure that this was not a *zalmoxis*.

I put down this record for what it is worth, as the insect may subsequently be captured by some lucky individual. I have of course been asked why I did not stay a week or a month on the spot and attempt to capture so great a prize; the answer is that at that time (not long after the signing of the Treaty of Peace) passages to England were exceedingly difficult to obtain, and having booked and paid for two berths (for myself and my wife) on a homeward bound steamer six months in advance, I was unable to give the time necessary for the purpose without losing our passages. As a matter of fact, I reached my port of embarkation with only two days to spare.

T. Alexander Barns.

Mr. Barns is once again in Africa in quest of this rare insect, but at the time of writing no specimens have been seen. Confirmation of the existence of this butterfly has been supplied by my friend, Monsieur F. Le Cerf, of the Paris Museum.

A certain Sergeant Monceaux (now Captain), when employed on the Franco-Liberian Boundary Commission for the delimitation of the frontier between Liberia and French Guinea, made a collection of over 4,000 Lepidoptera which he brought to the Paris Museum. He stated as having seen in the region of the Upper Sasandra River a large butterfly drinking at a pool of water on the road. It closed and opened its wings alternately, and the observer was able to get fairly close to

it before it flew away. The sergeant stated that the wings of this butterfly were very long and for the greater part of a brilliant blue color.

Monsieur Le Cerf showed Sergeant Monceaux several species in the museum, including *P. zalmoxis,* but he recognized none of them as being the insect he had seen. The sergeant pulled out some other drawers and seeing *P. antimachus,* exclaimed: "C'est comme cette espèce là, mais avec beaucoup de bleu brilliant et encore plus grand." (It is like that species there, but with a lot of bright blue and still larger.)

This butterfly has been observed also on two occasions in Nigeria.

—G. TALBOT.

(Copied from "Wonderland of the Eastern Congo," pages 253-254 and 267; author, T. Alexander Barns, F. R. G. S., F. Z. S., F. E. S. G. P. Putnam's Sons, London and New York.)

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **24**—Annales de la Societe Entomologique de France, Paris. **52**—Zoologischer Anzeiger, Leipsic. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus des seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **111**—Archiv fur Naturgeschichte, Berlin.

**GENERAL. Bedel, Louis**—Notice necrologique sur. . . **24,** xci, 165-89. **Gillett, F.**—Light trap experiments in connection with temperatures, etc. **9,** lv, 274-7. **Index generales**—Annuaire general des universites . . . Publie sous la direction de R. de Montessus de Ballore. Paris, 1921, 1845 pp. **Parshley, H. M.**—On the formation of family names like Tingidae. **68,** lvi, 754-5.

**ANATOMY, PHYSIOLOGY, ETC.** **Bowen, R. H.**—Studies on insect spermatogenesis. **70,** xxxvii, 79-194. Notes on the occurrence of abnormal mitoses in spermatogenesis. **100,** xliii, 184-202. **Brocher, F.**—Etude experimentale sur le fonctionnement du vaisseau dorsal et sur le circulation du sang chez les insectes. V. **24,** xci, 156-64. **Bugnion, E.**—Les organes lumineux du ver luisant provencal (Phausis delarouzeei). (Festschr. fur Zschokke. N. 33. Basel). **Crozier, W. J.**—"Reversal of inhibition" by atropine in caterpillars. **100,** xliii, 239-45. **Desoil et Delhaye**—Essais d'infestation experimentale du tube digestif par oeufs et larves de Calliphora vomitoria. **69,** lxxxvii, 1303-5. **Mallock, A.**—Divided composite eyes. **76,** cx, 770-1. **Metz, C. W.**—Chromosome studies on the Diptera. IV. Incomplete synapsis of chromosomes in Dasyllis grossa. **100,** xliii, 253-66. Association of homologous chromosomes in tetraploid cells of Diptera. **100,** xliii, 369-73.

**ARACHNIDA AND MYRIOPODA.** **Gudger, E. W.**—Spiders as fishermen. (Nat. Hist., New York, xxii, 565-8).

**ORTHOPTERA.** **Giglio-Tos, E.**—Genera insectorum. Fasc. 177. Mantidae, subf. Eremiaphilinae.

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**HYMENOPTERA. Emery, C.**—Genera insectorum. Fac. 174b. Formicidae, subf. Myrmicinae, p. 95-206. **Garlick, W. G.**—Concerning the feeding habits of the purslane sawfly larva. **4,** liv, 240. **Mayor, A. G.**—The tracking instinct in a tortugas ant. (Carnegie Inst. Wash., Pub. No. 312, p. 103-7.).

# Doings of Societies.

## Entomological Society of America.

The seventeenth annual meeting of the Entomological Society of America was held in Cambridge, Massachusetts, in the Buildings of the Massachusetts Institute of Technology, on December 26, 27 and 29, 1922. The meetings were unusually well attended, the attendance ranging from about 75 to 250 in the different sessions.

Seventy-four new members were elected during the past year, bringing the total membership to 652, the largest in the history of the society.

Professor T. D. A. Cockerell, of the University of Colorado, was elected president; William S. Marshall, of the University of Wisconsin, was chosen first vice-president; F. E. Lutz, American Museum of Natural History, New York, second vice-president, and C. L. Metcalf, University of Illinois, secretary-treasurer.

Other elections were: Managing Editor of Annals, Prof. Herbert Osborn, Ohio State University; additional members of Executive Committee, Arthur Gibson, Dominion Entomologist, Ottawa, Canada; Dr. William A. Riley, University of Minnesota; Prof. R. A. Cooley, Agr. Experiment Station, Bozeman, Montana; Charles W. Johnson, Boston Society of Natural History; Dr. E. P. Felt, State Entomologist, Albany, New York, and Prof. A. L. Melander, State College, Pullman, Washington.

The Society voted to raise the annual dues from $2.00 to $3.00, effective January 1, 1924.

Professor J. J. Davis, of Purdue University, was appointed Treasurer of the Thomas Say Foundation, to succeed Dr. E. D. Ball, resigned.

Messrs. R. A. Cooley, R. W. Harned and Guy C. Crampton were elected as new members of the Editorial Board of the Annals.

The Society approved the constitution for the Union of American Biological Societies, as published in *Science* for September 29, 1922, and appointed A. N. Caudell and A. G. Böving as the representatives

of the Society to attend such meetings as may be called in Washington during the coming year.

The following subject was selected for the Symposium at the Cincinnati meeting in 1923: "Methods of Protection and Defense Among Insects."

C. L. METCALF, *Secretary.*

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### The American Entomological Society.

Meeting of April 27, 1922, in the hall of the Academy of Natural Sciences of Philadelphia. Eight persons present, Dr. Henry Skinner presiding.

Mr. Cresson, of the Property Committee, reported the following additions to the Cabinet: 7 named Hymenoptera from Hawaiian Islands, from Dr. D. M. Castle; 2 paratypes from Michigan, of *Enocherus liljebladi* Wal. (Coleop.) from A. B. Wolcott; 81 Hymenoptera, 96 Diptera, U. S., Dr. Victor A. Loeb; 41 Coleoptera (Tenebrionidae) from U. S., from Dr. F. E. Blaisdell.

Dr. Arthur D. Whedon, 525 South High Street, West Chester, Pa., and Mr. John C. Holinger, Girard Trust Co., Phila., were elected to membership in the Society.

HYMENOPTERA.—Dr. Bradley, of Cornell University, exhibited a new first American species of the genus *Incomathis* (Hymenoptera), there being four other species known.

LEPIDOPTERA.—Mr. Williams exhibited some slides and drawings of the male genitalia of the larger Hesperidae and made some remarks on the characters disclosed.

Dr. Skinner remarked on the "Corona," as he designated the curious chitinous and membraneous appendages found in some species of Hesperidae at the apex of the aedoeagus.

DERMAPTERA.—The combined exotic collection of Dermaptera was exhibited by Messrs. Rehn and Hebard. Two hundred and forty-four species are now included, representing ninety genera. In the collection are also the types of twenty-four species. Burr's treatment of the Order in the *Genera Insectorum* was shown, which included one hundred and forty-six genera, the number of subsequently described genera brings the total up to approximately one hundred and sixty. The growth of this portion of the collection has in recent years been very rapid and it was pointed out that the Dermaptera are among the most difficult Orders of insects to secure quantity. The North American collection of Dermaptera is now complete, containing material of every species found north of the Mexican border.

Dr. Skinner spoke of Dr. Malcolm Burr, the Dermapterist, and of a visit to his home and collections, followed by a further tribute to Dr. Burr and his work by Mr. Rehn and Mr. Hebard.

R. C. WILLIAMS, *Recording Secretary.*

## OBITUARY.

HENRY JOHN ELWES, F. R. S., F. E. S., was born in 1846 and died at his home, Colesborne Hall, Cheltenham, England, November 26th, 1922, after a long illness.[1] He was educated at Eton and subsequently joined the Scots Guards, in which he became Captain. His activities were big game hunting, horticulture, agriculture, systematic botany and entomology. He traveled extensively and covered a large part of the world and made collections in the Himalayas, Andes and the mountains of Japan and China, as well as in the Rocky Mountains and other parts of North America. It botany he was favorably known by his monograph on the lilies and his great work on *The Trees of Great Britain and Ireland*. He was an authority on the Palaearctic Rhopalocera and published many interesting and valuable papers on these butterflies. The papers on *Parnassius* and *Erebia* are well known, also an annotated list of the Rhopalocera of Sikkim.

He was elected a member of the Royal Society in 1897 and President of the Entomological Society of London for the years 1893 and 1894. In 1897 he was elected a Corresponding Member of The American Entomological Society.

As stated above, Mr. Elwes collected in this country and took a great interest in its butterfly fauna. His revision of the genus *Argynnis*[2] included the species found in North America and the same is true of his paper on the genus *Erebia*,[3] in which he described a high altitude form of *epipsodea* under the name *brucei*. Another interesting paper is *On a Collection of Lepidoptera from Arctic America*.[4] With this is a color plate of rare species, including *Colias boothi* Curtis and *Erebia fasciata* Butler. A large part of his valuable collection was presented to the British Museum and the remainder was purchased by Mr. J. J. Joicey.

HENRY SKINNER.

[1]Entomologists Record, 1922, xxxiv. By G. T. Bethune-Baker.
[2]Trans. Ent. Soc. Lond., 1889, p. 535.
[3]Trans. Ent. Soc. Lond., 1889, p. 317.
[4]Trans. Ent. Soc. Lond., 1903, p. 239, pl. ix.

The December, 1922, issue of ENTOMOLOGICAL NEWS was mailed at the Philadelphia Post Office, December 11, 1922.

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" devilliersi
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Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera

From Assam, India:

**1200 BUTTERFLIES AND MOTHS, INCLUDING**

Papilio arcturus
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Vol. XXXIV No. 3

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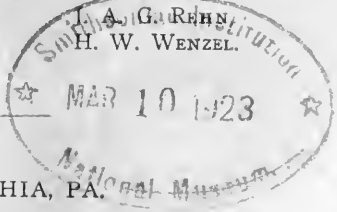
1855-1908



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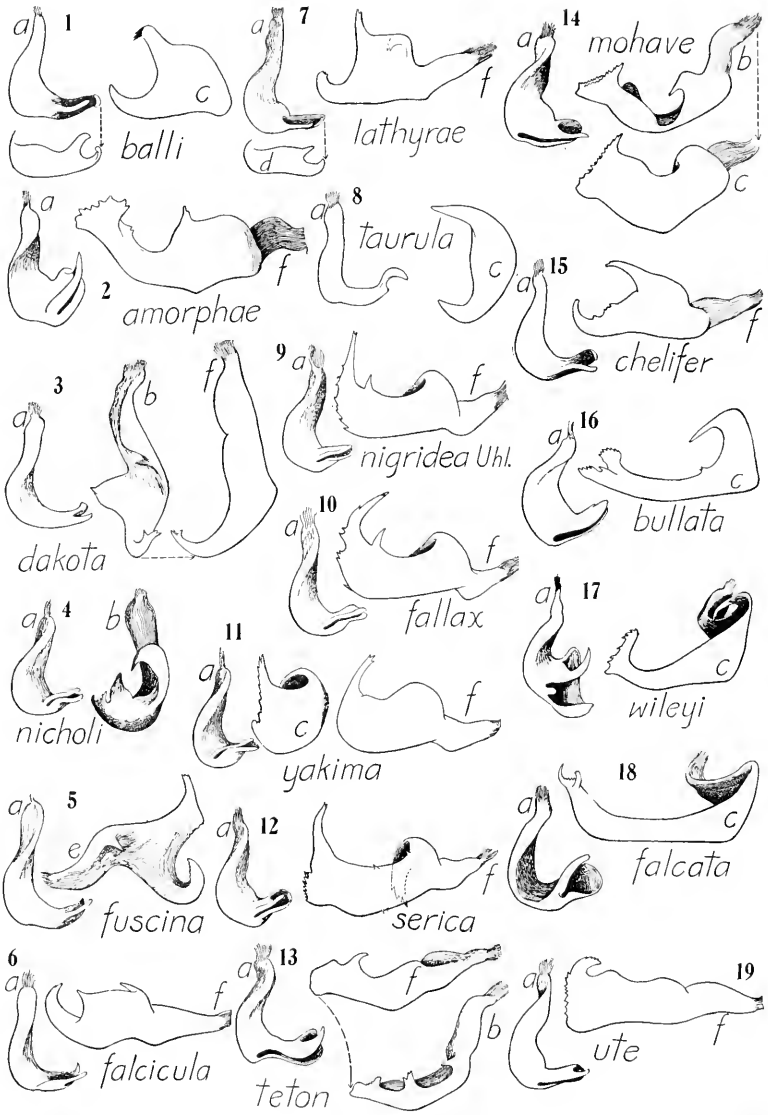


MALE GENITAL CLASPERS OF SPECIES OF LOPIDEA.—KNIGHT.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

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CONTENTS



## A Fourth Paper on the Species of Lopidea (Heteroptera, Miridae).[1]


By HARRY H. KNIGHT, University of Minnesota, St. Paul, Minnesota.


(Plate II.)

Lopidea amorphae new species (Plate II, Fig. 2).

♂. Length 5.9 mm., width 2 mm. *Head:* width 1.1 mm., vertex .34 mm. *Antennae:* segment I, length .60 mm.; II, 2.09 mm., thickness .114 mm., tapering to more slender on apical half; III, 1.2 mm.; IV, .46 mm. *Pronotum:* width at base 1.84 mm. Genital claspers (fig. 2) indicate a very close relationship with *reuteri*, but in the large series examined the distal portion of the right clasper shows differences that are constant. Hemelytra with red areas bearing fine yellowish pubescence, while in *reuteri* the same areas bear black pubescent hairs; smaller than *reuteri* and more yellowish in color, the majority of specimens more yellowish than red. Breeds on *Amorpha fruticosa* where the nymphs and adults were taken in numbers.

♀. Length 6.3 mm., width 2.3 mm., very similar to the male in form and coloration.

[1]Published, with the approval of the Director, as paper No. 353 of the Journal Series of the Minnesota Agricultural Experiment Station.

*Holotype*: ♂ July 8, 1922, Ramsey County, Minnesota (H. H. Knight), taken on *Amorpha fructicosa*, found growing on bank of Mississippi river; Minnesota University collection. *Allotype*: same data as type. *Paratypes*: 16 ♂ 14 ♀, taken with types; 9 ♂ 26 ♀ July 18, 1922, type locality (H. H. Knight). 2 ♂ 2 ♀ July 2, 1920, type locality (P. B. Lawson).

**Lopidea lathyrae** new species (Plate II, Fig. 7).

♂. Length 5.9 mm., width 1.9 mm. *Head*: width 1.11 mm., vertex .65 mm. *Antennae*: segment I, length .65 mm.; II, 2 mm., cylindrical; III, 1.58 mm.; IV, .61 mm. *Pronotum*: width at base 1.71 mm. Size, form and color very suggestive of *confluens* Say; deep red, legs, antennae, pronotal disk except lateral and anterior margins, scutellum, broad stripe each side of commissure and membrane black; clothed with fine yellowish pubescence on the red areas but black over the dark surface, with a few sericeous, yellowish pubescent hairs about margin of calli. Genital claspers (fig. 7) distinctive of the species.

♀. Length 6.2 mm., width 2.2 mm.; very similar to the male but with embolium and outer half of cuneus pale.

*Holotype:* ♂ July 6, 1919, Anoka County, Minnesota (H. H. Knight); Minnesota University collection. *Allotype*: taken with the type. *Paratypes:* 75 ♂ ♀, taken with the types on *Lathyrus venosus*. DAKOTA—3 ♂ 6 ♀ July 30, 1920, Turtle Mountains (T. H. Hubbel). MINNESOTA—♂ July 10, 1920, Morrison County (A. A. Nichol). ♀ July 2, 1919, Mille Lacs County (V. R. Haber.) ♂ Aug. 6, 1910, Koochiching County. 5 ♂ 1 ♀ June 19, 1921, Ramsey County (H. H. Knight.) CANADA, MANITOBA—♀ July 20, 1915, 2 ♀ July 18, 1916, Aweme (N. Criddle). SASKATCHEWAN—♂ July, 1922, Saskatoon (A. E. Cameron).

In Anoka County the writer found this species so numerous that in spots the host plants were largely killed. From this observation it would appear that this insect may be regarded as a potential pest of cultivated vetches.

**Lopidea balli** new species (Plate II, Fig. 1).

♂. Length 5.7 mm., width 2.2 mm. *Head*: width 1.21 mm., vertex .70 mm. *Antennae*: segment I, length .63 mm.; II, 2.2 mm., thickness .10 mm., very slightly more slender on apical one-fourth. *Pronotum*: width at base 1.74 mm. Genital claspers (fig. 1) indicate a close relationship with *lathyrae*, but in form broader and with less blackish on

the dorsum; pronotum red to roseous, calli scarcely darkened; pubescence nearly as in *lathyrae*, but basal half of clavus bearing sericeous, silvery pubescence, the dark hairs on embolium and outer half of corium becoming yellowish apically.

♀. Length 6.1 mm., width 2.2 mm.; very similar to the male in form and coloration.

*Holotype:* ♂ July 22, 1900, Denver, Colorado (E. D. Ball); author's collection. *Allotype:* ♀ Aug., 1906, Glen, Sioux County, Nebraska (H. G. Barber). *Paratypes*: 1 ♂ 1 ♀, taken with allotype.

**Lopidea chelifer** new species (Plate II, Fig. 15).

♂. Length 5.3 mm., width 1.9 mm. *Head*: width 1.17 mm., vertex .64 mm. *Antennae:* segment I, length .63 mm.; II, 2.03 mm., nearly cylindrical; III, 1.36 mm.; IV, .39 mm. *Pronotum*: width at base 1.66 mm. Genital claspers (fig. 15) indicate a relationship with *batti*, but differences are apparent, the dorsum also more thickly clothed with dusky to black pubescence; femora pale fuscous and with black dots.

*Holotype*: ♂ Aug. 1-15, 1916, Jemez Springs, New Mexico (J. Woodgate); author's collection.

**Lopidea dakota** new species (Plate II, Fig. 3).

†*Lomatopleura caesar* Uhler, Hemip. Colo., p. 31, 1895.

♂. Length 6.4 mm., width 2.5 mm. *Head*: width 1.22 mm., vertex .77 mm. *Antennae*: segment I, length .77 mm.; II, 2.44 mm., thickness .09 mm., tapering to slightly more slender apically; III, 1.57 mm.; IV, .57 mm. Size and color very similar to *reuteri;* genital claspers (fig. 3) indicate a close relationship with *instabilis* but the antennae are more slender; dorsum clothed with stiff, suberect black hairs which in length nearly equal thickness of antennal segment II.

♀. Length 6.9 mm., width 2.4 mm.; more robust than the male but very similar in form and coloration. Named after the Dakota Indians, the largest division of the Siouan family.

*Holotype*: ♂ July 12, 1920, Cass County, North Dakota (A. A. Nichol); author's collection. *Allotype:* same data as the type. *Paratypes:* COLORADO—2 ♂ Aug. 3, 1894, Colorado Springs; ♂ June 5, 1894 Fort Collins (C. P. Gillette). 3 ♂ 1 ♀ August, Denver (N. Banks). ♂ July 22, 1900, Denver; ♂ July 13, ♀ July 16, 1900, Fort Collins (E. D. Ball). ♂, "Colo. Spr."; 3 ♂, "Colo. 1599, 1606." ♀ July 22, 1900, Pueblo. MINNESOTA—♂ ♀, Big Stone County; ♂ ♀, Traverse County (O. W. Oestlund). NEBRASKA—♂ Aug., 1903, Glen,

Sioux County (H. G. Barber.) MONTANA—♂ August 24, ♀ Aug. 21, 1892, Assiniboin. NORTH DAKOTA—4 ♂, taken with types. 4 ♂ 4 ♀ July 19, 1920, Devil's Lake. ♂ July 30, ♂ Aug. 4, 1920, Turtle Mountains (T. H. Hubbel). ♂ ♀ July 29, 1921, Edgeley. SOUTH DAKOTA—♂ ♀ June 16, 1891, Brookings (H. C. Severin). WYOMING—3 ♂, 2 ♀ July 20-25, 1920, Yellowstone National Park (A. A. Nichol). CANADA: BRITISH COLUMBIA—♂ June 9, 1905, Vernon. ♀ Aug. 15, 1919, Fort Fraser (W. B. Anderson). MANITOBA—♂, Winnipeg (A. W. Mitchener). ♀ July 22, 1910, Winnipeg (J. Cocks). SASKATCHEWAN—♂ ♀ July, 1922, Saskatoon (A. E. Cameron); reported as injurious to "small fruits."

**Lopidea falcicula** new species (Plate II, Fig. 6)

♂. Length 6.5 mm., width 2.3 mm. *Head*: width 1.11 mm., vertex .65 mm. *Antennae*: segment I, length .63 mm; II, 2.2 mm., cylindrical; III, 1.61 mm.; IV, .46 mm. *Pronotum*: width at base 1.8 mm. Color suggestive of *dakota* but the calli, scutellum and hemelytra with deeper black, and the pubescence on the dorsum finer and less conspicuous; genital claspers (fig. 6) distinctive.

♀. Length 6.8 mm., width 2.4 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ August 2, 1900, Rico, Colorado (E. D. Ball); author's collection. *Alltotype*: same data as type. *Paratypes*: ♂, topotypic. ♀ August 5, 1900, Antonio, Colorado.

**Lopidea fuscina** new species (Plate II, Fig. 5).

♂. Length 6.2 mm., width 2.14 mm. *Head:* width 1.22 mm., vertex .40 mm. *Antennae*: segment I, length .67 mm.; II, 2.16 mm., nearly cylindrical but perceptibly more slender near apex. *Pronotum:* width at base 1.86 mm. Form and color suggestive of *falcicula* but red areas of dorsum bearing yellowish pubescence; genital claspers (fig. 5) distinctive.

*Holotype*: ♂ June 6-8, 1907, Mount Diablo Range, Fresno County, California (J. C. Bradley); Cornell University collection.

**Lopidea taurula** new species (Plate II, Fig. 8).

♂. Length 5.9 mm., width 2 mm. *Head*: width 1.14 mm., vertex .68 mm. Genital claspers (fig. 8) indicate a close relationship with *taurina* but in this case the prongs of the right clasper scarcely form a half circle; dorsum clothed with short, black pubescent hairs, also more broadly red than in *taurina*.

*Holotype*: ♂ June 24, 1882, Umatilla, Oregon; author's collection.

**Lopidea nigridea** Uhler, Hemiptera Colorado, p. 30, 1895.

Distinguished by the genital claspers (Plate II, fig. 9), also by the chiefly fuscous coloration and the short, erect black hairs of the dorsum. The figure of the genital claspers here presented was drawn from one of the co-types (♂ July 16, 1894, Steamboat Springs, Colorado, C. F. Baker).

**Lopidea fallax** new species (Plate II, Fig. 10).

♂. Length 6 mm., width 2 mm. *Head*: width 1.14 mm., vertex .40 mm. *Antennae*: segment I, length .54 mm.; II, 1.97 mm., cylindrical. *Pronotum*: width at base 1.66 mm. Genital claspers (fig. 10) distinctive, although showing a close relationship with *nigridea*; differs from *nigridea* in the soft fine pubescence, nearly black hemelytra with reddish margins and the deep rose red pronotum with black calli.

*Holotype*: ♂ June 11, 1915, below Mountain Springs, San Diego County, California (Harold Morrison); author's collection. *Paratypes*: 2 ♂, taken with type. 3 ♂ June 11, 1915, Jacumba to Campo, San Diego County (Harold Morrison), and ♂ ♀, Los Angeles County, California.

**Lopidea serica** new species (Plate II, Fig. 12).

♂. Length 5.8 mm., width 2.24 mm. *Head*: width 1.23 mm., vertex .71 mm. *Antennae*: segment I, length .60 mm.; II, 2 mm., cylindrical; III, 1.16 mm.; IV, .46 mm. *Pronotum*: width at base 1.9 mm. Genital claspers (fig. 12) indicate a close relationship with *nigridea*, but *serica* differs in that the hemelytra bear in addition to black hairs, closely appressed, yellowish sericeous pubescence; hemelytra red, only slightly infuscated at commissure, scutellum nearly black, disk of calli with black spots.

♀. Length 5.7 mm., width 2.3 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ June 28, 1900, Fort Collins (E. D. Ball); author's collection. *Allotype*: taken with type. *Paratypes*: 2 ♂, topotypic.

**Lopidea yakima** new species (Plate II, Fig. 11).

♂. Length 5.1 mm., width 2 mm. Closely related to *aculeata* but evidently differs in structure and color of the genital claspers (fig. 11). Dorsum bright red, calli and scutellum black, dorsum clothed with short black hairs and intermixed, at least on clavus, with closely appressed, sericeous yellowish pubescence.

*Holotype*: ♂ August, 1893, Olympia, Washington (Kinkaid); author's collection. Named after the Yakima Indians.

**Lopidea mohave** new species (Plate II, Fig. 14).

♂. Length 5.7 mm., width 2 mm. Related to *marginata* but differs in the genital claspers (fig. 14). Dorsum fusco-reddish, pronotum more fuscous than reddish, cuneus bright red; calli with margins black and spots on disk of each.

*Holotype*: ♂ July 25, 1907, San Antonio Canyon, Ontario, California; author's collection. Named after the Mohave Indians.

**Lopidea nicholi** new species (Plate II, Fig. 4).

♂. Length 5.8 mm., width 2 mm. *Head*: width 1.14 mm., vertex .64 mm. *Antennae*: segment I, length .60 mm.; II, mutilated. *Pronotum*: width at base 1.52 mm. Dorsum yellow as in *robiniae* but scutellum and each side of commissure not so distinctly black; dorsum clothed with short stiff, suberect black hair. Genital claspers (fig. 4) distinctive of the species.

*Holotype*: ♂ August 7, 1920, Columbia County, Washington (A. A. Nichol); author's collection.

**Lopidea ute** new species (Plate II, Fig. 19).

♂. Length 5.7 mm., width 1.7 mm. *Head*: width 1.14 mm., vertex .61 mm. *Antennae*: segment I, length .48 mm.; II, 1.86 mm., cylindrical; III, 1.26 mm. *Pronotum*: width at base 1.6 mm. Coloration suggestive of *navajo*; dorsum dark fusco-reddish, anterior margin of pronotum, embolium and outer margin of cuneus pale; clothed with very fine yellowish pubescence; genital claspers (fig. 19) distinctive of the species.

*Holotype*: ♂ July 15, 1894, Steamboat Springs, Colorado (C. F. Baker); Cornell University collection. *Paratypes*: 2 ♂, "Colo. 1330, 1341." Named after the Ute Indians, a tribe that inhabited the mountains of Colorado.

**Lopidea teton** new species (Plate II, Fig. 13).

♂. Length 6.3 mm., width 2.43 mm. *Head*: width 1.2 mm., vertex .68 mm. *Antennae*: segment I, length .71 mm.; II, 2.1 mm., nearly cylindrical, although perceptibly tapering smaller on apical half; III, 1.54 mm.; IV, .47 mm. *Pronotum*: length 1.26 mm., width at base 2.01 mm. Pubescence and color nearly as in *dakota* but the red coloration tinged with rose, disk of pronotum distinctly rose colored. Genital claspers (fig. 13) distinctive.

♀. Length 6.1 mm., width 2.36 mm.; very similar to the male in form and coloration. *Antennae*: segment II, length 1.86 mm. *Pronotum*: length 1.2 mm., width at base 2 mm.

*Holotype*: ♂ June 16, 1920, Norman County, Minnesota (A. A. Nichol); author's collection. *Allotype*: ♂ July 12, 1920, Cass County, North Dakota (A. A. Nichol). *Paratypes*: COLORADO—♂ ♀ June 6, ♀ July 17, 1900, Fort Collins (E. D. Ball); ♀ June 13, 1915, Morrison (E. C. Jackson). KANSAS—♂ May 29, Riley County; 2 ♀ May 30, Topeka (Popenoe). MINNESOTA—♀, Ottertail County (O. W. Oestlund); ♀ June 20, 1922, Norman County (A. A. Nichol). MONTANA—♂ June 18, 1911, Gallatin Valley. NEVADA—♂ April 20, 1915, alt. 6300 ft. Round Mountain (E. G. Holt). NORTH DAKOTA—♀, Dickenson (H. Osborn). SOUTH DAKOTA—2 ♀ June 16, ♂ June 21, Brookings; 2 ♂ 2 ♀ June 1, 1921, Capa (H. C. Severin). TEXAS—♀ April, 1914, Fort Worth (W. S. Adkins). Named after the Teton Indians, a name signifying "dwellers of the prairies."

**Lopidea bullata** new species (Plate II, Fig. 16).

♂. Length 4.6 mm., width 1.7 mm. *Head:* width 1.30 mm., vertex .80 mm. *Antennae*: segment I, length .34 mm.; II, 1.18 mm., slender, cylindrical; III, .86 mm.; IV, .37 mm. *Pronotum*: length .91 mm., width at base 1.51 mm. Closely related to *puella* but surface clothed only with soft yellowish pubescence, also the right clasper (fig. 16) without an erect, acute spine at dorsal angle, nor is the distal portion longitudinally furrowed. Pale to fuscous, head large, anterior margin of pronotum, scutellum, embolium and cuneus pale to white; membrane pale, veins and a ray behind smaller areole fuscous.

♀. Length 4.3 mm., width 2 mm.; embolar margins strongly arcuate; coloration similar to the male; membrane abbreviated, just attaining tip of abdomen.

*Holotype*: ♂, Los Angeles County, California; Cornell University collection. *Allotype*: same data as type. *Paratypes*: ♂ ♀, topotypic.

**Lopidea bullata fusca** new variety.

Genital claspers not differing appreciably from the typical species but with membrane and veins uniformly infuscated; scutellum and paler parts of head and pronotum reddish.

*Holotype*: ♂, Los Angeles County, California; Cornell University collection.

**Lopidea wileyi** new species (Plate II, Fig. 17).

♂. Length 4.6 mm., width 1.6 mm. *Head*: width 1 mm., vertex .60 mm. *Antennae*: segment I, length .43 mm.; II, 1.5 mm., cylindrical;

III, .91 mm. *Pronotum:* width at base 1.36 mm. Black, hemelytra with a reddish tinge, pronotum red, calli blackish; clothed with fine short blackish pubescence; genital claspers (fig. 17) very distinctive of the species.

♀. Length 4.6 mm., width 1.6 mm.; very similar to the male in form and coloration.

*Holotype*: ♂ April 20, 1921, Eastland County, Texas (Grace O. Wiley); author's collection. *Allotype*: same data as the type. *Paratypes*: 2 ♂ 7 ♀, taken with the types. ♀ April 24, ♂ May 2, San Diego, Texas.

**Lopidea falcata** new species (Plate II, Fig. 18).

♂. Length 5.4 mm., width 2 mm. *Head:* width 1.14 mm., vertex .63 mm. *Antennae:* segment I, length .57 mm.; II, 2 mm., nearly cylindrical but tapering to slightly more slender apically. Black, lateral margins of pronotal disk behind calli, cuneus, embolium, base of clavus and outer half of corium red; dorsum clothed with fine yellowish pubescence; genital claspers (fig. 18) very distinctive of the species.

♀. Length 6.3 mm., width 2.2 mm.; larger than the male but very similar in form and coloration.

*Holotype*: ♂ July 12, 1915, Jemez Springs, New Mexico (J. Woodgate); author's collection. *Allotype*: same data as type. *Paratypes*: 2 ♂ 3 ♀, topotypic.

EXPLANATION OF PLATE II.

Male genital claspers of *Lopidea*

*a*, left clasper, dorsal aspect.
*b*, right clasper, dorsal aspect.
*c*, right clasper, posterior aspect.
*d*, left clasper, posterior aspect.
*e*, right clasper, internal lateral aspect.
*f*, right clasper, lateral aspect.

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**The Mulford Biological Exploration of the Amazon Basin.**

Two accounts of some of the experiences of this expedition (on which some notes were published in the NEWS for 1922) have recently appeared. One is by the Director, Dr. H. H. Rusby: Report of Work on the Mulford Biological Exploration of 1921-22 (Journal, N. York Botan. Gard., xxiii, pp. 101-112), the other by Dr. O. E. White: Botanical Exploration in Bolivia (Brooklyn Botan. Garden Record, xi, pp. 931 et seq.)

## Notes on the Biology of Two Species of Stenopelmatus (Orth.: Tettigoniidae).

By Carl D. Duncan, Stanford University, California.

Very little is known concerning the lives of these singular insects, references in consequence being few and generally vague, most authors having dismissed the subject with a statement to the effect that *Stenopelmatus* is supposed to feed on decaying or dead animal or vegetable matter. On the other hand, Essig[1], says, "However, we do know that they are often responsible for considerable injury to potatoes before they are dug. The tubers are gnawed so as to be unfit for keeping or selling. Occasionally a large proportion of the crop may thus be injured but this is more likely to occur in small newly cleared areas." The following observations therefore, though made on insects in the laboratory, and not at all extensive, have the value of definiteness, which may justify their publication.

**Stenopelmatus longispina** Brunner.

On March 5, 1921, a large female was collected from under a stone near Cooley's Landing on San Francisco Bay, near Palo Alto, and brought into the laboratory. Here it was put into a small wire screen cage with about an inch of damp sand in the bottom. A card-board box cover, open at one end, was placed on the sand to give shelter to the insect should it choose to remain above ground.

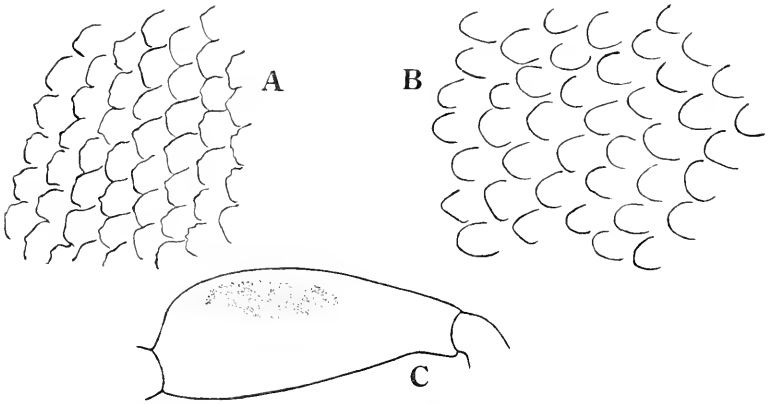
The specimen was kept from March 5 to March 24. On the latter date it was found dead, the cause of death not being apparent. Dissection showed the specimen to be a fully adult female, the abdomen containing twelve apparently fully formed eggs and many others in various stages of development. The mature eggs were of a regularly elliptic form, measuring two mm. by four mm., and were of a lemon-yellow color.

The insect burrowed into the sand during the day, where it remained quiet unless disturbed. At night it came out and crawled actively about the cage climbing all over the sides. When the sand became dry through neglect, or very wet when too much water was put in, *Stenopelmatus* stayed above ground and used the card-board shelter.

[1] Essig, E. O. Injurious and Beneficial Insects of California, p. 37-8.

For several days I kept a petri dish of water in the cage, but I failed to observe the captive drink, although I frequently watched it at night at varying hours up to 2.30 A. M.

About thirty-six hours after having collected the specimen, it having passed the intervening time in a small bottle, I placed it on a laboratory table and began teasing it with a pair of forceps. It exhibited the usual defensive and belligerent attitudes characteristic of the genus and in addition, to my surprise, began stridulating. The sound produced was quite similar to




*Stenopelmatus longispina* Brunner: A, portion of rasp of male; B, portion of rasp of female; C, inner surface of hind femur of male, showing stridulatory rasp.

that made by rubbing two pieces of rough paper together and was made by rubbing an elongated, roughened area on the upper edge of the inner surface of the hind femur (Fig. C) against the short spines which are scattered over the sclerites and connectiva of the side of the abdomen. An examination of several specimens in the University collection showed both sexes to possess the stridulating apparatus.

The mechanics of the stridulation vary. When first noted the insect pressed the femora against the sides of the abdomen and the latter was then jerked upward and slightly forward from one to several times. Later on the insect stridulated when walking away from me and at such times the legs furnished practically all the movement. Stridulation is not

naturally incident to walking, however, as the insect at times walked quite noiselessly. Again, quoting from my notes, "When touched on its back or cerci it kicks one or both of its hind legs high in the air over its back, rubbing its femora against the abdomen in doing so."

The function of the stridulation, as indicated by this specimen, seems to be defensive and intimidatory. For example, "I drop an angleworm in front of 'Steno.' At the squirming of the worm 'Steno' draws back quickly and stridulates twice. I put two *Batrachoseps* (a small salamander) into the cage, dropping one alongside 'Steno,' who promptly stridulated. She stridulated again when I pecked the sand behind and slightly to one side of her with my forceps."

The only food that I succeeded in getting the insect to eat was animal. It refused to eat bits of apple or potato or the berries of *Eugenia* sp., even when not supplied with any other food for two or three days. It ate a number of freshly killed Cerambycid larvae and several large termites which were placed in the cage in a petri dish. So far as observed it fed only at night. When feeding, the click of its mandibles was audible for at least four feet from the cage. An angle-worm which I put alive into the cage was apparently eaten for it disappeared. However, the angle-worm may have escaped from the cage through a hole in one corner, although this seems impossible as the hole was fully one and one-half inches above the sand and it seems unlikely that an angle-worm would forsake an attractive home of wet sand to crawl about a dry metal cage.

A small salamander, *Batrachoseps attenuatus*, about four and a half inches long, which I put into the cage, and which burrowed immediately into the sand, disappeared during the course of four days. I later found what appeared to be the tail of the salamander in the cage. However, I should not like to say that the *Stenopelmatus* killed and ate the salamander as it could easily have climbed out of the cage through the hole mentioned before. Nevertheless, the belligerence and strength of the *Stenopelmatus* which would make the *Batrachoseps* an easy prey should it be chosen for such a fate at

least makes it seem not impossible that the salamander met its death at the "hands" of the former.

Decaying animal matter, such as Cerambycid larvae, crickets, crane fly larvae and two dead ring-necked snakes were untouched by the *Stenopelmatus* although they were left in the cage for several days. No food of any sort was eaten during the four days preceding the insect's death.

**Stenopelmatus pictus** Scudder.

On October 22, 1921, a male of this species was found near Stanford University under a pile of garbage which had been exposed to the weather for several months and was nearly dried out. It bore the empty shells of thirty-eight elliptic, white eggs of a Dipterous parasite, of which seven were on the legs, five on the thorax and twenty-six on the abdomen. The *Stenopelmatus* did not seem to be in the least incommoded by the eggs or the larvae which had hatched from them and were even then living within its body.

I kept the specimen in a large jar, without any sand or earth. It received no food until October 27, when at 7.30 P. M., I put in a small grass-hopper, *Melanoplus* sp., of which I pinched the head and removed the hind legs in order to render it less lively. At 8.10 P. M., the *Stenopelmatus* began feeding on the grass-hopper and continued to do so until only the detached hind legs, a few eggs that I had squeezed out of it in killing it, and a piece of the pronotum remained. The chitinous parts were chewed and swallowed along with the rest. The click of the *Stenopelmatus*' mandibles was distinctly audible as it fed.

After feeding ceased I began teasing the insect. Continued teasing for several minutes failed to elicit stridulation. An examination of the specimen, however, revealed the same stridulatory mechanism as that possessed by *S. longispina*. I repeatedly turned it on its back with my forceps or caught and held it by one leg. In answer to the former it usually merely righted itself and tried running away again. To all appearances it ran in any direction which proved convenient, as frequently toward my threatening forceps as away from them. When held by one leg it turned and used its other legs

and its mandibles in attempts to free itself. When picked up by the thorax it would use all six legs in an attempt to get free. After considerable teasing it lost its good nature and began to show resentment, running away less. When approached by the forceps it would rear up its body in a defensive attitude, lifting its middle and fore legs on the side next the forceps. It would defend itself with great vigor, biting and scraping the forceps. No stridulation whatever took place.

On October 28 I placed a cricket in the jar. The *Stenopelmatus* followed it about, making several unsuccessful attempts to capture it. From what happened it was not apparent whether the *Stenopelmatus* were actually hostile or merely manifesting curiosity. Both insects shortly became quiet on opposite sides of the jar and remained so until 12.30 P. M. of the next day, at which time I put in a grass-hopper, *Melanoplus* sp. The grass-hopper jumped about excitedly, much to the discomfort of the *Stenopelmatus* and the cricket. After several attempts the former caught the grass-hopper and chewed a big hole in the venter of its thorax. Then it left the grass-hopper practically dead and with legs twitching.

At 8 P. M. the hole in the grass-hopper's thorax was much larger. I put in a live fly, *Calliphora erythrocephala*.

On October 30 at 2.30 P. M. the cricket was dead and the fly apparently killed and eaten, since it had disappeared.

On October 31 the *Stenopelmatus* killed but did not eat another *Calliphora*. A third was left unmolested.

On November 3 the *Stenopelmatus* died.

On November 7, A. M., parasitic larvae began to emerge. They all emerged within twenty-four hours, making their exit from the host through a slit in the dorsum of the abdomen between segments two and three. In all seventeen larvae emerged. They showed considerable variation in size.

A few days later the mature flies emerged. These were determined by Mr. F. R. Cole as *Plagioprosphcrysa parvipalpis* Van der Wulp.

The species of *Stenopelmatus* were determined by the author with the aid of Hebard's paper on the genus[2].

[2] Hebard, M. Jn. N. Y. Ent. Soc. 24: 70-86. 1916.

## Observations on the Behavior of Spiders ; the Safety of Spiders from becoming Entangled in their own Webs (Aran.).

By Richard M. Brickner, College of Physicians and Surgeons, New York City.

It was the belief of Fabre[1], substantiated by a single set of experiments, that the spider secreted some sort of fatty fluid, soluble in carbon disulphide, which protected the legs of the animal from becoming stuck to the sticky parts of its web.

The following observations were carried out on the basis of this view. Large orb spiders, strong and very vigorous, were held by one leg, while several of their other legs were bathed in carbon disulphide. Opportunity was given for the surplus carbon disulphide to evaporate, and the spiders were then dropped on to the floor of large funnel or orb webs. In making its first attempt to walk the spider became completely entangled. A series of controls was run simultaneously, and the following results were obtained in every case: Controls: normal spiders were able to move about with ease in any web in which they were placed. Experiments: spiders whose legs had been bathed with carbon disulphide were unable to manouvre properly in any web, because their legs became adherent to the silky strands. Technique: the animal was held in the left hand, by six or seven legs. The remaining leg or legs were allowed to lie upon the tips of the fingers. Carbon disulphide was allowed to drop from a pipette, upon these free legs. In most cases the remaining legs were freed, one by one, and similarly bathed. The legs were allowed to become perfectly dry. Care had to be exercised not to touch any portion of the animal's body with carbon disulphide except the legs; otherwise instant death followed.

The fact being that a bath of carbon disulphide causes the legs of the animal to stick to the silk of a web, the following possibilities obtain in explanation: 1. The globules of carbon disulphide themselves serve as a glue. 2. The carbon disulphide causes paralysis of the leg muscles. 3. There is a pro-

[1]Life of the Spider, page 274.

tective fluid, which is dissolved away by the carbon disulphide (Fabre's hypothesis). 4. The dust, etc., upon the leg becomes condensed among the setae.

Possibility No. 1 is disposed of at once, because the leg was always allowed to become perfectly dry before the experiment proper was commenced, and there was not the least possibility of any of the very volatile bathing fluids remaining upon the animal's limb. The possibility of paralysis is raised by the following facts: in every case in which merely the two forelegs had been wet with carbon disulphide, the spider, in quitting the floor of the strange web, kept these wet legs raised aloft, and would not allow them to touch the silk at all. This was observed even with hind legs which had been bathed alone. In some instances the bathed legs were dragged after the spider, behind, motionless and more or less stiffly. This peculiar attitude may have been due to paralysis, or simply to an effort at protection, on the part of the subject. That the former contention is incorrect is definitely proved by the vigorous motion of all the subjects, after removal from the trap web, and particularly by the following instance: The bathed subject was placed on the floor of a tunnel web. Instead of essaying to escape it stretched itself out at full length, with legs extended and lying together, four toward the head and four toward the tail—as the same variety of spider frequently does in its own web, or under a leaf, in the presence of large enemies, like a human hand. No amount of poking would make this animal budge. Thinking it possible that it might be dead, I picked it up in my hand. In a few seconds the limp spider suddenly sprang to its feet and rushed away. This specimen repeated its performance twice, but finally attempted to walk off the delicate floor of its own web, in which I had subsequently placed it, and succeeded only in shattering the structure, and in carrying a good deal of the substance off on its feet.

The hypothesis of Fabre, that the sticking is due to the solution of some organic, secreted protective fluid, has no direct proof. It is rather a broad jump to assume that the particular fluid which the spider is supposed to secrete happens to be soluble in carbon disulphide.

The damage done to the spider's leg is temporary, and seems to be repaired by a process of combing, which the animal performs after its bath, and which is described in the following paragraph.

It is possible and even necessary to assume, with the protective fluid theory, that this act, which invariably restores to the spider its facility and without which the facility does not seem to return, replenishes the supply of fluid to the legs from which it has been dissolved. While there is no proof that this does not occur, repeated observations of the process under the binocular have failed to exhibit the presence of any droplets, such as might be expected, upon the freshly combed legs, and the following observation furnished conclusive proof that the operation accomplishes (perhaps among other things) a cleansing of the combed leg. I observed a single combing, which went on in the palm of my hand, with a lens. First the legs were carefully drawn between the chelicerae, several times. The pedipalpi were then inserted between the chelicerae and were used as brushes. The pedipalpi were soon withdrawn from the chelicerae, covered with dirt, which they had evidently brushed from the latter. The spider now rubbed its pedipalpi together and rolled up a little pill of dirt which it discarded. This fascinating act was repeated.

Inasmuch as it is an easily perceived fact that the dust, etc., on the spider's leg, is quite condensed among the setae, and that the setae themselves are matted down, and more or less adherent to the shaft of the leg, after the carbon disulphide bath, it is very probable that this matting and condensing are the factors which do away with the free play of such a leg. In fact, it seems rather far-fetched and unnecessary to seek any further for an explanation.

The following further observation is the only positive indication against the fluid theory. The body of a spider which had been dead about 43 hours was examined, and found to be so dry that the legs had to be handled with care to prevent their breaking off. It is a fair assumption that no film of protective fluid could have been left on the legs or body of this animal, and

yet the legs showed as great an immunity as ever, when touched to, or rubbed against, a sticky thread.

We now have a method of causing the temporary loss of the animal's immunity. Wherein, then, lies the actual facility of the normal animal? If we do not seek some fluid as the source of it, another protective agency must be found, and the first place to look for it is in the structure of the animal's body itself.

The following experiments, repeated a number of times, furnished final proof that no part of the body of a spider will adhere tightly to a web, if merely placed in contact with some sticky part of it. A medium-sized zigzag spider was chosen. The common observation of the journey of the animal across the sticky areas of its web was made and it was found that the glue upon the strands offered no impediment whatsoever. Firm grasp of a leg was taken, and the structure was rubbed vertically along a strand. Very slight sticking occurred. Rubbing of the leg horizontally along the strand was thereupon performed, and the same immunity was observed. This experiment was repeated with numerous specimens with unchanging results. The abdomen of the spider was then held against sticky threads in every conceivable position. Again, only very slight adherence occurred. The tip of the abdomen was introduced between three parallel and consecutive sticky threads. When the body was drawn away from the web, the three threads followed it a little way, but they were invariably released and sprang back to their original positions. All parts of the abdomen were thus found to be equally non-adhesive, under a control series. When the same manouvre was attempted with a blade of grass, and with a small straw, the threads were never able to spring back to their original parallelism, because of an attachment formed with the instrument. In all cases, the three threads were pulled much farther out from their supporting radii than had been the case when the various parts of the spider's body had been the pulling apparatus. In every instance, in the control set, at least one thread broke.

Referring again to the dried body of the spider which had

been dead 43 hours, it should be mentioned that the abdomen, as well as the legs showed normal immunity.

The legs and bodies of some demoiselles, and of several other smooth-winged insects, were now tried; and, surprisingly enough, were found to be as slightly adherent as the similar parts of the spider. The legs of a grasshopper were drawn across the sticky strings like the bow of a violin; its passage was entirely unimpeded. If the body of the spider contains no safeguard which is greater than that of the insects which it makes its prey, why is the home in which the spider lives in ease and comfort a death trap for flies and grasshoppers?

It is possible that the spider is possessed of an instinct which enables it to take care of itself in a web, whereas the insects which are unfortunate enough to tumble into a spider's web are not so blessed, and soon find themselves lost. The obvious hypothesis is that it is the entanglement in which the ordinary insect involves itself which causes that animal to be completely entrapped, and hopelessly entangled in the end.

It might be surmised then that even a spider, thrown violently into a web, might find itself in difficulties. Such is exactly the case. A large zigzag spider was selected and was pitched, with some violence, into a web of a larger specimen. It struggled and soon became completely entangled. The spider had sufficient strength so that a thread lying across its back caused it no trouble, but it did not have strength enough to pull any one leg out of its silk sheath, until all the others were free, except with the most extreme difficulty. I, however, was able to draw any leg out of its wrapping with ease; the silk peeled off. The observation was repeated a number of times. The spider was found to possess no particular facility except when in the standing position. When thrown into a web the first effort was always to achieve the standing position, and to present the least possible body surface to the sticky strands. This is accomplished, of course, by resting on the individual strands upon the claws, and by clutching the strands with these claws. It will be observed that this position is the one used by the spider when it is traveling across the sticky part of its web; as well as when it is resting in the central, non-sticky portion of it, and also

that the spider actually handles the sticky lime silk, when the web is being built, by clutching it between its claws.

It would seem that darning needles, grasshoppers, etc., which are accustomed to being caught and involved, when they strike webs, could save themselves, if they eliminated their wild struggles, and, instead of slapping at the trap with their wings, should fold up the latter and devote themselves to aping the spider by acquiring the position of standing quietly upon their points of least body surface, namely, their feet.

A damsel fly's wings were cut off short; the fly had no trouble at all in dropping out of the web, provided only that it was placed there on its feet. Occasionally the long abdomen became entangled and had to be freed by hand. In freeing itself, the clipped damsel fly did not drop off of the web at once, but clung to it with her claws. Upon my attempting to liberate her from her entanglement, the shackles slid off easily enough, but the animal subsequently clung to them with her own claws. Repeated observations of this character were convincing that the bewilderment and lack of the proper instinct, as well as the massive bodily projections, such as wings, or long abdomens which singly were not very adhesive, but which, together, could become very much entangled, are what contribute most largely to the fatal entanglement of most of a spider's prey; and that the particular factor which bestows upon the tenant of the web its own dexterity in getting about, is a body which is so constructed that the animal is not burdened by ponderous projecting parts; and, second, an instinct by which the spider remains in, or immediately achieves, the standing position when in, or placed in, a web.

It must not be forgotten that a spider builds a web for its own individual use, and that it cannot help placing the succeeding strands just so far apart from each other that the distance is best fitted to be covered by legs which are of the exact size of those possessed by that particular spider. The grasshopper which strikes the web is not built for such a home; its comparatively massive body occupies too much space, covers too many sticky threads. One or two moves, and the grasshopper has wrapped itself in a fatal sheath. The poor ant which finds

itself upon a web is usually in an equally embarrassing position. Even if it were possessed of the spider's instinct, it could not reach; it is too small, one strand is often all it can touch, and it can do little but haul its poor body slowly along that sticky strand.

Regarding the generic and specific names of the spiders, I am, unfortunately, not able to be as precise as I desire to be. The spiders were not identified properly at the time the experiments were done, because of the interference of certain circumstances, and the saved specimens were lost. I have spent considerable time in examining the spider collection at the Museum of Natural History; this work leads to the probable identification of the "orb" spider I used as *Tetragantha extensa,* and of the "zigzag" spider as *Miranda aurantia.* The fallibility of this second-hand method of identification, however, makes it impossible to be certain of the results.

## A New Species of Agrilus (Buprestidae, Col.).

By A. B. Champlain and J. N. Knull, Bureau of Plant Industry, Harrisburg, Pennsylvania.

A collection of *Agrilus* belonging to the University of Minnesota was submitted to the authors for determination, through Prof. J. G. Sanders, Director of the Pennsylvania Bureau of Plant Industry. In identifying the material one species was found which did not agree with any of the described members of the genus, and though the kindness of Prof. H. H. Knight, the authors were permitted to describe it.

**Agrilus egeniformis** n. sp.

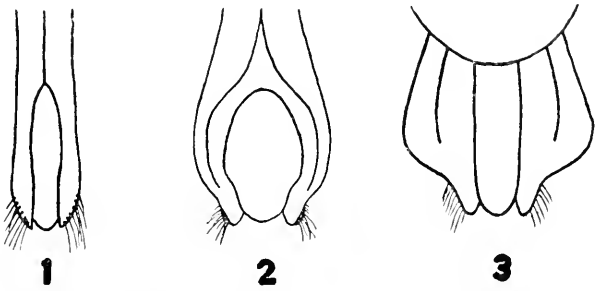
Olive bronze, more shining below than above. Antennae reaching the hind angles of the prothorax in the male, serrate from the fifth joint. Vertex of head with a feeble median impression. Prothorax wider than long, sides arcuate, hind angles rectangular with an oblique carina, lateral margin deflexed in front, disk convex with two rather shallow median impressions, lateral oblique depression prominent, surface lightly transversely strigose. Scutellum transversely carinate, surface granular. Elytra with sides sinuate near base, dilate behind middle, apices rounded and serrulate, surface imbricate, each elytron with three pubescent spots, one at base, one in front of middle and one back

of middle. Prosternal lobe truncate, slightly emarginate. Abdomen sparsely punctate, pygidium carinate, carina not prolonged, tarsal claws broadly toothed at base. Length 4.5 mm.

♂.—Front more shining. A dense line of pubescence extending from prosternum to end of second ventral segment. First and second ventral segments of the abdomen impressed at middle.

♀.—Prosternum not pubescent, ventral segments of the abdomen not impressed at middle.

Superficially this species resembles *A. fallax* Say, but can readily be separated from this species by the serrate fifth antennal joint. According to Horn's key this species would run to *A. egenus* Gory, but it is distinct from this species and *A. celti* Knull by the marked pubescent patches of the elytra and by the structure of the male genitalia.




Outline drawings of the male genitalia of the following species of *Agrilus*: 1. *A. celti* Knull; 2. *A. egenus* Gory; 3. *A. egeniformis* n. sp.

Although the adults of *A. egenus* Gory, *A. celti* Knull and *A. egeniformis* n. sp. approach each other in general appearance, the genitalia of the males show striking differences which are best shown by the accompanying outline drawings.

Described from a series labeled "Mo." in the collection of the University of Minnesota, and from one specimen labeled "Lawton, Oklahoma," collected by G. W. Barber, and two specimens labeled "West Pt., Nebraska, June," in the collection of C. A. Frost. The authors are indebted to Mr. Frost for the loan of his material. *Type* labeled "Mo." in the authors' collection.

*G. H. Horn—Trans. Amer. Ent. Soc., Vol. 18, p. 277-336, 1891.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MARCH, 1923.

### A Possible Service to Entomologists.

It has been suggested that the NEWS might do a service to working entomologists, especially those who have not access to large libraries or to the rarer entomological books and papers, by occasionally reprinting brief articles which never enjoyed a large circulation. Such are some of the specific descriptions of Thomas Say, S. S. Haldeman and others. Perhaps to reproduce these in the NEWS would be a real help to students. Under present costs of publication, the NEWS could not increase its pagination to include such reprintings, nor would it be fair to greatly delay the appearance of new work by taking more than a few pages per year for this purpose. We shall be glad to receive expressions of opinion on this proposal from our readers, as well as the titles of papers desirable to be reprinted, should this idea be carried into execution.

### Oxycnemus histrina on Fungus (Col.: Nitidulidae).

Mr. Charles Leng has advised me to publish a record capture of a beetle found on the mushroom (*Phallus impudicus*-Stink Horn Fungus) which I collected at Mulhall Station, Virginia (near Washington) on September 23. I wrote to Mr. Leng after consulting Dr. E. A. Schwarz and Mr. Barbour of the National Museum in regard to the advisability of recording this capture and the three seem to agree that it is quite unusual. The beetle in question is the Nitidulid beetle—*Oxycnemus histrina*. In collecting this beetle, I came across one single mushroom and found it in a very decayed state. In the mushroom itself, or better yet in the partial remains of the mushroom, I took the astounding number of 38 specimens and had I wished to exterminate the colony, very likely could have taken at least 75-100 more. All three of the gentlemen whom I consulted agreed that this is by far a record. Dr. Schwarz had never captured more than 3 on a single plant and Leng had taken but 5 and both agreed that in most cases not more than one specimen was to be found on a single plant. Blatchley says in his "Coleoptera Known to Occur in Indiana" that only one or two specimens have ever been found on a single plant.

I should be pleased to hear further from collectors on this question. It may be that I am mistaken in calling my case a record one.

MORTIMER L. J. HIGGINS, 1303 P St. Northwest, Washington, D. C.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

**A Supplementary Note on Gomphus dilatatus (Odon.: Aeshnidae).**

Mr. Philip Laurent, to whom I owe so much interesting Odonate material, has given me a male *Gomphus dilatatus* Rambur, taken by himself at Gunntown, Levy County, Florida, March 1-15, 1922. Its capture was, consequently, subsequent to the publication of my recent paper[1] on this species and its allies. This male is the seventh of its sex known to me.[2] A comparison of it with such of my previous material as is now available, viz.: the male from Suwanee Springs (?), Florida, from which figs. 14, 15, 17 and 21 of my Plate XV were drawn and the fragments from Amite River, Louisiana, shows some interesting facts. When I drew my figure 21, I believed, from comparisons with *lineatifrons* and *vastus*, that the terminal filaments of the penis of *dilatatus* were in reality as long as they are represented in my figures 22 and 23 for *lineatifrons* and *vastus* respectively, and I therefore indicated them as broken, showing a part of their supposed length by dotted lines. On relaxing the new Gunntown male, I carefully extruded the penis, experiencing no difficulty in the operation, and then found that it and the Suwanee (?) and the Amite River males agree in possessing *short* terminal filaments to the penis. Their actual length would be expressed by retaining only the first two pairs of dots for each filament in my figure 21 and expunging the others. Each filament in all three males terminates in a very acute point, very much more slender than the filaments of *lineatifrons* and *vastus* at the same distance from their bases.

This difference in the length of these filaments will thus constitute another structural character in the male of *dilatatus vs. lineatifrons* and *vastus*.

I also note that the Gunntown male has the tooth of the second penis joint (*tp* of my figure 23) not as attenuate as apex, nor with the slight ante-apical process, as shown in my figure 21, but is more as in figure 22. The same statements are probably true for the Amite River male although this tooth has been damaged.

The posterior margin of the vesicle of the penis, fully extended, of the Gunntown male, measures 1.406 mm., which is .345 of the height of the hind margin of abdominal segment 2. Corresponding figures for a second male (paratype) of *G. lineatifrons* from the Tippecanoe River, Indiana, are 1.48 mm. and .4 (*cf.* character 18, Trans. cited, p. 224).

[1]Trans. Amer. Ent. Soc. xlvii, pp. 221-232, pls. xiv,xv. Dec. 27, 1921.

[2]In addition to the five mentioned in my paper, *l. c.*, pp. 225, 230, I believe that there is still another in Mrs. A. T. Slosson's collection.

Mr. Herbert Campion, of the British Museum of Natural History, wrote me under date of August 21, 1922: "I have examined John Abbot's coloured drawing (No. 14)[3] of *Gomphus dilatatus* with your remarks on the species before me As regards the coloration of abdominal segment 8, which is the subject of comment in your paper, there is no indication of any middorsal line, but there is an anterolateral yellow spot on each side, which, on the right side, at all events, is continued backwards as a rather broad band to the posterior margin of the segment. Segments 7 and 9 also have lateral yellow markings. The thoracic pattern agrees very well with your fig. 13, except that posteriorly, the junction between 1*a* and 2*a* is rounded, and not straight, as shown by you."

PHILIP P. CALVERT.

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**Leucorhinia proxima at a High Altitude in Colorado (Odon.: Libellulidae).**

Prof. T. D. A. Cockerell recently presented to the collection of the Academy of Natural Sciences of Philadelphia a male of this species taken at Ward, Colorado, at a swamp, on July 1, 1922, by B. Hill. Prof. Cockerell wrote: "Ward is 9230 feet altitude and so far as I can find this is by far the highest altitude for the genus. Tillyard remarks (Biol. Dragonflies, p. 315) on absence of Libellulinae at high altitudes, so the record ought to be published."

In this connection we may recall the occurrence of *Sympetrum corruptum*, of the same subfamily, at 11,000 and 13,000 ft. in Colorado (Ent. News, xxvi, p. 119). PHILIP P. CALVERT.

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**Insects Taken at Hot Springs, Rotorua, New Zealand.**

The past summer it was my good fortune to be associated with the University of Iowa expedition to the Fiji Islands and New Zealand in the capacity of entomologist and ornithologist. During the course of my stay in New Zealand a side trip to the Rotorua district was made and some collecting was indulged in there. The hot springs, so alluring to all, were visited and some of the entomological findings are here recorded briefly.

The center of the so-called thermal district in New Zealand is in the North Island at Rotorua, which has a population, exclusive of the tourists, of about 2000. Rotorua is about 170 miles southeast of Auckland, 800 feet above sea level and has been the scene of a great amount of volcanic and thermal activity, the sulphurous fumes and streets of volcanic ash constantly reminding one of these occurrences. Owing

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[3] *Cf.* Hagen, Stet. Ent. Zeit. xxiv, p. 373, 1863; Proc. Bost. Soc. Nat. Hist. xvi, p. 359, 1874.

to the fact that the waters of the region possess certain curative properties, many hotels and bath houses are maintained for the accommodation of the public. Several of these are under government supervision.

At the north edge of the town, immediately facing Lake Rotorua, is a native Maori village known as Ohinemutu and it was along the lake shores in front of this village that the observations recorded below were made. Here, hot or boiling water issues from the sandy ground in the form of miniature geysers the water from them uniting shortly to form numerous small pools and streams which ultimately flow into Lake Rotorua. Some of these streams are as much as six inches in depth while others are only one or two inches deep.

Certain insects seem to be attracted by the heated earth in the vicinity of the bubbling hot water, the heat being great enough to be felt through the soles of heavy collecting shoes as one walks over it. If the insects on the sand are disturbed some jump or fall into the hot water and are killed. A good many were thus taken from the shallow streams as they were being carried to the lake a few yards away. Covering the margins and bottoms of most of the streams and pools, is a slimy dark green vegetable growth of varying thickness, which serves as food for some kinds of insects and gives an added incentive for them to visit the region.

On July 27 and again on July 31 several species of flies (Diptera) were found in this situation; one, a small blackish form was very abundant on the warm sand. Another large, black, active species fed greedily on the algae growing in the hot water and along its edge. In some instances the flies rested on the surface of the water while feeding, but if accidentally immersed in it they quickly succumbed, thus indicating that they are not totally immune to the effects of the hot water. A species of crane fly was also found feeding on the algae growing on the hot sand.

Of Hemiptera, two species were taken; one, a small blackish heteropteran in both nymphal and adult stages, was found on the algae around the hot springs, while small water striders glibly glided over the surface apparently suffering no inconvenience from the heated supporting medium.

In the water a species of small hydrophilid beetle (Coleoptera) as well as its larva was taken and here, too, fly larvae were found breeding.

At least five species of insects representing three different and distinct orders were taken in, on or in the immediate vicinity of the hot springs. In the case of those insects which breed in the water some interesting items of ecological significance are suggested. Apparently abundant food and a considerable freedom from enemies is afforded. A constant temperature is maintained throughout the year so that the need for a definite breeding season is eliminated although the climatic

conditions of winter and summer are well marked. It would be interesting to know to what degree, if any, these insects have changed their nature by long and continued residence in the hot water.—Dayton Stoner, University of Iowa, Iowa City, Iowa.

## Entomologische Mitteilungen.

Dr. Walther Horn, of the Deutsches Entomologisches Museum, Berlin-Dahlem, Gossler-Str. 20, Germany, writes that his Museum lacks financial support and is hardly able to continue its existence. The publication which he issues, namely *Entomologische Mitteilungen*, is critically feeling the financial conditions of Germany, and especially the monetary exchange. Prices of printing have risen enormously, and hopes for the future are very dim. On account of the condition of the exchange, subscriptions to the journal when sent in German marks are not welcome, because of the constant and extremely rapid decline in value of the mark. Doctor Horn wishes that American subscribers to the journal should send their subscription price ($1.25) in American money; and if this is done, and if more subscriptions are sent in, he hopes that the journal may be able to continue.

L. O. Howard.

## An Interesting New Case of Phoresie (Heterop.: Coreidae; Hymen.: Proctotrypidae).

*Anoplocnemis curvipes* is a Coreid which is very injurious to vegetable crops, especially legumes, in the Belgian Congo. Lieut. Jean Ghesquière, Entomologist to the Belgian Congo, in a brief note in the Bulletin of Agriculture of the Belgian Congo for 1921, of which he has just sent me an author's extra, described the habits of an egg-parasite of this bug, and they are extremely interesting. The parasite is not identified, but is referred to as a Proctotrypid. From the illustration, it would seem to be a *Telenomus*, or at least a Telenomine. Lieutenant Ghesquière states that the parasite flies around over the plants which are actively visited by the bug, and when a female parasite gets the chance she jumps upon the pronotum or the top of the head of the bug. She tries to find females especially, but, failing the females, she will jump on the head of a male; never, however, will she mount larvae or nymphs of the bug. If she finds herself on the head or back of a male, at the moment when the bugs couple she passes to the female. The egg-laying of the *Anoplocnemis* takes place a few minutes after coupling, and the parasite then leaves the adult bug, but lays its eggs in the eggs which are laid. After egg-laying is completed, she resumes her earlier position on the head of the female host.—L. O. Howard, U. S. Bureau of Entomology, Washington, D. C.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **39**—The Florida Entomologist, Gainesville, Florida. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **64**—Parasitology, London. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison on the Hudson, N. Y. **76**—Nature, London. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **91**—The Scientific Monthly, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **95**—Annales des Sciences Naturelles, Paris, Zoologie. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **111**—Archiv fur Naturgeschichte, Berlin. **115**—Societas Entomologica, Stuttgart.

**GENERAL. Essig, E. O.**—Insect notes from Laguna Beach, Cal. **13**, xiv, 75-8. **Hartman, C.**—Swarming insects simulating smoke. **68**, lvii, 149-50. **Latour, B.**—Insectes d'autrefois. **67**, xlix, 127-31. **Martin & McKittrich.**—A key for the identification of animal parasites found in the human feces. (Bul. Univ. Wisconsin, iv, 371-94, 1917). **Muller, G. W.**—Insektenlarven an wurzeln von wasserplanzen. (Mitt. Naturw. Ver. Neuvorpom. u. Rugen in Greifswald, Berlin, xlviii, 30-47). **Robson, G. C.**—A note on the species as a gene-complex. **11**, xi, 111-15. **Sharp, David**—Obituary note of **10**, xxiv, 207. **Stiles, C. W.**—Zoological nomenclature: Musca and Cal-

liphora. **76,** cxi, 115. **Wheeler, W. M.**—Social life among the insects. VI. The termites or "white ants." **91,** xvi, 160-77 (cont.)

**ANATOMY, PHYSIOLOGY, ETC. Burge, W. E.**—A comparison of the catalase content of luminous and non-luminous insects. (Abs-Bul. Nela Res. Lab. Gen. Elect. Co., Cleveland, Ohio, i, 448-9.) **Dehorne, A.**—Determination du nombre des chromosomes dans les larves de Corethra plumicornis. **92,** lviii, 25-30. **Janet, C.**—Considerations sur l'etre vivant. Pt. 2, L'individu la sexualite, la parthenogenese et la mort, au poit de vue orthobiontique. Beauvais, 1921, 196pp. **Kopec, S.**—The influence of the system on the development and regeneration of muscles and integument in insects. **85,** xxxvii, 15-25.

**THE SMALLER ORDERS OF INSECTA. McDunnough, J.**—Notes on Canadian dragonflies for the season 1922. **4,** liv, 255-7. **Nakahara, W.**—Notes on the feeding habits of scorpion-flies. **5,** xxix, 212-13

**Needham & Claassen.**—The N. Am. species of the genus Acroneuria. **4,** liv, 249-55. **Watson, J. R.**—On a collection of Thysanoptera from Rabun Co., Georgia. A new thrips from citrus in Alabama. **39,** vi, 33-9, 47-8; 45.

**ORTHOPTERA. Hebard, M.**—Dermaptera and Orthoptera from the state of Sinaloa, Mexico. Pt. 1. **2,** xlviii, 157-96. **Hubbell, T. H.**—Notes on the Orthoptera of North Dakota. The Dermaptera and Orthoptera of Berrien County, Michigan. **88,** No. 113; No. 116. **Macfie, J. W. S.**—Observations on the role of cockroaches in disease. **98,** xvi, 441-48. **Morse, A. P.**—The European house cricket; hearth cricket. **5,** xxix, 225.

**HEMIPTERA. Bergroth, E.**—On some Neotropical Tingidae. **33,** lxii, 149-52. **Drake, K. J.**—Neotropical Tingitidae with descriptions of three new genera and thirty-two n. sps. and var. (Mem. Carnegie Mus., ix, 351-78.) **Ferris, G. E.**—Notes on Coccidae X. **4,** liv, 246-8. **Hungerford, H. B.**—Oxyhaemoglobin present in backswimmer, Buenoa margaritacea. **4,** liv, 262-3. **Hussey, R. F.**—Hemipterological notes. **5,** xxix, 229-33. (Hemiptera from North Dakota.) On some Hemiptera from Berrien Co., Michigan. **88,** No. 115; No. 118. **Peneau, J.**—Troisieme contribution a l'etude des metamorphoses des Hemipteres. (Bul. Soc. Sci. Nat. Ouest de la France. 1921, 35-43.) **Poisson, R.**—Armature genitale et squellette chitineux de l'organe copulateur chez les hemipteres aquatiques. **20,** 1922, 269-74. **Weiss & West.**—Notes on Livia maculipennis. **5,** xxix, 226-9.

**Knight, H. H.**—The N. Am. species of Labops. **4,** liv, 258-61. **Metcalf, Z. P.**—On the genus Elidiptera. **4,** liv, 263-4.

**LEPIDOPTERA. Bowditch, F. C.**—Notes on the gipsy moth in my unsprayed woods at East Marion, Mass., 1922. **5,** xxix, 213-16. **Hoffmann, C. C.**—Restos de una Antigua del Norte entre los lepidopteros Mexicanos. (Rev. Mex. Biol., iii, 1-37.) **Moore, S.**—A list of northern Michigan L. **88,** No. 114. **Schaus, W.**—Notes on the Neotropical Epipaschiinae, with descriptions of new g. and sps. **10,** xxiv, 208-41. New sps. of Hydriomena from Mexico and Guatemala. **15,** x, 205-18.

**DIPTERA. Akehurst, S. C.**—Larva of Chaoborus crystalinus (Corethra plumicornis). (Jour. R. Micros. Soc., 1922, 341-72.) **Aldrich, J. M.**—The Neotropical muscoid genus Mesembrinella, and other testaceous muscoid flies. **50,** lxii, Art. 11. **Dyar, H. G.**—Notes on tropical American mosquitoes. **15,** x, 188-96. **Stiles, C. W.**—Musca Linnaeus, 1758, and Calliphora Desvoidy, 1830. **68,** lvii, 176. **Young, C. J.**—Notes on the bionomics of Stegomyia calopus, in Brazil. **98,** xvi, 389-406, 425-39. **Warburton, C.**—The warble-flies of cattle. Hypoderma bovis and H. lineatum. **64,** xiv, 322-41.

**Garret, C. B. D.**—New sps. of Helomyzidae. **15,** x, 175-7.

**COLEOPTERA. Bounoure, L.**—Anomalie d'une larve de "Dytiscus." **95,** v, 391-97. **Burke, Hartman, & Snyder.**—The lead-cable borer or "short-circuit beetle" in California. (U. S. Dept. Agr., Bull. 1107.) **Dabbert, H.**—Ein hermaphrodit von Dytiscus marginalis. **115,** xxxviii, 1-3. **Fisher, W. S.**—The leaf and twig mining buprestid beetles of Mexico and Central America. **50,** lxii, Art. 8. **Herrera, M.**—Breve monografia del Megasoma elephas. (Secret. Agric. y. Fomento. Direc. Estudios Biol., Mexico. 1922. 16pp.) **Macnamara, C.** Tiger beetle larvae. **4,** liv., 241-6. **Obenberger, J.**—Beitrage zur kenntnis der Buprestiden. **111,** 1922, A, 12, 64-168.

**HYMENOPTERA. Browne, F. B.**—On the life-history of Melittobia ascasta; a chalcid parasite of bees and wasps. **64,** xiv, 349-70. **Cresson, E. T., Jr.**—The Bassett types of Cynipidae. **2,** xlviii, 197-203. **Cushman, R. A.**—The identity of Ichneumon coccinellae. **10,** xxiv, 241-2. **Enderlein, G.**—Beitrage zur kenntnis der Copeognathen VII. **52,** lv, 245-8. **Gennerich, J.**—Morphologische und biologische untersuchungen der putzapparate der H. **111,** 1922, A, 12, 1-63. **Hartley, E. A.**—Some bionomics of Aphelinus semiflavus, chalcid parasite of aphids. **82,** xxii, 209-36. **Plath, O. E.**—Notes on the nesting habits of several N. Am. bumble bees. **5,** xxix, 189-202. **Smulyan, M. T.**—New England sawflies of the genus Tenthredella. (Proc. Boston Soc. N. H., xxxvi, 383-465.) **Stuart, M.**—Amber and the dammar of living bees. **76,** cxi, 83-4. **Wheeler & Chapman**—The mating of Diacamma. **5,** xxix, 203-211.

INSECTS OF ECUADOR.

CATALOGO SISTEMATICO Y SINONIMICO DE LOS ODONATOS DEL ECUADOR. Por el Prof. FRANCISCO CAMPOS R., Zoólogo del Estado (1905), Catedrático de Ciencias Naturales y Cosmografia en el Colegio Nacional Vicente Rocafuerte. Revista, Coleg. Nac. Vic. Rocafuerte, Guayaquil, Año IV., Núms. 8 y 9, pp. 1-75, lam. 1-3. June—September, 1922.

For the past twenty-two years the author has occupied the chair of natural history in the College of Vicente Rocafuerte at Guayaquil and has devoted his free hours from professional duties to the cultivation of entomology. Papers by him on Heteroptera, Lepidoptera, Diptera, Coleoptera, Hymenoptera, Neuroptera, Trichoptera and Euplexoptera of Ecuador have appeared in earlier numbers of the *Revista* of the College from 1919 on. In the study of all of these groups he has sought the assistance of specialists in America and in Europe to determine the material which he and his friends have collected in the Republic of the Equator.

The present catalog embraces 126 species of Odonata, without including varieties and doubtful forms, belonging to 54 genera. Seven species are indicated from the Galapagos Islands, three were described as new from the author's material, 5 are still to be described and 52 were not recorded from Ecuador previous to their collection by the author. 'Many other species,' he adds, 'must surely inhabit the country, since they are mentioned from bordering regions, but I have preferred to omit these from my catalog, signalizing only those for which there are definite evidences of capture in the national territory.' Species reported from Ecuador in the existing literature, or whose occurrence therein rests on manuscript communications to the author by specialists, have, of course, been included, although many of these species are simply recorded as from "Ecuador." A list of Ecuadorian localities, with their altitudes in meters, chiefly those at which the author and his friends have collected, is given on pages 9 and 10. It consists of 29 localities in western Ecuador, 5 to 1280 meters, 14 in interandine Ecuador, 2588-3288 meters, and 3 in eastern Ecuador, 440-1800 meters.

Under each species is given the bibliographical references, including synonyms, the localities and months in Ecuador and not infrequently a note on habits. There are three half-tone plates showing the facies of 9 species of Zygoptera, 6 Aeschnidae and 10 Libellulidae, respectively.

We congratulate Prof. Campos on the publication of his catalog and hope that he may for many years continue his studies and enlarge still more our knowledge of the Odonata of his country.

Prof. Campos' ESTUDIOS SOBRE LA FAUNA ENTOMOLOGICA DEL ECUADOR. 3. COLEOPTEROS occupies pages 24-100 of the same *Revista* for December, 1921, and lists 548 species of 342 genera belonging to 62 families, from the literature and from his own collections. Three half-tone plates reproduce photographs of 28 species. Nos. 4, 5, 6 and 7 of the ESTUDIOS were published in the *Revista*, Año IV, Num. 7, for March, 1922, and deal respectively with the Hymenoptera (pp. 54-71, 2 half-tone plates of 13 spp.), 113 species of 50 genera; 'Neuroptera (pp. 71-73, 1 half-tone plate of 2 spp.), 14 spp. of Myrmeleonidae and Ascalaphidae; Trichoptera (p. 74), 2 spp. and Euplexoptera (pp. 74-77), 18 spp.

PHILIP P. CALVERT.

# Doings of Societies.

## Entomological Section, The Academy of Natural Sciences of Philadelphia.

Meeting of September 28, 1922. Nine persons present. Director Laurent presiding. Mr. Frank R. Mason was elected a member.

LEPIDOPTERA.—Mr. Williams exhibited drawings of the male genitalia of the North American species of *Hesperia* and allied genera, and made some remarks on the strong characters presented by these organs and their value in determining species.

ODONATA.—Dr. Calvert presented eight specimens of Odonata from New Jersey and Pennsylvania to the collection. He also exhibited a male of *Gomphus dilatatus* Rambur, collected by Mr. Philip Laurent, at Gunntown, Florida, March 1-15, 1922, and remarked on the specific characters furnished by the terminal filaments of the penis. [Published in detail on page 87 of this number of the NEWS.] He also read a passage from "Our Search for a Wilderness," by M. B. and C. W. Beebe, describing a species of *Mecistogaster* capturing spiders in British Guiana, and exhibited a *Megaloprepus coerulatus* from Costa Rica which had a spider in its mouth at the time of capture; also a microscopic slide of the excrement of another *M. coerulatus* from the same country, in which a bit of the last tarsal joint and claws of a spider were visible.

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Meeting of November 16, 1922. Director Philip Laurent in the chair. Nine persons present.

DIPLOPODA.—Dr. Skinner read a letter about an infestation by millipedes of a house at Haverford. Mr. Kisliuk reported an infestation of a field of imported bleeding-hearts by this pest working in the roots and destroying the entire planting.

LEPIDOPTERA.—Mr. Williams spoke about some more of his researches in the lepidopterous family Hesperiidae, showing some important genitalic characteristics by lantern projection of microscopic mounts.

DIPTERA.—Mr. Cresson made some comments on the more conspicuous genitalic structures in the dipterous family Micropezidae, illustrating his remarks by lantern projection of drawings. Mr. Laurent commented on the diversity of terms used for the same parts of the genitalic structure.—E. T. CRESSON, JR., Recorder.

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## The American Entomological Society.

Meeting of October 19, 1922, in the hall of the Academy of Natural Sciences of Philadelphia. Dr. Henry Skinner, president, in the chair. Eleven persons present.

Mr. Cresson reported the following additions to the collection: 25 specimens (14 species) Hemiptera (Aradidae), United States, C. W. Drake; 23 specimens (12 species, 15 paratypes) Diptera Dolichopodi-

dae) United States, M. C. Van Duzee; 11 specimens Diptera from Florida, Philip Laurent; Paratype of *Zorotypus swezeyi*, Caudell, A. N. Caudell; 2 paratypes of two species Diptera from Illinois; 2 paratypes of 3 species Evaniidae from Peru; 3 Hymenoptera, Illinois and Peru, T. H. Frison; 2 paratypes of *Bremus kirbyellus alexanderi*, *Bremus sylvicola hitzii*, from United States, T. H. Frison; 2 specimens *Celeris calida* Butler, Lep. 15 specimens *Crabro destructor* from Hawaiian Islands, F. X. Williams, 1 Diptera, *Orophoro townsendi* Bez., type from Peru; 14 Diptera Trypetidae determined from Africa, Prof. M. Bezzi; 8 specimens (4 species) *Drosophila* (Diptera) Penna., Dr. P. P. Calvert; 5 specimens *Longitarsus subrufus* LeC. from Penna., F. M. Craighead; 1 photo of Frank R. Mason; 6 copy books containing numerous letters to entomologists and many other letters from entomologists to Mr. H. F. Bassett from his daughter, Mrs. Howard W. Ford; 78 photographs of entomologists purchased from Deutsche Entomologische Institut, Berlin.

Orthoptera.—Mr. Rehn made a few remarks on the rarity of a fissate condition of the pronotum in the Blattidae. The speaker exhibited the genera *Schigopilia* and *Schistopeltis* of the Panchlorinae, which possess such fissations, while tendencies toward this type, as found in several related genera, were also pointed out.

Lepidoptera.—Mr. Bayliss reported the capture of *Apatura celtis* (Lep.) at Burlington, New Jersey, this species not being recorded in Smith's list.

Coleoptera.—He exhibited a fine collection of the local Cicindela (Coleop.)

Diptera.—Mr. Kisliuk reported the presence of the Lesser Bulb fly larvae on Narcissus bulbs imported from Holland and exhibited adults and pupa of *Eumerus strigatus*, Fab. (Dipt.). Shipments of the plants were held up and thoroughly fumigated and action taken to prevent the introduction of the insect in this manner.

Mr. Rehn made some interesting remarks in regard to his last collecting trip with Mr. Hebard, particularly in Arizona.

R. C. Williams, *Recording Secretary.*

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Meeting of December 11, 1922, in the same hall. Dr. Skinner presiding. Twelve persons present.

The annual reports were read and the following were elected to serve as officers and committees for 1923: *President,* Henry Skinner; *Vice-President*, J. A. G. Rehn; *Corresponding Secretary,* Morgan Hebard; *Recording Secretary*, R. C. Williams; *Treasurer*, E. T. Cresson. *Publication Committee*, J. A. G. Rehn, *Chairman*, E. T. Cresson, P. P. Calvert; *Finance Committee*, Morgan Hebard, *Chairman*, D. M. Castle, J. A. G. Rehn; *Property Committee*, E. T. Cresson, Jr., Morgan Hebard, Philip Laurent.—J. A. G. Rehn, *Recording Secretary, pro tem.*

# NEW ARRIVALS

From Colombia, South America:
OVER 10,000 BUTTERFLIES, INCLUDING

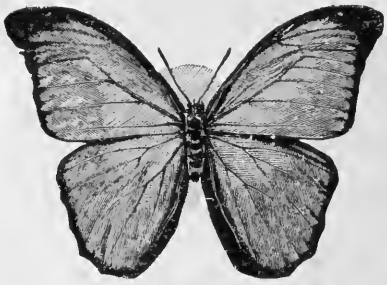
Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:
1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:
Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea
2000 Coleoptera
200 Orthoptera



From Assam, India:
1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan):

Armandia iidderdalii
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APRIL, 1923

# ENTOMOLOGICAL NEWS

Vol. XXXIV No. 4

WILLIAM HARRIS ASHMEAD
1855-1908





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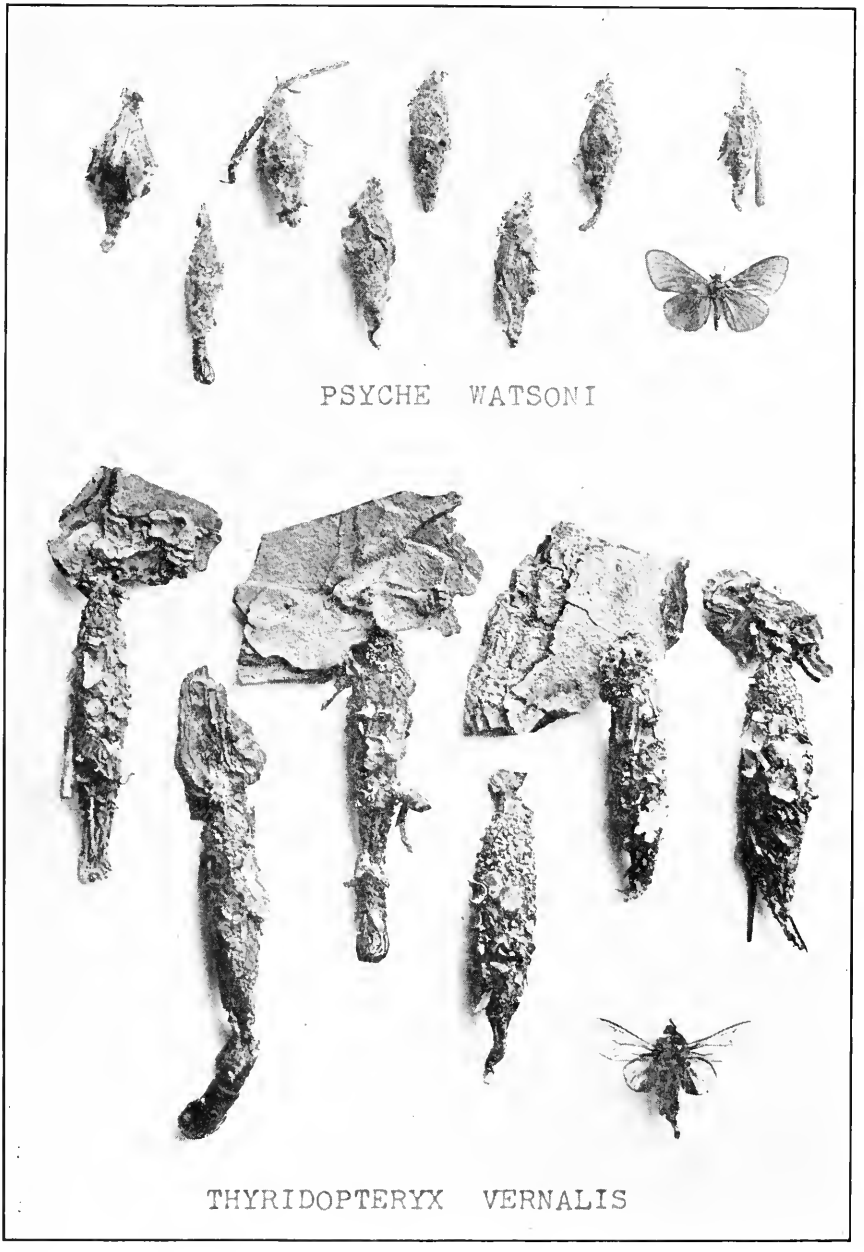



TWO NEW PSYCHIDS.—JONES.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIV APRIL, 1923 No. 4

CONTENTS



## Variation in Thyridopteryx: Two New Psychids (Lepid.: Psychidae).

By FRANK MORTON JONES, Wilmington, Delaware.

(Plates III, IV.)

In the *Psychidae*, wing-venation of the male has been largely employed in the characterization of species, genera and sub-families; but when, judged by this character, we not infrequently reach the absurdity that one-half of an insect falls to one species, genus, or sub-family, the other half to another genus or even to another sub-family, it becomes apparent that until we determine, for a given species, the prevalence and extent of such variation, this character considered alone must be most inconclusive and unsatisfactory.

Of our North American *Psychids* probably no species is more variable than *Thyridopteryx ephemeraeformis* Haw. The fol-

lowing notes on this species are based on the examination of fifty males, from a considerable range of food-plants and localities, the specimens taken at random from the breedings of a period of ten years. It is confidently believed that a single species only is represented in this material, and this belief is not modified by the extreme variability of structure manifested, for the full range of variation in any one venational character is not infrequently exhibited in a single asymmetrical insect.

If we consider Comstock's figure to represent the normal venation of *ephemeraeformis*, he shows an 11-7 veined insect with $R_3$ and $R_4$ (9 and 8) of primaries stemmed to the cell, $M_2+M_3$ (5 and 4) of both wings coincident, $Sc+R_1$ (8) of secondaries stemmed with $Rs$ (7)—then of the fifty examples studied, seventeen, or only 34%, approximate the normal venation (Plate IV, figs. 1 and 3).

With regard to the number of veins reaching the wing-margin, the most common variation is in the divergence of the normally coincident 4 + 5 of primaries (Plate IV, fig. 6), eight examples of the fifty showing these veins divergent at the margin, stemmed to the cell, on one or both primaries, and three showing these veins of secondaries (fig. 4) similarly divergent and stemmed. One example (fig. 9) shows vein 2, another (fig. 6) vein 6, forked at the margin on one primary; one lacks vein 9 (fig. 5) on one primary, another (fig. 10) vein 11; and several show vein 6 completely fading out before reaching the margin. In three examples (fig. 2) vein 7 on one primary is stemmed to the stem of 8 and 9, and in one example 10 is stemmed to the stem of 8 and 9; in two, a spur from the cubitus toward the anal veins (fig. 9) partly closes a cell bounded by these veins; in one example (fig. 5) vein 1c (Comstock's 1st Anal) of primaries, usually a short internal spur and often scarcely visible, is strongly developed to the outer margin.

On the secondaries, two examples (not illustrated) show on one side vein 6 entirely absent from cell to margin, and one example shows this vein absent on both secondaries; veins 7 and 8, normally slightly to widely divergent at margin, are rarely coincident from cell to margin, as shown in fig. 11 (*vernalis*); and the basal portions of these veins, in ten of the fifty, are modified as illustrated in figure 7 or figure 8, on one or both sides.

The primaries of seven of the fifty (figs. 9 and 10) show from one to four accessory cells formed by veins 10 and 11, 7, 8, 9, and 10, or even by 6 and 7, these cells usually occurring in one wing only. Figure 9 is a composite of the right and left primaries of the same individual; figure 10 is drawn from two examples, one lacking vein 11, the other

with 6 and 7 forming an accessory cell; all the other figures of venation are traced from individual wings. Whenever necessary for study, the wings were cleared with a brush and examined dry,—not chemically bleached and mounted in balsam, the latter method frequently causing the disappearance of weak veins.

A composite to exhibit the maximum complexity of venation indicated by the variations in these fifty specimens, counting the anal veins as one, and numbering consecutively all the others running to the margin, would show a 14-8 veined insect with a whole series of accessory cells; a composite to show the minimum venation indicated, a 9-5 veined insect with no accessory cell. It would be difficult to assign phylogenetic significance to many of these variations. Perhaps the most significant is the frequent furcation of 4+5, indicating the correct identification by Comstock of the normally missing vein of *ephemeraeformis* as *M2* (5), not *M1* (6).

Size, wing shape, density of scaling, number of antennal joints, leg armature, form and chitinization of the abdominal plates, to some extent the genitalia, share in the structural variability of this insect; so that several fictitious species might excusably be characterized, or a closely related insect escape detection, in this remarkable medley of structural variation. In the belief that the latter actually has occurred, it is here proposed to describe a form which has been under observation for many years, and which certainly deserves a name.

Few caterpillars have a longer list of observed food-plants than *ephemeraeformis,* for though it shows preference by especially abounding on arbor-vitae, cedar, willow, sassafras, locust, persimmon, button-ball, and many other trees and shrubs, yet lacking these it seems to thrive even on herbaceous plants. Its familiar life-cycle, described so frequently in the extensive literature of the species, is that of a single-brooded insect, emerging in the late summer or the fall, and passing the winter in the egg stage only. The systematic winter examination of hundreds of the "baskets" indicates the invariability of this life-cycle, at least in the more northern distribution of the species. In distinction from this polyphagous habit and this life-cycle, from southern Delaware to Georgia a related insect has been re-

peatedly observed upon a single food-plant and which hibernates as a larva, completing its transformations in the spring. For this insect is proposed the name of

**Thyridopteryx vernalis** n. sp. (Plates III; IV, figs. 11, 12).

Larval case, affixed for pupation.—Length 38-50 mm.; diameter 8-9 mm. in the ♂, 11 mm. in the ♀; frequently affixed to the bark of the tree, often near the base of the trunk, by a flat button of silk, and rarely expanding the button into a twig-encircling band as in *ephemeraeformis;* the case of the ♂ is longer and proportionately more slender than is usual in *ephemeraeformis,* and the lower extremity, until stretched by the emerging moth, is contracted into a tail-like appendage; fine particles of bark are extensively incorporated into the silk composing the case, and the larger particles attached externally are usually flakes of bark or bits of lichen, rather than of leaf. In neither sex is the shape and texture of the case obscured by this attached material, as is so commonly the condition in *ephemeraeformis.*

Adult ♂.—Expanse 25 mm.; in appearance very similar to *ephemeraeformis;* the collar is usually conspicuously and contrastingly gray, the patagia sometimes mixed with gray; in shape and venation the primaries resemble those of *ephemeraeformis,* two of five examples showing 4 + 5 furcate at the margin, and none showing accessory cells; the secondaries are usually proportionately smaller than is common in *ephemeraeformis,* with highly arched costa and rounded rather than angulated outer margin; the venation of secondaries may duplicate that of normal *ephemeraeformis,* but in two out of five examples the course of vein 7 (the apparent 6th vein) is as in figure 12, and in one example as in figure 11, neither of these being duplicated in the fifty specimens of *ephemeraeformis* with which they were compared; in *vernalis,* 7 and 8 of secondaries are usually coincident from cell to margin, and are very rarely so in *ephemeraeformis.* The genitalia are not obviously different from those of *ephemeraeformis;* but the dorsal abdominal plates, in the material examined, are conspicuously narrower than in that species.

Described and illustrated from five adult males and many larval cases. *Type locality:* Seaford, Sussex County, Delaware; emergences in May, from cases collected at Seaford, Delaware; Tilghman's Island, Saulsbury, and Ocean City, Maryland; Chincoteague Island, Virginia; the characteristic cases were also collected at Summerville, South Carolina, and Tallulah Falls, Georgia. The *type material* is in the collection of the author. Food-plant, *Pinus rigida* (and probably related pines, not distinguished).

Larvae were obtained in the late summer and in the autumn, and in some numbers and of various ages were successfully carried through the winter, but none lived to complete their transformations after becoming active in the spring. All the adults secured were from cases gathered in the open and after pupation, in April or May. This insect has thus been under occasional observation since 1892. The repeated evidence of its spring emergence, its consistently characteristic larval case and single food-plant, seem fairly conclusive of its specific distinctness, aside from the color and structural characters which usually serve to separate it from *ephemeraeformis;* if further study of the latter species, especially in its southern and southwestern distribution, should necessitate a change of status, the name *vernalis* may properly be applied to the spring-emerging gray-collared form here described as distinct.

Among the insects collected in Haiti in the spring of 1922 by Mr. F. E. Watson, of the American Museum of Natural History, were numerous specimens of a small *Psychid* found feeding upon the leaves of the Sea-grape, *Coccolobis*. Included in this material were old cases spun fast for pupation, and living larvae of various ages. The latter, brought to this country in April, accepted a variety of food-plants including leaves of maple and rose, and upon rose a few were carried through to maturity. Averaging slightly larger but otherwise resembling our *Psyche (Platoecetieus) gloveri* Packard, this insect presents structural characters conclusively separating it from that species, nor does it seem to be among the few *Psychids* recorded from the West Indies, and for it is proposed the name of

**Psyche watsoni** n. sp. (Plates III, IV; figs. 13-15, 17, 19.)

*Larval case.*—15-20 mm. in length; widest at the middle, tapering toward both ends; of grayish silk and of rather smooth texture, more or less decorated with small fragments of leaf or bark, irregularly applied; in some examples these completely cover the silk, usually without obscuring the shape of the case; in others the pale gray silk is only flecked with minute particles of extraneous matter.

*Larva*, last stage (Pl. IV, fig. 14).—Length 13-20 mm; width of head 1.6 mm. Dark brown; the head and the heavily chitinized portions of the thoracic segments are pale (almost white) with dark brown dots and foliaceous bars, much as in *Oiketicus*. The upper portion of the

front is pale, conspicuously outlined laterally by the dark frontal sutures, and below by the dark brown clypeus, from which an upward extension of the dark area surrounds each of the two frontal setae, leaving the pale area of the front symmetrically arrow-shaped; the frontal punctures are included in a double brown dot; the ventral margin of the clypeus and the antennal basal cones are pale, the labrum and the distal portions of the antennae ferruginous. The frontal setae are well below the level of the frontal punctures, and the 2nd adfrontals are slightly above the punctures.

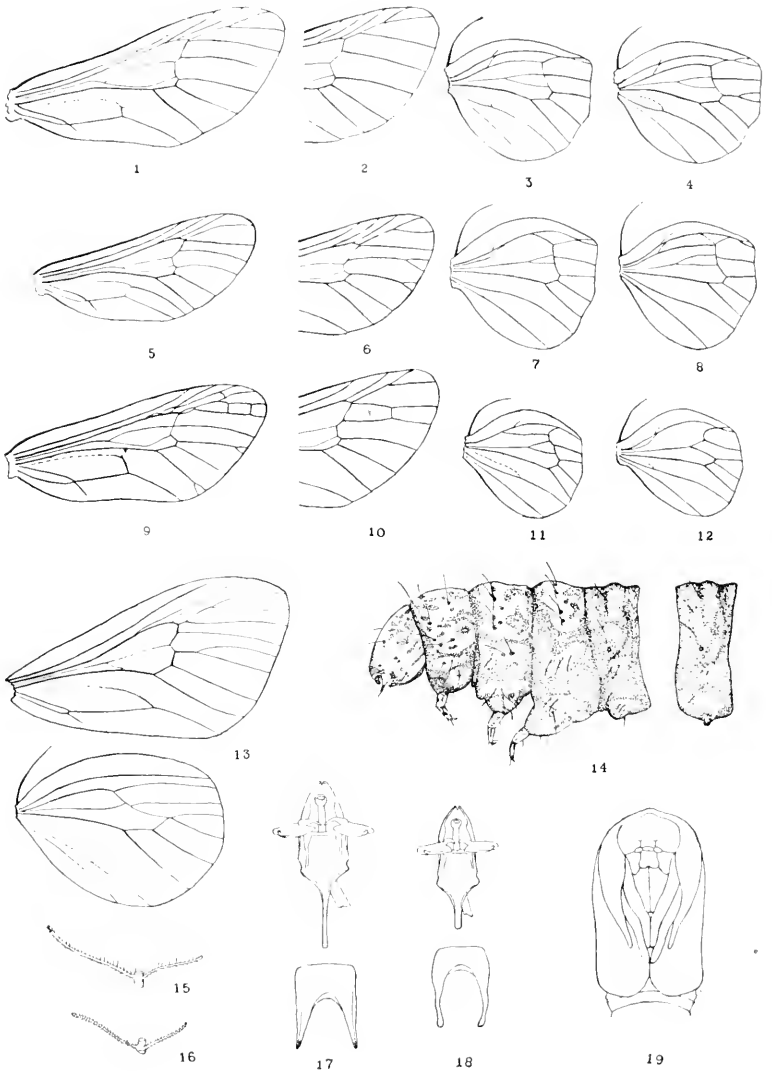
*Pupa of* ♂ (Pl. IV, fig. 19).—Length 8-10 mm.; reddish amber brown, darker on the distal portion of the wings, and almost black on the caudal margins of abdominal segments 2, 3, 4, 5, 6 and 7, on each of these segments forming a broad well-defined dark ring about the abdomen; the wings extend ventrally almost to the cephalic margin of the 4th abdominal segment; the antennae and the prothoracic legs terminate opposite the caudal margin of the first abdominal segment; a dorsocephalic spiny ridge, the teeth directed cauded, is present on segments 4, 5, 6, 7 and 8, the ridge shortened but the teeth enlarged on 8; of segments 3, 4 and 5 (sometimes vestigally on 2) each bears a dorsocaudal row of fine short spines, their points bent cephalad; the caudal thorns are weak and are not darkened, and the spiracles are raised slightly above the body surface.

Compared with the pupa of *gloveri* Packard, *watsoni* has longer maxillae (Mosher nomenclature), these exceeding the labial palpi by nearly half their length.

*Pupa of* ♀.—Length 11-13 mm.; bright mahogany brown, the caudal margins of the free abdominal segments black and conspicuously contrasting.

*Adult* ♂.—Expanse 15-20 mm. A sooty black opaque-winged species of rather slender build, the abdomen in dried examples equalling or slightly exceeding the secondaries. The antennae are dark, broadly bipectinate, and have about 31 joints; compared with *gloveri,* the antennae of *watsoni* (fig. 15) are longer, more broadly pectinated, and have greater number of joints; the pectinations are smooth surfaced,—not irregularly cross-striate as in *gloveri,*— and the hairs which clothe the pectinations are longer and finer and are more regularly arranged in spaced rows,—not short, stubby and irregularly placed (fig. 16) as in *gloveri.* The fore tibiae are not spined. The genitalia of *watsoni,* (fig. 17) especially the saccus, are proportionately longer and narrower than those of *gloveri,* and the furcations of the "8th sternite" plate are tapering, pointed, and regularly divergent in *watsoni,*—in *gloveri* (fig. 18) more uniformly narrow and at their extremities rounded and spoon-like.

The costa of primaries is arched, the apex rather acute; the secondaries rounded. The primaries have twelve veins; 4 and 5 are stemmed




THYRIDOPTERYX EPHEMERAEFORMIS, 1-10; T. VERNALIS, 11-12; PSYCHE WATSONI, 13-15,17,19; PS. GLOVERI,16,18.—JONES.

to the cell; 8 and 9 are stemmed, and 7 may proceed from the same point on the cell, or may be shortly stemmed to the stem of 8 and 9. The secondaries have eight veins, with 4 and 5 shortly stemmed or from a common point; 7 and 8 are not usually connected. The anal veins of primaries send one short branch to the inner margin at about one-fourth the wing length from the base, and coalesce beyond the middle of the wing. The venation of *watsoni* (fig. 13) is thus substantially identical with that usually presented by *gloveri* Pack., which, contrary to Packard's characterization of the genus *Platoecetieus*, is more frequently 12-8 than 12-7.

Described and illustrated from five males, bred from larvae collected in April, 1922, by Mr. F. E. Watson, at Aux Cayes, Fort Ilet District, Haiti, and emerging as adults May 22 to September 1, 1922. The *type* and *type material* are deposited in the American Museum of Natural History, New York. This insect is named in honor of its collector, through whose kindness the author has been permitted to examine and describe it.

Acknowledgment is also due to the Rev. C. R. N. Burrows, of Stanford-le-Hope, England, whose prolonged study of the palaearctic *Psychidae* is providing a basis for the intelligent use of the genitalia and the abdominal plates in the classification of this difficult group, and who has most generously, in advance of publication, placed all of his results at our disposal.

## Notes on Rhodobaenus 13-punctatus (Ill.), the Cockle-Bur Bill-Bug (Col.).

By Harry B. Weiss and Ralph B. Lott, Highland Park, New Jersey.

This species which is listed by Smith (Ins. N. J., p. 397) as occurring throughout New Jersey and breeding in the stems of a variety of weeds such as *Ambrosia*, *Helianthus*, *Oenothera*, *Xanthium*, etc., was made the subject of some observations during the summer of 1922 and the following notes represent our summarized findings:

The adult overwinters and in the central part of New Jersey (Monmouth Junction) eggs are plentiful in the field during the first two weeks of June, although newly hatched larvae can be found during the first week of June. The adults do consider-

able feeding at this time, puncturing the stems and bases of the leaf petioles which injured places later turn black and become distorted. All of our observations were confined to ironweed (*Vernonia noveboracensis*) as other weeds did not appear to be infested. In addition to Smith's host records, Riley (3rd Ann. Rept. Nox. Ben. Other Ins. Mo., 1870 (1871), p. 60) also mentions *Xanthium strumarium*, the common cockle-bur. Chittenden mentions *Eupatorium perfoliatum*, *Polymnia uvedalia*, *Cirsium* and *Silphium* in addition to those already listed (Bull. 22, U. S. Div. Ent. 1900). Webster (Bull. 40, Div. Ent. U. S. Dept. Agric., 1903) records the adult as feeding on the half-ripe seeds of the garden sunflower and the larvae as burrowing in the stalk. It is therefore evident that the species is more or less of a general feeder within a wide range of plants.

In ironweed most of the eggs appear to be deposited in the upper portion of the young stem. The egg cavity is a rather shallow, longitudinal cavity. In this depression will be found what appears to be a wisp of shredded tissue anchored to each end of the cavity and in the central part of this wisp is the elongate, whitish egg. Usually the wisp of tissue and the sides of the cavity become black and are more or less soiled with excrement. After hatching, the larva bores up the centre of the stem for a short distance and then downward, the entire larval cavity reaching an average length of about twelve inches. Many infested stems contain small openings full of grass and it is quite likely that these are made by the larva for the purpose of getting rid of borings, etc., as the larval cavities were comparatively free from such materials. Only one larva was found to a stem. By the first week of August many larvae are full grown and some have pupated. The pupal chamber, which is from one to one and one-half inches long, is usually located in the middle of the larval cavity and separated from it by closely packed borings. About the last of August and beginning of September adults appear, escaping through circular openings in the sides of the stems.

*Egg.* Length about 1.29 mm. Width about 0.6 mm. Elliptical with broadly rounded ends. Whitish.

*Mature Larva.* Form subcylindrical, tapering slightly at both ends,

more so posteriorly, slightly curved, smooth, creamy white, head reddish brown. Head comparatively small, subcircular; collum absent; epicranial suture distinct; epicranial halves bearing a few long chitinous hairs; frons triangular slightly tuberculate anteriorly, bearing two chitinous hairs near lower edge, one on each side near angles. Clypeus transverse, light brown. Labrum with anterior edge arcuate and fringed with closely placed short, chitinous hairs; two hairs arising from middle surface of labrum. Ocelli convex, lenticular, on front margin of head. Antennae minute, single jointed, almost obsolete. Gula indistinct, membraneous. Labium with mentum and submentum fused, anterior edge circular, terminating in an acute point posteriorly. Labial palpi short, two-jointed. Maxilla bearing several chitinous hairs, fused with labium to near apex; maxillary palpi two-jointed, first joint barrel-shaped, apical joint minute; galea absent; lacinia fringed with short chitinous hairs on inner surface. Mandibles triangular, broad across base, slightly bifid at tip.

Thoracic segments slightly compressed rather short. Prothoracic segment slightly embrowned dorsally. Thoracic and abdominal segments transversely wrinkled, each with three dorsal plicae.

Abdominal segments four, five and six sometimes somewhat swollen and constituting the widest part of the body. Last two abdominal segments slantingly truncate dorsally, penultimate one bearing two oval brownish areas, each enclosing two or three black, thread-like marks; between these oval areas is a slight, broad elevation bearing two chitinous hairs. On lateral side of each oval area is a large broad tubercular elevation bearing two setae; anterior to each oval area is a transverse tubercular area bearing two chitinous hairs, one on either side of a median line. Ultimate segment bearing eight chitinous hairs in groups of four each on either side of middle. True legs absent, indicated by ambulatory tubercles, each bearing four comparatively long hairs and sometimes several short ones. Cerci absent. Hairs on head and posterior abdominal segments are the longest. Length of larva about 13 mm. Greatest width about 4 mm.

*Pupa.* Creamy white. Elongate, subcylindrical, third and fourth abdominal segments sometimes wider than remaining abdominal segments or thoracic segments. Head bearing a single pair of chitinous hairs near anterior edge. Beak bearing three pairs of chitinous hairs, one pair above and one small pair below antennal insertion and one pair at the antennal insertion, several minute hairs present. Antennal cases oblique, reaching to near the ends of the femora of the first pair of legs.

Femora of all pairs of legs bearing a short chitinous hair near distal end. Prothorax bearing a transverse row of six chitinous hairs situated about one-half way between anterior and posterior edges; posterior to this row, on each side and nearer the posterior and lateral edges are two closely placed hairs. Mesothorax bearing a diagonal row of three

hairs on each side of a median line and several scattered, smaller ones. Metathorax with a transverse row of chitinous hairs, three on either side of a median shallow depression.

Abdominal segments each bear a row of dorsal, transversely placed chitinous hairs, four of them being closely placed on either side of middle on all but seventh segment which bears three closely placed ones. Ultimate segment with two lateral tubercles each bearing a group of four long, chitinous, downwardly directed hairs. All hairs becoming longer posteriorly. Large lateral spiracle on prothorax. Length of pupa about 10 mm. Width, 3-4 mm.

*Adult.* This was described by Illiger in 1791 (Schneid. Mag. V. 1791, 613). Blatchley and Leng (Rhyn. N. E. Amer. 1916, p. 550) give a redescription of the beetle and state that it occurs over the entire United States. In Leng's "Catalogue of the Coleoptera of America North of Mexico," two varieties based on color are listed, these being *pulchellus* (Schon.) and *quinquepunctatus* (Say). The species is variable insofar as its spots are concerned and this variation is probably responsible for the nine synonyms listed in this catalogue. Chittenden (loc. cit.) has observed two chalcidid parasites, one being *Habrocytus rhodobaeni* Ash.

## The Anal Veins in the Wings of Diptera.†

By Alex. D. MacGillivray, Urbana, Illinois.

The students of Diptera as a rule recognize only a single anal vein. Some exception is found to this in the superfamily Tipuloidea where most, if not all, species have at least two easily recognized anal veins. To the first of these Osten-Sacken applied the name of axillary and to the second the name of spurious. This terminology is used by Williston in the last edition of his *Manual*.

Osten-Sacken, although he figures the wings of forty species of Tipulidae, shows in only a few cases an additional anal vein to the two just named and one of these figures, the wings of *Gnophomyia tristissima*, is the only figure of a tipulid wing showing this additional anal vein accurately.

Needham, in his paper on the wings of the Tipulidae, recog-

†Contributions from the Entomological Laboratories of the University of Illinois, No. 79.

nizes only two anal veins. The additional vein is not shown on a single one of his many figures, many of which are very inaccurate for the anal region. This additional anal vein, however, can be readily identified on each of the six figures of wings reproduced from photographs. This additional vein is not shown on any of the over two hundred and fifty wings of Tipuloidea figured by Alexander.

Redtenbacher, the first author to use a uniform system for the naming of the veins of the wings of insects, in his classic paper on the wings of insects, *Flugelgeader der Insecten,* shows fairly accurately the three anal veins in a wing of a *Tipula,* but it is doubtful if he appreciated the full significance of his figure.

Comstock in his *Manual* shows in practically every figure this additional anal vein. It should now be stated that this additional anal vein is the first anal vein or *1st A.* The figure of *Protoplasa* which shows only a single anal vein was copied from Osten-Sacken. It is very inaccurate in the anal region. For this wing, as well as all the wings of the Tanyderidae, contains three anal veins. While the artist, who made the figures of Comstock, was consistent in showing the first anal vein in practically every wing, he has rarely drawn this vein accurately. Attention should be called to the fact that Comstock did not recognize the structure here designated as the first anal as a distinct vein, but only as a fold, the anal fold.

Comstock and Needham in the *Wings of Insects* have not departed from the interpretation given by Comstock in his *Manual.* The drawings used in making the figures for the *Manual,* relabelled with their new system of letters instead of the numbers used by Redtenbacher, are used.

Comstock in *The Wings of Insects* has the following to say about the anal veins of the Diptera:—"In most Diptera the first anal vein is wanting as a distinct vein but in many there is a suture-like line, the anal furrow, immediately back of cubitus and closely parallel with this vein; this is a vestige of the first anal vein; this furrow is represented in several of the figures in this chapter by a dotted line. The first anal vein is retained, however, in certain Asilidae; where, although some-

what shortened, it is a distinct vein extending from the base of the wing to near the point where vein *Cu* forks. The second anal vein is the most persistent of the three anal veins; it is well preserved in many families; and is represented in several of the figures in this chapter. The third anal vein is well-preserved in comparatively few forms, although a vestige of it exists in many. It is well preserved in *Tipula* and is fairly, well preserved in *Stratiomyia*." This is an excellent, concise, general statement of the anal region of the dipterous wings as I understand it.

There are several features existing in the proximal end of the wings of Diptera not included in the above account. It is unfortunate that the expense of reproducing figures is such that figures cannot be included, as the structures to be described have not been figured. They will soon be shown, however, in a number of wings in a morphological text-book to be printed soon, it is hoped. An examination of the proximal portion of almost any tipulid wing, as *Tipula cinctans*, shows a long area behind *R+M*. There is extending into this area three long spurs, two of which, if they are represented upon figures, are usually shown as extending obliquely toward *R+M* with which they are usually shown as fused. They are never fused, however, so far as I have observed, but their direction and position are due to folds in the wing membrane which they support. The first spur extends from opposite the proximal end of cubitus and the caudal end of the arculus. It is always present in the Tipulidae. The second spur is always much longer than the first and while it is found in all Tipulidae it is also distinct in many other Diptera, as for example, *Culex*, *Dixa*, *Rhyphus*, *Leptis*, *Tabanus* and *Eristalis*. The second spur appears, particularly in the Tipuloidea, as a continuation of the second anal vein. The third so-called spur, which is frequently long, especially so in *Tipula*, is generally omitted from figures and appears to be a direct continuation of the third anal vein. The first two of these so-called spurs are true spurs and may be known as the cubital and anal spurs respectively, but the other projection represents the combined cubitus and three anal veins.

In *Tipula* a cross-vein-like structure extends from cubitus

to the second anal vein opposite the caudal end of the arculus. This apparent cross-vein is considered as the continuation of the stem of cubitus. Comstock has shown in the case of *Sialis* and other species from a study of pupal wings that this is the actual course of cubitus. That such must be the course of cubitus in the Diptera seems self-evident. This transverse part of cubitus is not always located opposite the arculus but may be situated distinctly nearer the proximal end of the wing, as in *Cladura* and *Tricyphona*. In *Rhyphus*, *Scenopinus* and *Hilaria*, where the cubital spur is not represented, the transverse part of cubitus has changed its course and extends lengthwise of the wing. *Eulonchus*, *Midas* and *Eristalis* show an almost complete suppression of the transverse part of cubitus and a large anal spur continuous with cubitus and the second anal vein. The Tanyderidae, particularly *Tanyderus* and *Protoplasa*, show an entirely different modification of this region so far as I have studied it. The cubital spur is as a rule not present while the transverse part of cubitus has been suppressed by the anastomosis of the second anal vein with the longitudinal part of cubitus at the caudal end of the arculus.

The first anal vein in the Diptera is frequently a distinct vein in the Nematocera, particularly at its point of origin, sometimes extending nearly to the margin of the wing and usually to or beyond the cubital fork. The enlarged proximal portion of this vein, which is always vein-like, usually arises from the angle formed by the union of the transverse part of cubitus and the second anal vein, sometimes from the second anal vein. The fact that it has actual origin from the transverse part of cubitus is sufficient to disqualify it as a furrow and to prove Comstock's contention that it is a true vein. If it is a true vein, it cannot be other than the first anal vein. Through the changes in the position and direction of the transverse part of cubitus in the Brachycera and Cyclorrhapha, there is apparently a change in the origin of the first anal vein. An examination of such wings as *Leptis* and *Tabanus*, however, leaves no doubt that even in the specialized Diptera, the first anal vein arises from the transverse part of cubitus.

There is no question that the anal spur is a spur formed on

the angle of the combined cubitus, first and second anal veins in the wings of the Tipulidae where the three proximal projections extending into the area on the caudal side of *R+M* are usually present. That the single projection usually figured as a continuation of cubitus in the wings of the specialized Diptera is homologous with the anal spur in the Tipulidae is easily proven by an examination of the wings of such genera as *Rhyphus, Eulonchus, Hesperinus, Eristalis, Midas, Scenopinus, Hilaria, Psilopus, Conops, Stratiomyia* and *Erax*, where the third so-called spur, the stem of *Cu+A* is present. The *A* of the formula just used is the equivalent of *1st A+2nd A+3rd A* and is always used in this sense.

In many Tipulidae there is, near the caudal end of the transverse part of cubitus, another transverse cross-vein-like structure, which is here homologized as *Cu+1st A+2nd A*. In the genera named in the preceding paragraph there is some variation in the portion of the caudal vein preserved; in *Rhyphus*, for instance, the distal part of *3rd A* is distinct and the proximal portion represented by folds, while in *Erax* and *Scenopinus* the combined proximal portion is distinct and the most of the distal portion of *3rd A* has disappeared.

The wings of *Protoplasa fitchii* and other tanyderids show three anal veins, as already stated, and not a single one as the figure of Osten-Sacken would suggest. The first anal is of the same distinctness as this vein in the Tipulidae and was undoubtedly considered as a fold and for this reason omitted from the figure. The cubital spur is wanting and the anal spur is long. The stem of *Cu+A* is prominent while the free part of the third anal vein is short; instead of extending toward the distal end of the wing, it extends obliquely proximad in line with the cross-vein-like portion of the fused *Cu+1st A+2nd A*.

The correctness of this interpretation of the relation of the cubital and anal veins of the proximal end of the wing rests or falls upon the question whether the transverse cross-vein-like vein opposite the caudal end of the arculus in the Tipulidae is the continuation of the stem of cubitus or not. Comstock shows such a modification of the base of cubitus in the Tri-

choptera, Micropterygidae, and Hepialidae. I believe that a similar switching has occured in the Diptera and that the veins of the anal region should be homologized as stated above. Unfortunately the pupal wings offer no corroborative evidence in this order, since the tracheae do not map out the course of the veins.

I am especially indebted to Dr. Charles P. Alexander, of the Massachusetts Agricultural College, for an opportunity to study his very extensive collection of mounted wings of Tanyderidae and Tipulidae.

## Observations on the Occurrence and Biology of Triatoma flavida in Cuba (Heterop. : Reduviidae).

By Prof. Dr. Med. W. H. Hoffman, Habana, Research Laboratory of the Health Department, Republic of Cuba

In March, 1922, Dr. S. C. Bruner, Entomologist of the Agricultural Station of Santiago de las Vegas, published a notice that he had received from the eastern part of Cuba a Reduviid, which he had identified as *Rhodnius prolixus* Stål. The notice attracted my attention because the Reduviids, especially *Triatoma conorhinus* (formerly *Conorhinus megistus*) and *Rhodnius prolixus* are known as natural carriers of human trypanosomiasis in South America, and I had been seeking for those Reduviids in Cuba for some time, though I was informed by experts that they do not exist here, also that the disease just mentioned is not observed in Cuba.

It seems really that this insect is very rare in Cuba. Besides the one or two specimens of Dr. Bruner, I have been able to obtain one more from the same source. But all the other attempts, to get animals or any notice about them, failed. There is no doubt, however, that the animal belongs to the fauna of Cuba, because it is already found in the well-known collection of the Museo Gundlach of Habana. Lately I heard of its occurrence in the provinces of Camaguey and Santa Clara. Recent information from the U. S. National Museum in Washington, however, is to the effect that it is really *Triatoma flavida*, described by Neiva in 1912 from the type in the Museum in Washington.

Fortunately the animal which I have is a female which laid many eggs from which I have been able to rear a great number of larvae, so that I could make a series of biological observations which may have some interest, although I do not think it necessary to give a detailed description of the insect, which is very similar in its form and size of 3 cm. to *Triatoma conorhinus*, but having a color which is more yellowish grey.

The natural habits in Cuba are little known. In South America the Reduviids live in human houses; but possibly that is a recent habit and it might be, that in this country they prefer other conditions, perhaps even another host.

I have fed the female for six months with my own blood, because I wanted to know if the animal is infected, which seems not to be the case, also in the contents of the intestines I never found suspicious organisms, especially no flagellated forms of pro'ozoa.

The female has laid eggs every day, from June 18 to the present day (December 1), on the whole about 600 eggs. From June to the beginning of September all the eggs, about 370, were fecundated. I suppose that the female, being isolated, must have kept in its organs sufficient quantity of sperm for fecundation since the last copulation with a male before being caught. All the eggs, laid since September, about 200, proved to be sterile.

The eggs are whitish yellow, of regular oval form, 1.5:2.5. mm. in size. They have at one end a cover, which opens in a regular line, to let the ripe embryo pass. The eggs, if fertilized, assume in a few days a pink color, the embryo being transparent through the chitinous wall of the egg. After 2-3 weeks the young larvae come forth, being very vivid from the beginning. They are of darkish color and like to put some particles of dust on the surface of their bodies to be less visible. They begin to suck blood after some days very easily. I used to feed them on my arm every 7-9 days, though they can live a longer time without food. Until now they have developed very well, but in 5-6 months have not reached more than 12mm. in length, so that the whole development will take more than one year. The bite is not painful but generally the next day some swelling develops.

Many times I have observed that the larvae easily suck the blood from the well filled abdomen of other larvae or of the mother instead of from the human skin. This observation is of special importance for pathology, because in many diseases it is supposed that the germs are transmitted hereditarily in the arthropod host. This question must be studied anew, because the observations on *Rhodnius* show that the larvae may become infected by sucking blood from infected insects, producing the impression of hereditary transmission if only the fact is considered, that they were not given a chance to suck blood from a patient. Of course the corresponding observations may be much more difficult in other animals than in *Rhodnius*.

Undoubtedly the presence of *Triatoma* is of great hygienic importance for Cuba and it will be necessary to pay careful attention to the study of the presence of trypanosomal infection in man and to its possible importation from South America and to prevent an eventual infection of the Reduviids.

## Additional Records of Lepidoptera from North Carolina. I. Papilionidae to Noctuidae both Inclusive.

By C. S. Brimley, Division of Entomology, N. C. Department Agriculture, Raleigh, North Carolina.

This list contains species not listed in previous papers by us on the Lepidoptera of North Carolina (see Entomological News, March, 1907, p. 94, April, 1904, p. 120, and January, 1909, p. 33).

I. Butterflies.

Pieris napi Linn. Spruce, several specimens taken in late May of 1912 and 1913.

Terias elathea Cramer. Smiths Id., summer, 1909, C. L. Pollard.

Heliconia charitonia Linn. Skinner in his Catalog of Rhopalocera gives its range as North Carolina to Florida.

Phyciodes phaon Edw. Smiths Id., summer, 1909, C. L. Pollard.

Danais berenice Cramer, Southern Pines, Beaufort, Whiteville and Smiths Id., all eastern localities, May to August.

Debis creola Skinner. Two males taken by myself at Raleigh on September 29, 1902, and in August, 1911.

Lycaena scudderi Edw., Blantyre, mid May, 1908, F. Sherman.

THECLA HENRICI G. and R. Raleigh and Tryon in April, these records being attributed to *T. irus* in Ent. News for March, 1907, but *irus* remains on our list by virtue of specimens of that species taken at Asheville by J. H. Comstock on June 30 and July 3, 1901 and at Blantyre by Sherman in mid-May, 1908.

PAMPHILA ETHLIUS Cramer. Magnolia, early October, 1911, larvae very destructive to cannas, and adults bred from same. S. C. Clapp.

PAMPHILA ARROGOS B. and L. Richmond County, August, 1893, F. M. Jones.

PAMPHILA MACULATA Edw., Wilmington, August, 1893, F. M. Jones.

II. MOTHS.

HEMARIS DIFFINIS Boisd. Joanna Bald, near Andrews, mid May, 1908, one, FS.

TRIPTOGON LUGUBRIS Linn. Southport, Nov. 4, 1919, one, J. E. Eckert.

AMPELOPHAGA CHOERILUS Cramer. Raleigh, bred from larvae on *Azalea nudiflora* in May, and taken in June, July and August; Southern Pines, taken by Manee in August.

AMPELOPHAGA VERSICOLOR Harris, one bred from larva on *Cephalanthus* May 9, 1909.

SPHINX CHERSIS Hübner. A battered specimen taken at light at Raleigh, June 17, 1912.

SPHINX EREMITUS Hübner. Raleigh, Sept. 22, 1910, a full grown larva taken on *Monarda*, also recorded from Mitchell County.

SPHINX KALMIAE S. and A. Raleigh, July 13, 1914, one bred, also taken at Chapel Hill in May, 1916, by G. B. Lay.

CHLAEONOGRAMMA JASMINEARUM Bdvl. Two under light at Raleigh in late July, taken by G. B. Lay.

PAONIAS ASTYLUS Drury. Raleigh, Aug. 31, 1914, one at light.

PAONIAS MYOPS S. and A. Raleigh, Sept. 7, 1914, one caught by cat; also taken at Southern Pines by Manee in August, 1908.

LYCOMORPHA PHOLUS Drury, Lake Fairfield, August, 1904, F. M. Jones.

CLEMENSIA ALBATA Pack. Raleigh, late August, one.

OZONADIA UNIFASCIA G. and R. Raleigh, common on goldenrod flowers in September and October, 1914, also taken in mid June, 1914.

UTETHEISA ORNATRIX Linn. Southern Pines one specimen, A. H. Manee.

HAPLOA CLYMENE Brown. Brinkleyville, one July 16, 1912, taken and sent in by Miss Mary Hinton.

HAPLOA COLONA Hübner. Lake Ellis, very common in May and June, 1905 to 1908, also at Clayton, May 22, 1902.

HAPLOA LECONTEI var DYARI Merrick. Southern Pines, June 11, 1907, June 13, 1914, A. H. Manee.

ESTIGMENE CONGRUA Drury. Raleigh, May, April, July and August, not uncommon, also at Spruce in late May, 1912.

APANTESIS ANNA Grote. Balsam, one in collection, T. M. Rickards.

APANTESIS MICHADO Grote. Southern Pines, April 4, 1912, Manee.

APANTESIS PLACENTIA S. and A. Southern Pines, June, 1920, W. T. Davis.

APANTESIS RADIANS Walker. Raleigh, May, July and September, also taken at Southern Pines.

APANTESIS VIRGO Linn. Balsam, Blowing Rock, Black Mt., and Hendersonville, all mountain localities, in July and September.

APANTESIS VITTATA Fabr. Raleigh, July and October.

PYGARCTIA ABDOMINALIS Grote. Southern Pines, A. H. Manee.

HALISIDOTA LONGA Grote. Raleigh, mid June, 1907, one, FS.

HALISIDOTA MACULATA Harris. Southern Pines, one, Manee.

CHARADRA DERIDENS Guenée. Raleigh, late August, 1919, one, CSB.

ACRONYCTA BETULAE Riley. Hamlet, August, 1892, F. M. Jones.

ACRONYCTA DACTYLINA Grote, same data as preceding.

ACRONYCTA EXILIS Grote. Raleigh, July and August.

ACRONYCTA HAMAMELIS Guenée. Mitchell Co., July, Dr. H. Skinner.

ACRONYCTA HASTA Guenée. Raleigh, June, Hamlet, August.

ACRONYCTA LITHOSPHILA Grote. Raleigh, May 22, 31, 1921, CSB.

ACRONYCTA OVATA Grote. Raleigh, June and July.

ACRONYCTA SUBOCHREA Grote. Raleigh, April, one male.

PHOLOLOSIA BRIMLEYANA Dyar. Raleigh, September 8, 1907, CSB.

CHYTONIX PALLIATRICULA Guenée. Raleigh, March and April; Hamlet, August.

BAILEYA DOUBLEDAYI Guenée. Hendersonville, July, 1907, FS.

ATHETIS TARDA Guenée. Raleigh, early September, 1909.

PERIGAEA SELENOSA Grote. Raleigh, mid August, 1919.

PERIGAEA XANTHIOIDES Guenée. Southern Pines, July, August, 1901, FMJ.

HADENA ARCTICA Boisd. Mitchell Co., July, Dr. Skinner.

HADENA DEVASTATRIX Brace. Lake Fairfield, August, 1904, FMJ.

HADENA FRACTILINEA Grote. Raleigh, late September, 1909.

HADENA LIGNICOLOR Guenée. Mitchell Co., July, Skinner.

HADENA MODICA Guenée. Raleigh, early September, Lake Fairfield, August, Mitchell Co., July.

HYPPA XYLINOIDES Guenée, Spruce (Haywood Co.) late May, 1912, CSB.

MAGUSA DISSIDENS Felder, Raleigh, mid and late August, 1919, CSB.

RHYNCHAGROTIS ALTERNATA Grote, Raleigh, in September and October.

EUERETAGROTIS PERATTENTA Grote, Mitchell Co., July, Skinner.

SEMIOPHORA BADICOLLIS Grote. Raleigh, October.

AGROTIS NORMANNIANA Grote, Grandfather Mt., September 21, 1915, FS.

AGROTIS UNICOLOR Walker, Grandfather Mt., September 2, 1915, F. Sherman.

PERIDROMA RUDENS Harvey, Hamlet, August, 1892, FMJ.

NOCTUA BICARNEA Guenée, Blowing Rock, August, 1906, FS.

FELTIA GLADIARIA Morrison, Raleigh, moths scarce in October, although the larvae are the worst and commonest of the spring cutworms.

POROSAGROTIS VETUSTA Wlkr., Southern Pines, larvae taken by R. W. Caviness in April, 1901, also observed by W. L. McAtee at Poplar Branch (Anson Co.) in September, 1909 (Bull. 109, US. Dept. Agr., Div. Ent.)

EUXOA TESSELLATA Harris, Blowing Rock, July, 1911, FS.; Mitchell Co., July, Skinner.

MAMESTRA ADJUNCTA Boisd., Raleigh, late August, 1919, CSB.

MAMESTRA CAPSULARIS Guenée, Southern Pines, May 2, 1914, AHM.

MAMESTRA LOREA Guenée, Spruce, late May, 1912, CSB.

MAMESTRA OLIVACEA Morrison, Grandfather Mt., September 2, 1915, FS., Mitchell Co., July, Skinner.

MAMESTRA RENIGERA Stephens, Raleigh, May, September and October.

CIRPHIS PSEUDARGYRIA Guenée, Raleigh, August 8, 1915, CSB: Southern Pines, July, August, 1901, FMJ: Blantyre, early May, 1908, FS.

ORTHODES VECORS Guenée, Blantyre, early May, 1908, FS.

GRAPHIPHORA OVIDUCTA Guenée, Raleigh, April, May and September, not uncommon. Wilmington, April 13, 1920, Max Kisliuk.

TRICHOLITA SIGNATA Walker, Raleigh and Lake Fairfield, in August, Mitchell county in July.

GRAPTOLITHA LATICINEREA Grote, Raleigh, December 8, 1918, CSB.

GRAPTOLITHA VIRIDIPALLENS Grote, Raleigh, January 24, 1920, CSB.

CUCULLIA CONVEXIPENNIS G. and R., Asheville, summer, 1915, Mitchell county, July.

CUCULLIA LAETIFICA Lintner, Raleigh, mid August, 1911.

BELLURA GORTYNOIDES Walker, Hamlet, August, 1892, FMJ.

SPHIDA OBLIQUA Walker, Raleigh, several bred in April.

GORTYNA NICTITANS Bork., Mitchell Co., July, Skinner.

GORTYNA VELATA Walker, same data as preceding.

PAPAIPEMA POLYMNIAE Bird, Black Mts.

PYRRHIA UMBRA Hufn., Raleigh, June, August, Elizabeth City, August.

EUCIRRHOEDIA PAMPINA Guenée, Raleigh, late October, 1920, Waynes, September 14, 1908, Z. P. Metcalf.

GLAEA INULTA Grote, Raleigh, October, two.

GLAEA VIATICA Grote, Raleigh, one each in October, November, January and February.

RHODOPHORA FLORIDA Guenée, Mitchell Co., July, Skinner.

SIDNIA GRACILENTA Hübner, Hamlet, August, 1892, FMJ.

SCHINIA GLORIOSA Strecker, Southern Pines, Manee.

SCHINIA JAGUARINA Guenée, Southern Pines, August, AHM.

SCHINIA LYNX Guenée, August 16, 1909, AHM.

SCHINIA TRIFASCIA Hübner, Raleigh, August 13, 1921, CSB; Southern Pines, September 9, 1909, AHM.

Lygranthoecia brevis Grote. Southern Pines, Manee.

Lygranthoecia carolinensis Smith, Southern Pines, August.

Lygranthoecia constricta Edw., "NC" in Dyar's List N. Am. Lepidoptera, 1902, p. 190.

Acheroda ferraria Walker, White Lake (Bladen Co.), mid April, 1910, ES.

Plagiomimicus pityochromus Grote, Raleigh, August 28, 1907, CSB.

Plusia precationis Guenée, Raleigh, Southern Pines, Mitchell Co., April, May, July and August.

Eucalyptera bipuncta Morrison, Hamlet, Southern Pines, July, August, FMJ.

Eucalyptera humeralis Smith, "NC in August," Smith, Trans. A. E. S., XXIX, p. 220.

Eucalyptera obscura Grote, Raleigh, August 31, 1907, CSB.

Doryodes bistriaris Geyer, Beaufort, early June, 1909, FS.

Pleonectyptera habitalis Walker, Hamlet, July, August, 1901, FMJ.

Eustrotia musta G. and R., Raleigh, July 27, 1902, Hendersonville, July, 1907, FS.

Exyra ridingsii Riley, Hamlet and Southern Pines, July, August, White Lake, June.

Exyra semicrocea Guenée, Hamlet and Southern Pines, July, August.

Exyra rolandiana Grote, same date as preceding.

Spragueia onagrus Guenée, Raleigh, mid June, 1909.

Callopistria floridensis Guenée, Raleigh, bred in September and October from ferns, both outside and in greenhouse.

Hyamia perditalis Walker, Raleigh, mid June, 1907.

Drasteria crassius ula Haw., Raleigh, mid June, 1909.

Euclidia cuspidea Hübner, Blantyre, early May, 1908, FS.

Meliopotis limbolaris Geyer, Lake Fairfield, August, FMJ.

Syneda graphica Hübner, Wilmington, April 13, 1920, M. Kisliuk.

Catocala sappho Strecker, Southern Pines, Manee.

Catocala vidua S. and A., Raleigh, September and October, rare.

Catocala retecta Grote, Lake Fairfield, August, 1904, FMJ.

Catocala obscura Str., Raleigh, July 21, 1920, CSB.

Catocala tristis Edw., Raleigh, July 8, 1921, CSB.

Catocala unijuga Wlkr., Raleigh, August 14, 1916, CSB.

Catocala neogama S. and A., Raleigh, September and October, rare.

Catocala mulierc ula Guenée, Raleigh and Beaufort in July, also from Southern Pines.

Catocala serena Edw., Raleigh, July 29, 1919, CSB.

Catocala similis Edw., Southern Pines, A. H. Manee.

Catocala frater ula G. & R., Raleigh, June 25, 1915, CSB.

Catocala gracilis Edw., Raleigh, July 15, 1915, CSB., Grandfather Mt., September 2, 1915, FS., also from Southern Pines.

Phoberia atomaria Harvey, Raleigh, March.

GRAMMODES SMITHII Guenée, Raleigh, August 2, 1919, one, CSB.

PHURYS CAROLINA Smith, Raleigh, two in May and August, CSB: White Lake, three in mid April, 1910, FS.

TRAMA DETRAHENS Walker, Raleigh, July to September; White Lake, mid April: Southern Pines, July, August.

PHEOCYMA AERUGINOSA Guenée, Raleigh, April, June, July; Blantyre, May; Tryon, April, May, July, August.

PHEOCYMA BETHUNEI Smith, Tryon, August.

PHEOCYMA CORACIAS Guenée, Southern Pines, July, August, 1901, FMJ.

PHEOCYMA CUREMA Smith, Raleigh, May, July, August; Tryon, June.

PHEOCYMA LINEOSA Walker, Raleigh, June to September, not uncommon.

PHEOCYMA METATA Smith, Raleigh, July and August.

EREBUS ODORA Linn., Raleigh, one in late August 1912, G. B. Lay; also once taken at Southern Pines by A. H. Manee.

EPIZEUXIS ROTUNDALIS Walker, Raleigh, mid August, 1909.

ZANCLOGNATHA CRURALIS Guenée, White Lake, June, 1910, FS.

HORMISA ABSORPTALIS Walker, Raleigh, June.

GABERASA AMBIGUA Walker, Raleigh, mid August, 1909, CSB.

DIRCETIS VITREA Grote, Raleigh, August.

BOMOLOCHA BALTIMORALIS Guenée, Hamlet and Lake Fairfield, August, FMJ.

BOMOLOCHA MADEFACTALIS Guenée, Raleigh, late July, 1912, CSB.

Most of the really hard identifications are by or confirmed by Dr. H. G. Dyar, of the U. S. National Museum, to whom I express my sincere gratitude for his invariable kindness in identifying our material.

## Life-History of, and Notes on, Certain Chrysomelidae (Coleoptera).

By E. M. CRAIGHEAD, Bureau of Plant Industry, Harrisburg, Pennsylvania.

During the past two years the writer has been collecting and studying the larvae of the family Chrysomelidae. Many of these larvae could be obtained only by rearing methods, and very often in order to identify the species it was necessary to rear them through the adult age. The following notes include records and observations made at the Field Laboratories of the Pennsylvania Bureau of Plant Industry, located at Chambersburg and North East, and are published at the suggestion of Prof. J. G. Sanders, Director of the Bureau.

**Oedionychis gibbitarsa** Say, Chambersburg, Pa., June 6.

Many adults were collected by sweeping on undetermined mint, and were then caged on plants brought into the laboratory. Copulation was observed the following day and two days later many eggs were collected in masses under small particles of debris. The eggs were placed on end and fastened together by some secretion. Oviposition continued over a period of two weeks, and an average of eleven days elapsed before larval emergence. In most cases the larvae emerged through a longitudinal slit, but in several instances they emerged through the end of the eggs. Eggs were never observed on the host plant. As soon as the larvae emerged they crawled upon the host plant and began to feed. After feeding for 18 days, average, the larvae entered the ground and constructed a small earthen cell within which they pupated four to five days later, transforming to adults eight days later. This species hibernates as adults.

**Zygogramma suturalis** Fabr., Chambersburg, Pa., August 8.

Fifty-seven larvae collected by sweeping ragweed (*Ambrosia trifida* L.). Larvae were transferred to potted plants in the laboratory. August 19, larvae entered ground and pupated two days later in small earthen cells. On September 1, adults emerged. Hibernate as adults.

**Monocesta coryli** Say, St. Thomas, Pa.

During August thousands of larvae were feeding on the foliage of slippery elm (*Ulmus fulva* Michx.) and by the latter part of the month the trees were completely defoliated. Many larvae were collected and adults reared with the expectation of securing some parasites, but without results. So abundant were the larvae that a few more years of defoliation will probably kill the trees. Fortunately this tree is not used in this locality for ornamental purposes and the infestation is quite limited; in fact, this appears to be the only place in the State where this insect has been recorded as destructive. Mr. George L. Ehrhardt records it from St. Thomas, August 4, 1913. The larvae hibernate 3-4 inches under the sod. This insect has been recorded previously from Virginia, Illinois, Kansas, Missouri and Florida.

**Chrysochus auratus** Fabr., Chambersburg, Pa., 1922.

Many adults were observed feeding and ovipositing on dogbane (*Apocynum cannabinum* L.). A short description of the egg-laying habits is presented by J. L. Zabriskie*. The newly hatched larvae fall to the ground and at once commence feeding on the tender roots. In May of the next year the larvae are nearly full grown and can be found feeding on the larger roots 1-6 inches below the ground. The bark on the roots is quite thick and very often the larvae by feeding will make a pocket large enough so that when the root is removed from the soil the larvae remain attached to the root. They hibernate in the larval stage. First pupae were found May 16; pupal duration about twenty days. Adults first noted June 4.

**Longitarsus subrufus** Lec., Chambersburg, Pa.

During July, 1921, hundreds of adults were collected by sweeping false gromwell (*Onosmodium hispidissimum* Mackenzie). Many of the adults were dissected and the females contained eggs. Egg-laying habits were not observed, but it is probable that the eggs are placed at the base of the plant on the surface or just under the ground. The larvae feed on the roots and are not very active. On examining infested roots one may find the larvae in their galleries or among the roots and when about to pupate they move a little distance away from the host.

The larva has a well-developed labrum, three-jointed maxillary palpus, ninth abdominal segment well developed, legs present, antennae two-jointed, body straight and cylindrical; 0.7 mm. to 1.2 mm. long and 0.1 mm. wide. It resembles the larva of *Diabrotica*. The larvae move around until they have formed well-defined cells in the soil and two days later pupate. Larvae remain in pupal stage from 9-15 days, averaging 10.6 days. Hibernate as larvae.

The adults feed on the leaves of *Onosmodium* and cut small irregular holes through them. Where the host was found the beetles were very abundant and by the latter part of August defoliation was complete. The adults are very active and when disturbed jump to another part of the host plant or fall to the ground where they conceal themselves under leaves. Previously recorded from Kansas and Indiana.

*Journal of New York Entomological Society—Vol. III, p. 192 (1895)

**Systena hudsonias** Forst., Chambersburg and North East, Pa.

This small Chrysomelid has many host plants, none of which are of economic importance except the grape. In Erie County, Pa., the feeding of the adults on grape foliage was so extensive that in many cases it reduced the vitality of the vine and the grapes did not mature properly. The leaves in many instances appear as if riddled with small shot and they then turn brown. Other host plants are ragweed, elder, smartweed, pigweed, horseweed, goldenrod and "brown-eyed susan."

Many adults were collected during May and placed in a cage with a potted *Solidago* plant. July 7, ten eggs were removed from the cage. The eggs were in most cases laid singly and were either placed at the base of the plant or under small lumps of dirt an inch or two from the plant. In one instance eggs were found three inches in the ground and the dead female was found beside them. The eggs are light yellow in color, 1mm. long and 1-30mm. wide. The larvae feed on the roots and hibernate in this stage. By the middle of July few adults could be found in the field. The first appearance of adults is about the middle of May and this seems to hold good for the greater part of the State. The egg stage is about eight days. Twenty-eight larvae were collected May 11 while digging for *Chrysochus* larvae. Larvae under laboratory conditions pupated on top of soil. This was due to the fact that each day they were disturbed so as to get the exact pupa stage. The pupa stage averaged 13.9 days. This insect is very abundant in uncultivated fields and orchards, and along fence rows. Clean cultivation will undoubtedly kill many of the larvae. It is doubtful if this insect will ever become of great economic importance for even with the grape the infestations are in most cases along the outer edge of a vineyard.

### Manuals of Hemiptera in Preparation.

Just now [Feb. 10, 1923] I am busy correcting proof for the *Hemiptera of Connecticut*, so that work should be out within three months. My work on the family Miridae amounts to a revision of the species for the northeastern states. It will merely require additions, and boiling down of descriptions of new species, to complete my work for the *Manual of Hemiptera*, which a half-dozen of us are preparing.—H. H. KNIGHT, University of Minnesota, St. Paul, Minn.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., APRIL, 1923.

### The Number of Living Insects.

We are frequently told that this is the Age of Insects, that there are more species of insects than of all other animals. It is interesting to have, from time to time, the latest figures on the number of insects. Perhaps the most recent census is that of Dr. Anton Handlirsch, who is furnishing the historical, paleontological and systematic parts of the newest German text book —the *Handbuch der Entomologie*, edited by Prof. Dr. Chr. Schröder, of Berlin-Lichterfelde. Dr. Handlirsch's paleontological contribution may be considered as a revised and abridged edition of his *Die Fossilen Insekten*, and we look forward to a review of it in the NEWS from the pen of Prof. T. D. A. Cockerell. Near the close of chapter 7, Paleontologie, 1921, Dr. Handlirsch has a Tabular Review of the Development in Time of the orders and families of insects in past geological periods and in the present. His figures for this last may be summarized as follows:

| Orders | Families | Species | Orders | Families | Species |
|---|---|---|---|---|---|
| Thysanura | 2 | 250 | Corrodentia | 6 | 600 |
| Entotrophi | 3 | 105 | Mallophaga | 2 | 1,350 |
| Protura | 2 | 15 | Siphunculata | 2 | 80 |
| Collembola | 4 | 1,030 | Coleoptera | 98 | (195,000) |
| Ephemerida | 1 | 450 | Strepsiptera | 1 | 150 |
| Odonata | 10 | 2,600 | Hymenoptera | 24 | 67,500 |
| Perlariae | 1 | 480 | Megaloptera | 2 | 100 |
| Embiodea | 1 | 60 | Raphidides | 1 | 40 |
| Saltatoria | 11 | 9,500 | Neuroptera | 6 | 2,000 |
| Phasmida | 5 | 1,900 | Panorpatae | 4 | 163 |
| Dermaptera | 4 | 740 | Trichoptera | 1 | 1,600 |
| Diploglossata | 1 | 2 | Diptera | 40 | 51,000 |
| Thysanoptera | 2 | 500 | Suctoria | 1 | 350 |
| Blattariae | 1 | 2,000 | Lepidoptera | 39 | 92,000 |
| Mantodea | 1 | 1,000 | Heteroptera | 36 | 21,000 |
| Isoptera | 3 | 500 | Homoptera | 11 | 16,000 |
| Zoraptera | 1 | 3 | | | |

Total: 33 orders, 327 families, 470,000 species of living Insects.

## New Names in the Order Lepidoptera.

My attention has recently been called to two homonyms which I published while with Dr. Barnes. Mr. F. H. Benjamin points out that *Oncocnemis punctilinea* B. & L. (Bull. Brook. Ent. Soc. xvii, 71, 1922) is preoccupied by *O. punctilinea* Hampson. I propose the new name ONCOCNEMIS BENJAMINI for this species, in recognition of Mr. Benjamin's excellent work on the Noctuidae.

Through Mr. Charles P. Alexander, I learn that *Nothophila* B. & L. (Bull. Brook. Ent. Soc. xvii, 75, 1922) is preoccupied by *Nothophila* Alexander in Tipulidae, published earlier in 1922. I propose the new name BANDELIA for this genus.

A third item deals with an error in our treatment of *Argus* Scopoli in the Ann. Ent. Soc. Am. xv, 90, 1922. Captain N. D. Riley, of the British Museum, has called Mr. Benjamin's attention to the fact that this name is preoccupied, and that *Satyrodes* will stand.—A. W. LINDSEY, Denison University, Grantville, Ohio.

## On the Authorship of the Encyclopédie Méthodique, Vol. IX. A Correction (Lepid.).

In the ENTOMOLOGICAL NEWS for Nov., 1922 (xxxiii, 281-2), I called attention to an apparent mistake in the customary citation of authorship of the species of Lepidoptera described in this work. As has happened many times before, incomplete evidence led to erroneous conclusions. Even in these I was preceded by Sherborn and Woodward, Ann. & Mag. Nat. Hist. (7), xvii, 577-582, 1906. Mr. George Talbot, of the Hill Museum, has kindly brought this reference to my attention, and I am indebted to Dr. Calvert, editor of the NEWS, for supplying me with a summary of its contents.

The paper by Messrs. Sherborn and Woodward is entitled "On the Dates of Publication of the Natural History Portions of the 'Encyclopédie Méthodique'." According to Dr. Calvert's summary, the authors draw from apparently reliable sources evidence that part one of volume nine, including pages 1-328, was published in 1819, while part two, including pages 329-828, did not appear until 1824. In a footnote they express the same erroneous conclusion as my own, in the following words: "9. Mr. Kirby has copies of these two parts as issued. The article 'Papillons' was written by Godart (see the preface to the volume)."

The error in this conclusion and the actual authorship of the species concerned are fully explained in a letter from Dr. Karl Jordan, dated Dec. 12, 1922. Dr. Jordan has brought to my attention another footnote in the Encyclopédie Méthodique which, with the evidence pointed out in my previous note, explains the division of the work on this volume completely. This footnote is on page 706, under the introduction to the "Hespérides", and reads as follows: "Afin d' accélérer le publication de ce demi volume, je me suis chargé de la rédaction de cette tribu des lépidopteres diurnes; j' en excepte seulement le genre *Uranie* et les

*Hespéries d 'Europe*. Latreille." This shows conclusively that Latreille himself described the exotic skippers, and accounts for *Hesperia godart* without reflection on the modesty of his learned collaborator.

In conclusion it may be well to cite Dr. Jordan's summary, which states that the butterflies, *Urania, Castnia, Agarista* and the European Hesperiidae were written up by Godart; the exotic Hesperiidae were handled by Latreille. Certain internal evidence also bears out these points. Dr. Jordan further states that "Kirby and others quote Latreille as the author of the Castnids. It should be Godart. The same applies to '*Agarista Leach*', which is a *Coronidia*."—A. W. LINDSEY, Denison University, Granville, Ohio.

### Preservation of Rare Species.

In the *Entomologist* for February, 1923, we note a paragraph by N. D. Riley, "Preservation of rare species," in which he mentions that by a Police Order of 30th June, 1921, certain species of butterflies in Prussia are placed under protection, and comments that it is "a pity no such law exists in this country [England] for the protection of our rare insects . . ."

## Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **6**—Journal of the New York Entomological Society. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **41**—Bulletin de la Societe Entomologique Suisse, Bern. **50**—Proceedings of the United States National Museum. **67**—Le Naturaliste Canadien, Quebec. **76**—Nature, London. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **93**—Bulletin, Division of the Natural History Survey, Urbana, Illinois. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **138**—American Museum, Novitates, New York.

**GENERAL.** Bather, F. A—The rule of priority in nomenclature. **76,** cxi, 182-3. Campos, F.—Estudios sobre la fauna entomologica del Ecuador. IV, Himenopteros. V, Neuropteros. VI-VII, Trichopteros, Euplexopteros. (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil, 1922, iv, 53-78.) Folsom, J. W.—Entomology with special reference to its ecological aspects. Rev. Ed. 3. (Philadelphia, P. Blakiston Son & Co., 1922, 502 pp.) Lizer, C.—Primer ensayo bibliografico de entomologia Argentina. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 321-80.) McDunnough, J.—Qu'est-ce que l'entomologie. **67,** xlix, 153-5. Moreira, C.—Entomologia agricola Brasileira. (Min. Agr., Indus. e Comm., Rio de Janeiro, Bol. No. 1, 182 pp., 1921.) Scheerpeltz, O.—Meine bisherigen erfahrungen mit der schwemm-methode als rationelle sammelweise fur terricole kleintiere. **124,** iii, 8-10, cont. Wade, J. S.—On entomological publications of the U. S. Government. **10,** xv, 1-32. Weiss & West—The insects and plants of a moist woods on the piedmont plain of New Jersey. **6,** xxx, 169-91.

**ANATOMY, PHYSIOLOGY, ETC.** Breitenbecher, J. K.—A red-spotted sex-limited mutation in Bruchus. **90,** lvii, 59-65. Brocher, F.—Les trachees inversees. **41,** xiii, 259-61. Clausen, R. E.—Inheritance in Drosophila hydei. I. White and vermilion eye-colors. **90,** lvii, 52-58.

**ARACHNIDA AND MYRIOPODA.** Dempsey, J. H.—A list of Arancida collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, 42-3.)

**THE SMALLER ORDERS OF INSECTA.** Campos, F.—Catalogo sistematico y sinonimico de los Odonatos regionales. (Ecuador). (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil, 1922, iv, N. 8, 1-75). Jorgensen, P.—Los Tricopteros Argentinos. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 389-99.) Pierson, E. L.—A list of Odonata collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, p. 41.) Withycombe, C. L.—The wing venation of Raphidia maculicollis. **9,** lvi, 33-5.

**ORTHOPTERA.** Caudell, A. N.—Steiroxys hendersoni, a new katydid. **50,** lxii, Art. 22.

**HEMIPTERA.** Lizer, C.—Una nueva subespecie de "Ceroplastes de la Republica Argentina. Sobre una nueva hemipterocecidia Argentina. (Prim. Reun. Nac. Soc. Argentina Cien. Nat., 1916, 381-82; 383-88.) Williams, C. B.—A froghopper damaging cacao in Panama. **22,** xiii, 271-4.

Duncan, C. D.—The N. Am. species of Phylloxera infesting oak and chestnut. **4,** liv, 267-76.

**LEPIDOPTERA.** Adkin, R.—The relative attractiveness of various kinds of light for moths. **9,** lvi, 43-4. Gable & Baker—Notes on a migration of Libythea bachmanni. **4,** liv, 265-6. Glenn, P. A.

—Codling-moth investigations of the state entomologist's office, 1915-1917. **93,** xiv, 219-89.

**Dyar, H. G.**—The N. Amer. short-winged Psychidae. Note on Cucullia alfarata. A note on Datana perspicua. New American L. **15,** xi, 1-5; 5-7; 10-11; 12-30. **McDunnough, J.**—A new western Catocola. **4,** liv, 288.

**DIPTERA. Aldrich, J. M.**—New genera of two-winged flies of the subfamily Leptogasterinae of the family Asilidae. **50,** lxii, Art. 20. **Bonne-Wepster & Bonne**—A new Megarhinus from Surinam. **15,** xi, 7-9. **Dunn, L. H.**—Observations on the oviposition of the housefly, Musca domestica, in Panama. **22,** xiii, 301-5. **Johannsen, O. A.**—Stratiomyiid larvae and puparia of the Northeastern states. **6,** xxx, 141-53. **Wille, J.**—Biologische und physiologische beobachtungen und versuche an der kasefliegenlarven (Piophila casei). **39,** xxxix, Zool., 301-20.)

**Curran, C. H.**—New D. in the Canadian Nat. collection. **4,** liv, 277-87. **Dyar, H. G.**—The mosquitoes of the Yellowstone national park. **15,** xi, 36-46. **Kieffer, J. J.**—Diagnose de quelques nouveaux Tanypodines. **20,** 1922, 296-7.

**COLEOPTERA. Wolcott, A. B.**—The male of Cymatodera horni. (Cleridae). **6,** xxx, 191-4. Two new species of West Indian Cleridae. **138,** No. 59. **Sampson, W.**—Notes on the nomenclature of the family Scolytidae. **11,** xi, 269-71. **Hawkins, D. C.**—A list of C. collected at Concord, Mass. (Proc. Thoreau Mus. Nat. Hist., i, 44-47.) **Campos, F.**—Estudios sobre la fauna entomologica del Ecuador. III. Coleopteros. (Rev. Col. Nac. Vicente Rocafuerte, Guayaquil. 1921, No. 6, 24-100.)

**Blackman, M. W.**—Mississippi bark beetles. (Miss. Agr. Exp. Sta., Tech. Bull., 11, 130 pp., 1922.) **Dawson, R. W.**—New species of Serica (Scarabaeidae). V. **6,** xxx, 154-69. **Fall, H. C.**—A review of the North Am. species of Agabus, together with a description of a n. g. and sps. of the tribe of Agabini. (Mount Vernon, N. Y., J. D. Sherman, Jr., 1922, 36 pp.) A revision of the N. Amer. species of Hydroporus and Agaporus. (Privately printed, Jan., 1923, 129 pp.) **Knaus, W.**—Two new forms of Cicindela with remarks on other forms. **6,** xxx, 194-7.

**HYMENOPTERA. Frisch, K. V.**—Ueber die "sprache" der bienen. **89,** xl., Zool., 1-186. **Forel, A.**—Le monde social des fourmis. Tome I-III (1921-1922). Geneve, Libr. Kundig. **Yuasa, H.**—A classification of the larvae of the Tenthredinoidea. (Illinois Biol. Mon., vii, No. 4.)

**Cockerell, T. D. A.**—Descriptions and records of bees.—XCVII. **11,** xi, 263-8. **MacGullivray, A. D.**—Species of Dolerus from Oregon. **15,** xi, 31-5.

ENTOMOLOGY WITH SPECIAL REFERENCE TO ITS ECOLOGICAL ASPECTS. By JUSTUS WATSON FOLSOM, Sc.D. (Harvard) Assistant Professor of Entomology at the University of Illinois. Third Revised Edition. With five plates and 308 text-figures. Philadelphia, P. Blakiston's Son & Co., 1922. 8 vo., pp. vii, 502.

The two previous editions of this work have been reviewed by the present writer in the NEWS for September, 1906, and for November, 1913, respectively. In the first place cited, this statement was made: "The book seems to us to be excellently adopted as a text-book in zoological courses in which the aim is to understand insects as a whole without laying especial emphasis on the taxonomy, or the special morphology or embryology of any particular group or set of structures. . . ." After sixteen years of additional experience in the class room, he finds himself still holding this opinion, adding that he has never advocated the use of any one book unaccompanied by frequent reference to many other publications dealing with special topics.

The two preceding editions bore the words "Biological and Economic," instead of "Ecological," on the title page* and in conformity with this change is the addition of a new chapter (XIII) "Insect Ecology," pp. 348-409. Its subject headings are:

I. Conditions of Terrestrial Existence. 1. Soil; 2. Atmosphere: Light, Temperature, Pressure, Moisture, Composition, Movement, Electricity, Evaporation; 3. Food Relations; 4. Biotic Conditions.
II. Conditions of Aquatic Existence. 1. Chemical Conditions; 2. Physical Conditions; 3. Food Conditions; 4. Biotic Conditions.
III. Environmental Factors in General.
IV. Classification of Environments.
V. Communities.
VI. Examples of Insect Communities: Grasshoppers [in Michigan after Vestal], Communities of Streams [after Shelford], Community Relations in New Mexico [after J. R. Watson].
VII. Succession.

Lest the general commendation of the book given above be interpreted to cover all its contents, be it remarked in passing that this classification of the subject matter of ecology is not that which seems the most satisfactory.

The typesetting of this third edition is new throughout, although the page form remains the same. There is one additional plate, four additional text-figures, and some other new ones, and 100 more pages than in the second edition. The text, including the copious bibliography (now of 48 pages) at the end thereof, has been extensively revised, so that one notes many omissions, changes and additions in comparison with its immediate predecessor.

The number of classes of Arthropods is raised from 6 to 9 by the

*The *cover* of our copy of the third edition has the old title.

recognition of the Pauropoda, Symphyla and Myrientomata as of that rank. Changes are made in the statements of the characters, and in the sequence, of the Orders of Insects, now numbering 17 by the admission of the Dermaptera, Parasita and Strepsiptera. The Platyptera are retained to include Isoptera, Embioptera, Zoraptera, Corrodentia and Mallophaga as suborders. A number of new paragraphs on the interrelationships of the orders are to be found on pages 22-26. The name Locustidae is accepted for Acrididae and Tettigoniidae for Locustidae ((pp. 62, 63, 92). Interesting statements of the author's present views on the homologies and segmental value of the superlinguae are given on pages 36-37, 44, 81, 133 and 135. Voss' elaborate work on the thoracic muscles of the cricket might have been mentioned on page 78. Much new matter has naturally been incorporated into the chapters on Transmission of Diseases by Insects, Insect Behavior and Insects in Relation to Man. Under geological distribution, pp. 340-347, is no statement of the Australian Triassic Insects or of the actual discoveries at Florissant by Prof. Cockerell.

But who is the entomologist who can write a book on all insects to satisfy all his colleagues?—PHILIP P. CALVERT.

## OBITUARY.

The death of DR. KÁLMÁN KERTÉSZ of Budapest, Hungary, December 28, 1922, has left a regrettable void in the ranks of the World's scientists. His published works in Dipterology are well known and are of the highest quality. For the greater part they are such that the enormous amount of labor involved in their preparation is seldom realized by those benefited, and they stand as unembellished monuments to their deceased author. Dr. Kertész was born January 2, 1867, and so was in the fifty-fifth year of his life. He was Director of the Hungarian National Museum, and a member of several European and American Entomological Societies. Of his more important publications may be mentioned the *Catalogus Dipterorum*, of which seven volumes have been issued, completing the Orthorrhapha and the Cyclorrhapha aschiza (Families Syrphidae, Pipunculidae and Phoridae), leaving the great Schizophora, or Myodaria, still to be published. It is hoped that the manuscript for this latter is available and in shape for publication, or nearly so. At the time of his death he was publishing a contribution towards a monograph of the Stratiomyidae and allies (*Notocantha*). He worked up the Lauxaniidae of the Sauter-Formosa expedition, and also published on this family and the Lonchaeidae of several other faunas, including that of North America. E. T. CRESSON, JR.

# NEW ARRIVALS

From Colombia, South America:

**OVER 10,000 BUTTERFLIES, INCLUDING**

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

**1500 BUTTERFLIES AND MOTHS, INCLUDING**

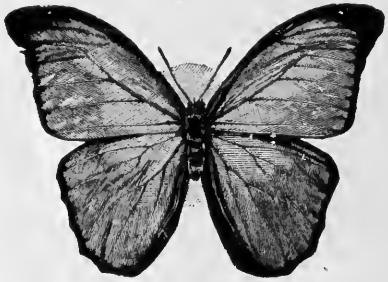
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera



From Assam, India:

**1200 BUTTERFLIES AND MOTHS, INCLUDING**

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

**And Many Other Showy Species**

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Parnassius hardwicki

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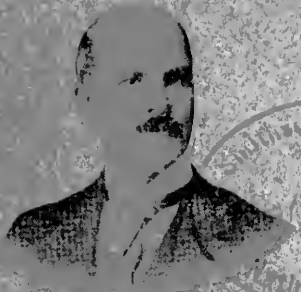



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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV MAY, 1923 No. 5

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### X. Megaloprepus, Its Distribution, Variation, Habits and Food.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

*Megaloprepus caerulatus,* of all living Odonata, has the greatest wing-expanse, attaining, at the maximum, 190 mm., while the long and slender abdomen is recorded to reach 102 mm. in the male and 97 mm. in the female. It is an inhabitant of the continental American tropics from the State of Vera Cruz, Mexico, to central Bolivia.

#### DISTRIBUTION IN COSTA RICA.

In the *Biologia Centrali-Americana* it was cited from the following localities in Costa Rica: Cachí (misspelled Caché), Carrillo, Santa Clara and finally Quebrada de Java in southern Costa Rica. Dr. Ris[1] has examined specimens from near Tuis

[1]Archiv f. Naturgesch. 82 Jahrg., Abt. A, 9 Heft, S. 65. 1918.

(3 ♂ 4 ♀) and Infernillo (=Juan Viñas) (1 ♂ 1 ♀) at 1000 meters elevation, and from near Orosi (1 ♂ 4 ♀) at 1500 meters, as well as 9 ♂ 1 ♀ without definite locality from that country. The following Costa Rican specimens are before me, taken by myself, except where the name of another collector is specified:

*Atlantic Slope*: Near Guápiles, 300 meters, 980 feet, ♂ No. 1, forest, June 2, 1909. Near Guápiles, 1 ♂ No. 13, July 13, 1915, D. E. Harrower. Florida Road, west of Guápiles, forest, 3 ♂♂, Nos. 2-4, June 3, 1909; 1 ♂ No. 5, 1 ♀ No. 6, June 5, 1909, W. Schaus & J. Barnes; 1 ♂ No. 7, Nov. 18, 1909. Guacimo, ca. 240 meters, banana field, 1 ♀ No. 8, June 7, 1909, Messrs. Stähle & Blair. Peralta, 320 meters, Chiriqui [?] River trail, 1 ♀ No. 9, August 10, 1910. Estrella, below 250 meters, 1 ♂ No. 10, 1 ♀ No. 11, April 22, 1916, C. H. Lankester. Ontario Farm [between the Reventazon and Parismina Rivers], below 100 meters, 1 ♂ No. 12, September 17, 1919, C. H. Lankester.

My field note books contain the following records of this species, although specimens were not taken: Holanda Farm, Agua Buena Creek, November 7, and Rio Banana, forest near the Limon reservoir, November 9, 1909, both localities below 100 meters. Peralta (see above), tropical forest, August 7, 1909. Juan Viñas, bottom of the cañon of the Rio Reventazon, 760 meters, 2500 feet, June 25, 1909; road down the same cañon at above 3000 feet, the highest altitude at which I saw this species, September 29, 1909. In August, 1909, in the Museo Nacional, at San José, I saw a male labeled as taken at Carrillo, July, 1909, by P. Biolley, Jr.[2]

*Pacific Slope*: Near Alajuela, 980 meters, 3200 feet, 1 ♂ No. 14, August 8, and 1 ♂ No. 15, August 12, 1915, D. E. Harrower. Aguacate Mountains [500-1000 meters?], 1 ♂ No. 16, July, 1914, C. H. Lankester.

## Variation.

In 1860, De Selys recognized three "races" of this species: *caerulatus*, *brevistigma* and *latipennis*.[3] In 1886, having found intermediates between the first and the third of these, only two races were maintained, *caerulatus* and *brevistigma*,[4] and the latest opinion which he expressed,[5] as well as that of Dr. Ris (1918),[6] is to the same effect. In consequence of some corre-

[2] For the localities cited see A. S. and P. P. Calvert, A Year of Costa Rican Natural History, New York, MacMillan Co., 1917.

[3] Bull. Acad. roy. Belg. (2), x, pp. 13-14. [4] Mem. Couron. Acad. Belg. xxxviii, p. 7. [5] Annales Soc. Ent. Belg. xxxiv, Comptes Rendus, p. cxx. 1890.

[6] Dr. Ris, *l. c.*, p. 64, says "Calvert endlich (Biol. C. A. Neur, p. 51, 352—1901, 07) lässt auch *brevistigma* fallen." Nothing is said in the *Biologia* volume about *brevistigma*, but reference *is* made to *latipennis*.

spondence with Prof. T. D. A. Cockerell, who raised the question of the specific distinctness of *brevistigma*, I have examined the Costa Rican material and a few South American specimens referable to, or near to, *brevistigma* in some detail. These latter specimens are:

2 ♂, Nos. 21, 23, 1 ♀ No. 22, head waters of the Rio Carare, (Rio Minero), in woods near the emerald mines of Muzo, Colombia, 2000-5000 feet, Terry Duce, collector, studied by Prof. Cockerell and lent to me by him; 1 ♀ No. 19, "Brésil," from M. René Martin's collection; 1 ♀ No. 20, road to Coroico, Yungaz, Bolivia, April 20, 1899, W. J. Gerhard (the last two in the Academy of Natural Sciences of Philadelphia).

Some of the results of this examination follow.

Length of abdomen ♂: Guápiles 70-103 (5 ♂♂, June) Estrella 91, Ontario Farm 81, Alajuela 86 (2 ♂♂), Rio Carare 80, 99 mm.; ♀: Costa Rica 72-84 (4 ♀♀ listed above), R. Carare 66, Brésil 88, Coroico 90 mm.

Length and maximum width of left hind wing and ratio of the first to the second of these dimensions, ♂: Guápiles (5 ♂♂, June) 59-92 mm., 14-23.5 mm., 3.72-4.21; Estrella 78 mm., 20 mm., 3.9; Ontario Farm 64 mm., 16 mm., 4.0; Alajuela 66, 72 mm., 17, 18.5 mm., 3.88, 3.89; Rio Carare 68, 79 mm., 17 mm., 4.0, 4.65. ♀: Costa Rica (4 ♀♀) 64-73 mm., 17-20 mm., 3.65-3.88. Rio Carare 57 mm., 14 mm., 4.07; Brésil 77 mm., 15.5 mm., 4.97; Coroico 80 mm., 17 mm., 4.71.

Pseudopterostigma, *total* number of cells, *both front* wings, ♂: Guápiles (5 ♂♂, June) 10-6, Estrella 6-8, Ontario Farm 5-6, Alajuela 6-10, Rio Carare 3-11; ♀: Costa Rica (4 ♀♀) 12-17, Rio Carare 10-11, Brésil 4-6, Coroico 6.

Pseudopterostigma, length of costal margin on *left hind* wing, and *total* number of cells *both hind* wings, ♂: Guápiles (5 ♂♂, June) 2.74-4.14 mm., 4-10 cells; Estrella 3.33 mm., 5-6; Ontario Farm 2.96 mm. (4+ -5; Alajuela 2.81, 3.48 mm., 6-10; R. Carare 2.29, 3.18 mm., 2+-9; ♀: Costa Rica (4 ♀♀) 2.96-3.85 mm., 8-12; Rio Carare 2.44 mm., 6-7+; Brésil 2.0 mm., 3-4; Coroico 2.96 mm., 5-6. (These measurements by eye-piece micrometer, Zeiss binocular, oc. 4 obj. *F*55.

Dark band of *front* wings; (*a*) greatest length measured parallel to the costa, position of its proximal edge (*b*) in reference to the point of origin of vein *M*2 (nodal sector) in cells and also (*c*) in reference to the fork of *M*4 (short sector) in cells. ♂: Guápiles (5♂♂, June) *a* 27-19 mm., *b* 3 proximal—3 distal [7], *c* 2 proximal—1 distal; Estrella *a*

[7] This means that in the five males from near Guápiles, taken in June, the position of the proximal edge of the dark band of the front wings varied from three cells proximal to the point of origin of *M*2 to three cells distal to the same point, and similarly in the other statements.

20 mm., *b* 7 Left 8 Right distal, *c* 7 R 5 L distal; Ontario Farm *a* 21 mm., *b* 5½ L (origin of M2 irregular on the right, *c* 10 R 7 L proximal; Alajuela *a* 17-19 mm., *b* 2-4½ distal, *c* 1 proximal—3 distal; R. Carare *a* 12, 19 mm., *b* 2 R, 3 L, 13 L distal, *c* 3 R, 5 L, 15 L distal. ♀ : Costa Rica (4 ♀ ♀) *a* 15-20 mm., *b* less than 1-7 distal, *c* 1½ proximal—5 distal; R. Carare *a* 16 mm., *b* ½ R 1 L distal, *c* 1½ proximal R, at the fork L; Brésil *a* 12 mm., *b* 7 distal, *c* 11 L, 13 R distal; Coroico *a* 16 mm., *b* 3 R 4 L distal, *c* 11 R 8 L distal.

Ratio of (*d*) the point of origin of *M2* and (*e*) of the fork of *M4* to the length of the *front* wing, ♂ : Guápiles (5 ♂ ♂, June) *d*. .62-.65, *e* .68-.69; Estrella *d*. .62, *e* .66; Ontario Farm *d* .71, *e* .74; Alajuela *d* .61, .64, *e* .69, .73; R. Carare *d* .63, .65, *e* .66, .68; ♀ : Costa Rica (4 ♀ ♀) *d* .58-.63, *e* .66-72; R. Carare *d* .62 R .64 L, *e* .70 R .67 L; Brésil *d* .69, *e* .68; Coroico *d* .68 R .67 L, *e* .66. I have also measured the same ratio for M2 in the *left hind* wing and find only a slight difference in the second decimal place from that given for the front wing of each individual.

Distance (*f*) from the nodus to the origin of *M2*, (*g*) from the origin of *M2* to its end on the wing margin, (*h*) *difference between* (*f*) and (*g*), all in millimeters and with reference to the *left hind* wing only, ♂ : Guápiles (5 ♂ ♂, June) *f* 27 to 41, *g* 20.5 to 34.5, *h* 5 to 7.5; Estrella *f* 35, *g* 30, *h* 5; Ontario Farm *f* 30, *g* 21, *h* 9; Alajuela *f* 32, 29, *g* 27, 24.5, *h* 5, 4.5; R. Carare *f* 31, 36.5, *g* 26, 28, *h* 5, 8.5; ♀ : Costa Rica (4 ♀ ♀) *f* 28 to 31, *g* 25 to 29.5, *h* 1 to 4; R. Carare *f* 28, *g* 19, *h* 9; Brésil *f* 39, *g* 25, *h* 14; Coroico *f* 39, *g* 28, *h* 11.

Length of the fork of *Cu* 1 measured from the bifurcation to the end of the distal branch at wing margin, all in millimeters, ♂ : Guápiles (5 ♂ ♂, June) 6-10+ front, 8.5-10+ hind; Estrella 10 + f, h; Ontario Farm 6 f, 9-9.5 h; Alajuela 5 f, 6-11.5 h; R. Carare 4.5-7 f, 3-10 h; ♀ : Costa Rica (4 ♀ ♀) 10+ f (7 in one wing only), 7.5-10+ h; R. Carare 3.5 f, 6.5-7.5 h; Brésil 4-4.5 f, h; Coroico 2 f, 3-5. h (f=front, h=hind wings).

The branches of the fork of *Cu*1 do not extend into the dark band of the wings of the larger ♂ Rio Carare, Brésil ♀, Coroico ♀, nor on the right hind wing of the Aguacate ♂ ; on the other three wings of this last ♂ only the most distal secondary branch of the fork reaches the band. In all the remaining specimens listed above the branches of the fork extend into the band to a distance varying in different individuals; in some of them the point of bifurcation lies within the band, in others it is proximal to the band.

A milky band is present bordering the proximal margin of the dark band of the wings in ♂ ♂ Nos. 3, 7, 10, 12, 13, 14, 15, 21; traces of it

[8] This highest ratio is that of the smallest of the five males and the only one of the five in which the proximal edge of the dark band is proximal to the origin of *M2*; the *e* ratio for this same male is .683.

are visible in ♂ No. 1, ♀ ♀ Nos. 8, 9, 22; it is entirely absent in ♂ ♂ Nos. 2, 4, 5, 16, 23, ♀ ♀ Nos. 6, 11, 19, 20. Milkiness distal to the dark band is present in ♂ ♂ Nos. 16, 23, ♀ ♀ Nos. 6, 8, 11, 19, 20, 22[9]; traces of it are visible in ♂ ♂ Nos. 1, 3, 10, 12, 13, 14, 15, 21; it is absent in ♂ ♂ Nos. 2, 4, 5, 7.

Transverse diameter of median ocellus (*i*), maximum diameter of right lateral ocellus (*k*), ♂ : Guápiles (5 ♂ ♂, June) *i* .37-.44, *k* .30-.44; Estrella *i* .39, *k* .37; Ontario Farm *i* .44, *k* .37; Alajuela *i* .37, *k* .37; R. Carare *i* .37, .44; *k* .33, .52; ♀ : Costa Rica (4 ♀ ♀) *i* .36-.44, *k* .30-.44; R. Carare *i* .30, *k* .30; Brésil *i* .44, *k* .41; Coroico *i* .39, *k* .38. All the dimensions are in millimeters by eye-piece micrometer, Zeiss binocular, oc. 4 obj. F35.

These preceding data may be directly compared with those of Dr. Ris (1918) based on a more extensive series of specimens from several other countries in addition to Costa Rica. He has given definitions for distinguishing the races *caerulatus* and *brevistigma* founded on five major characters. An examination of his data on which these definitions are based clearly shows that the one race grades into the other.

The twenty-four Costa Rican examples whose data he gives fall, for the most part, within the two limits of each character assigned to the race *coerulatus;* however, in five of his individuals the fork of *Cu*1 is less than 10 mm. long (in two of the five less than 5 mm.), and in five the ratio of the length to the width of the hind wing exceeds 4.0.

Of the sixteen specimens from Costa Rica discussed in the present paper, 12 out of the total of 32 front wings and 6 out of the 32 hind wings have the fork of *Cu* 1 shorter than 10 mm. Even the smallest individual (♂ No. 4), hind wing 59 mm., has the dark band of the wings 19 mm. wide. Four examples (Nos. 2, 3, 4, 16) have the ratio of length to width, left hind wing, exceeding 4.0 viz.: 4.06, 4.10, 4.21, 4.69, respectively. The extreme range of the difference *h* (see above) is from + 1 (♀ No. 6) to + 9 (♂ No. 12), and of the length of the costal edge of the pseudopterostigma, left hind wing, is from 2.74 (♂ No. 4) to 4.37 (♂ No. 13) mm.

Yet all of these sixteen individuals are to be referred to race *coerulatus;* even ♂ No. 16 whose relatively narrow wings would place it in *brevistigma* is *coerulatus* in the other four characters of Dr. Ris, and the short fork of *Cu*1 (7-8.5 mm. except in the left hind wing where it is 10 mm.) and the short

[9] In ♀ No. 9 (Peralta) is no distal milkiness but there are two patches of white veins in its place.

pseudopterostigma of ♂ No. 4 only place it in the intermediate condition between *brevistigma* and *coerulatus*, while its other three characters are those of *coerulatus*.

If we write the individual numbers of the entire twenty-one specimens studied in this paper in the order of their magnitudes, from one extreme to the other for each character, thus

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ♂ | 5 | 3 | 12 | 7 | 13 | 2 | 10 | 4 | 21 | 1 | 14 | 15 | 16 | 23 | ♀ | 8 | 9 | 6 | 11 | 20 | 22 | 19 |
| | 13 | 3 | 5 | 7 | 14 | 2 | 10 | 16 | 21 | 1 | 12 | 15 | 4 | 23 | | 6 | 9 | 8 | 11 | 20 | 22 | 19 |

in which the upper line is for the greatest length of the dark band of the hind wing and the lower line for the length of the costal edge of the pseudopterostigma of the left hind wing, we observe a correlation of these two characters in 8 out of a possible 14 for the males and 5 out of a possible 7 for the females. That these correlations are not exactly correlated with locality may be seen by comparing the individual numbers and their habitats as given on page 130, *antcá, e. g.* ♂♂ Nos. 21 and 23, 14 and 15.

It seems hardly useful to occupy more space by giving similar examples of the degree of correlation between other characters studied. Suffice it to say that the maximum number observed for the males is 11 (between the length of the hind wing and the distance from the origin of *M2* to its end) and 7 for the females (*not* for the same pair of characters just given as showing the maximum correlation for the males, but between the length of the hind wing and the distance from either the base of the wing or the nodus to the origin of *M2* and also the length of the abdomen).

For the sake of completeness be it added that of the five non-Costa Rican specimens used for comparison in this paper (page 131 *antcá*) only the Brésil ♀ No. 19 is *brevistigma* by all five of Dr. Ris' characters; then follow in order: ♂ No. 23, ♀ No. 20, ♀ No. 22, ♂ No. 21, the last being more *coerulatus* than *brevistigma*.

De Selys wrote in 1890 *l. c.*: "Le Dr. Hagen me demande encore si le nom de *Meg. caerulatus* (Drury) ne s'applique pas mieux á la race *brevistigma*, Selys, qu'à celle que j'ai considérée comme type de l'espéce et que Drury avait recue de Honduras." He then gave reasons for rejecting this suggested change. The following data, taken from Drury's figure, strengthen de Selys' view:

Abdomen 77, left hind wing 68, its max. width 18 mm., ratio of these latter two 3.77, max. length dark band of front wings, measured parallel to the costa, 20 mm., its proximal edge at 42 mm. from the base on left side on the vein *M1+2* and at 47 mm. on *M4*; no milky bands or spots, costal edge of pseudopterostigma, left hind wing, 3.0

mm. The stigma is shown as crossed by about seven vertical lines on the front wings, by eight oblique lines on the left hind wing and solid on the right hind; fork of *Cu*1 12 (front), 13 (hind) mm. long on the left side, reaching into the dark band on all the wings. In none of the wings is the venation exact, especially at the bases, the right and left wings of each pair are different. In the left hind one long vein, apparently *M*4, is omitted altogether, or perhaps consolidated with *Cu*1. *Cu*1 is shown on both left wings as forking 7 mm. proximad to the proximal edge of the dark band, while on the right wings no fork is shown, unless it be hinted at at the very proximal edge of the dark band. No forking of *M*4 and no origin of *M*2 is shown on any wing.

Drury's description reads: "All the wings are reticulated and transparent, having a broad patch of a deep mazarine blue crossing them near the extremities, the tips being transparent." On comparing the figure in the copy of Drury's *Illustrations* at the Academy of Natural Sciences of Philadelphia with Ridgway's *Color Standards and Color Nomenclature* of 1912, the color of the band on the wings of the former is nearest the "Dusky Violet Blue (2)" of Plate xliii of the latter.

Needham[10] and Tillyard[11] have figured the race *brevistigma*, Munz[12] the race *caerulatus*.

With two slight exceptions, to be mentioned presently, I have found no evidence of any geographical or seasonal variations within the few Costa Rican individuals studied in this paper. The five males, Nos. 1-5, taken near Guápiles, June 2-5, 1909, under nearly uniform environmental conditions, do not form a group by themselves, as compared with the other Costa Rican males. I noted at the time that the three males taken along the Florida road, June 3, 1909, "all in the same mile measure as follows: abdomen 69.5, 86, 91, hind wing 58, 70, 79 mm.," respectively Nos. 4, 2 and 3 of page 130 *anteá*. The characters of male No. 7, taken in the same environment, November 18, 1909, fall, in every case, within the range of the corresponding variations of Nos. 1-5. The two slight exceptions referred to are that the three males, Nos. 14-16, from the Pacific Slope of Costa Rica agree in possessing (1) the minimum length (16-18 mm., 19 mm. in the front wings of No. 14) of the dark band of the wings of all the Costa Rican males, those from the Atlantic Slope having this dimension from 27 to 19 mm., and (2) the difference *h* (see above) is from + 4.5 to + 5. mm.; in this latter respect, while homogeneous, they are not isolated, as the Atlantic Slope males show variations from + 3 to + 9. With the few specimens accessible to me it is impossible to determine the significance of these two exceptions; it should be the subject of future study of more abundant material.

(To be continued)

[10] Proc. U. S. National Mus., xxvi, p. 748, fig. 37. 1903.

[11] Biology of Dragonflies, Cambridge, University Press, pl. i, fig. 8. 1917.

[12] Memoirs Amer. Ent. Soc., pl. viii, fig. 46. 1919.

## Supplementary Note on Megaloprepus (Odon. : Agrionidae).

By T. D. A. Cockerell, Boulder, Colorado.

Last year Mr. Terry Duce sent me several specimens of *Megaloprepus* from the head waters of the Rio Carare (Rio Minero), in woods near the Emerald mines of Muzo, Colombia, at altitudes of 2000-5000 feet. Looking them over, I was surprised to find two very distinct forms, which have been described as *cærulatus* (Drury) and *brevistigma* (Selys). It seemed to me that they were distinct species, not varieties of one as is commonly supposed, so I wrote out my conclusions and sent the manuscript to Dr. Calvert. This led to a very interesting correspondence, and Dr. Calvert has fully stated his conclusions above. There remain certain speculations not covered in Dr. Calvert's paper, and at his suggestion I give these for what they may be worth. The effort is made to treat the problem as a dynamic one, in the belief that sound judgments concerning evolutionary processes may eventually be attained as the result of establishing a multitude of concurrent probabilities. For this kind of work the insects afford the best material, owing to the vast number of different types available for study.

We do not know the existing biological relationships between *cærulatus* and *brevistigma*. The available information appears to show that in Colombia they fly together, but probably *brevistigma* does not occur north of Panama. In tabulating the characters of the two forms, confusion is introduced because in certain respects the *brevistigma* female is not so extreme as the male, and its curve is overlapped by that of the *cærulatus* males. Some characters, such as wing-length, are extremely variable in both forms. I dissected out the penis of a Colombia *brevistigma*, and found it quite like that of *cærulatus* from the same locality, except that in the latter it was distinctly more slender.

Thus we have a type of Odonata, undoubtedly of great antiquity, which presents very few forms, so close as to be regarded as races of a single species. We might expect such

an organism to be very constant in its characters, but instead it is extremely variable. The variations are of such a nature that they cannot in any large part be attributed to the direct effects of environment, and hence we must assume that the insects are strongly heterozygous in their composition. We have no evidence that *cãerulatus* and *brevistigma* cross, but also no grounds for believing that this is impossible. It seems entirely possible that in the comparatively recent times when the Isthmus of Panama was under water, *cãerulatus* was the Central American species, and *brevistigma* that of the Andean region of South America. Existing thus isolated, they may have developed their special characters. Since it became possible to cross from one region to the other, each may have invaded the other's territory, and hybridisation may have occurred, producing an epidemic of variation. But *brevistigma,* having a large range in the Andean region, has remained in part unmodified, though its territory is gradually being overrun by *cãerulatus* from the north. Eventually, especially in the valleys of the Andes, homozygous combinations may be sorted out giving rise to a series of closely allied races or species, as may be seen in numerous genera of butterflies and birds of the same region. Whether this is now in process, can only be determined by elaborate statistical studies of materials yet to be gathered.

A very instructive case for comparison with that of *Megaloprepus* is that of *Steganura*, a genus of African birds, discussed by Mr. J. P. Chapin in *American Museum Novitates,* No. 43 (1922). *S. aucupum* has been considered a subspecies of *S. paradisaea,* but Chapin believes that it is distinct. He supposes that when the equatorial forest was more extensive, *S. aucupum* was restricted to the grasslands north of it, *S. paradisaea* to the south. These birds have now invaded each others territory, and were held by students to be forms of a single variable species. The females cannot be separated with any confidence, but the males in "eclipse plumage" are readily distinguished. Chapin thinks that they do not interbreed, but has no exact information on this point.

## A New Genus and Species of Sphinx (Lepid.).

By Henry Skinner, The Academy of Natural Sciences of Philadelphia.

**KLONEUS**, new genus.

Allied to *Pachysphinx* R. and J. Female. Antennae on the upperside clothed with coarse yellow hairs and on the sides and beneath with light brown, velvety pile. Eyes large, 5 mm. in diameter. Palpi large and greatly swollen above and square at the lower end. Thorax unicolorous. Primary wings scalloped as in *Pachysphinx* and the wings of the same shape, widening as the outer margin is approached. Secondaries also scalloped and not entire as in *Pachysphinx*.

*Type—Kloneus babayaga* n. sp.

**Kloneus babayaga**, n. sp.

♀.—Upperside. Primaries brown with a curved dark brown band near the apex of the wing; a round spot near the middle of the same color, 4 mm. in diameter; a small dark brown spot at base and a large spot on inferior margin, extending 8 mm. into the wing. Secondaries brown with a dark brown fascia on outer margin 9 mm. wide at top and 3.5 wide at anal angle; inside and parallel to this is a dark brown line.

Underside considerably lighter in color and the primaries and secondaries have two parallel lines crossing from the costa to the inner margin, 9 mm. apart. Expanse of one primary wing 55 mm. and of one secondary 37 mm.

Thorax, abdomen and wings concolorous.

*Locality*, Eden Mine, Nicaragua, June 13th. 1922, J. S. McKenzie.

*Type* in the collection of The Academy of Natural Sciences of Philadelphia.

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### Insecta Part of the Zoological Record for 1922.

The attention of Entomologists throughout the world is called to the fact that, beginning with the Volume for 1922, the preparation of the "Insecta" part of the "Zoological Record," is being undertaken by the Imperial Bureau of Entomology. In order that the Record may be as complete as it is possible to make it, all authors of entomological papers, especially of systematic ones, are requested to send separata of their papers to the Bureau. These are particularly desired in cases where the original journal is one that is not primarily devoted to entomology. All separata should be addressed to The Assistant Director, Imperial Bureau of Entomology, 41, Queen's Gate, London, S. W. 7, England.

# The Cordylurid Genus Paralleloma and its Nearest Allies (Dipt.).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

This paper deals with North American species only. The genus *Paralleloma* was erected by Becker for the reception of the species previously placed in the genus *Cordylura* which have the thoracic dorsocentral bristles reduced or almost absent. I recently published, in my paper on the Diptera collected by the Canadian Arctic Expedition, a key to the genera of Scatophagidae in which I cited characters for the differentiation of all the genera then known to me as occurring in America. In the present paper I have proposed a subdivision of the genus *Paralleloma*, which adds two genera to our list, though the species cited as genotypes are among those already known to science.

## AMERICINA gen. n.

Differs from *Paralleloma* in having the arista pubescent, prealar bristle absent, posterior notopleural generally present, and the sixth wing-vein traceable to margin of wing though very indistinctly so.

Genotype, *Cordylura adusta* Loew.

**Americina adusta** (Loew)

The specimens which I have examined are all similarly colored. Shining whitish yellow, black on upper half of occiput, ocellar spot, apex of third antennal segment, broadly on each side of mesonotum and scutellum, on dorsum of mesonotum a longitudinal stripe below and behind base of wings, and the entire abdomen. All tarsi blackened. Wings slightly infuscated at apices.

The posterior notopleural bristle in one male is duplicated. Scutellum longer than in any allied species, slightly flattened on disc, and almost triangular, with 4 bristles, the basal pair shortest. The short stout bristles on ventral surface of mid femur in male distinguish this species from any of its allies.

Originally described from New Jersey and since recorded from New Hampshire. I have taken it in Illinois and seen specimens from Maryland, near Plummers Island (McAtee), and Indiana (Aldrich).

**Americina inermis** (Loew).

Differs from the preceding species in having the antennae entirely yellow, the dorsum of thorax, scutellum and metanotum black, and the wings clear.

The scutellum is short, with two very long lateral bristles and two minute apical hairs, the legs are entirely without strong bristles, and the tarsi are pale.

Originally described from the White Mountains, New Hampshire. I have seen one male from Viola, Idaho. Cresson has redescribed this species from the northwest as *Cordilura nudicornis*.

**ACHAETELLA** gen. n.

Differs from *Parallelomma* and *Americina* in having postvertical bristles absent. The sixth wing-vein is continued rather distinctly to the margin, the prealar bristle is present as is generally also the posterior notopleural.

Genotype, *Lissa varipes* Walker.

**Achaetella varipes** (Walker).

The black body, conspicuously marked black and yellow legs, and black tipped wings of this species distinguish it from any other in the group.

Originally described from Ohio. Since recorded from New Jersey, Wisconsin, Illinois and Montreal, Canada. It is very common and generally distributed in Illinois and the Atlantic States as far south as District of Columbia.

(To be continued)

## The Life History of Hesperia ericetorum Boisd. (Lepid.: Hesperiidae).

By Karl R. Coolidge, Hollywood, California.

*Hesperia ericetorum* has been recorded from California, New Mexico, Arizona, Colorado and Oregon, and recently Mr. Erval J. Newcomer has written me that the species occurs quite commonly about Yakima, Washington.

It is a fairly abundant butterfly in Southern California, but though possessing a strong flight, is only rarely found at any distance from the vicinity of its food-plants, and for this reason it has sometimes been considered as being quite scarce. About Los Angeles I have found *ericetorum* on the wing practically

every month of the year, and while the various broods so overlap that I have not found it convenient to draw definite sharp lines of distinction between them, my records of the past ten years indicate that there are at least six broods, issuing as follows:

A first brood as early as the first week in February, but only in scanty numbers. On the Colorado Desert, however, the first brood is much more numerous and its members appear as soon as the last week in December. About Los Angeles fresh specimens are again in evidence in late March and early April, while a third brood appears during the first two weeks of June. Again, from the middle of July on another brood comes forth, and the last of September finds a fifth, which in point of numbers, is the largest brood of the season. Then from the first to the middle of October a final brood appears, and after the first week of November until February, specimens are only rarely seen. In all the broods the males appear a week or more prior to the emergence of the females.

Naturally, in the mountainous regions, the broods are more restricted, probably to two or three at an elevation of five thousand feet, and in the still higher ranges limited to a single brood. Mr. Newcomer writes me that in Washington it is double-brooded, appearing in June and in August, with the latter brood much the larger.

Of the life history of *cricetorum* nothing has been recorded except the very brief reference by W. G. Wright (Butt. West Coast) stating that the food-plant is *Malvastrum thurberi*, and that "The egg is white, globular, and laid on the young leaves."

The following food-plants are known to me:

MALVACEAE.

*Malvastrum* sp.—About Los Angeles commonly on *M. fasiculatum* (Nutt.) Greene, (=*thurberi* Gray), popularly known as "False Mallow" and typically at home in the lower altitudes of the chaparral belt. Other species of *Malvastrum* here upon which I have found eggs or larvae are *M. orbiculatum* Greene and *M. davidsonii* Robinson. On the Mohave Desert the usual food-plant is *M. exile* Gray, while on the Colorado Desert, about the Salton Sea, I have taken larvae from the showy "Five Spot" or "Spotted Mallow," *M. rotundifolium*.

*Sphaeralcea ambigua* Gray.—Desert Mallow. The common food-plant on the Colorado Desert. In the vicinity of Indio and the Salton Sink I have also obtained larvae from *S. angustifolia* var. *cuspidata*.

*Malva borealis* Linn.—Cheeseweed, an introduction from Europe. A single specimen bred from this at Los Angeles. *H. tesselata occidentalis* Skinner, which breeds here on *M. borealis*, is also occasionally found on the species of *Malvastrum*.

*Althea*.—Hollyhock. Mr. Newcomer has sent me specimens bred from this in Washington.

AMARANTHACEAE.

*Amaranthus bilitoides* Wats.—Pigweed. Mr. Newcomer writes me that he has found the larva on this at Yakima, Washington.

In ovipositing the female seems to prefer the just unfolding young leaves, often tucking the egg in so nicely on the upper surface that it is well hidden from view. But again the egg may be placed on the under surface of the leaves, and even occasionally on the stem.

The egg period varies, but on the average is twelve days. So also there is variation in the duration of the various instars, but on the whole these stages average about fourteen days, and from oviposition to the emergence of the adult a period of seventy-five to eighty days, though in the hot summer months this is greatly shortened.

There is nothing new or of special interest in the behavior of the larvae. The newly hatched larva spins only a few weak, loose strands on the upper surface of the leaf, biting out small irregular holes, and resting in a coiled position. In the second instar the larva spins a rather heavy matting of silk, on which it rests, eating out roundish holes in the leaf. I observed no larvae in the second instar forming regular nests.

But after the second moult the larva builds itself the usual type of nest, forming larger ones as it increases in size, and in every instance under observation pupation occurred within the nest of the final instar, the cremaster being weakly thrust into a small button of silk.

*The Egg*.—In shape sub-spherical, the base sharply flattened, thence swelling out roundly to the greatest width, in the middle of the lower fourth of the egg.

Traversed by a series of fairly straight but weak longitudinal ribs these are .03 mm. equidistant, with the walls about .001 mm. in thick

ness. Running transversely, a series of similar ribs, but scarcel lower than the longitudinal and forming with them, for the most par regular quadrate cells, .04 mm. in diameter. From the angles formed by these series of ribs arise blunt spines, .03 mm. in height, .01 mm. in thickness, and inclining apically.

The longitudinal ribs mostly extend to the micropyle, terminating there abruptly, but some coalesce with adjacent ribs before the summit is reached. The micropyle in a rather deep circular depression, .18 mm. in diameter.

Height, .68 mm. Diameter at base, .76 mm. Greatest diameter, .92 mm. Color, when first laid, a pale lemon yellow, soon assuming a nacreous reflection, and in a day or two becoming chalky white.

*Larva.*—The young larva escapes by eating out a jagged hole in the micropylar region, about .50 mm. in diameter, and does not devour the egg shell.

*First Instar.*—Body quite even, tapering but slightly posteriorly. Each segment with four, fine, transverse creases.

Head shining black, .48 mm. in diameter. A few, fine, scattered, colorless hairs on head, the longest of these .17 mm. in length. Collar .40 mm. in width, castaneous; the dorsal shield black. Two transverse series of colorless hairs, .16 mm. in length, on the collar.

On the body a number of series of rather high conical pale yellow tubercles, .02 mm. in height and diameter at base, from which project colorless forked hairs in the following series:

A subdorsal row, situated just a little anterior of middle. A laterodorsal row, situated just posterior to middle. A substigmatal central row. The subdorsal hairs project in a straight stem to a distance of .03 mm., where the branch occurs, the posterior branch bending roundly posteriorly, the anterior branch roundly anteriorly; these branches .07 mm. in length, with the stem at base .005 mm. in diameter. The laterodorsal hairs are much smaller, being only .07 mm. in their entire length.

Below the substigmatal row are two, straight, sharp hairs per segment, the anterior one projecting slightly anteriorly, the posterior one bent slightly posteriorly; the posterior hair slightly the longer, .09 mm. in length, while the anterior one is .07 mm. Both hairs are colorless and minutely spiculiferous.

Spiracles pallid, round, .02 mm. in diameter. Anal segment with a few long colorless hairs, projecting posteriorly, .23 mm. in length.

Color of body very pale lemon yellow, with a whitish sheen. Legs very pale gray brown, tipped with black. Prolegs and ventral surface pale lemon yellow.

Length 1.92 mm. Width at first thoracic segment .38 mm. Width at anal segment .28 mm. Height at first thoracic segment .52 mm.

*Second Instar.*—Body quite uniform, but tapering slightly and evenly posteriorly. Each segment with four, fine, but distinct, creases.

Head black, .84 mm. in diameter; mandibles reddish. Median suture of head rather deep and wide and the head is now very roughly corrugated, densely clothed with rather heavy, blunt and more or less crooked, white hairs, .08 mm. in length on the average. Collar .76 mm. in diameter, dark chestnut brown, the hairs on it white, .08 mm. in length, straight, stout, broken at the tips into four or five sharp prongs. These hairs are in a double row, and in addition there are some scattered similar hairs, very much smaller, .03 mm. in length.

The body now studded with bulbous white papillae, .02 mm. in height and of the same diameter at base, from which project colorless straight and rather thick hairs, .04 mm. in height, broken at the summit into four or five sharp prongs. These bulbous papillae arranged in five, even, regular, vertical rows.

A substigmatal fringe of colorless long, sharp hairs, originating in bulbous papillae; these hairs .18 mm. in length, two to a segment, one anterior, one posterior. Anal segment with a fringe of similar hairs. Spiracles oval, .04 mm. in length, with a heavy white border.

Color of body pale greenish yellow. Legs shining black, tipped with red brown. Prolegs and ventral surface pale yellowish.

Length 4.4 mm. Width at first thoracic .80 mm. Width at anal segment .64 mm.

*Third Instar.*—Body as before, the white pronged hairs arising from the bulbous tubercles now .12 mm. in length. The bulbous tubercles greenish yellow, .04 mm. in height. The substigmatal sharp hairs .20 mm. in length.

Head 1.2 mm. in diameter, black, roughly corrugated, heavily clothed with pronged white hairs, .08 mm. in length on the average; some similar smaller ones, .04 mm. in length. Collar 1.08 mm. in diameter, with its white pronged hairs .16 mm. in length.

Spiracles pallid, .02 mm. in diameter. Anal segment with a fringe of sharp colorless hairs.

Color of body pale greenish yellow. Legs pale brown, shining, fuscous at tips. Prolegs and ventral surface pale lemon yellow.

Length 7. mm. Width at first thoracic 1.06 mm. Width at anal segment .80 mm.

*Fourth Instar.*—Body as before, the pronged white hairs arising from the bulbous tubercles .14 mm. in their greatest length, some as short as .10 mm. The white, bulbous papillae mostly .06 mm. in height, but varying considerably. The sharp, substigmatal hairs .30 mm. in length.

Head 1.44 mm. in diameter, black, densely clothed with irregular, filament-like, branching hairs, white, almost completely obscuring the black ground color; these hairs about .1 mm. in length on the average. Collar 1.26 mm. in diameter, black, with its pronged white hairs .18 mm. in length. Spiracles pallid, .03 mm. in diameter.

Color of body pale greenish yellow. Legs pale brown, shining, dark brown at tips. Prolegs and ventral surface pale lemon yellow.

Length 12. mm. Width at first thoracic 1.24 mm. Width at anal segment 1. mm.

*Fifth Instar.*—Body as before, the colorless, bulbous papillae .06 mm. in height, .04 mm. in diameter; the white hairs arising from these truncate and sharply pronged, projecting to an average height of .12 mm. and .03 mm. in diameter at the summit; the largest of these hairs run to .20 mm. in length. Surface of body finely granulated. Segmental incisures sharply defined, green.

Head 2.90 mm. in diameter, black, rugose, densely clothed with filament-like, branching hairs, white; these hairs are irregular in length, about .5 mm. on the average and by their density almost completely obscure the black ground coloration. Collar sordid white, the fringe of colorless, truncated, pronged hairs on it averaging .34 mm. in length. Spiracles oval, .1 mm. in length.

Color of body pale yellowish green. A narrow, green, dorsal line. A laterodorsal, greenish stripe, indistinct, edged below with an equally indistinct, crenate, pale yellowish line. A substigmatal pale yellowish band. As the stage develops the larva assumes a more and more pale salmon tinting, in some cases quite obliterating the greenish ground color, and the bands become pale pinkish. Legs pale yellow, fuscous at the tips. Ventral surface and prolegs pale green.

Length 27. mm. Width at first thoracic 4. mm. Width at anal segment 2.3 mm.

*The Pupa.*—Densely covered with a bright bluish dusting, which, however, is easily dissipated. After this bluish dusting has been removed the thorax and the wing cases are yellow mahogany, the wing cases clear and shining. Abdominal segments dull pinkish. Eyes prominent, of a slightly deeper tone of coloration. Cremaster dull black, tipped with reddish.

Rather densely clothed, except on the wing cases, and especially on the abdominal segments, with strong, sharp, pointed hairs, of varying lengths; the largest .54 mm. in length, then shorter ones to .20 mm. These, for the most part, are colorless, but some, especially those on the thorax, are tinged with reddish. The tubercles from which these hairs arise very low, hardly perceptible.

Head case with five distinct patches of hairs, .60 mm. in length quite uniformly. Tubercles by eyes prominent, elevated, black. Spiracles oval, .19 mm. in length, with a fine fuscous ring.

On thorax a fine dorsal line, not observable when the bloom is removed, terminating a little posterior to middle in a short transverse band, more specifically two, more or less connected, quadrate spots; below these, at a distance of nearly 1 mm., two more similar spots, from which the fine dorsal line is continued. On either side of the dorsal line an inconspicuous row of dark points in a semi-circle.

Abdominal segments dorsally with a series of eight, rounded or subquadrate, dark points in a transverse row, not at all prominent until the bloom is removed; these spots of quite uniform size, but the two central ones are always the largest.

Length 16 mm. Width at eyes 4. mm. Width in middle of thorax 4.75 mm. Length of cremaster 1.4 mm.; width of cremaster at tip .34 mm.

## The Genus Pseudogarypus Ellingsen (Pseudoscorpionida-Feaellidae).

By Joseph Conrad Chamberlin, Stanford University, California.

### Introductory.

Due to its many unusual characters and its unusual systematic position the genus *Pseudogarypus* is possessed of more than ordinary interest to the student of the Chelonethi. So far as known it comprises but a single known species and since this species has so far been but inadequately treated, it has been thought well worth while to go into as great detail as possible in the following treatise. Since my material consists of but a single adult male specimen, it is obvious that in a number of respects this work must be incomplete, but nevertheless a great many facts and characters have been carefully worked out and it has been thought best to present this evidence at this time rather than to await the discovery of more material. The female should prove particularly interesting.

My thanks are due Prof. G. F. Ferris for his everwilling aid and advice. To Dr. R. V. Chamberlin, of Cambridge, I am indebted for the specimen upon which this paper is based.

### Historical Remarks.

*Pseudogarypus bicornis* was first described by Nathan Banks in 1895 from specimens collected in the Yellowstone National Park. While realizing some of its unusual features and remarking that it would possibly fall in a group generically distinct from *Garypus*, the genus to which he referred it, he did not bring out its distinctive features at all clearly and hence the species was practically lost sight of for many years. With, in his excellent paper of 1906, fully realized some of its unusual

features and commented that a new genus would probably be necessary for its reception. Finally, in 1909, Ellingsen, who had received a single specimen from Shasta Springs, California, erected a new genus for its reception which he called *Pseudogarypus*. He gave no figures and did not discuss it in any detail so that is has never aroused the interest to which its unusual features and characters entitle it.

### Determination.

There are several discrepancies between Banks' description and my specimen but these are, I am convinced, due to Banks' misinterpreting some of the characters of his specimen rather than to any valid difference. As Ellingsen remarked in his paper, "I have no doubt that the animal I have before me belongs to the same species described by Nathan Banks in spite of one or two differences between Banks' description and my animal." That this determination is probably correct is further enhanced by the geographical proximity of Bear Lake, Utah, where my specimen was collected, to the Yellowstone National Park, the type locality of the species. The close coincidence in measurements between my specimen and the measurements of the species as given by Ellingsen, make it seem very nearly certain that Ellingsen's specimen is also conspecific with mine.

### Systematic and Morphological Section.

#### Feaellidae Ellingsen.

1906—Feaellidae Ellingsen, Ann. Mus. Civ. Stor. nat. Genova. (3): II: 260-263: IV.

1906—Feaellidae Ellingsen, With. D. kgl. Dansk. Vid. Selsk. Skrift. 7. Række, nat. og. math. Afd. III: 58.

1908—Feaellidae Ellingsen, With, Særtryk af Vidensk. Meddel. fra den naturh. Foren. Copenhagen. 8-12: 1 figs. 1-10.

*Diagnosis—All tarsi single-segmented; tarsi always longer than tibiae; all femora divided into a pars basalis and pars tibialis by a freely movable ginglymous articulation; eleventh tergite and tenth (eleventh?) sternite fused into a single ventral shield which bears centrally the anal opening which is provided with a bi-partite operculum; with four eyes.*

*Remarks*—The above characters will include the only two known genera of the family. Ellingsen, in his paper of 1909

(on *Pseudogarypus*), does not make it clear whether or not he considered *Pseudogarypus* as falling into the Feaellidae or not. He rather noncommittally states that it will stand more or less between *Feaella* and *Garypus*. While the differences between the genera are considerable, the resemblances are likewise numerous and consequently it is my opinion that the two genera will fall into the same family. The most striking difference is in the pleural abdominal plates of *Feaella*, but since *Pseudogarypus* possesses a well-defined cephalothoracic pleural plate even this difference is not as great as it may seem. However, I think there is no doubt that the two genera are representatives of two distinct sub-families.

As to the relationship of the family as a whole I am not at present competent to speak. As a purely tentative opinion I think that there is considerably more resemblance to the *Chthoniids* and especially the *Obisiids* than the leg structure warrants me to believe. However, the single-segmented tarsi are not too great a barrier, since their elongate structure gives some reason for thinking that this may be due to a secondary fusion of an originally two-segmented condition. This same feature is exemplified in the Chthoniidae where we find elongate fore tarsi which are single-segmented, while the hind tarsi are of the typical two-segmented structure of the *Obisiidae*, *Garypidae*, etc. My conclusion is based to a great extent on the structure of the male genitalia, which strikingly resemble in several respects those of the *Chthoniid-Obisiid* group of genera. For example, the remarkable genital sacs here figured for *Pseudogarypus* are almost duplicated in *Garypinus* (Chamberlin, 1923) and the two crescent-shaped posterior chitinous portions which bear the setae (Fig. 14-b) find their counterpart in both the *Chthoniids* and certain of the *Obisiids*.

FEAELLINAE Ellingsen.

*Diagnosis*—*With a well developed ginglymous articulation between the cephalothorax and the abdomen; apparently without a distinct cephalothoracic pleural plate; with a dorsal lateral row of fifteen small pleural plates and a similar row of fourteen ventral pleural plates; carapace bearing along its anterior*

*margin a double row of prominent bulges or rather tuberculate processes; palpi of a distinctly aberrant type, not shaped at all as in Garypus but approaching to some extent those of the Chthoniidae.*

For further information concerning this sub-family see the references listed under the family heading, all of which concern this sub-family only. So far three species have been described in the genus *Feaella*, two from Africa (*mirabilis* from Portuguese Guinea; *mucronata* from Natal) and one (*affinis*) from the Seychelles Islands.

(To be continued)

## A New Species of the Genus Buenoa (Hemiptera, Notonectidae).

By H. B. Hungerford, Lawrence, Kansas.

During August of 1922, under the auspices of the Entomological Survey of Minnesota, Doctor Harry Knight, Mr. Wm. E. Hoffmann and the writer made a 1200-mile collecting trip through Minnesota. Special attention was given to the aquatic insects of this region of innumerable lakes and ponds. A portion of the journey was along the north shore of Lake Superior to Grand Marias. North of Grand Marias and some fifteen miles from the lake, we camped by a large beaver pond. This pond occupies a basin hemmed in against a high hill by a meandering glacial eskar. This high and well-defined ridge, after running for some distance parallel with the hill, makes a wide crescentic curve to the hill, thus disputing the right of way with the drainage between hill and eskar. A stream had cut a narrow gap of a few rods through the eskar, and at this strategic place, the incomparable rodent engineers have built a high dam, forming a pond that is at least eight feet deep in spots and covers several acres.

Here and there stand stark trees, killed when the water encompassed them, and piles of drift brush lodged in time of freshet. The water is stained therefore with the amber color characteristic of such places. This first dip of the writer's net brought up two specimens of a beautiful new species of back-

swimmer. Diligent collecting by Mr. Hoffmann and the writer secured a splendid series of this most striking and distinct North American *Buenoa*.

The apparent isolation of this insect and our failure to collect it elsewhere in our rather careful search for aquatic Hemiptera, is worthy of note. Like the others of its genus, it swims submerged, and its body is richly supplied with the blood-red oxyhaemoglobin-bearing cells. It, like the smaller *B. elegans* Fieb., swims in the shallow, protected waters along shore, differing thus from *B. margaritacea*, which prefers the deeper water.

**Buenoa limnocastoris** species new.

*Size*: Length, 6.25 mm. to 7 mm.; width across the eyes in largest female, 1.3 mm.; greatest body width, 2 mm. The males are more slender, the head being fully as wide as greatest body width, the average being about 1.2 mm. for head width.

*Color*: The living insects are very striking in their pattern of black and white, the limbs and underside of body deep mahogany. The prothorax is whitish with a smoky to black patch on either side above the margin; scutellum colorless; elytra whitish with shining black band covering humeral angle and extending along the anterior margin of wing for about one-third of its length, another large, triangular, black spot at tip of corium, extending across the wing; propleura of prothorax black, opaque; parapleural plates black, save a yellow patch along ventral margin; longitudinal dark area on sides of thorax visible through the transparent wings; the abdominal segments immediately beneath the corial black patches, black; abdominal venter blackish in dead specimens; median longitudinal black stripe on beak, all the tibiae and hind femora. In life the rich red of the oxyhaemoglobin within the abdomen, shows through the sides of abdomen and makes the venter dark mahogany.

*Shape*: The eyes are protuberant and prothorax narrow, markedly narrower than the head in both sexes, and impressed with two longitudinal depressions more or less distinct. The pronotum of the male inflated, and in dead specimens the disc stands up as a transparent, elongate, heart-shaped area, divided longitudinally by the median carina. Scutellum reduced, narrow, elevated, but depressed near its front margin by a deep transverse groove.

*Structural Peculiarities*: Tylus prominent, more prominent in male than female. Synthlipsis narrower in male than in female in which it is less than half the vertex. In cephalic view the inner margin of eyes parallel.

Pronotum faintly tricarinate in the female, more distinct in the male; in lateral view the pronotum of the male is strongly arched and inflated, the lateral margins prominent and distinctly ledged, the lateral areas beneath the ledge depressed. Scutellum reduced in both sexes, relatively larger in female than in male; in the female, scutellum two-thirds length of pronotum and a little less than one-third length of elytral suture; in the male scutellum is not more than one-half length of pronotum and less than one-third length of elytral suture. Claval orifice just behind tip of scutellum, two-thirds the length of scutellum in both sexes. Surface of elytra rastrate and pebbled, especially in the black areas; the dark sides of pronotum above the ledge sparsely rastrate, also the upper half of parapleural plates.

Front femora greatly swollen in male and somewhat thickened in female. Front tibiae flattened in both sexes, broader at base in male and bent along its long axis; tarsi two-segmented in both sexes. Middle femora slender, angulate; tibiae flattened, not quite attaining distal end of trochanter when limb is flexed; tarsi two-segmented, segment one not quite a third longer than two; tarsal claws about one-third length of distal tarsal segment in male, claws more developed in female, about one-half distal segment; front and middle limbs equipped with strong, mobile setae. Hind limbs flattened and fringed, tibia one-seventh shorter than the femur; hind tarsi two-segmented, segments subequal in length, tarsus about one-fifth shorter than hind tibia.

Described from a long series taken near Maple Hill, Cook County, Minnesota. *Holotype* in University of Minnesota collection, *allotype* in University of Kansas collection, *paratypes* in University of Minnesota, U. S. National Museum and following private collections: W. E. Hoffmann, J. R. de la Torre Bueno, R. F. Hussey, Dr. Carl Drake, Dr. H. M. Parshley and that of the writer.

NOTES: This species is quite unrelated to the *Buenoa margaritacea-platycnemis* series, which have orange in their coloring and are very compactly formed creatures. Furthermore, each of the above species has a head that fits firmly against the short pronotum, a large scutellum as long as the pronotum at least, and very broad; and in them, the elytral orifice is less than one-third the length of the scutellum, which is more than one-half the elytral suture.

The new species is much more nearly related to what we know as *B. elegans* Fieb. This latter species I have taken in large numbers in what is known as "Stubbs Pond," near Law-

rence, Kansas. *B. elegans* Fieb. is considerably smaller, however, and structurally distinct. The new species has, in general, the same coloring—black and white. The humeral and corial black spots are the same. The black stripe on sides of thorax in *B. elegans* Fieb. is more prominent, but in all of my specimens, the pronotal lateral spots are lacking. I have specimens of this smaller species which lack all black markings.

In structure, the two species are quite distinct: the eyes of *B. elegans* are closer together; in males the synthlipsis very narrow, eyes almost touching; the pronotum is not arched and scutellum is much larger. In the male the scutellum is three-fourths as long as pronotum, more than twice as long as elytral orifice and one-third as long as elytral suture; in the female the scutellum is relatively larger, being as long as pronotum. In side view the difference between these two species is especially well marked in the males. *B. limnocastoris* has front femora more strongly incrassate and pronotum arched. Furthermore, the male genitalia show them to be distinct.

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### Notes on Two Species of Lepidoptera Described by Guenée (Noctuidae, Geometridae).

**Acronycta clarescens** Gn.

1852, Gn., Spec. Gén., V, Noct., I, 54, *Acronycta.*

M. C. Oberthür, *Études de Lépidoptérologie Comparée*, XVII, 21, states: "L'étiquette écrite par Guenée, auteur toujours extremement sincère, est ainsi conçue: 'Je ne me rapelle pas si cet individu a servi á ma description, mais j'ai tout lieu de le croire.'" On plate DV, fig. 4217 this specimen is shown. In view of the fact that M. Guenée appeared to be in doubt whether this specimen served for his description or not and the fact that there is a specimen labeled "type" in the British Museum, which corresponds to *A. clarescens* in the sense used by Hampson and later authors and where the Doubleday specimens described by Guenée should be, the present authors are led to disagree with Dr. McDunnough, who placed *primi* Harris synonomous, in a recent paper—(1922 Ent. News., xxxiii, 228).

With doubt cast upon the authenticity of M. Oberthür's type by M. Guenée himself, there seems to be no other course available than to accept the type in the British Museum as representing the species. The synonomy in the Check List (B. & McD., 1917) will stand unaltered.

**Xanthorhoe defensaria** Gn.

1851, Gn., Spec. Gén., X., 411, *Coremia.*

1920, Oberthür, Etud. Lepid. Comp., XVII, 23, (pl. DVII, f. 4240, Fig. type?, *convallaria?*, *guenéata?*) *Coremia.*

1922, McD., Ent. News, XXXIII, 229, *Coremia.*

Dr. McDunnough, evidently not seeing the text of the *Études*, states that M. Oberthür's figure cannot represent the type of *defensaria* and "represents a specimen of *Perizoma polygrammata*, Hlst. or one of its close allies."

The species figured by M. Oberthür is probably *Perizoma custodiata*, Gn=*guenéata* Pack.

Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1923.

### Those Unlabeled Figures.

A short time ago, in preparation for an exercise of our professorial function, we studied Dr. W. T. M. Forbes' paper on *The Wing-Venation of the Coleoptera* in the Annals of the Entomological Society of America for December, 1922. We do not profess any expert knowledge of beetles but we have made preparations of the wings and we have followed the general outlines of the work of Lameere, Gahan and others on the application of venation to the classification of the Coleoptera. Our expectations that we would derive much instruction from Dr. Forbes were realized. We must confess, however, that what made a greater impression upon us was the fact that we were constantly compelled to turn back several pages from his plates to find out just what genus a given figure represented. At last there appeared to be nothing else to relieve our growing disgust than to take pencil and write the name of the genus alongside each one of the 71 figures on the seven plates. Our kindly feelings toward the author and the editor were not improved by these labors. It was a relief not to be obliged to repeat this performance in studying Mr. G. A. Graham's paper on the same subject in the June, 1922, number of the same Annals.

We wrote in the NEWS for October, 1921:

> One source of annoyance to the reader of illustrated papers arises from having to compare figures relating to different forms on a plate and to hunt for the names of the species in an "Explanation of Plates," or even in a list of names at the bottom of the plate. Why would it not save time and irritation and prevent neglect if we put the specific [or generic] name (or an abbreviation of the name) alongside each figure, or group of figures, on the plate itself?

A frequent contributor of papers with many illustrations to our entomological journals, with whom we had some corre-

spondence on this question of labeling figures, wrote that, while this was desirable, the expense of having the names *engraved* was prohibitive. We never dreamed of engraving. An author who draws his own figures, as most of us do, can surely lay his plate of drawings on a board with a straight edge, level it with a T-square, make two parallel pencil lines separated by an appropriate distance, near each figure or group of figures, and with his pen insert the name of the genus or species, as the individual case requires, between these guiding lines.

But of course we don't expect these suggestions (not to use a stronger word) to do any good where improvement is most needed. Those who, like Mr. Knight in the NEWS for March, 1923, are already convinced of the desirability of this practice will continue in their praiseworthy course, but those, otherwise minded (and we don't class Dr. Forbes here)—

But the editors of our entomogical journals *can* do something to improve the condition complained of. Will they?

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### On the Geographical Distribution of Thorybes confusis Bell (Lepid.: Hesperiidae).

Though this species was described from specimens collected at Tampa, Florida, it appears that its geographical distribution covers a wide range over the southern part of the United States.

In the paper of Dr. Henry Skinner and Mr. R. C. Williams, Jr., *On the male genitalia of the Larger Hesperiidae of North America* (Transactions of the American Entomological Society of Philadelphia, Pa., XLVIII, 124), it is recorded from Blanco County, Texas; Georgia, South Carolina and North Carolina, and I have received specimens from Hope, Arkansas; Jennings, Missouri; Takoma Park, Maryland, and Washington, D. C., and have seen some from localities in Alabama.

The distribution of this butterfly therefore probably covers all of the States from Maryland, south to Florida, west to Missouri, Arkansas and Texas, and further collecting will very likely record it from the states immediately west of Arkansas and Missouri, as it does not seem at all scarce at Hope, Arkansas, which is quite close to the Oklahoma line, while its occurrence at Washington, D. C., and nearby places in Maryland make it seem probable that it will also be found in Delaware and possibly the extreme southern portion of New Jersey.—E. L. BELL, Flushing, N. Y.

### Professor and Mrs. Cockerell to Visit Siberia.

My wife and I expect to visit the coast of Siberia during the summer. Very good fossil insects have been found there. We expect to leave Seattle June 7, have four days in Japan and reach Vladivostock June 25.

T. D. A. COCKERELL.

### Robbery! High Reward! Warning to Buyers!

In the summer of 1921 the following species were stolen from our establishments: *Parnassius davidis, honrathi, simo, delph.* v. *cardinalis, charltonius, princeps, imperator* ♂, *musageta, nordmanni, etc.*, note especially: *imperator* ♀, *musageta* ♀, with gigantic ocellae, *charltonius verus* ♂, *bryki* ♀, Co-Types, as well as many exotic Lepidoptera (probably already stolen in 1920) especially show specimens and rarities.

We promise a high reward to everyone being able to furnish us any notice about these insects and we guarantee to use their information under the strictest discretion. In case one or the other above mentioned species should have been offered to you by dealers or by persons, even seemingly highly trustworthy, please send us the correspondence.—DR. O. STAUDINGER & A. BANG-HAAS, Dresden-Blasewitz, Germany.

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### Vitality of a Cecropia Moth (Samia cecropia, Saturnidae, Lep.).

In the early part of the Winter, Mr. William Jay, of Mt. Airy, Philadelphia, brought me a branch of elder on which was clustered a compact bunch of eleven Cecropia cocoons, some of which were dead, but quite a few were alive. Wishing to retain the cluster of cocoons intact, I soaked them in gasoline, with the idea of killing such pupae as were alive. The cocoons were hung in a room where the temperature was kept at about seventy degrees Fahrenheit. On February 4, a male moth emerged; I placed the moth out of doors where it remained all night in a temperature between 15 and 17 degrees. In the morning the moth to all appearances was dead; I took it in the house and placed it in a room where the temperature was 50 degrees. In about an hour I noticed a twiching of the feet, so I removed the moth to a warmer room where the thermometer registered 72. In an hour the moth was flying around the room.—PHILIP LAURENT, Philadelphia, Pa.

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### Bolletino della Scuola Superiore d'Agricoltura de Portici.

The authorities of the Scuola superiore d'Agricoltura of Portici, Italy, are desirous of increasing the range of diffusion of their *Bollettino* and are making a subscription price of two dollars per volume to American entomologists. This journal contains many very important articles and is well worth the price asked for it. It should be on the shelves of all our entomological libraries. Correspondence concerning subscriptions may be addressed to Professor F. Silvestri at the school.—G. F. FERRIS, Stanford University, California.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **14**—Proceedings of the Zoological Society of London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **46**—Contributions to the Natural History of the Lepidoptera of North America. Ed. by Wm. Barnes. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **54**—Proceedings of the Biological Society of Washington, D. C. **68**—Science, Garrison on the Hudson, N. Y. **70**—Journal of Morphology, Philadelphia. **86**—The Quarterly Journal of Microscopical Science, London. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **101**—Journal of The Linnean Society of London. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rundschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **138**—American Museum Novitates, New York.

**GENERAL. Berlese, A.**—Gli insetti, Vol. II, Fasc. 28-33. **Brues, C. T.**—Choice of food and numerical abundance among insects. **12**, xvi, 46-51. **Felt, E. P.**—Problems in economic entomology. **12**, xvi, 39-45. **Graham & Ruggles**—The obligation that economic entomology owes to forestry. **12**, xvi, 51-61. **Hagan, H. R.**—Historical outline of the development of entomology to 1800. (Trans. Utah Acad. Sci., ii, 47-54). **Horn, W.**—Et meminisse et vaticinari liceat. **49**, xii, 67-i. **Leng, C. W.**—Memories of fifty years ago. **19**, xviii, 1-12. **Sanders, J. G.**—Whither in entomology. **12**, xvi, 31-9.

**ANATOMY, PHYSIOLOGY, ETC.** **Bowen, R. H.**—Studies on insect spermatogensis. **86,** lxvi, 595-626. **Cannon, H. G.**—A further account of the spermatogenesis of lice. **86,** lxvi, 657-67. **Huettner, A. F.**—The origin of the germ cells in Drosophila melanogaster. **70,** xxxvii, 385-419. **Yocum, H. B.**—The occurrence of Telosynapsis in the male germ cells of an Hemipteron, Leptocoris trivittatus. **70,** xxxvii, 287-306.

**ARACHNIDA AND MYRIOPODA.** **Brolemann, H. W.**—Notes on female paraiulids (Myriapods), with description of a n. sp. **7,** xv, 281-309. **Stear, J. R.**—Introduced mite attacking willow. **12,** xvi, 96.

**THE SMALLER ORDERS OF INSECTA.** **Krafka, J.**—Morphology of the head of trichopterous larvae as a basis for the revision of the family relationships. **6,** xxi, 31-52. **Mertens, H.**—Biologische und morphologische untersuchungen an Plekopteren. **111,** 1923, A, II, 1-38. **Sulc, K.**—Eine neue Psylla und eine neue Rhinocola aus Surinam. Eine neue Panisopelma und eine neue Trioza aus Chile. Ueber die stinkdrusen und speicheldrusen der Chrysopen. (Sitz. Bericht. Bohmischen Gesel. Wiss., Math.-Natur. Clas., 1914, IV, V, IX). **Tillyard, R. J.**—The wing-venation of the order Plecoptera or mayflies. **101,** xxxv, 143-62. **Walker, E. M.**—Notes on the Odonata of Godbout, Quebec. **4,** lv, 5-12. **Williamson, E. B.**—Notes on the habitats of some tropical species of Heterina. A new species of Archaeogomphus. (Odonata). **88,** No. 130; 134.

**ORTHOPTERA.** **Carpentier, F.**—Musculature et squelette chitineux. (Mem. Ac. R. Belg., Cl. Sci., vii, Fasc. 3, 56pp.) **Hebard, M.**—Studies in the Mantidae and Phasmidae of Panama. **2,** xlviii, 327-62.

**Davis, W. T.**—A new walking-stick insect from eastern N. A. **6,** xxxi, 52-55.

**HEMIPTERA.** **Baker, A. C.**—Tingidae. **68,** lvii, 272. **Hungerford, H. B.**—Notes on the eggs of Corixidae. **19,** xviii, 13-16. **Matthews, A. L.**—Some uncommon plant pests. (Trans. Utah Acad. Sci., ii, 41-4.) **Osborn, H.**—Neotropical Homoptera of the Carnegie Museum. (An. Carnegie Mus., xv, 8-79.) **Otanes, F. Q.**—Head and mouth-parts of Mecoptera. **7,** xv, 310-27. **Parshley, H. M.**—The type specimens of Lygaeus kalmii, subsp. angustomarginatus. **19,** xviii, 23.

**Davis, W. T.**—Notes on N. American cicadas with descriptions of n. sps. **6,** xxxi, 1-15. **Horvath, G.**—A new species of Galeatus from New Mexico. (An. Carnegie Mus., xv, 108-9.) **Knight, H. H.**—A new sp. of Labopidea on garlic. **19,** xviii, 31. **McAtee, W. L.**—A new sp. of Otiocerus (Fulgoridae). **54,** xxxvi, 45-8. **Olsen, C. E.**—Studies of the species in the genus Cicadella of America, north of Mexico. **7,** xv, 353-69.

**LEPIDOPTERA. Bell, E. L.**—Amblyscirtes textor from Virginia. Euphyes dion in New Jersey. Collecting notes on L. Collecting Florida butterflies in March. **19,** xviii, 12; 21; 24-27. **Draudt, M.**—Fauna americana. Genera Eudamus-Heronia; Lithosiinae: Chrysozana-Tigrioides. (Seitz. Macrolep. of the World, Part 266-272.) **Gaede, M.**—Alte und neue Arctiinae des Berliner Zool. Mus., **114,** xl, 7-8 (cont.). **Heinrich, C.**—On the synonymy of the pea moth. **4,** lv, 13. **Jordan, K.**—Ueber einige alte und neue Sphingides. **49,** xii, 51-7. **Kaye, W. J.**—A catalogue of the Trinidad Lepidoptera Rhopalocera. (Mem. Dep. Agric. Trinidad and Tobago, No. 2, 1921, 163pp.). **Kruger, E.**—Weiteres ueber Columbische Brassoliden. **114,** xl, 8 (cont.). **Lavallee, A.**—Comportement et homochromie de la chenille du Sphinx pinastri. **20,** 1923, 19-20. **Prout, L. B.**—New species and forms of Geometridae. **11,** xi, 305-22. **Schaus, W.**—New sps. of Notodontidae from S. America in the Carnegie Museum. (An. Carnegie Mus., xv, 80-9). **Seitz, A.**—Fauna americana. Micrarctiinae: Eubaphe-Leptarctia. Spilosomini: Spilosoma-Turuptiana. (Seitz. Macrol. of the World, Part 272, 273). **Stichel, H.**—Beitrage zur kenntnis der Riodiniden fauna Sudamerikas. **45,** xviii, 1-9.

**Barnes & Benjamin**—Nomenclature, notes and new species. **46,** v, 53-96. **Fruhstorfer, H.**—Neue Parnassiusrassen aus Nordamerika. **115,** xxxviii, 5. **Mayfield, H. D.**—A new form of Catocala gracilis. **19,** xviii, 33.

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new mosquito from Br. Columbia. **4,** lv, 4-5. **Hull, F. M.**—New Syrphidae from Mississippi. **7,** xv, 370-73. **Malloch, J. R.**—Some new g. and sps. of Lonchaeidae and Sapromyzidae. **10,** xxv, 45-53. A new N. Am. species of the genus Beckerina. The N. Am. sps. of the chloropid genus Cetema. **19,** xviii, 32-3. **Shannon, R. C.**—A reclassification of the subfamilies and genera of N. Am. Syrphidae. **19,** xviii, 17-21.

**COLEOPTERA. Bowditch, F. C.**—Studies among the American Galerucidae. **9,** lvi, 62-4. **Dury, C.**—Lepidocricus herricki. **19,** xviii, 27. **Forbes, W. T. M.**—The wing-venation of the Coleoptera. **7,** xv, 328-51. **Lucas, R.**—Coleoptera fur 1916. (Mit nachtragen zu fruheren berichten). **111,** 1917, B, V, 1-325. **Mueller, R.**—Ueber die sinneszellen im fuhler von Necrophorus vespille. **114,** xl, 5-7 (cont.). **Mutchler, A. J.**—Notes on West Indian Lycidae and Lampyridae, with descriptions of new forms. **138,** No. 60. **Pavlovsky, E. N.**—On the biology and structure of the larvae of Hydrophilus caraboides. **86,** lxvi, 627-56. **Van Duzee, E. P.**—An entomological antique. **68,** lvii, 269. **Verhoeff, K. W.**—Beitrage zur kenntnis der Coleopteren-larven mit besonderer berucksichtigung der Clavicornia. Zur kenntnis der Canthariden-larven. **111,** 1923, A, I, 1-109; 110-37. **Wolcott, A. B.**—Two n. sps. of West Indian Cleridae. **138,** No. 59.

**Blatchley, W. S.**—Notes on the C. of southern Florida, with descriptions of n. sps. **4,** lv, 13-20.

**HYMENOPTERA. Bell, E. L.**—A hymenopterous parasite of Epargyreus tityrus. **19,** xviii, 33. **Bluthgen, P.**—Zur biologie der bienengattung Sphecodes. **45,** xviii, 19-23. **Criddle, N.**—The life habits of Cephus cinctus in Manitoba. **4,** lv, 1-4. **Cushman, R. A.**—A new subfam. of Braconidae from termite nests. **10,** xxv, 54-6. **Davis, W. T.**—Late swarming of ant Lasius claviger. **19,** xviii, 23. **Elliott, E. A.**—Monograph of the hymenopterous family Stephanidae. **14,** 1922, 705-831. **Frison, T. H.**—Systematic and biological notes on bumblebees. **2,** xlviii, 307-26. **Stumper, R.**—Etudes sur les fourmis. V. Les reflexes de nettoyage. **34,** v, 29-31.

**Banks, N.**—Notes and descriptions of some fossorial H. **4,** lv, 21-3. **Cockerell, T. D. A.**—The earliest known ponerine ant. **9,** lvi, 51-2. Two nocturnal bees and a minute Perdita. **138,** No. 66. **Curran, C. H.**—A new genus and sp. of Xyelidae from western Canada. **4,** lv, 20.

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A Naturalist on Lake Victoria, with an Account of Sleeping Sickness and the Tse-tse Fly. By G. D. Hale Carpenter, Uganda Medical Service, etc. E. P. Dutton & Co., New York. 8vo., pp. xxiv, 333, 2 col. pls., map, charts, 87 ills. First published in 1920.

The extent of entomological literature is so great and the ability to examine it so limited by the various demands on one's time, that we

make no excuse for admission to the pages of the NEWS of notices of articles and books which have been published for some years, or have not been sent to the NEWS for review, as happens in this case. We regret that so few notices of entomological literature are offered to us for publication, and would gladly welcome more.

Dr. G. D. H. Carpenter, son of the well-known zoologist and student of the echinoderms, P. H. Carpenter, F. R. S., investigated the bionomics of the Tse-tse fly, *Glossina palpalis*, at various places on or near Victoria Nyanja[1], from the middle of 1910 to about March, 1913, from December, 1913, to August, 1914, and for some period subsequent to November, 1918, under the auspices of the Tropical Disease Committee of the Royal Society. "This book is an attempt to give an account of the life on the islands of the Victoria Nyanja." The first three chapters contain one of the best, summarized, historical narratives of Sleeping Sickness, its natural history and that of *Glossina palpalis*. Three chapters furnish a description of the lake, three are devoted to the vertebrates. The last four (pp. 195-322) deal with insects, 80 of these pages being concerned with the coloration of insects, as displayed in Uganda, and with the case of *Pseudacraea curytus*. This last is a member of a genus of Nymphaline butterflies closely allied to the more widely spread *Limenitis*, but confined to the Ethiopian region, including Madagascar. *Ps. curytus* is "a single, [widespread], polymorphic species [which] mimics sundry species of models of very different appearance in different localities; where a model is sexually dimorphic the sexes of the mimic faithfully copy the corresponding sex of the model. Yet in the very locality where this dimorphism of model and mimic exists, other species of monomorphic models are closely copied by monomorphic forms of the same species of mimic" (p. 242). That the various forms of *curytus* are not different species is shown by the facts that, (*a*) there are no differences in the genital armature of the males, as pointed out by Dr. Karl Jordan in 1910, and (*b*) that from the eggs of the same female, reared by Dr. Carpenter, the varied forms of both sexes are produced (p. 264).

Prof. E. B. Poulton contributes a preface to this volume and many extracts from his letters to the author are contained in the chapter on *Pseudacraea*. Dr. Carpenter writes as an adherent of the theories of the value of coloration of which Prof. Poulton is so well known an advocate, and presents arguments in favor of the origin of mimetic varieties as due to natural selection as against mutation.

Notes on almost all the greater groups of insects are to be found in this book, which can be strongly recommended to entomologists and lovers of nature generally. PHILIP P. CALVERT.

[1]"Nyanja, not Nyanza. The former is Luganda for lake, the latter means nothing, and is erroneously copied from one book to another."

# NEW ARRIVALS

From Colombia, South America:
OVER 10,000 BUTTERFLIES, INCLUDING

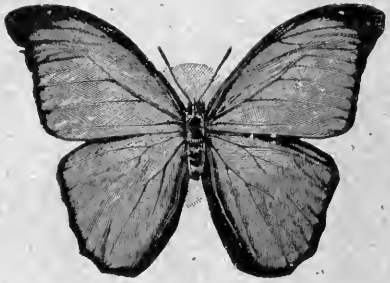
Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:
1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:
Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea
2000 Coleoptera
200 Orthoptera



From Assam, India:
1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species
From Tibet (Bhutan):

Armandia lidderdalii
Parnassius hardwicki

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JUNE, 1923

# ENTOMOLOGICAL NEWS

Vol. XXXIV No. 6



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MANUSCRIPTS. Address all other communications to the editor, Dr P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

TO CONTRIBUTORS. All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Proof will be sent to authors only when specially requested. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS*

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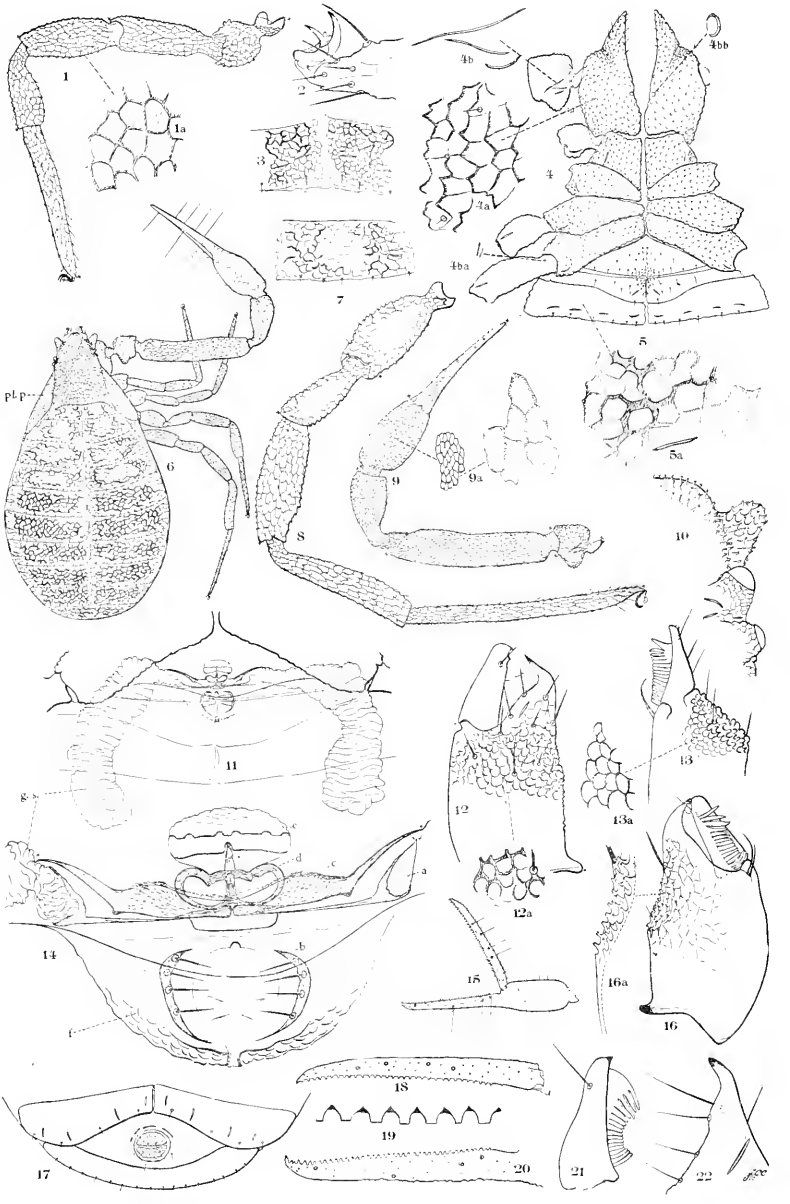
Owing to increased cost of labor and materials, no illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates.




PSEUDOGARYPUS BICORNIS.—CHAMBERLIN.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV JUNE, 1923 No. 6

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## The Genus Pseudogarypus Ellingsen (Pseudoscorpionida-Feaellidae).

By JOSEPH CONRAD CHAMBERLIN, Stanford University, California.

(Continued from page 149)

(Plate V.)

PSEUDOGARYPINAE subfamily nov.

*Diagnosis—Without a ginglymous articulation between the cephalothorax and abdomen; with a distinct and prominent cephalothoracic pleural shield laterad of the carapace and dorsad of the coxae of the legs; without the double row of abdominal pleural plates so characteristic of Feaella; each anterior lateral corner of the carapace prolonged into a prominent tuberculate process; palpi typical in shape, much as in Garypus.*

**Pseudogarypus** Ellingsen.

1909—*Pseudogarypus* Ellingsen, Estratto dal Boll. del Labor. di Zoologia generale e agra. Portici: 217-218.

*Orthotype—Garypus bicornis* Banks. Western United States of America.

The genus is sufficiently characterized by the sub-family diagnosis, and, since it is monotypic, by the following specific description.

**Pseudogarypus bicornis** (Banks) (Plate V, Figs. 1-22).

1895—*Garypus bicornis* Banks, Journ. New York Ent. Soc. III: 8-9.

1906—*Garypus bicornis* Banks, With, Dan. Exped. to Siam 1899-1900, III. Chelonethi, Dansk. Vidensk. Selskr., pp. 100 and 103.

1906—*Pseudogarypus bicornis* (Banks) Ellingsen, T. c. 218.

*Previous records and habitat notes*—Banks makes the following interesting statement: "This interesting species was found by Mr. Hubbard between the laminae of rocks at Specimen Ridge, Yellowstone National Park. Many were young and had formed little cases of silk and earth, in which to pass the moulting period. The structure of these young forms is not however different from that of the adult." Ellingsen had one specimen (sex not noted) from Shasta Springs, California.

*Material examined*—A single adult male from Bear Lake, Utah. Collected by Dr. R. V. Chamberlin. Habitat not designated.

The three known records would seem to indicate that the species will be found to range throughout the mountain regions of Western North America from elevations of 2,000 to 8,000 feet, depending upon various climatic factors.

*Measurements*—All the following series of measurements are given in millimeters. Length always precedes breadth and measurements of the legs and palpi are from trochanter to tarsus. Measurements are taken in the way With describes in his paper of 1906, pp. 57-58, (ref. cited under Feaellidae).

Length 2.7 mm. Carapace, (0.72-0.396). Abdomen, (2.03-1.57).

Palpus—(0.216-0.224), (1.116-0.216), (0.522-0.225), hand (0.522-0.288), fingers (0.828).

Chelicera—Length (tip of movable finger to base of hand), 0.243; width of hand 0.234; length of movable finger 0.108.

Leg I—(0.270-0.162), (0.387-0.117), (0.342-0.126), (0.288-0.09), (0.54-0.0684).

Leg IV—(0.34-0.162, (0.306-0.108), (0.45-0.108), (0.576-0.09), (0.756-0.0684).

Palpal teeth of movable finger—Average basal width 0.0115; average heighth 0.0115; average distance between teeth, 0.0076.

In the figures the points from which measurements were made are indicated by small cross marks (Fig. 9 for example).

*Morphology*—The carapace is much as shown in Fig. 6, but is scarcely as sharply marked off from the pleural plates (Fig. 6 pl. p) as might be inferred from the drawing. Rather the demarcation is a sort of "fading" from the hard reticulated chitin to a similarly reticulate divisional membrane and thence to chitin again, much as shown in Fig.

3. There is a slight trace of a median longitudinal furrow but this is not surely valid. The two anterior lateral horns arise from under the eye tubercles and extend forward almost even with the anterior median part of the carapace. Both anterior and posterior eyes are borne upon distinct tubercle-like processes (Fig. 10). Closely associated with the eyes (Fig. 10) are two or three lyriform fissures. The pleural plates are more or less sub-triangular, the apex lying almost directly under the posterior eye, while the more or less evenly rounded basal portion lies about even with the anterior margin of the third pair of coxae. Apparently they are somewhat more heavily chitinous than the carapace.

There are only ten visible tergites, the eleventh being fused with the last sternite and being completely invisible from a dorsal aspect. All tergites with the exception of the tenth are divided longitudinally by a distinct membranous suture, or rather area (Fig. 4). The first two tergites lie between the pleural plates and in consequence are considerably smaller than those which follow. Each tergite bears posteriorly from 18-20 or more minute setae which are very difficult to see on account of the heavy reticulation of the tergite and their minuteness. Likewise bordering the posterior margin of each tergite are about 10-18 lyriform fissures which are anterior to the setae row and which lie more or less laterally. Segment V bears 16 such fissures and in addition has one near each anterior lateral corner; the bordering setae number 20.

The chelicerae are basally (all but the fingers) entirely hidden from the dorsal aspect by the carapace. They are so completely figured (Figs. 12, 13, 16, 21, and 22) that there is little point in describing them in detail but a few points should be noted. The serrula exterior consisting of 17 or 18 teeth, is fused along its entire length to the movable finger, but as is clearly shown in Fig. 21 it is not a very long step to a condition where it would be distally free. This is practically identical with the type found in a few, if not many, of the Obisiidae, forms which are supposed to have this organ distally free. Lamina exterior absent or possibly present in a much reduced vestigial condition. The serrula exterior is apparently of a broad plate-like type and not toothed as in many forms, but its structure could not be worked out in any but the most sketchy way with the material available. The galea is apparently present (Fig. 13) but it is broken off on both chelicerae of my specimen. The arrangement of the setae and lyriform fissures will almost surely be found to be generic in character. The flagellum consists of two apparently simple setae, the anterior one of which is longest and also strongly curved distally (Fig. 13-16). An interesting feature of the chelicerae is the extremely rugose and heavily chitinized area on the basal part of the fixed finger and that part of the hand adjacent to it (Fig. 16 and 16a). Fig. 16a shows by a dotted line the actual thickness of the chitin and shows how greatly it increases in density where the rugosity is greatest. These rugose portions of each chelicera normally face each other and hence it seems likely that they

are manducatory in function, their rugosity and heavy structure admirably adapting them for a crushing or tearing function.

The coxae of the palpi or the maxillae are very large, having almost as great an area as that of the coxae of all the legs combined. They partially overlie the basal part of the chelicerae. I am not able to entirely follow With, in his excellent treatment of the maxillae in his paper of 1906, but apparently he applies this name to the entire coxae of the palpi. The anterior seta bearing portion is spoken of as the manducatory portion (Fig. 4). The central elliptical lyriform fissure is present but rather small (Fig. 4bb). This fissure is found in many of the Obisiidae and some of the Garypidae, but not apparently in the Cheliferidae or related families, thus forming another bit of evidence tending to show that the affinities of the genus *Pseudogarypus* are not with the single-segmented-tarsal forms. The labrum apparently consists of a rather elongate, narrow process, which is semi-membranous in structure, with an evenly rounded anterior termination. The sucking organ and a number of other oral structures could not be worked out in my specimen. The trochanter of the palpus bears ventrally a system of three prominent lyriform fissures (Fig. 4b), while the trochanter of each of the legs bears a single one. Minute setae are sparsely scattered over the coxae. Each coxa bears a single lyriform fissure near its posterior lateral corner.

The palpi while resembling those of *Garypus* are notable for their comparatively short tibia, which is no longer than the hand. (Fig. 9). The arrangement of the tactile setae is figured in detail. All the setae have been broken off in my specimen but the wide areoles leave no doubt as to their function. The prominence and even and compartively wide spacing of the palpal teeth is noteworthy. The fixed finger bears 41 teeth; the movable one 33.

The legs are figured in detail, showing the approximate distribution of the setae and the characteristic reticulation. The setae bordering the posterior margin of the tarsi are apparently not paired although giving a superficial appearance of it. No tactile setae were observed on any of the legs, nor were any areoles noted which were fitted for their reception. This latter might be very easily overlooked however owing to the roughness of the reticulations. Both claws and subterminal setae are simple (Fig. 2). The smooth place on the trochanter and pars basalis of Leg IV (Fig. 8) is apparently where they rub against the body of the animal.

The genitalia are fairly complex and present a very characteristic general appearance (Fig. 11 and 14). Owing to the lack of a terminology it is impossible to say much concerning the genital characters other than to point out some of the most salient features. Overlying the entire genitalic structures are the first two abdominal sternites (really the first and third?), the first one entire and more or less subtriangular, the second one typically divided. They bear medially

a dense cluster of minute setae (Fig. 5). Everything shown in Fig. 14 is internal. The genital sacs (Fig. 11 g. s.) form one of the most interesting features. They are almost surely homologous with those similar structures found in the males of *Garypinus* (Chamberlin, 1923).* These genital sacs are found generally throughout the Obisiidae apparently. The prominent lateral chitinous rods or apodemes (Fig. 14-c) apparently help support these sacs. They are connected across ventrad of the median chitinous loop (Fig. 14-d) by a rather slender chitinous rod or bridge. Apparently they attach basally to the median loop. Projecting anteriorly from this loop extends a short chitinous rod which bears distally a complex semi-membranous sac (?) or structure (Fig. 14-e). The genital sacs themselves seem to arise from two slender rods which distally flare into a cone-like funnel structure (Fig. 14-a). Posteriorly there appear two prominent crescent-shaped sclerites, each bearing four prominent setae (Fig. 14-b). Apparently ventrad (not surely) of these sclerites is a large, lunate, rather weakly chitinized structure which I believe to be the wholly invaginated and hidden second ventral sternite (Fig. 14-f).

As I see it the ventral segmentation is as follows. There are in all 11 sternites (the normal number of segments in the Pseudoscorpionida). Of these the last one has fused with the 11th tergite to form the shield bearing the anal opening (Fig. 17). The first one is the broadly triangular, unpaired sclerite which lies immediately behind the fourth coxae. The second one then consists of the aforementioned lunate, internal, unpaired structure (Fig. 14-f) which has been entirely invaginated and hidden by the forward growth of the third sternite which thus superficially appears as the second segment (Fig. 5). Thus the second segment has been modified for some special function in connection with the genitalia. (A study of female and immature specimens, I should say, will prove or disprove this theory). In structure and general appearance the sternites are very similar to the tergites. The central reticulation of each lateral half is however visibly different, the reticulations forming a sub-circular region where the areas enclosed by the somewhat fainter than normal reticulations, are considerably smaller than on the rest of the sclerite. The fifth sternite is bordered posteriorly by a row of 24 minute setae and 10 lyriform fissures. The lyriform fissures of the posterior segments appear to have a distinct tendency to assume a longitudinal position in the sternites but this is not the case in the anterior ones (Figs. 5 and 17). An interesting feature is found in the lyriform fissures which tend to encircle the anal opening. Each half of the bi-partite anal operculum bears two minute setae (Fig. 17).

*Remarks*—Unfortunately I am unable to say anything regarding the structure of the spiracles. Apparently they are

*1923—Chamberlin, J. C., Proc. Calif. Acad. Sci., Vol. XII.

located in the more or less membranous portion of the abdominal pleura and hence are practically impossible to observe without more dissection than is advisable in the present case.

The skin structure forms one of the most characteristic features of the animal. It seems to be very much like that found in *Feaella*, but as I have seen no specimens of the latter genus I cannot speak definitely. The figures give a fairly adequate impression of its general appearance.

Explanation of Plate V.

1—Leg I.
1a—Detail of skin reticulation of leg.
2—Detail of tip of tarsus of Leg I.
3—Median portion of 7th abdominal tergite, showing membranous median area and longitudinal scutal suture.
4—Coxae of legs and palpi.
4a—Detail of skin reticulation of coxae.
4b—Lyriform fissures of coxa of palpus.
4ba—Small lyriform fissures on dorsal aspect of pedicel of trochanter of Leg IV.
4bb—Circular lyriform fissure of coxae of palpi.
5—Genital area and first few ventral abdominal segments showing distribution of superficial setae and lyriform fissures.
5a—Skin detail of abdominal sternites.
6—General dorsal aspect of entire animal showing general appearance. The tactile setae of the fingers of the palpi were broken off in the specimen available for study.
7—Skin detail of right half of 2nd abdominal tergite.
8—Leg IV.
9—Palpus (On smaller scale than 1 and 8).
9a—Skin detail on hand of palpus.
10—Detail of carapace. Right half of anterior margin showing the anterior "horns" and the positions of the eyes.
11—General aspect of internal genital structures, showing primarily the position and relative size of the convoluted *genital sacs*.
12—Dorso-lateral aspect of chelicerae.
12a—Skin detail on chelicera.
13—Lateral aspect of chelicera.
13a—Skin detail.
14—Details of internal chitinous structures of the genitalia.
15—Claw of palpus from a lateral aspect. Tactile setae not seen.
16—Ventro-lateral aspect of chelicera.
16a—Detail of heavily granulate margin of chelicera. The dotted line indicates thickness of chitin.
17—Ventral aspect of tip of abdomen showing the fused 11th tergite and sternite which medianally bears the anus with its divided operculum.
18—Lateral aspect of movable finger of claw of palpus showing dentition and positions of the tactile setae areoles.
19—Detail of dentition of fingers of claw of palpus.
20—Lateral aspect of fixed finger of claw of palpus showing dentition and positions of tactile setae areoles.
21—Dorsal aspect of movable finger of chelicera.
22—Ventral aspect of fixed fingers of chelicera.

## Notes on the Desmodium Sawfly, Atomacera desmodii Dyar* (Hymen.: Tenthredinidae).

This species, while not recorded by Smith in his "Insects of New Jersey," is known to occur at Monmouth Junction and undoubtedly exists in other sections of the state where its food plant grows. It was described by Dyar in 1900 (Jour. N. Y. Ent. Soc., vol. VIII, pp. 26-27) from specimens collected by him in company with Mr. Busck in Alexandria County, Virginia.

At Monmouth Junction, New Jersey, adults appear from about the middle of May to the first week of June and the females deposit their eggs in the leaves of *Meibomia* (*Desmodium*) *canadensis*, which plant is common along the borders of streams and swamps in the northern half of the state. The egg is inserted in the leaf from the upper surface and the tissue is pushed out considerably above and to a small extent below each egg. This results in a little, blister-like swelling which later becomes tinged with red. The presence of eggs is readily recognized by such discolored swellings. Each egg is whitish, translucent, irregularly bean-shaped, broadly rounded at both ends, somewhat compressed at sides and about 0.7 mm. long and 0.48 mm. wide across the middle. Some eggs are deposited in irregular, somewhat compact groups, whereas others are placed scatteringly in the leaf tissue. Various leaves were examined and found to contain from 5 to 30 eggs each.

After hatching the larvae feed on the lower surface of the leaf eating everything except the upper epidermis. The leaf is thus skeletonized from the lower surface. The larvae are somewhat gregarious and feed in groups of two or three or more. Most of them are greenish, but some of them have a pink or red tinge, many of these latter ones, however, being mature or nearly so. In severe infestations nearly every leaf on a plant is injured and sometimes killed.

After becoming full grown the larvae descend to the base of the plant and construct on the surface of the ground, somewhat loose, irregular, sepia-colored cocoons. In captivity, with soil absent, these cocoons are made between two parts of a folded leaf or between the small developing leaves at the tip of a shoot. Pupation requires about eight days during the summer and the winter is passed by either larvae or pupae in cocoons at the base of plant. Observations made in the field at Monmouth Junction indicate two broods, about two months being required for a complete life cycle. Adults are present in numbers during the last of May and first part of June and again during the last of July and first part of August. Due to the emergence of the adults and egg deposition over a period of several weeks, considerable overlapping of the broods takes place. The larval stages were described by Dyar (loc. cit.) and need not be gone into here.—HARRY B. WEISS and RALPH B. LOTT, New Brunswick, N. J.

* Identified by Mr. S. A. Rohwer through the courtesy of Dr. L. O. Howard.

# Studies on Costa Rican Odonata.

## X. Megaloprepus, Its Distribution, Variation, Habits and Food.

By Philip P. Calvert, University of Pennsylvania, Philadelphia, Pa.

(Continued from page 135)

### Habitat.

As has been stated in the Neuroptera volume (page 53) of the *Biologia Centrali-Americana*, *Megaloprepus* is an inhabitant of tropical forests. The "Florida road," west of Guápiles, from which our specimens Nos. 2-7 were obtained was, to quote from my diary of June 3, 1909:

a trail leading into untouched forest . . . westward. . . . We followed it for about a mile perhaps. . . . Its width varies and is often not greater than that of one's body, but is travelled often on horse- or mule-back. On each side of the trail the vegetation is so thick and dense that one can not make way for more than a few feet unless he cut it with a machete. . . . In this forest are mingled deciduous exogenous trees of many kinds and a variety of palms. The former are rather high on the whole perhaps, but there are many exceptions. All the trees lack branches until they are many feet above the ground but this lower space is occupied by the epiphytes and parasitic plants, bromeliads, ferns, orchids, lianas and other vines which from the trunks or from the far-away branches shoot upward or hang down and twist and twine in both profusion and confusion. On the ground itself are shrubs and smaller plants reaching up to mingle with those descending. There is much difference in the trunks of the trees as to bareness or to being covered with lichens. The large exogenous trees rise out of the soil with many ridge-like buttresses, while the palms have many aerial roots. Most of the birds are far away overhead in the foliage of the trees proper, but sometimes an opening above, admitting sunshine, gives a glimpse of them, or there is a swarm of butterflies around a full-flowered tree. [Peccaries and red monkeys were observed by some of our party here this day.]

Another forest area near Guápiles, in which male No. 1 was taken on June 2, 1909, and which was revisited on June 4, is described in my diary of the latter date in these words:

The forest differs from that through which the Florida road passes in the very much fewer palms to be found in it, although the difference in elevation is not more than 100-200 feet. It may have been partially cleared once, but as many of the tall exogenous trees are untouched

and surrounded by thick growth it seems unlikely that these would have been left and the palms cut out if they had been here, since comparatively few species of the latter are of use to man.

The female from Guacimo, of June 7, 1909, was brought to me alive by Messrs Stähle and Blair, who said that they had caught it in the banana field. As these fields in many places extended to the forest, no long flight would be required of the *Megaloprepus* to come into the open.

The cañon of the Rio Reventazón at Juan Viñas, in which this species was observed on June 25 and September 29, was occupied by the remains of a forest including

great trees draped with mosses and Tillandsias, hung with lianas, with epiphytic bromeliads and arums perched on every projection. On a lower level were small palms, begonias, maiden hair and other ferns, arums large and small, and many kinds of Musaceae and Marantaceae, etc., many with large bracts of brilliant red or orange. A cart road descended the side of the cañon in a series of zigzags.

At Peralta, on August 7, 1909, a *Megaloprepus* was watched in

tropical forest with very tall exogenous trees and many palms from both of which hung lianas, mosses and ferns, the lianas binding the trunks and branches together, while the soil was very damp and in places deep mud. Altho' the sun was shining the foliage was dense enough to prevent strong light from reaching the ground. . . . It was between two views of monkeys [*Cebus capucinus*] that I saw a *Megaloprepus* . . .alight first on one then on another twig, 7-10 feet above a little stream whose waters were arched over and partly covered by vegetation. . . . [The next morning, August 8], I went back to the woods where I saw the monkeys and *Megaloprepus* yesterday afternoon, but although I spent two hours in the immediate neighborhood, I saw none of the two M's.

On August 10, I went up the Chiriqui [?] river trail; the river empties into the Reventazón one mile north of Peralta station on the railroad. After passing through woods,

I reached a clearing with much grass and a few trees, beyond which was a grove of large trees with no undergrowth or grass, the ground much cut up with hoofs and muddy. Crossing this clearing I caught a *Megaloprepus* much to my surprise—the locality was indeed 'far from water' but certainly not 'deep woods.' The buttress-roots of some of

the trees in the grove enlarged the diameters of their trunks at the ground to twenty or thirty feet. The altitude of the little hill on which this grove was situated was 1400 feet by my aneroid.

One individual *Megaloprepus* was observed in a stretch of woodland along Agua Buena creek, within two miles of the Caribbean coast, on November 7, 1909,

alighting on leaves and stems for longer or shorter periods, sometimes directly over water, at others not more than ten feet away, and sometimes not more than one foot from the water's surface.

Another individual was seen, at about five miles (8 km.) distant from the preceding locality and six miles from the sea-coast, in dark forest, near the upper reservoir, on the Rio Banana, supplying Limón with water, November 9. In this same forest were seen or taken *Mecistogaster modestus, Philogenia carrillica, Protoneura remissa, Gynacantha gracilis* and *Triacanthagyna satyrus* Martin, teste Wilmsn. (*trifida* auctorum, *pars*).

### Time of Flight.

The dates when the imagos were seen or taken on the Atlantic slope of Costa Rica fall between April 22 and November 18. These are in the wetter part of the year although no sharp distinction into wet and dry seasons can be made for this slope. The few dates from the Pacific side of the country, where this distinction holds good, are in the wet season; one exception, however, must be noted. The male from Quebrada de Java, cited in the *Biologia*, page 352, was dated 18. II. 97, presumably, therefore, in the dry season.

### Manner of Flight and Position at Rest.

The following notes were made at Guápiles, June 2, 1909:

When flying the four wings are spread quite far apart, fore and hind wing of the same side far apart, body horizontal. Flight slow enough so that the movements of each separate wing can be seen—insect consequently moves slowly but can dodge. Mr. Barnes compared the movements of the wings to that of a windmill, but the revolving movements are lacking; I should say the effect produced by the wings is more like that of a jumping-jack with movable arms and legs pulled by one string, rather slowly, but, of course, at regular intervals.

When caught and held by the wings, the legs are folded up against

the thorax and held immovable, even though they are touched or rubbed —animal seems to "play 'possum." Held by the mid-abdomen, movement soon appears in legs and wings.

The male on which these notes were based was kept alive and after dark let loose in my bedroom, whose walls and ceiling were of dark-stained wood, with yellow straw matting on the floor, and having an incandescent electric light hanging from the ceiling in the centre of the room. [The light was turned on.] *Megaloprepus* always went up to the ceiling, a height of 8-9 feet, although the light hung at mid-height from floor to ceiling. Once, when released near the light, the insect got under its fluted shade and bumped against it repeatedly until I gently moved the insect out and then the latter went up to the ceiling. I noticed that specimens in the forest at which I struck and missed usually rose, at the same time making into the vegetation.

The dark purple blue band on the otherwise clear wings makes the insect conspicuous when flying through the forest. Some writers, who have not seen this insect in life, have suggested that the dark bands, by resembling flickering shadows cast by leaves, etc., are thereby protective, but I can not see that this supposed resemblance exists.

As to the position assumed by *Megaloprepus* when at rest under entirely natural conditions, I have but one note, made at Peralta, August 7, 1909, in continuation of that quoted *anteá*, page 169, viz.: that on alighting on twigs, the abdomen and wings hung downward, the abdomen almost perpendicularly.

The experiment in my bedroom, the occurrence of the specimens in the banana field at Guácimo and in the grove on the Chiriqui river trail near Peralta may, perhaps, indicate positive geotropic and phototropic tendencies in this insect in spite of its normal habitat in dense forest.

### Persistence of Life Without Food.

The female taken at Guácimo on June 7, 1909, was carried alive to Cartago where it flew a little around our room in the afternoon of June 8 and had some power of wing movement on June 9.

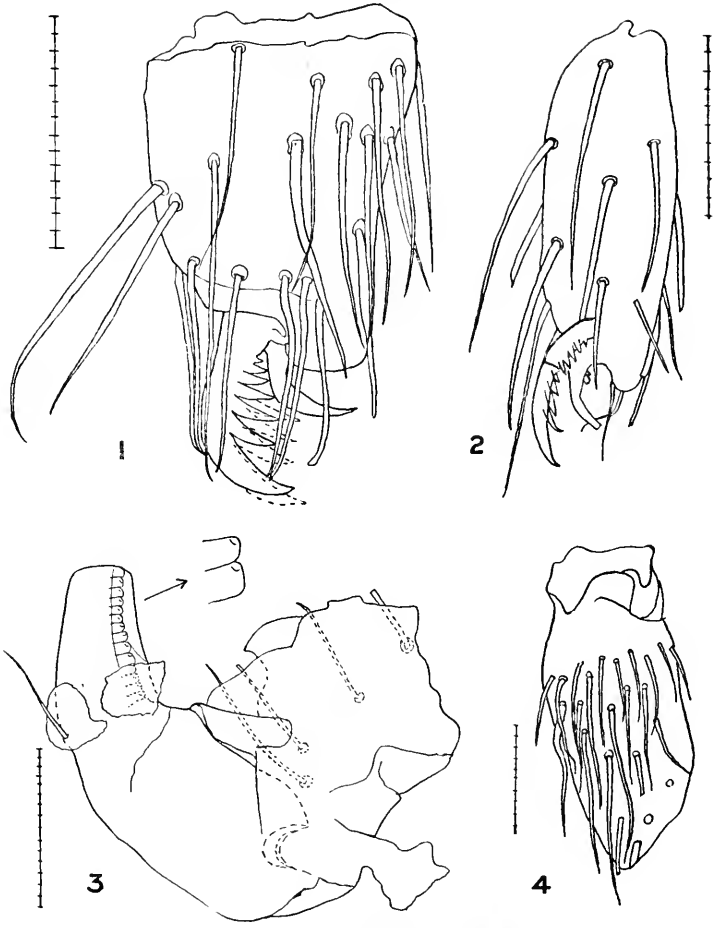
### Food.

The male *Megaloprepus* No. 14, taken at Alajuela, Costa Rica, August 8, 1915, by Mr. D. E. Harrower, remained in the paper envelope in which it had been placed by the collector until August 10, 1922. It was then studied in detail for the

first time and was found to have a spider, about 5 mm. long, in its mouth. The spider was held principally by the dragonfly's labium which was below the prey, all the other mouth parts being above it and their positions not indicative of having had hold of it at the time of death of the dragonfly. The maxillae were almost touching each other at the tips of their inner lobes, the mandibles had their tips partly crossed. The median lobe of the labium was thrown caudad of the lateral lobes, the position of the latter being such that their sharp (unarticulated) spines held the spider between them. The anterior four legs of the dragonfly were drawn up toward the mouth and in the dead insect supported the anterior part of the spider's body—whether this was only a death position or represented actual conditions while the dragonfly was alive, it is impossible to say. It was the hind end of the spider that was held by the lateral labial lobes; it had already been lacerated and some small detached pieces of it were found deeper in the dragonfly's mouth. The chelicerae, pedipalps and all eight legs of the spider were still attached to its body, but several of the more distal joints of the anterior three left legs had become detached when the examination was made, which was after the dragonfly in its envelope had been in a relaxing jar for 24 hours.

This spider was kindly examined by Mr. Nathan Banks who wrote that it was "an immature specimen of a *Gasteracantha;* it might be one of two or three closely related species, probably *cancriformis* or *kochi.*"

It is frequently my practice, when collecting Odonata, to put each specimen at once, into a paper envelope for some hours before killing it in order that it may empty the contents of its alimentary canal and so lessen the amount of decomposition within its body after death and reduce the extent of discoloration of the abdomen. Having done so with some of my *Megaloprepus* and having preserved their excrement, I softened the pellets in distilled water, teased them apart, dehydrated, cleared and mounted them in balsam. A microscopic examination of the excrement of male No. 1 revealed the two fragments represented in text figures 1 and 4, while from that of




FRAGMENTS OF SPIDERS FROM THE EXCREMENT OF *Megaloprepus caerulatus*.

Fig. 1, Apex of tarsus with claws, some of the lower claw dotted. Fig. 2, A last tarsal joint; one of the serrate claws is broken straight across at less than half length, the other is intact. Fig. 3, Basal part of a chelicera; dotted lines show hairs on the under side of the preparation. Fig. 4, Terminal joint of a pedipalp?[13] Figs. 1 and 4 are from the excrement of male No. 1, figs. 2 and 3 from that of female No. 8 All four drawings were made by camera lucida attached to a compound microscope with oculars 2 or 3, objectives C or DD Zeiss. Alongside each figure is a scale in 1-100s of 1mm.

[13] A comparison of our figures 1-4 with the following figures in Prof. J. H. Comstock's *Spider Book:* 121, 122, page 123 (tarsal claws); 81, page 101 (chelicera); and 90, page 105 (pedipalp), respectively, will enable the interested reader to judge of the probability of the correctness of the legend below our figures.

female No. 8 came the pieces shown in figures 2 and 3. Mr. Banks saw the drawings from which these figures have been made and wrote of them:

Numbers 1 and 2 show tips of tarsi of probably an Agalenid spider, but if front tarsi might be, as far as I can tell, of a Theridiid spider. They are not of an Epeirid spider (family of *Gasteracantha*), since there are no accessory claws (serrate spines) present. I cannot guess the family of the other figures.

In this connection may be quoted a passage from a non-entomological source[14] recording the only observation known to me on the food habits, not of *Megaloprepus* it is true, but of another member of its group:

Spinning through the aisles made by the giant columns of tree-trunks, were curious translucent pin-wheels, and not until we captured one in the butterfly net did we realize we were looking at the same attenuated forest dragon-flies (*Mecistogaster sp.*) which had deceived us so completely five years ago in Mexico. The movement of the long narrow wings with the spot of white at the tips was, to the eye, a circular revolving whirl, with the needle-sized body trailing behind. The white spots revolved rapidly, while the rest of the wings became a mere gray haze. These weird creatures, apparently so ethereal and fragile, were hunting for spiders, and their method was regular and methodical. From under leaves or from the heart of widespread webs, good-sized spiders were snatched. A momentary juggling with the strong legs, a single nip and the spider minus its abdomen dropped to the mould, while the dragon-fly alighted and sucked the juices of its victim. If we drew near one of these spiders on its web, it instantly darted away, sliding down a silken cable to the ground or dashing into some crevice, but the approach of the hovering dragon-fly, although rather deliberate, was unheeded, the spider remaining quiet until snatched from its place.

Spiders are not included in Mr. Campion's list of *Some Dragonflies and their Prey*.[15]

I was unable to find the still unknown larvae of *Megaloprepus*. One would expect them to occur in situations analogous to those of *Mecistogaster*, whose larval characteristics and transformation were described in Numbers II and III of these Studies.[16]

[14] Beebe, M. B. and C. W. Our Search for a Wilderness, New York, Henry Holt & Co., 1910, pp. 270-271. The observation was made near the Big Aremu River, British Guiana, in late March, 1909.

[15] Annals & Magazine Nat. Hist., London, (8) XIII, pp. 495-505. 1914

[16] Entom. News, XXII, pp. 402-411, 449-460, pls. xvii-xix, 1911.

# The Cordylurid Genus Paralleloma and its Nearest Allies (Dipt.).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

(Continued from page 140.)

**PARALLELOMA** Becker.

This genus is difficult to distinguish from *Cordylura*, at least in this country, if one attempts to do so by using the principal character cited by its describer for that purpose. The dorsocentrals in the great majority of the species of *Cordylura* are very much stronger than in typical species of *Paralleloma*, but in some species they are weak and only the complete sixth wing-vein serves to separate them from *Paralleloma* when this is the case. I have included in the key *Cordylura pracusta* Loew, and a new species of that genus which have the thoracic dorsocentrals much weaker than is the rule in *Cordylura*, though they belong to that genus.

The genotype of *Paralleloma, albipes* Fallen, has the apical third of the first wing-vein setulose as has also another European species I have seen. No American species has more than one or two weak setulae near apex of first vein but I do not consider they are entitled to generic separation.

Thoracic coloration in this genus is very variable, some species having the dorsum entirely black, or yellow, or with a pale central vitta and two black lateral vittae.

*Keys to species.*

*Males.*

1. Mid tibia without long hairs on ventral surfaces .....2
—Mid tibia with erect soft hairs on ventral surface which are at least as long as diameter of tibia .....3
2. Basal segment of fore tarsus with fine hairs on posterior side which are longer than width of segment, mid and hind femora with dense erect soft hairs ventrally; processes of fifth sternite rounded at apices .....*tarsalis* sp. n.
—Basal segment of fore tarsus and mid and hind femora without such hairs; processes of fifth sternite truncate at apices..*scapularis* (Loew)
3. Sixth wing-vein complete; fifth abdominal sternite elongate, tapered posteriorly, bare on disc, and armed with a number of black bristly hairs along its upper margin; thorax entirely yellow ..... ..... ....*Cordylura pracusta* Loew.

—Sixth wing-vein not reaching margin of wing; fifth abdominal sternite not as above .....4

4. Processes of fifth abdominal sternite rounded at apices, their surfaces with long and moderately dense hairs all over .....5

—Processes of fifth abdominal sternite either emarginate at apex or the surface has at most a few weak hairs .....6

5. Fore tibia with long yellow hairs on posterior surface in addition to the yellow bristles; pleurae largely black or at least with a black streak posteriorly; mesonotum black to extreme lateral margin .....*pleuritica* (Loew) (*slossonae* Coquillet; *vicina* Cresson?)

—Fore tibia with very short yellow hairs, the strong bristles black and not very long; pleurae entirely yellow; mesonotum narrowly yellow along lateral margins .....*dimidiata* Cresson

6. Neither mid nor hind femora with strong black bristles ventrally....7

—Both mid and hind femora with strong black bristles ventrally.....8

7. Fore tibia with soft hairs on posterior surface which exceed in length the diameter of tibia; all hairs on mid tibia much longer than diameter of tibia; fifth abdominal sternite broad, longer than in *praecusta*, the apex with a slight rounded emargination...*emarginata* sp. n.

—Fore tibia similar to above; mid tibia with hairs not distinctly longer than its diameter except on its posterior side; processes of fifth abdominal sternite slightly pointed at apex, the ventral margin longer than the upper and straight, the upper or dorsal margin with a small but distinct rounded emargination near base, the apex not emarginate .....*banksi* sp. n.

8. Fore tibia with short hairs in addition to the long bristles; mid tibia with the ventral hairs not longer than the tibial diameter except posteriorly; posterior notopleural bristle present; sixth vein tapered to a fine line apically; processes of fifth abdominal sternite short and broad, with a small rounded emargination.....*similata* sp. n.

—Fore tibia with short hairs, the bristles weak; all hairs on ventral surface of mid tibiae as long as, or longer than, tibial diameter; posterior notopleural bristle absent; sixth vein abruptly broken off at apex; processes of fifth abdominal sternite narrow and rounded apically, their lower margin straight to near middle, presenting a truncate appearance and with a few short setulose hairs at lower anterior angle .....*munda* (Loew)

*Females.*

1. Fore femur with 3 long, black bristles on basal half of posteroventral surface; cross-veins of wings not distinctly infuscated; mid and hind femora without ventral bristles .....*scapularis* (Loew)

—Fore femur with at least 4 long, black bristles on posteroventral surface, the last one distinctly beyond middle, at least the outer cross-vein infuscated; hind femur with ventral bristles.....2

2. Sixth wing-vein complete, traceable to wing margin .....3

—Sixth wing-vein not reaching margin of wing .....4

3. Yellow species, legs and palpi yellow; a pair of fine setulose apical hairs on scutellum; abdominal tergites with distinct apical bristles .....*praecusta* Loew
—Glossy black species, legs black, bases of femora and entire fore tibia yellow, fore tarsi yellow at bases of segments below, and black at apices; no apical hairs on scutellum; abdominal tergites without distinct apical bristles ..... .....*deceptiva* sp. n.
4. Mid femur with one or two strong bristles beyond middle on anteroventral surface; thorax either entirely yellow or with two linear brown dorsal vittae, both notopleural bristles long and strong; first vein with one or two setulae on apical half.....*similata* sp. n.
—Mid femur without anteroventral bristle, or the thoracic dorsum is largely or entirely black; first vein bare .....5
5. Mid femur with one or two bristles on apical half of ventral surface; posterior notopleural bristle present; pleurae yellow; ventral bristle on mid tibia of moderate size .....*glabra* (Loew)?
—Mid femur without bristles on apical half of ventral surface .....6
6. Pleura with a black vitta below base of wing; last section of costa, between apices of veins 3 and 4, less than half as long as preceding section; humeri almost entirely black; ventral bristle on mid tibia strong .....*pleuritica* (Loew)
—Pleura entirely yellow; lower half of humeri yellow .....7
7. Posterior notopleural bristle absent; mid tibia with a ventral bristle .....*munda* Loew
—Posterior notopleural bristle present .....8
8. Thoracic dorsum glossy black .....*dimidiata* Cresson
—Thoracic dorsum yellow, with 2 broad black vittae ...*emarginata* sp. n.

**Paralleloma scapularis** (Loew).

Pale yellow, black on upper half of occiput, ocellar spot, each side of dorsum of thorax and scutellum, almost all of metanotum, and the abdomen except hypopygium in male. Wings clear.

Mid and hind femora in both sexes without distinct ventral bristles. The only male I have seen lacks the prealar bristle.

Originally described from Canada. I have seen specimens from Glen House, New Hampshire, and Cohasset, Massachusetts, and took it at Chain Bridge, Virginia, and Grand Tower, Illinois.

**Paralleloma tarsalis** sp. n.

♂.—Shining black; head whitish yellow, upper half of occiput and ocellar spot black; thorax with a yellowish vitta which does not extend over scutellum; a black mark covers most of the metanotum and is faintly visible below bases of wings and above hind coxae; processes of fifth sternite and the legs yellow. Outer cross-vein and tips of wings clouded.

Hairs on fore tibia short, the bristles weak; fore tarsus slightly broadened, the marginal hairs longer than usual, especially on posterior side of basal segment; mid and hind femora with soft erect dense hairs on ventral surfaces which are not conspicuously longer at any part than diameter of femur; mid tibia without soft hairs, the bristles short. Processes of fifth sternite moderately long, parallel-sided, rounded apically with but few hairs. Venation as in *munda*.

Length, 7 mm.

*Type*, Chain Bridge, Virginia, May 7, 1922 (J. R. Malloch), in the author's collection. *Paratype*, male, Ottawa, Canada (U. S. N. M.).

**Paralleloma pleuritica** (Loew).

Pale yellow, black on occiput except lower third, upper half or more of frons, entire dorsum of thorax, scutellum and metanotum, all of abdomen except the hypopygial forceps of male, and a stripe below and behind bases of wings, and sometimes the greater part of pleurae. The hind femora are sometimes brown above apically, and there is usually a brownish suffusion on the cross-veins and apices of wings anteriorly.

The male has the fore and mid tibiae long haired ventrally and posteriorly and all the femora long haired ventrally and without distinct ventral bristles. The female has a preapical anteroventral bristle on hind femur, and a preapical ventral bristle on mid tibia. The processes of fifth abdominal sternite in male are a little longer than broad and evenly rounded apically.

Originally described from Canada. Since recorded from Massachusetts, New Hampshire, Connecticut, and New Jersey. I have seen specimens from Rhode Island and Illinois. Coquillett described this species as *Cordylura slossonae* from Massachusetts, and New Hampshire, and Cresson as *vicina* from Pennsylvania.

**Paralleloma dimidiata** Cresson.

In addition to the characters mentioned in the key this species differs from *pleuritica* in having the fore tarsi slightly broadened in both sexes and with fine hairs along the posterior margins, most noticeable on basal segment and in male.

Originally described from Pennsylvania. I took a male and female at Glen Echo, Maryland, July 2, 1922. The female was previously unknown.

**Paralleloma similata** sp. n.

Glossy testaceous yellow, with the upper part of occiput, posterior part of frons and dorsum of thorax darker; ocellar spot and two narrow, submedian, dorsal vittae on thorax blackish; abdomen varying from brown to fuscous. One male from New Hampshire has the

dorsum of the thorax almost entirely brownish black, and the abdomen except the hypopygial forceps and processes of fifth abdominal sternite similarly colored. Legs entirely yellow. Wings with the cross-veins and the tips of longitudinal veins at apex of wing slightly infuscated.

The mid and hind femora in male are rather long haired ventrally and have each one or two preapical black bristles on anteroventral surface. The female has no long hairs on the femora and the anteroventral bristles are farther from apex. Both the mid and hind femora in this sex have a very long, fine bristle at base on ventral surface and the mid and hind tibiae have each a preapical, ventral bristle. Posterior notopleural and prealar bristle both long. Processes of fifth abdominal sternite not longer than broad, with a small rounded emargination in apical margin, the surface almost bare, with a few hairs along the truncate part of lower margin.

Length, 7-8 mm.

*Type*, male, and *allotype*, Ottawa, Canada, May 15, in the author's collection. *Paratypes*, one male, Bretton Woods, New Hampshire, June 26, 1913; one female, Mt. Washington, New Hampshire, July 28, 1915, 2500 ft. (C. W. Johnson).

**Paralleloma munda** (Loew).

This species closely resembles *pleuritica* Loew and more especially the form in which the pleura are largely yellow, the color being almost identical except that the black streak on posterior part of pleura is either absent or very short in *munda*. The femora are also pale in both sexes. The processes of the fifth abdominal sternite in the males of the two species are very different, that of *munda* having a truncate part on lower margin which is about half as long as the process, and there are only a few hairs present which are confined to the anterior angle of the truncation on lower margin.

Originally described from Canada and since recorded from New Hampshire. I have taken it frequently in Illinois and it is common near Washington, D. C., in May, where it is the commonest species of the genus. I have also seen it from Quebec, Canada.

Both sexes have a color variety with a broad yellow dorsocentral thoracic vitta which extends over disc of scutellum.

**Paralleloma emarginata** sp. n.

In color similar to the vittate variety of *munda*.

The processes of the fifth ventral abdominal sternite of male differ very strikingly from those of *munda*, being a little longer than broad, of equal width to apex and with a broad rounded emargination at apex; the lower margin has a few hairs on apical half which extend onto the disc slightly.

Length, 7-8 mm.

*Type*, male, Auburndale, Massachusetts, August 2. *Allotype*, same locality, June 26. *Paratype*, Riverside, Massachusetts, May 22 (C. W. Johnson); Germantown, Pennsylvania, May 25, 1907 (Harbeck). In the collection of the Boston Society of Natural History.

**Paralleloma emarginata** var. **dorsalis** var. n.

Differs from the type form in having the dorsum of thorax glossy black, and the propleura and metapleura dull black. In other respects similar to type.

Length, 8 mm.

*Type*, Chain Bridge, Virginia, May 23 (N. Banks) in Mr. Banks' collection.

**Paralleloma banksi** sp. n.

♂.—Similar in color to the dark form of *pleuritica*, the dorsum of thorax and abdomen being wholly glossy black and the pleura almost entirely black. The processes of fifth abdominal sternite of male are almost entirely yellow. Legs yellow. Wings slightly browned at apices.

The mid and hind femora have fine, but not very long, ventral hairs and no distinct ventral bristles, and only the posterior hairs on mid tibiae are distinctly longer than the diameter of the tibiae. The processes of fifth abdominal sternite are longer than broad, their ventral margin almost straight and longer than the upper, the latter with a short rounded emargination near base.

Length, 7.5 mm.

*Type*, New York. From the Loew collection, labelled "sp. n. *munda* aff." In the Museum of Comparative Zoology, Cambridge, Massachusetts.

**Cordylura deceptiva** sp. n.

♀.—Glossy black. Face and bases of palpi cream colored, frontal orbits and frons and the narrow postocular orbits white pruinescent. Fore coxae, trochanters, and bases of all femora, entire fore tibiae, knees of mid and hind legs, and bases of tarsi yellow, the apices of fore tarsal segments black below. Tips of wings and the cross-veins infuscate.

Arista short, long plumose above and below. Posterior notopleural and prealar short, only the posterior pair of dorsocentrals distinct. Scutellum with 2 strong bristles. Fore femur with 4 or 5 posteroventral bristles on basal half; hind femur with 2 or 3 anteroventral bristles on apical half; mid tibia with the ventral bristle strong; hind tibia with 2 anterodorsal, 1 anteroventral, and 2 posterodorsal bristles. Outer cross-vein nearly twice its own length from inner; first vein bare.

Length, 7 mm.

*Type*, Henry, Michigan, August 27, 1919 (W. L. McAtee), in the United States National Museum.

Superficially closely resembles *Achaetella varipes* Walker.

# Undescribed Crane-Flies from Argentina (Dipt. : Tipulidae). Part VI.

By Charles P. Alexander, Amherst, Massachusetts.

The species described in the present installment were all collected by Dr. Charles Bruch in the Provinces of Buenos Aires and Córdoba. My deepest thanks are extended to Dr. Bruch for his co-operation in making known the interesting Tipulid fauna of Argentina. The types are preserved in the writer's collection.

**Molophilus honestus** sp. n.

Head yellowish; antennae of male rather short, dark brown; mesonotal praescutum brownish yellow, the median area indistinctly darkened; pleura pale with a conspicuous, brown, longitudinal stripe; halteres yellow; wings pale brownish, subhyaline; abdomen dark brown, the hypopygium and ovipositor yellowish; male hypopygium with the ventral appendage elongate, with a small acute spine on the ventromesal face near two-fifths the length, the apex of the blade slightly flattened and with close-set appressed teeth.

♂. Length 3.4-3.5 mm.; wing 4.6-4.7 mm. ♀. Length 4 mm.; wing 4.8 mm.

Rostrum testaceous; palpi dark brown. Antennae of the male rather short, if bent backward, not extending beyond the wing-root; antennae dark brown; flagellar segments elongate-oval with the long, black verticils; in the female, the flagellar segments are cylindrical or short-oval. Head pale yellowish, the vertex with conspicuous yellow bristles.

Pronotal scutellum conspicuously white. Mesonotal praescutum brownish yellow with an ill-defined, brownish, median area, the lateral margins whitish; interspaces with long, black bristles; scutum pale, the lobes brown; scutellum broad, pale yellow; postnotum brown. Pleura pale with a whitish bloom; dorsopleural membrane whitish; a broad, conspicuous, dark brown stripe extending from the cervical sclerites to the postnotum and base of the abdomen; mesosternum brown. Halteres light yellow.

Legs with the coxae and trochanters pale yellow; femora and tibiae brownish yellow; tarsi brown.

Wings pale brownish, subhyaline, the base a little more yellowish; veins pale brown; wing-apex slightly pointed. Venation: Deflection of $R_4+_5$ about equal to *r-m;* basal deflection of $Cu_1$ about two-thirds the petiole of cell $M_3$; vein *2nd A* long, the distal end bent strongly toward the wing-tip.

Abdomen dark brown, the hypopygium obscure yellow. Male hypopygium with the ventral appendage very long and slender, extending almost to the ends of the pleurites, at about two-fifths the length, on

the ventro-mesal face, with a small, acute spine; the long apical point is slightly flattened near the tip, this apical blade with numerous appressed serrations. Ovipositor reddish horn color, the tergal valves rather strongly upcurved; sternal valves dark brown, slender, straight.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* 2 ♂'s.

**Molophilus bruchi** sp. n.

Antennae pale brown; mesonotal praescutum obscure yellow, with three, broad, dark brown stripes; halteres with the knobs yellow; wings with conspicuous, brownish black hairs; abdomen brownish black; ventral appendage of male hypopygium shaped as broad-based simple horns.

♂. Length about 2.8-3 mm.; wing 3.7 mm.

Rostrum and palpi dark brown. Antennae pale brown, the basal segments light yellow; flagellum short, the segments cylindrical. Head grayish brown.

Mesonotal praescutum narrowly margined with whitish, the disk obscure yellowish brown with the humeral region brighter yellow, with three, broad, ill-defined dark brown stripes, the median stripe very narrowly and indistinctly split by a pale line; praescutal interspaces with conspicuous black and yellow setae; remainder of mesonotum dark brown. Pleura dark brown, gray pruinose. Halteres light brown, the knobs conspicuously light yellow.

Legs with the coxae yellowish brown; trochanters obscure yellow; remainder of the legs dark brown.

Wings pale brown with conspicuous, brownish black trichiae; veins rather pale.

Abdomen dark brownish black. Male hypopygium with the ventral appendage in the form of a conspicuous, curved, simple horn, broad basally, tapering gradually to the acute point. Pleural appendage slender, deeply branched, the dorsal arm slender, the ventral arm widened into a truncated blade. Gonapophyses flattened, near the base on the lateral margin with a conspicuous, laterally directed spine.

*Holotype:* ♂, Palo Blanco, La Plata, April 24, 1920 (C. Bruch). *Paratopotypes:* numerous ♂'s.

This interesting *Molophilus* is named in honor of the collector, Dr. Charles Bruch.

**Gonomyia (Progonomyia) saxicola** sp. n.

General coloration pale yellow, variegated with brown; male hypopygium with the intermediate appendage bifid, the outer branch appearing as a tiny spine at the base of the long inner branch.

♂. Length 4-4.2 mm.; wing 5.8-6 mm. ♀. Length 5.8 mm.; wing 6.2 mm.

Rostrum dark brown, sparsely pruinose; palpi dark brown. Antennae dark brown, the basal segment of the scape sparsely pruinose; flagellar segments elongate. Head broad, light gray, the center of the vertex suffused with light brown.

Pronotal scutum large and conspicuous, pale brownish yellow, heavily dusted with whitish pollen; scutellum dull yellow, the median area narrowly brown. Mesonotal praescutum pale brownish gray with four dark brown stripes, the intermediate stripes very closely approximated; pseudosutural foveae large and conspicuous, black; scutum brownish gray, the centers of the lobes darker; scutellum pale; postnotum dark brown, paler laterally, the pleurotergites conspicuously light gray pruinose. Pleura pale yellow, with a broad, brownish, longitudinal stripe extending from the cervical sclerites to beneath the wing-root; sternum largely dark brown. Halteres elongate, pale, the knobs brown.

Legs with the coxae obscure brownish yellow; trochanters dull yellow; femora and tibiae obscure brownish yellow, the tips of the latter narrowly and indistinctly darkened; tarsi brown.

Wings subhyaline; stigma small, short-oval, pale brown; veins pale brown. Venation: *Sc* moderately elongate, $Sc_1$ extending to about one-third the length of *Rs*, $Sc_2$ far from the tip of $Sc_1$, a little before mid-length of that part of *Sc* beyond the origin of *Rs*; *r* at the fork of $R_2+_3$, oblique in position, sometimes indistinct; $R_2$ straight, in alignment with and longer than $R_2+_3$; cell *1st* $M_2$ open; basal deflection of $Cu_1$ at or before the fork of *M*.

Abdomen uniform brown, the sternites a little paler. Male hypopygium with the intermediate appendage darkened, conspicuous, two-branched, the lateral branch very tiny, appearing as a slender spine at the base of the long inner branch; this latter is slender, slightly curved, the tip suddenly narrowed into a short blunt spine; inner pleural appendage a slender, slightly curved spine; outer pleural appendage a fleshy lobe with the setae all on the mesal face, directed strongly backward to produce an hystriciform appearance. Penis-guard slender, narrowed to the simple apex.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* numerous ♂'s and ♀'s.

**CRYPTOLABIS** Osten Sacken **PROCRYPTOLABIS** subgen. n.

Apical cells of wings entirely without macrotrichiae; cells $M_3$ and $Cu_1$ deep. Male hypopygium with four conspicuous digitiform lobes that surround a blackened, elongate, penis-guard. Ovipositor with the valves fleshy.

*Type of the subgenus: Cryptolabis (Procryptolabis) argentinensis* sp. n. (Neotropical Region).

**Cryptolabis (Procryptolabis) argentinensis** sp. n.

General coloration brownish black, dusted with gray; wings with a faint brownish tinge, the base yellowish.

♂. Length 3 mm.; wing 3.5 mm. ♀. Length 2.5-2.9 mm.; wing 4 mm.

Rostrum and palpi black. Antennae brownish black; flagellar segments oval, provided with a sparse white pubescence. Head dark gray; front and anterior part of vertex whitish; vertex between the eyes somewhat compressed into a median ridge.

Pronotum dark, the scutellum obscure yellow. Mesonotum brownish black, sparsely dusted with gray; an impressed, transverse line that extends from the pseudosutural foveae almost across the sclerite; remainder of the mesonotum black, sparsely dusted. Pleura brownish black, the dorso-pleural membrane obscure brownish yellow. Halteres light brown, the knobs pale.

Legs with the coxae dark brown; trochanters yellowish brown; femora brown, the bases obscure yellow, narrowest on the fore legs where only the bases are pale, broadest on the hind legs where only the tips are brown; tibiae yellowish brown, the tips darker; tarsi dark brown.

Wings with a faint brown tinge; wing-base yellowish; stigma very long and narrow, pale brown; veins dark brown. Venation: *Sc* short, $Sc_1$ ending but a short distance beyond the origin of *Rs*, $Sc_2$ removed from the tip of $Sc_1$, lying proximad of the origin of *Rs*; $Sc_1$ longer than *Rs*; *Rs* very short, straight, oblique, shorter than $R_2+_3$; *r* on $R_2$ about its own length belond the fork of $R_2+_3$; deflection of $M_1+_2$ very short, so *M* is almost in alignment with $M_1+_2$, the latter weak and without macrotrichiae on its basal third; basal deflection of $Cu_1$ about its own length beyond the fork of *M*; cells $M_3$ and $Cu_1$ deep, $Cu_2$ being about three times the deflection of $Cu_1$.

Abdomen brownish black. Male hypopygium surrounded by four flattened digitiform lobes; a central black penis-guard that is inserted far in the body, the base flattened, the middle portion deeply constricted. Ovipositor with the valves short and blunt, simulating the male hypopygium.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀, pinned with the ♂. *Paratopotypes,* 4 ♂ ♀'s.

**Limnophila platensis** sp. n.

Antennae dark brown; mesonotum yellowish brown, the praescutum with four, narrow, dark brown stripes; pleura yellow, with small, brown spots above the middle and hind coxae; halteres elongate; wings dusky, with small, brown spots, including a longitudinal series in cell *R*; cell $M_1$ present, long; abdominal tergites dark brown, margined posteriorly with yellow.

♂. Length 8.4-9 mm.; wing 9.5-10.6 mm. ♀. Length 10 mm.; wing 10 mm.

Rostrum brown; palpi with the basal segment light brown, the distal segments black. Antennae dark brown throughout, moderately elongate, the flagellar segments long-oval with the longest verticils on the dorsal surface. Head brownish yellow, the center of the vertex brown.

Pronotum dark brown medially, paler laterally. Mesonotal praescutum yellowish brown, with four, narrow, dark brown stripes, the intermediate pair narrowly separated, their anterior ends divergent; scutum broadly dull yellow medially, the lobes brownish testaceous; scutellum yellowish testaceous; postnotum with the posterior half yellow, the anterior half brownish. Pleura light yellow, sparsely pruinose; a conspicuous, brownish black spot at the base of the middle coxa; a smaller but similar spot at the base of the hind coxa. Halteres long and slender, dark brown, the extreme base of the stem paler.

Legs with the coxae and trochanters dull yellow; femora yellowish brown, the tips a little darker; remainder of the legs dark brown.

Wings with a dusky tinge; stigma not well-defined; small brown spots on the wing-surface, distributed as follows: A cloud at the origin of *Rs;* spots at tip of *Sc*, fork of *Rs*, fork of $R_2+_3$, ends of $R_1$ and $R_2$; narrow seams along the cord and outer end of cell *1st* $M_2$; a large cloud in cell *Cu* near midlength; in addition, a series of from two to ten brown spots in cell *R*, rather equidistantly spaced, sometimes more or less confluent, resulting in a reduction in number; veins dark brown. Venation: $Sc_2$ at the tip of $Sc_1$, the latter ending opposite or slightly beyond the fork of $R_2+_3$; *Rs* long, strongly angulate or sometimes spurred at origin; $R_2+_3$ varying in length, sometimes longer than the deflection of $Cu_1$; *r* at tip of $R_1$; cell *1st* $M_2$ long and narrow; cell $M_1$ deep, two to three times as long as its petiole; basal deflection of $Cu_1$ some distance beyond the fork of *M;* vein *2nd A* very long, ending beyond the origin of *Rs*.

Abdominal tergites dark brown, the caudal margins of the segments narrowly and indistinctly yellow; two, small, yellow dots near midlength of the tergites; sternites more uniformly brownish yellow, the lateral margins at midlength more infuscated; hypopygium dark brown.

♀. Similar to the male but the wing-pattern is more clear-cut. Ovipositor with the tergal valves slender, upcurved.

*Holotype:* ♂, Palo Blanco, La Plata, April 18, 1920 (C. Bruch). *Allotopotype:* ♀, May 2, 1920. *Paratopotypes:* 5 ♂'s, April 18-24, 1920.

**Brachypremna australis** sp. n.

Frontal prolongation of the head and mouth parts light yellow; head light gray; mesonotal praescutum yellowish brown with two, intermediate, parallel, dark brown stripes; lateral stripes pale brown, each sending a brown line laterad to the margin of the sclerite; a conspicuous,

black, rounded spot at the pseudosutural foveae; tibiae and tarsi uniformly dark brown; wings light grayish yellow, the costal and apical region more saturated.

♂. Length 11.5 mm.; wing 13.3-13.5 mm. ♀. Length 14 mm.; wing 14.2-15.2 mm.

Frontal prolongation of head and the mouth parts conspicuously light yellow; palpi with the basal two segments dark brownish black, the distal segments paler brown. Antennae with the scapal segments light yellow, sparsely pollinose; flagellum dark brown, the basal two or three segments more brownish yellow. Head light gray, dusted with yellow.

Pronotum pale buff, with three brown markings, the median mark broadest. Mesonotal praescutum rather bright yellow to reddish brown, subshiny; three praescutal stripes, the broad median stripe almost of the ground-color, the margins conspicuously but narrowly dark brown, these markings ending before the suture; lateral stripes pale brown, from the anterior end of each a darker mark extends laterad to the margin of the sclerite; pseudosutural foveae small, rounded, black; scutum with the median area dull yellow, each lobe more grayish, with a V-shaped brown marking; scutellum yellow with a small brown spot in the center; postnotum brownish yellow with a brown longitudinal stripe on either side of the narrow median line. Pleura pale yellow, sparsely pruinose, the mesepisternum a little infuscated. Halteres yellow, the knobs pale brown.

Legs with the coxae pale, the middle coxae with a rounded dark brown spot on the cephalic face, the posterior coxae with a slightly larger spot on the outer face; trochanters dull yellow; femora brownish yellow, the tips narrowly dark brown; tibiae and tarsi uniformly dark brown.

Wings light grayish yellow, the costal region more saturated yellow; apex slightly darkened; stigma yellow, narrowly encircled with brown; some of the longitudinal veins narrowly seamed with darker, clearest at the tips of $R_4+_5$ and $M_1$. Venation: *r-m* very short or obliterated by the punctiform contact of $R_4+_5$ on $M_1+_2$; vein *2nd A* very short.

Abdominal tergites yellowish brown, the subterminal tergites darker, almost black; lateral margins of sclerites narrowly grayish; sternites with elongate-oval black marks; male hypopygium light yellow. In the female, the abdomen is uniformly light brown, but the basal tergite shows two parallel darker longitudinal stripes.

*Holotype:* ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* several of both sexes, some in alcohol.

*Brachypremna australis* is the most southerly representative of the genus yet made known. In the venation and uniformly darkened tibiae and tarsi, it agrees only with the Amazonian *B. uniformis* Alexander, from which it differs conspicuously in its yellow mouth parts and conspicuous thoracic pattern.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JUNE, 1923.

### The Worthy Flea.

In years gone by more than one entomological journal has drawn remarks appropriate to our science from the writings of Oliver Wendell Holmes. Another source, also of high literary quality, for critiques of the study, and of students, of insects is to be found in *Enjoying Life and Other Literary Remains* of W. N. P. Barbellion. Barbellion was the pen name of Bruce Frederick Cummings, for five years on the entomological staff of the British Museum, the brief announcement of whose death is to be found in the NEWS for May, 1920, page 149. One of his delightful essays is entitled *The Scarabee Monographed*, published originally in *The Forum* and reprinted in *Enjoying Life*. Here is a bit that will surely whet the reader's appetite for more:

Recollecting, perhaps, the sentiment expressed by Boyle, that nothing can be unworthy of investigation by man that was not unworthy of being created by God, a member of the wealthy Rothschild family is at the present moment the foremost authority on the Siphonaptera, a name which polite students give to the fleas. In the lay mind the flea is only a joke—and always one which must be cracked. But, "pour les vrais savans," he is a serious and very attractive study in comparative anatomy, bionomics and metamorphosis. Even lice have never lacked students. Henry Denny monographed the British species as early as 1842. The "Monographia Anoplurum Britanniae" is a very curious old book, concluding with a quotation from the 91st Psalm: "These all wait upon Thee that Thou mayest give *them* their meat in due season."

### Cellucotton for Packing Unmounted Insects.

During the summer of 1919 the writer began using cellucotton as a substitute for glazed cotton, for packing unmounted insects as collected in the field. This material has been used each year since, and with evident satisfaction on the part of all who have tried it. For entomological purposes cellucotton has been found superior to glazed cotton on the following counts: thick layers may be cut easily with scissors to fit any container; the material may be separated readily into layers of any desired thickness at the moment of using; there are no fibers to cling to the insects such as may occur when using cotton.

Cellucotton is a woodpulp product, apparently developed during the war period as a substitute for cotton in all its uses as an absorbent material and for surgical dressings. For those purposes it is excellent, but cellucotton is now being put to other uses where soft thin layers are required, such as packing for delicate glassware or unmounted insects. This material may now be obtained in rolls 24 inches wide and weighing approximately 17 pounds. A recent quotation gave the price as 23 cents per pound, and it takes a considerable volume to make a pound. The roll may be unwound into a layer one inch thick, and this in turn, if desired, be separated into thin sheets little thicker than lens paper. Cellucotton may now be obtained from most wholesale drug firms, although the chief distributing agency appears to be the Lewis Manufacturing Company, Walpole, Massachusetts.—HARRY H. KNIGHT, University of Minnesota.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record. Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **16**—The Lepidopterist, Salem, Mass. **24**—Annales de la Societe Entomologique de France, Paris. **50**—Proceedings of the United States National Museum. **71**—Novitates Zoologicae, Tring, England. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **89**—Zoologische Jahrbucher, Jena. **95**—Annales des Sciences Naturelles, Zoologie, Paris. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **109**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rund-

schau, Stuttgart. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **143**—Stettiner Entomologische Zeitung.

**GENERAL.** **Browne, H. B.**—"Window" envelopes [for papered specimens]. **9,** lvi, 92-3. **Gahan, A. B.**—The role of the taxonomist in present day entomology. **10,** xxv, 69-78. **Howes, P. G.**—Photographing insect life. (Nature Mag., May, 1923, 9-14.) **Littlewood, F.**—Killing with cyanide. **9,** lvi, 90-2. **Lutz, F. E.**—Flowers and their insect visitors. (Nat. Hist., New York, xxii, 125-34.) **McCulloch & Hayes**—The reciprocal relation of soil and insects. (Ecology, iii, 288-301.) **O'Hea, J. P.**—Tactile vision of insects and arachnida. **76,** cxi, 498. **Phisalix, M.**—Animaux venimeux et venins. Tome I. Masson & Cie., Paris, 1922.

**ANATOMY, PHYSIOLOGY, ETC.** **Rabaud, E.**—Recherches sur la variation chromatique et l'homochromie des arthropodes terrestres. **78,** lvii, 1-69.

**ARACHNIDA AND MYRIOPODA.** **Mello-Leitao**—Quelques Araignees nouvelles ou peu connus du Bresil. **24,** xci, 209-28.

**Chamberlin, R. V.**—The No. American species of Mimetus. **13,** xv, 3-9. **Ewing, H. E.**—The dermanyssid mites of North America. **50,** lxii, Art. 13.

**THE SMALLER ORDERS OF INSECTA.** **Campion, H.**—On the use of the generic name Brachycercus in Plectoptera and Orthoptera. **11,** xi, 515-18. **Durken, B.**—Die postembrionale entwicklung der trachenkiemen und ihrer muskulatur bei Ephemerella ignita. **89,** xliv, Anat., 439-626. **Ewing, H. E.**—New genera and species of sucking lice. (Jour. Wash. Ac. Sci., xiii, 146-9.) **Kennedy, C. H.**—The naiad of Pantala hymenaea (Odonata.) **4,** lv, 36-8. The ecological relationships of the dragonflies of the Bass Islands of Lake Erie. (Ecology, iii, 324-36.) **Kruger, L.**—Psychopsidae. Beitrage zu einer monographie der Neuropteren-familie der Psychopsiden. Berothidae. Beitrage zu einer monographie der Neuropteren familie der Berothiden. Hemerobiidae. Beitrage zu einer monographie der Neuropteren-familie der Hermerobiiden. **143,** lxxxiii, 17-48; 49-88; 138-72.

**McDunnough, J.**—New Canadian Ephemeridae with notes. **4,** lv, 39-50.

**ORTHOPTERA.** **Campion, H.**—(See under Smaller Orders.) **Caudell, A. N.**—A new sp. of Zoraptera from Bolivia. **10,** xxv, 60-2. **Fontes et Veloso.**—Sur lest mouvements automatiques des muscles des pattes de Blatta germanica. **77,** lxxxviii, 835-37.

**HEMIPTERA.** **Davidson, J.**—Biological studies of Aphis rumicis. The penetration of plant tissues and the source of the food

supply of aphids. **72,** x, 35-54. **Dudich, E.**—Die Phymatiden des Ungarischen national museums. **109,** xix, 161-81. **Gerhard, W. J.**—The periodical cicada. (Field Mus. N. H., Leafl. 4.) **Parshley, H. M.**—On the ecology of Podops cinctipes and Rhytidolomia saucia. **4,** lv, 69-71.

**Hungerford, H. B.**—Some studies on the genus Hydrometra in America, north of Mexico, with description of a n. sp. **4,** lv, 54-8.

**LEPIDOPTERA. Ainslie, G. G.**—A corn-feeding geometrid (Pleuroprucha insulsaria.) **82,** xxiii, 89-101. **d'Almeida, R. F.**—Notes sur quelques lepidopteres Rhopaloceres du Bresil. **24,** xci, 229-35. **Bowman, K.**—Annotated check list of the Macrolepidoptera of Alberta. **4,** lv, 71-2. **Coolidge, K. R.**—Notes on California moths. **139,** xxii, 16. **Jordan, K.**—On the sensory organ found on the head of many lepidoptera. On the scent-organs in the males of certain American Castniidae. A note on the families of moths in which vein 5 of the forewing arises from near the center or from above the center of the cell. **71,** xxx, 155-8; 159-62; 163-66. On the comb-bearing flap present on the fourth abdominal segment in the males of certain Notodontidae. **71,** xxx, 153-57. **Littlewood, F.**—(See under General.) **Mousley, H.**—Erora laeta Edwards. **4,** lv, 26-9.

**Cassino & Swett**—Some new Geometridae. **16,** iv, 1-8. **Hill, C. A.**—A new sp. and a new var. of noctuid moths from Southern California. **139,** xxii, 17-19.

**DIPTERA. Becker, T.**—Dipterologische studien. Dolichopodidae. B. Nearctische und Neotropische region. (Abh. Z. B. Gesell. Wien, xiii, 1-294, 1921.) **Duda, O.**—Revision der altweltlichen arten der gattung Borborus (Capsela.) **111,** 1923, A, 4, 35-112. **Greene, C. T.**—The immature stages of Hydrophorus agalma. **10,** xxv, 66-9. **Surcouf, J. M. R.**—Dipteres nouveaux ou peu connus. **24,** xci, 237-44. **Tonnoir, A.**—Le cycle evolutif de Sactylocladius commensalis sp. n. Chironomide a larve commensale d'une larve de Blepharoceride. (An. Biol. Lacustre, xi, 279-91.)

**Curran, C. H.**—Our No. American Leucozona, a variety of lucorum (Syrphidae.) **4,** lv, 38. The Stenosyrphus sodalis group (Syrphidae.) An apparently undescribed species of Scellus (Dolichopodidae.) Change of names. **4,** lv, 59-64; 73-4; 74. **McAtee, W. L.**—Descriptions of Bibio from the Carolinas. **10,** xxv, 62-4.

**COLEOPTERA. Brethes, J.**—Descripcion de varios coleopteros de Buenos Aires. **106,** xciv, 263-305. Primera contribucion para el conocimiento de los "Strepsiptera" Argentinos. Apendice. Hymenoptera. (Rev., Facult. La Plata, xv, 41-56.) **Bridwell, J. C.**—The host plant and habits of Acanthoscelides griseolus. **10,** xxv, 79-80. **Buchanan, L. L.**—The European Amalus haemorrhous, in

the U. S. **10,** xxv, 79. **Cameron, M.**—Descriptions of new species of Staphylinidae from the West Indies. **11,** xi, 363-400. **Kleine, R.**—Bestimmungstabelle der gattung Arrhenodes. **111,** 1923, A, 4, 169-80. **Kriesche, R.**—Zur kenntnis der Lucaniden. **143,** lxxxiii, 115-37. **Mueller, R.**—Ueber die sinneszellen im fuhler von Necrophorus vespillo. **114,** xl, 9-10. **Notman, H.**—A new genus and sp. of Staphylinidae parasitic on a S. American opossum. **138,** No. 68. **Schenkling, S.**—Coleopterorum catalogus. Pars 76: Cryptophagidae. **Scott, H.**—Longevity of a cerambycid larva. **8,** 1923, 90.

**HYMENOPTERA. Brethes, J.**—(See under Coleoptera.) **Cockerell, T. D. A.**—Some bees from British Guiana. **11,** xi, 442-59. Some bees from Victoria, Mexico. **50,** lxiii, Art. 8. **DuBois, A. D.**—A study in ant-power. (Nature Mag., May, 1923, 8.) **Gahan & Fagan**—The type-species of the genera of Chalcidoidea or chalcid-flies. (Bul. U. S. Nat. Mus., 124.) **Santschi, F.**—Description de nouvelles fourmis de l'Argentine et pays limitrophes. **106,** xciv, 241-62. **Sarin, E.**—Ueber fermente der verdauungsorgane der honigbiene. (Biochem. Zeit., Berlin, cxxxv, 59-84, 1922.) **Stumper, R.**—L'establissement des nouvelles colonies chez les fourmis. **95,** vi, 95-105. **Vogel, R.**—Zur kenntnis des feineren baues der geruchsorgane der wespen und bienen. **104,** cxx, 281-24.

**Fouts, R.**—Description of a new Serphoid parasite. **10,** xxv, 64-5. **Gahan, A. B.**—An Eulophid parasite of the chrysanthemum midge. **10,** xxv, 65-6. **Macgillivray, A. D.**—New western species of Dolerus. **4,** lv, 65-8.

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Responses of the Large Water-strider, Gerris remigis Say, to Contact and Light by C. F. Curtis Riley (Annals Ent. Soc. Amer. vol. XIV, No. 4, pp. 231-289).—Insect behavior receives so little attention from entomologists in general that it seems desirable to call attention to Prof. Riley's paper. It is probably difficult for economic entomologists to see any intimate relationship between insect control and many of the reactions produced by the work of complex external and internal forces, and collectively called behavior. However, a better understanding of the forces which call forth responses from living matter might lead to new methods for use in the economic field. The study of insect behavior calls for careful work in the laboratory and field on account of the various factors involved and the possibility of drawing wrong conclusions from too few, or wrongly correlated, data or failure to take physiological conditions into account. Prof. Riley's paper deals with the general responses to contact and light of *Gerris remigis*, one of the common species of aquatic Heteroptera, which lives usually on water-films of medium-sized permanent brooks and creeks. He found that the species responded readily to contact stimuli from

various objects in its habitat and that variations in responses took place when the stimuli were similar and general conditions were unchanged. These variations he states are probably due to different internal conditions at different times. Of course this is not a satisfactory explanation of such variations, but no other course was open to Prof. Riley in view of the absence of data and the difficulty of studying differences due to changes in the internal condition of the insects. The grouping of the animals, commonly in the fall, through contact stimuli and the various factors bearing on such aggregations and their later disintegration are discussed in an interesting manner, as are also the effects of severe droughts, rain and wind storms. It appears that responses to contact stimuli are strongly in evidence at the beginning of and during the hibernating period. So far as photic stimuli are concerned, *Gerris remigis* responded readily to various intensities. On certain occasions in laboratory aquaria it acted negatively phototactic to sunlight. To the stimuli of electric lights of 22 ca. m. and 44 ca. m., Prof. Riley found that the majority of the gerrids responded positively, the orientations and movements being less pronounced when light of lesser intensity was used. Stationary, oscillating and moving but not oscillating lights were used in the experiments. The author covers the habitat responses to sunlight only to a small extent but a later paper on this subject is promised. He concludes "that responses to contact and to photic stimulation play an important rôle in the daily lives of the water-striders," many of the normal habitat activities being due to the thigmotactic and phototactic propensities of the insects. The work of other investigators is reviewed throughout and the paper is accompanied by 12 figures, most of them being photographs of field conditions. These illustrations did not gain anything by being printed on the same kind of paper as the text.—HARRY B. WEISS, New Brunswick, N. J.

## OBITUARY.

I have recently heard that Dr. R. A. DUMMER, the distinguished botanist and collector, is dead. In the Report of the South African Museum for the past year there is a note by Dr. Péringuey, as follows:—"I much regret to say that I have received news of the death, by accident, of this collector." Since Dr. Dummer has advertised so extensively in "Entomological News," and undoubtedly has many correspondents in America who are awaiting news of him, I thought that it might be desirable to publish a brief statement to this effect.

CHARLES P. ALEXANDER.

# NEW ARRIVALS

From Colombia, South America:

**OVER 10,000 BUTTERFLIES, INCLUDING**

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

**1500 BUTTERFLIES AND MOTHS, INCLUDING**

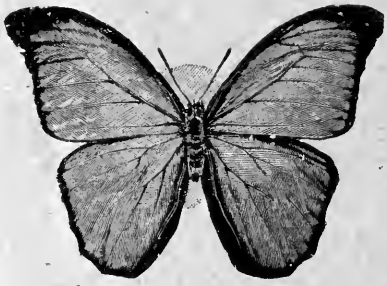
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera



From Assam, India:

**1200 BUTTERFLIES AND MOTHS, INCLUDING**

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

**And Many Other Showy Species**

From Tibet (Bhutan):

Armandia lidderdalii
Parnassius hardwicki

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JULY, 1923

# ENTOMOLOGICAL NEWS

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Owing to increased cost of labor and materials, no illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV JULY, 1923 NO. 7

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## Life-Histories in the Genus Schinia and Allies (Lepid.: Noctuidae) No. 1.

By HENRY BIRD, Rye, New York.

To students and collectors of the Noctuidae, that aggregation of forms which figured in the days of Grote as the "Heliothini" possessed an interest that called to them more than passing note, and they were favorite species with Henry Edwards, Strecker, Grote and Smith, while the work and summarization by Barnes and McDunnough have doubtless provided a compilation of nearly all the representatives of our fauna.

Though the tribal lines laid down by Grote for this grouping which had the old Ochsenheimer genus *Heliothis* as its type is not retained, and their phylogenetic position has been greatly and very properly changed by Hampson, their genera yet form a very distinct aggregation in American lists leading up to the Agrotid types, with which we are wont to associate the heavily spinose tibiae and other features of taxonomic degree.

Referring particularly to the genus *Schinia* Hb. and its near

ally *Lygranthoccia* G. & R., where a preponderance of the species occur, we now have a series of eighty-four accredited names, with their metropolis indicating a southern or southwestern center of dispersal. Such forms as are common to the Atlantic seaboard have long been familiarly known as adults, but even these, with one exception, it seems, are a perfect blank as to published data concerning their larval histories. Of the greater bulk of western and southwestern species less might be expected and no full description of a larval history has come to our notice.

All these species have a similar larval habit probably in feeding on flower-heads, seed-pods, seeds or ovules, are presumably single-brooded, gaining maturity at a rather late date in the season, so late in many instances that the usual collector of lepidoptera has given up all thought of securing larvae. With such habits some of them might readily become troublesome pests, upon undue increase in their numbers whereby an extension of food requirements proved imperative.

The adults are active moths for their size, may at times make an extended flight, as is indicated in the occasional appearance at the latitude of New York City of more southern forms, sometimes in considerable numbers.

Because of a short adult, egg and larval period in late midsummer and fall, with a major portion of their cycle passed as an underground pupa, they suffer less than some others from that scourge of insect life nowadays—fire. The moths fly readily to light, are to be found resting upon flower-heads or may be seen flying in afternoon hours, apparently feeding upon the nectar furnished by the current, seasonal bloom, which is also being patronized by bees. When the females are resting on flower-heads by day, it is natural to assume they may be associated with their foodplant, and it would appear there is considerable similarity in the color of the foodplant bloom and the predominating hues of the insect.

Doubtless many observations have been made which would help in elucidating the larval associations in this direction, but in being considered of small moment, they have not been

recorded to any extent. So, though the following notes are lamentably incomplete, in view of the facts, no excuses are offered.

**Schinia nundina** Dru.

On October 12, 1915, my son Junius discovered a mature larva feeding on Goldenrod bloom in a local woodland, and assuming it might be a *Schinia*, pains were taken to check the outcome, which ultimately registered a *nundina* emergence the following season. In the interval since this chance meeting, a yearly outlook has been maintained, with but five or six larval examples detected. One reason for poor success results from the great mass of *Solidago* bloom that decks the countryside, another is that the insect is rather uncommon at this location and finally, the close mimicry of the flower-head they occupy, makes the apprehension of these larvae difficult indeed. So far only *Solidago canadensis* L. seems the preferred one, but we assume this may be a mere chance, incidental to the fact that some examples of *canadensis* from favorable positions bloom earliest and thus happen to be selected by the females at the time of their flight.

The early stage larva likely mines the individual, unexpanded florets, feeding upon the tender ovules and stamens; later it remains in full exposure on the flower-head, solitary and sphinx-like, except that the retracted head and thoracic segments instead of being elevated, are curled under and bent to one side to avoid the stem whereon it has foothold. The yellow body color is similar in hue to the flower and a series of blackish, obliquely transverse markings on each segment correspond, in the full-grown larva, to the interstices between the florets of the flower-head, so that a striking resemblance to its surroundings exists. In curling the head downward there is a duplication of the frequency of the terminal ends of the inflorescence to curl under, so this unusual attitude happens, or would seem, to have a clear purpose for protective results.

The feeding is confined to one flower, but the larvae move to several during their later career, and a clew to their whereabouts comes through noting the damaged flowers with their

prematurely expanding pappus, showing where the seeds have been partially cut. It is the seeds that are desired, apparently at all times, such other eating of the bloom being secondary to getting access to them.

The apprehension of larvae of this type is not easy at best and it appears the females oviposit most frequently on the food-plant where it occurs in a narrow fringe, as the borders to a road or pathway, rather than selecting a great expanse of the plant. It may be a coincidence, but roads running east and west and furnishing such borderings, also the southerly side of waste lands where conditions are favorable, have been the situation where these and allied larvae were most frequently met. An explanation may offer that with the prevalent southerly winds of mid-summer the bulk of adults are moving in a northerly direction. With *nundina* the larval period is assumed to be about twenty days.

*Larva, penultimate stage*: Head normal, smooth, rounded, concolorous, of dull orange hue, the minute ocelli showing as black dots; setae weak; width of head 2 mm. Body cylindric, surface of skin minutely granular but without pile; setae weak, their position is generally indicated by blackish plates but IIIa on the abdominal segments is indeterminate, and due to the granulations, all are indistinctly shown; the leg plate bears a crinkled glistening hair which rather exceeds the others. The crochets of the fourth abdominal prolegs seem to number twenty. The cephalic shield is wider and paler than the head, is slightly elevated from the adjoining surface or hooded, thus permitting a better retraction of the head; on its anterior margin, two black markings are behind the vertex of the frontal lobes, and the lateral edge has a black margin. The general body color is dull yellowish, sometimes with an olive tinge, deepening to dull orange on the dorsum; a broken dorsal line is indicated and a transverse dorsal banding occurs on the anterior portion of each joint, obliquely continued laterad and finishing at the posterior suture above the line of tubercles III and IV, where it blends with a vague spiracular shading, all the marking being contrastingly shown in black. Length 18 mm.

*Mature Larva*: Similar to preceding stage; color a brighter chrome yellow, fully matching the flower; markings of same pattern and intensity. Length 26 mm. Maturity Oct. 10-15.

The *pupa*, in comparison to the larva, seems very short and small but shows the necessary conformity to the adult. The abdominal joints are retracted, conic, rigid; color, olivaceous brown and not shining like the

common noctuid pupa. A subterranean cell is formed at a depth of six centimeters or more and there is the long pupal period from mid-October to the following August. No parasitism was observed.

**Schinia arcigera** Gn.

This is the commonest species in the appearance of the adults at light in this locality, but the larva seems equally scarce as *nundina*. It is a week later in appearing and in flight about the late summer flowers, there has been no preference detected to suggest what might be the foodplant. Our meeting with the larva has only been in the last stage, with *Aster puniceus* L. and *A. laevis* L. alone concerned as foodplants.

This larva, when resting, leaves the flower and stretches to full length immediately below the inflorescence on some straight portion of the stem. When feeding, the individual floret is consumed from the side to get at the ovules, while the body, except the head and first segments, is closely appressed to the stem below. In its case there are no transverse markings and the even body color of mars brown blends rather well with the surroundings, as frequently the Aster stems take on a purplish brown tone.

An unexpected feature exists in it being a pilose larva, which was to the writer a distinct surprise.

*Mature Larva*: Head polished, round, comparatively small, a dull shade of orange tinged with brown; on the top of either epicranial lobe and near the median suture appears a brown marking, and a close examination shows the head to be checkered with fine reddish lines. The front is higher than wide, with the suture dividing the adfrontal space a straight line, and the latter area a mere linear delineation. Width of head 1.5 mm.

The last two segments taper sharply, and in life a noticeable flattening exists, which is lost in the inflated larval skin. The body, though shining and seemingly naked, is found to be covered with a thick pile, the hairs of which are about one-eighth the length of the usual setae arising from the tubercles. Under magnification they are shown to be stiff brownish hairs. The body color is an even shade of pale mars brown, on close inspection found to be mottled and streaked with fine yellowish hair lines, while a well evident, pale yellow, subspiracular longitudinal line, occurs as the chief marking. The cervical shield is prominent, longitudinally marked with two lines composed of black bands split by a yellow line, which in a way are continuations of the head markings. The spiracles are solidly black, the tubercles concolorous

and indeterminate. The hooks of the prolegs number twenty, and the larva attains a length of 26-27 mm. One larva was noted mature and entered the ground Oct. 20.

The *pupa* and its conditions conform to the details given for the preceding species.

**Lygranthoecia brevis** Grt.

The association of this moth with the common purple Aster, *Aster novae-angliae* L., where its markings were pointed out to so admirably blend with the flower, has been chronicled by Beutenmüller and others for this section, while Cockerell has noted the species resting on the discs of *Helianthus lenticularis*, at Boulder, Colorado.

The pattern and lines in the adult of this species exhibit the basic principles of optical illusion, and it would appear to the writer that the caterpillars show delineations which are even a greater success in the art of camouflage. While the adult in rare instances has been noted in abundance about flowers, but few have ever been taken at Rye, whereas its larva may be found here abundantly when one is conversant with the procedure. An extended time, in which the larvae attain maturity, is noticeable, and in some seasons the first week of November is not too late to secure them. *Aster novae-angliae, A. laevis* and *A. puniceus* serve as foodplants, with the first best adapted to this sturdy caterpillar.

As this stout larva is noted at maturity, lying in crescent form on the denuded receptacle and more or less hidden by the pappus, it is apparent here must be a close relative of a cutworm of the Agrotid type and we see ample confirmation of Hampson's interpretation of the taxonomic characters of the adult, with the radical change he instituted over its earlier list position.

When feeding on the inflorescence of the New England Aster, the first three larval stages are passed within the full-formed flower bud and though it never opens, the damaged ovules send out some premature pappus, advising of the culprit. Two other larvae, a coleopter and micro-lepidopter, are busy here also and their work is very similar in this respect.

Having consumed the ovules in the full-formed bud, the final larval stages are passed on the upper surface of the expanded

flower, the seeds of several being required. Digging under the seeds where they find attachment, the larva succeeds in hiding to a remarkable degree and as this action causes a premature expansion of the pappus, there is soon this characteristic puff, helping concealment. But this is an evanescent screen and the larval markings in dashes and obliques of brown on a drab surface help admirably to fit in with its surroundings, as from its increasing size it must come into fuller exposure.

A parasitic Tachinid fly finds them out, however, and its actual oviposition has been observed on several occasions. One or more pearly white eggs are glued to an attacked host at any point of vantage by the female fly, whose actions are very deliberate, due perhaps to the coolness of the late autumn days or to the functional processes of oviposition. These parasitic larvae doubtless come to rapid maturity and pass the winter as puparia, since oviposition may be as late as October 20. Through the courtesies of the U. S. National Museum, this fly has kindly been determined by Dr. J. M. Aldrich as *Winthemia quadripustulata* Fab.

Local records for the moth cover the first ten days of September, when it is flying in company with *S. arcigera*.

*Larva, penultimate stage*: Head proportionately small, polished, rounded, the epicranial lobes topped with conspicuous blackish shading; width 1.5 mm. Body covered with fine pile, cylindrical, constricted at segmental sutures, longitudinally lined with numerous brown and fine, crinkled, yellow lines, of which the dorsal and spiracular are prominent, the former dark brown, the latter pale yellowish; underlying shade is sienna brown to pale clay color. Much variation exists in the coloration and the continuity of the lines. Cephalic plate wider than head and marked with four, conspicuous, slightly oblique, black lines. Tubercles indeterminate, IV discernible on abdominal joints, while the leg plate is readily seen; anal plate small and segment reduced. Length 20 to 21 mm.

*Mature Larva*: Similar to preceding stage, except the color is lighter and the lines are frequently broken at the segmental sutures, which latter produces an effect whereby the larva more closely simulates its surrounding bed of pappus. Width of head, 1.6 mm.; length of body, 28 to 30 mm. Maturity at Rye, N. Y., Oct. 20 to Nov. 8.

The *pupa* agrees with the preceding species in its proportionately reduced size, rigid conic abdominal region, and the subterranean cell as a consequence seems large as compared with the usual Noctuid condition.

## Notes on Zygoptera (Odonata) from Maryland, with a Description of Enallagma pallidum, n. sp.

By Francis Metcalf Root, Ph.D., Baltimore, Maryland.

During the summer of 1922 I visited various bodies of water in eastern Maryland in the course of a study of the breeding places of Anopheline mosquitoes. Finding that I had some spare time at my disposal, I turned my attention to the Odonata, but since my time was limited, I was forced to neglect the larger, swift-flying dragonflies to a considerable extent, and spend most of my time in collecting the Zygoptera or damselflies. The records listed in this paper are fragmentary, extending over only a part of the season and including only a few visits to each locality, but even so they are of considerable interest, especially since comparatively little has been published on the Odonata of Maryland.

From the physiographic standpoint, the localities where collections were made can be conveniently classified as follows:

1. Small, rapid streams.

Gwynn's Falls—a small stream just west of Baltimore, running through Hillsdale and Windsor Hills before entering the city itself. Visited May 30, June 23, 29, July 5, 10, Aug. 1, 16, 22, 30, Sept. 5, 9, Oct. 6, 24.

Herring Run—a small stream north-east of Baltimore running through an area reserved as a park. Visited July 21.

Small Streams with a similar fauna were also incidentally noted at Glenburnie, Homewood, Lake Roland and Ten Hills.

2. Sphagnum bogs.

Beltsville—the Powdermill Bogs, about two miles west of Beltsville, between Baltimore and Washington. Visited June 10.

Glenburnie—a pitcher-plant bog near the town, on the Annapolis Short Line, between Baltimore and Annapolis. Visited June 22.

3. Small, artificial ponds.

Homewood—several small ponds on the grounds of the Johns Hopkins University. Visited July 3, Aug. 9.

Hillsdale—north-west of Baltimore. A small pond resulting from the disuse of an old mill-race. Visited June 23, July 5, 10.

Columbia Ave.—several small ponds in a disused brick-yard in south-west Baltimore. Visited June 12, July 15.

4. Large ponds and lakes (mostly artificial).

Glenburnie—a large boggy pond formed by the damming of Sawmill Creek. About one mile north-east of the sphagnum bog already mentioned. Visited Aug. 4.

Ten Hills—a large pond about four miles west of Baltimore. Formed by damming a branch of Dead Run. July 24.

Lake Roland—a large lake, a reservoir of the water-supply system, about four miles north of Baltimore. July 13, 17.

Salisbury—in Wicomico County, on the Eastern Shore. Collecting was done at three mill-ponds north and north-east of the town, formed by damming the Wicomico River. Visited June 15, July 26, 27.

5. Brackish water ponds and bays.

Sparrows Point—seven miles south-east of Baltimore. Collections made in a bay of Jones Creek. July 6, 7.

Magothy River—Collections were made along the shore of the river near its mouth and in a large brackish pond connected with the river. The locality is about five miles north of Annapolis. July 31, Aug. 15, 21, 29. Sept. 4.

The following list gives the species of damselflies which were encountered, followed by the description of a new species.

AGRION MACULATUM Beauvais.—Common at all small streams visited between June 23 and Oct. 24.

HETAERINA AMERICANA Fabr.—First seen at Herring Run, July 21. Common at Ten Hills, July 24, and at Gwynn's Falls from July 29 to Oct. 24.

LESTES FORCIPATUS Ramb.—Homewood, Aug. 20, several specimens.

LESTES RECTANGULARIS Say.—Found near all small ponds from June 12 to Aug. 9.

LESTES VIGILAX Hagen.—Salisbury, July 27, one male.

ARGIA APICALIS Say.—Common about small streams (Gwynn's Falls, Herring Run, Ten Hills) and large ponds (Salisbury, Ten Hills, Lake Roland) on all visits between June 15 and Sept. 9.

ARGIA BIPUNCTULATA Hagen.—Common at sphagnum bogs (Beltsville, Glenburnie).

ARGIA MOESTA PUTRIDA Hagen.—Fairly common along small streams on all visits between June 29 and Oct. 24.

ARGIA SEDULA Hagen.—Common along Gwynn's Falls, June 23 to Sept. 9.

ARGIA TRANSLATA Hagen.—Not rare at Lake Roland, July 13 and 17.

ARGIA VIOLACEA Hagen.—Next to *Ischnura verticalis*, the most widely-distributed damselfly in this area. Found along small streams (Gwynn's Falls, Herring Run, etc.), small ponds (Homewood, Hillsdale), large ponds (Salisbury, Ten Hills, Lake Roland) and even near brackish water (Magothy River) from June 15 to Oct. 24.

ENALLAGMA ASPERSUM Hagen.—At small ponds, Homewood, July 3, Aug. 9, and Hillsdale, July 10.

ENALLAGMA CIVILE Hagen.—Large ponds, Salisbury, June 15, and Ten Hills, July 24.

ENALLAGMA DURUM Hagen.—Very common about brackish water on all visits.

ENALLAGMA EXSULANS Hagen.—Common along small streams on all visits between May 30 and Sept. 9.

ENALLAGMA GEMINATUM Kellicott.—Common about large ponds at Glenburnie (Aug. 4) and Salisbury (June 15, July 26-27).

ENALLAGMA HAGENI Walsh.—Small pond, Hillsdale, June 23, one male.

ENALLAGMA PALLIDUM new species.—Salisbury, July 26, one pair in copula and one male.

ENALLAGMA VESPERUM Calvert.—Salisbury, July 26-27, several specimens.

ENALLAGMA SIGNATUM Hagen.—Salisbury, June 15, July 26-27, Sparrows Point, July 6-7, and Magothy River, all visits.

ENALLAGMA TRAVIATUM Selys.—Not uncommon, Salisbury, June 15, July 26-27.

TELAGRION DAECKII Calvert.—One male, Salisbury, July 26.

NEHALENNIA GRACILIS Morse.—Sphagnum bog at Glenburnie, June 22, fairly common.

AMPHIAGRION SAUCIUM Burm.—Common at sphagnum bogs (Glenburnie, June 23 and Beltsville, June 10).

ISCHNURA POSITA Hagen.—Homewood, Aug. 9. Common at large ponds at Glenburnie, Aug. 4, and Salisbury, June 15, July 26-27.

ISCHNURA RAMBURII Selys.—Common at Magothy River on all visits.

ISCHNURA VERTICALIS Say.—Common about all small streams, small ponds, and large ponds from June 15 to Sept. 9.

**Enallagma pallidum** new species.

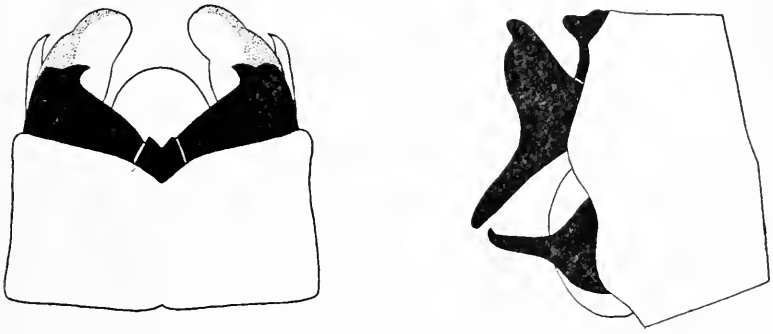
♂.—Pale blue with black as follows: a mid-basal dot on the labrum, a basal band connected with two spots laterally on the nasus, a short transverse isolated stripe a short distance ventral to the median ocellus, which the blue attains, and most of the vertex, leaving the following pale blue spots: two large post-ocular spots, a transverse bar along the posterior margin (not or barely connected with post-ocular spots), two small triangular spots between the median ocellus and the two lateral ones (in one male these two spots are connected with each other and with a small oblong spot between the two lateral ocelli), and two slightly larger triangular spots just external to the lateral ocelli. Second antennal segment black with a bluish spot on ventral surface.

A pair of curved black stripes, connected with a transverse band along posterior margin, on middle lobe of prothorax, an oblong spot dorsally on each lateral lobe. Mid-dorsal thoracic stripe divided into three narrow black stripes by two narrow pale blue areas; none of these three black stripes wider than one-sixth of the width of a mesepisternum.

Humeral stripe distinct above, ending in a fork on dorsal margin of mesinfraepisternum below, narrow and somewhat indistinct between and having adjacent to it a circular black spot on the anteroinferior angle of the mesepimeron. A short black line at upper end of each lateral thoracic suture.

Abdominal segments 1 to 7 black dorsally, except that the posterior margin of 1 is pale blue, the black on 2 is shaped like a spear-head pointing anteriorly, and there are interrupted pale blue basal bands on 3 to 7. Segments 8, 9 and 10 are all pale blue, except for very narrow transverse black lines at base of 8 and at base and apex of 10.

Superior appendages dark brown. Viewed from above, the upper branches are slightly divergent, the lower branches convergent. Upper branch short and stout, with large ante-apical tooth. Lower branch broad and blade-like, thickened externally and thin internally. Viewed



Dorsal and right lateral views of the male appendages of *Enallagma pallidum* n. sp. Camera lucida outlines.

in profile, upper and lower branches appear about equal in length, upper branch stout with a notch just below tip, lower branch slender. Inferior appendages slightly shorter than superiors, slender, almost straight, with a small hook at tip (see text-figures).

Wings hyaline, pterostigma brownish, light-bordered, surmounting less than one cell. Costal margin longest, proximal shortest, distal shorter than posterior. Arculus distal to second antecubital at a distance shorter than the length of the upper limb of the arculus, its limbs sub-equal. Upper side of quadrilateral about one-half of lower side in fore wings, more than one-half of lower side in hind wings. Inferior sector of triangle arises very slightly in front of submedian crossvein (at a distance shorter than the length of the crossvein itself) and ends at about the level of origin of the nodal sector. Superior sector of triangle ends between levels of origin of nodal and ultranodal sectors. Submedian crossvein between first and second antecubitals, nearer to second. fore wings with about nine postcubitals, hind wings with about eight.

The nodal sector arises nearest the fifth postcubital in fore wings (fourth in one wing out of four) and nearest the fourth in all hind wings. Ultranodal sector arises two cells proximal to the inner brace vein of the pterostigma in fore wings and one cell proximal in hind wings. Three antenodal cells in both wings.

Dimensions—abdomen 26 mm., hind wing 17 mm.

♀.—Pale greenish blue and black. Markings as in the male, except that the humeral stripe is ill-defined and reddish brown, there is a brown line on the entire length of the second lateral thoracic suture, and the anterior two-thirds of abdominal segment 8 has a wide dorsal stripe of black, fully four-fifths as wide as the segment in dorsal view. There is a narrow transverse basal brown stripe on 9, interrupted mid-dorsally, but no dark line at apex of 10.

Wings as in the male, but the pterostigma is decidedly paler and has the distal margin sub-equal to posterior.

Dimensions—abdomen 26 mm., hind wing 18 mm.

This species differs from *E. traviatum* by its three, narrow, mid-dorsal thoracic black stripes, by the male having the lower branch of the superior appendages sub-equal to the upper branch in profile view, abdominal segment 10 pale blue, etc.

From *E. antennatum*, whose male appendages are similar in profile view, it differs by having abdominal segments 8 to 10 almost entirely pale blue, by its narrower black thoracic stripes, etc.

One male and one pair in copula of this species were taken on July 26 at the large mill-pond of the Electric Light and Power Co. north of Salisbury, Maryland. The exact locality was a small cove, on the east side of the pond, just north of the railroad trestle which crosses it. At first sight, the slender form and pale blue color of the specimens reminded me of *Telagrion daeckii*, of which I had just taken a fine male at a neighboring pond. When I came to actually compare the two, however, the smaller size and the shape of the male appendages showed at once that they were distinct. Later, being unable to identify the specimens myself, I sent one of the males to Dr. P. P. Calvert, who informed me that it was a new species of *Enallagma*, most closely related, apparently, to *E. traviatum* Selys. I wish here to express my very great indebtedness to Dr. Calvert for his kindness in giving me this information.

I have requested Dr. Calvert to deposit the *type male* and *allotype female* of this species in the collection of the Philadelphia Academy of Natural Sciences. The other male is retained in my own collection.

## Corrections to the "Annotated List of the Diptera (Flies) of Oregon."

By F. R. Cole, Redlands, California.

The writer and Prof. A. L. Lovett published a list of the Diptera of the State of Oregon in the *Proceedings of the California Academy of Sciences*, volume XI, December 14, 1921. Since the publication of this list our attention has been called to several mistakes in the paper. We are indebted to Mr. S. B. Freeborn, Mr. C. W. Johnson, Dr. J. M. Aldrich and Dr. C. H. T. Townsend for suggestions and corrections. The numbers used in the original list are referred to here for convenience. There are a few typographical errors to be noted.

40.—*apernax* should be *spernax*.

46.—"at *clavipes*" should read "as *clavipes*."

81.—*Anopheles occidentalis* D. & K. is the same as the European *maculipennis*, according to Edwards.

84.—The name *Theobaldia* is preoccupied and *Culiseta* should be substituted.

85.—*Culiseta consobrina* (Desv.) is synonymous with *Culex pipiens* L. and according to S. B. Freeborn, the species has been confused with *C. impatiens* (Walk.) and *C. inornatus* (Will.).

87.—*Culiseta inornata* (Will.) should be *inornatus*.

88.—The original description of *Culiseta sylvestris* (Theob.) was made under the genus *Culex*, later referred to *Aedes* and now considered synonymous with *Aedes vexans* Meig.

89.—According to Freeborn, *Culiseta stigmatosoma* (Dyar) belongs in the genus *Culex*.

234.—This species is not *costalis*, but is an undescribed form that will be considered in a revision of the Therevidae by the writer, now in press.

236.—This is not *notata*, an Atlantic coast species, but is a variety of the undescribed form mentioned above.

505.—*Syrphus americanus* is evidently preoccupied by the name used by Swederus in 1787 for a different Syrphid, possibly *Eristalis flavipes*, according to C. W. Johnson (see Can. Ent., Feb., 1919, p. 32). Mr. Johnson has proposed the name *zeidemanni* for the species generally known as *Syrphus americanus* Wied.

550.—*Eristalis meigenii* Wied. is a South American species, according to data furnished some years ago by Knab; our species is *Eristalis brousi* Will.

I am indebted to Dr. C. H. T. Townsend, now in Sao Paulo, Brazil, for a long list of corrections of names of the muscoid

flies in the Oregon List. Some of the suggestions and corrections may not be in accord with the views of other workers in the group, but they are nevertheless valuable and are greatly appreciated by the writer, whose knowledge of this difficult group is limited. Dr. Townsend has just completed a Manual of the Muscoid Flies of the World and believes that nothing but restricted genera will be found useful in the study of Muscoid forms and that they cannot be classified like other diptera.

620.—Probably *Bogeria fasciata* Swenk, according to Townsend, who states that *fasciata* Swenk, *fontinella* Clark and *emasculator* Fitch are all three distinct species.

621.—The holotype of *lepivora* Coq. is *Bogeria princeps* Aust., the allotype *Atrypoderma americana* Fitch.

623.—*Cistogaster immaculata* Macq., not *Gymnoclytia.*

625.—Townsend places *fuliginosa* R. D. in the genus *Rhodogyne.*

629.—Probably *Myiophasia oregonensis* Towns. and not *M. aenea* (Wied.).

631.—*Euadmontia pergandei* Coq., not *Hypercteinia.*

632.—Townsend places *retiniae* Coq. in *Urophyllopsis.*

635.—The holotype is *Methypostena barbata* Coq., and according to Townsend, *Hypostena* is a synonym of *Dexia* Meigen, both having the same genotype, and is far removed from *Masicera.* Aldrich recently called the writer's attention to the fact that the species belonged to the European genus *Arrhinomyia,* but Townsend can see a distinction between the genera, although they are closely allied. *Torytachina, Odontosoma* and *Medina* are all closely related to *Arrhinomyia* and form a natural group.

636.—Townsend places *pristis* (Walk.) in *Anaporia.*

637.—The species is said by Townsend to be *Uromacquartia halisodotae* Towns., not *Oxydexia acuminata* Bigot!

638.—*Leskia gilensis* (Towns.) is placed in *Sipholeskia.*

639.—*Leucostoma atra* Towns. is placed in *Paradionaea.*

640.—Townsend places this form as *Galiathocera antennalis* Coq.

642.—*Clytiomyia atra* Coq. is placed in *Trichoclytia.*

643.—*Dionea nitoris* Coq. is placed in *Neodionaea.*

644.—There are several species of *Xanthomelana* in the west.

646.—*Heteropterina nasoni* Coq. is placed in *Nasonimyia.*

647.—Townsend states that the form called *Paraplagia spinulosa* (Big.) is probably *Euptiloparcia crucicola* Coq.

648.—This is a species of *Voria.*

650.—Townsend thinks this species distinct from *trilineata.*

652.—*Ocyptera dosiades* Walker is placed in *Neocyptera.*

653.—*Panzeria ampelus* Walker is placed in the genus *Ernestia* by Tothill (Can. Ent., Sept., 1921). Townsend considers *Ernestia* to be

tribally distinct and would place the species in *Varichaeta*, but it is doubtful if this genus is valid.

655.—*Gymnochaeta alcedo* Lw. is placed in *Chrysotachina*.

656.—*Exorista futilis* O. S. is placed in *Euexorista*.

657.—The form called *Exorista vulgaris* (Fall.) is placed by Townsend as *Phryxe hirsuta* O. S. or a new species.

658.—Perhaps *Neophorocera edwardsii* Will.

659.—Townsend says, "no telling what genus."

660.—Aldrich agrees with Townsend that *Phorocera saundersii* Will. should be placed in the genus *Madremyia*.

661.—*Frontina frenchii* (Will.) is placed in *Achaetoneura*.

662.—The form determined as *Tachina mella* Walk. is said by Townsend to be a species of *Exorista*.

663.—*Tachina robusta* (Towns.) is placed in *Tachinomyia*.

664.—The form determined by Aldrich as *Tachina rustica* Fall. is *Eribea spinulosa* Towns., according to Townsend.

665.—*Blepharipeza adusta* is placed in *Rileymyia*.

667.—Townsend thinks this is not *Winthemia quadripustulata* (Fabr.) but another species of the genus.

668.—*Metachaeta helymus* (Walk.) should be *M. atra* Coq.

669.—*Metopia leucocephala* (Rossi) should be *M. huggeri* Towns. The latter species is made a synonym of *leucocephala* in the Aldrich Catalogue.

670.—*Hilarella fulvicornis* (Coq.) is placed in *Euhilarella*.

671.—*Brachycoma sarcophagina* (Towns.) should be left in the genus *Laccoprosopa*, where it was described.

672, 673 and 674, according to Townsend, should not be called *Gonia*, but *Salmacia*.

675.—Townsend says of this form, "no telling what genus or species."

676.—*Cuphocera furcata* (v. d. W.) is placed as a species of *Sphyricera*.

677.—The form called *Peleteria robusta* (Wied.) is *Sphyromyia malleola* Bigot.

679.—Townsend's splitting of the genus *Echinomyia* is rather difficult to comprehend. *E. algens* (Wied.) is placed in his genus *Eularvaevora*.

680.—*Echinomyia dakotensis* is placed in *Larvaevoropsis*.

681.—*Echinomyia decisa* (Walk.) is placed in *Pararchytas*.

682.—*Echinomyia hystricosa* (Will.) is placed in *Protodejeania*.

683.—*Epalpus bicolor* (Will.) is placed in *Xanthocpalpus*.

684.—*Epalpus signiferus* (Walk.) is placed in *Argentocpalpus*.

685.—*Bombyliomyia abrupta* (Wied.) is placed in *Bombyliopsis*.

686.—The form called *Jurinella soror* (Will.) is a species of *Eublepharipeza*, according to Townsend.

687.—Townsend gives *Dinera futilis* Smith for this species, but this is a manuscript name, according to Aldrich, although used in literature a time or two.

688.—Townsend says this species is probably not *leucozona*.

690.—For the species given as *Trixa* (not *Trixia*, a misprint) *gillettei* Towns., Aldrich did not give any definite genus. Townsend has established the genus *Arctophyto* for the species. The species is correctly determined, as Aldrich has *gillettei* from the type locality and has examined the type.

Townsend has established many new genera among the ruins of the old genus *Sarcophaga*. To the writer's eyes many of the forms separated by Townsend are truly congeneric, but possibly the muscoid viewpoint will have to be attained first, as suggested by Townsend.

691.—Townsend puts *Sarcophaga aculeata* Aldr. in the genus *Acridiophaga*.

693.—*S. cimbicis* Towns. is placed in *Boettcheria*.

694.—*S. elcodis* Aldr. is placed in *Elcodiomyia*.

695.—*S. haemorrhoidalis* (Fall.) is placed in *Stephanostoma*.

696.—*S. helicis* Towns. is placed in *Helicobia*.

697.—*S. hunteri* Hough is placed in *Protodexia*.

698.—*S. kellyi* Aldr. is placed in *Kellymyia*.

699.—*S. pallinervis* Thoms. should be *Euravinia communis* Park.

700.—*S. planifrons* Aldr. is placed in *Miltoravinia*.

703.—*S. sinuata* Meig. is placed in *Sarcotachinella*.

705.—*Megerlea rufocaudata* Big. is placed in the genus *Tephromyiopsis*.

707.—*Cynomyia cadaverina* Desv. is placed in the genus *Cynomyopsis* and Townsend states that the form listed is more likely to be a western species of the genus.

708.—*Calliphora erythrocephala* is placed in the genus *Musca* by Townsend, but this change cannot be made if *domestica* is fixed as the type of *Musca*.

711.—There is some difference of opinion as to the placing of the three species, *regina* (Meigen), *terrae-novae* Desv. and *azurea* (Fall.). Rodhain and Bequaert put all of them in the genus *Phormia* and Aldrich is inclined to this view. Bezzi in a recent paper accepts *regina* as the genotype and considers the other species distinct from it. Townsend states that *azurea* is the genotype, putting *regina* in *Euphormia* and *terrae-novae* in *Protophormia*. So the matter rests largely on the correct designation of the genotype of the genus *Phormia*.

714.—Townsend places *cornicina* in *Orthellia*. The fact is now known that *cornicina* (Fabr.) has never been introduced from Europe and that our species is *caesarion* Meigen. This has been proven by examination of the European types.

716.—The species determined as *Mesembrina resplendens* Wahlberg is said by Townsend to be *Eumesembrina latreillei* R. D.

717.—Townsend places *Musca domestica* in *Promusca*. Most dipterists

will not accept this and it is understood that the International Commission on Zoological Nomenclature will vote to fix the type of *Musca* as *domestica* as a *nomen conservandum*.

719.—*Lyperosia irritans* L. is probably preferable to *Haematobia serrata* Desv.

On page 317, figure 38, *fenestradis* should be *fenestralis*.

857.—According to C. W. Johnson, the species *Chaetopsis aenea* is misunderstood, the typical form being taken only from salt and brackish marshes of the Atlantic and Gulf Coast. The species taken in Oregon is probably *C. massyla* Walker, which Johnson has from Berkeley, California.

949.—*Leucopsis* is a misprint for *Leucopis*.

950.—This species is *avicularia* (L.).

## New North American Hesperiidae (Lepid.).

By A. W. LINDSEY, Denison University, Granville, Ohio.

During the Fall of 1922 Mr. W. C. Dukes, of Mobile, Alabama, sent me a number of specimens of skippers which included a fine new species and an extremely dark form of *dion* which I believe to be worthy of a racial name. One specimen of the new species was also sent to Dr. Wm. Barnes, at Decatur, Illinois, and was placed as new by Mr. Benjamin before my specimens had reached me. In view of my interest in the family Hesperiidae and my possession of three other specimens, Dr. Barnes and Mr. Benjamin have generously yielded the authorship of the species to me.

**Atrytone (Euphyes) dukesi** n. sp.

♂. Wings more broadly rounded than in normal *Euphyes*, the secondaries conspicuously different, approaching the ♀ wing form of the genus.

Upper surface: Primaries lustrous brownish black with a black stigma of typical form which appears rather short through lack of contrast. Stigma followed by scattered fulvous scales which form vague patches between the veins. Base of primaries with some scales of the same color in the better specimens. Basal two-thirds of secondaries behind anterior margin of cell with fulvous hairs and scales, forming a rather definite patch between $M_1$ and $M_3$ beyond cell, and a triangular spot in the angle of $M_3$ and $Cu_1$, but otherwise diffuse. Fringe concolorous, slightly paler toward anal angle of secondaries. Body concolorous.

Under surface: primaries brownish black with the costa before SC yellow-fulvous, and a heavy powdering of scales of this color extending on through the costal area, over the apex, and back on the outer margin to $Cu_2$. Secondaries completely overlaid with this color, veins pale. Through the cell, fading toward the outer margin, is a pale ray,

and between $Cu_2$ and the first anal there is a similar pale stripe which is less definite. These marks are much the same as the pale stripes of *dion*. The entire ventral surface of the body is almost white, unlike the related species. The abdomen bears a dark brown midventral line. Expanse 35 to 38 mm.

Described from four males, all taken in Mobile County, Alabama, in 1922. *Holotype:* Aug. 6, in coll. Barnes. *Paratype:* Aug. 27, returned to Mr. Dukes. The two remaining *paratypes*, taken Aug. 27 and 29, are in the collection of the author.

In examining the genitalia of the holotype *in situ*, I was inclined to agree with Mr. Benjamin that the valve differed in shape from that of *dion*. Subsequently I dissected out and mounted the genitalia of one of the paratypes, which prove to be indistinguishable from those of a specimen of *dion* from Wisconsin. The species is, however, very distinct from any other in the North American fauna. Its salient features are the extremely dark color and the abnormal wing shape. Mr. Benjamin compared the holotype with material in the National Museum, and has given me Mr. Schaus' note that it is nearest to *Hesperia aurina* Plötz from Jamaica, although undoubtedly distinct. It gives me great pleasure to name this species for Mr. Dukes, in acknowledgment of his unselfish efforts to advance our knowledge of the Lepidoptera of Alabama.

**Atrytone (Euphyes) dion** race **alabamae** new.

♂. Similar to *dion*, but with the yellow-fulvous of the upper surface reduced to a single subapical spot between $R_5$ and $M_1$, a streak in the lower angle of the cell, and a small dot beyond this which is the first of a series forming a greatly reduced band along the outer edge of the stigma. This leaves a fuscous terminal area occupying about two-fifths of the length of the wing. Secondaries also with the fulvous reduced, though less conspicuously.

Under surface darker than in *dion*. The macular band of the primaries is limited to three small spots beyond the stigma, and the two pale rays on the secondaries are less in contrast with the ground color than in *dion*.

*Holotype:* 1 ♂, Mobile County, Alabama, June 25, 1922, W. C. Dukes, in the collection of the author.

The records of distribution of *dion* available to me show New Jersey as the southernmost reported capture, and all specimens which I have seen are so much paler and brighter than *alabamae* that they might easily be taken for a different species. The primaries of the race are rather like those of *bimacula*.

Mr. Dukes has also sent me one male of *Poanes viator* taken at Chikasaw, Alabama, Oct. 1, 1922. This appears to be a new southern record also.

## Notes on Pennsylvania Diptera.

By A. B. Champlain and J. N. Knull, Bureau of Plant Industry, Harrisburg, Pa.*

Among the Dipterous material in the state collection of the Pennsylvania Bureau of Plant Industry are certain species or specimens that bring to mind some new or interesting facts of a biological nature, worthy of record.

The following notes are from captures and observations made by the authors, who have given special attention to bringing together and collecting biological data on local insects, and by other members of the Bureau, who have been credited with their notes in each instance.

The authors are indebted to Mr. Chas. W. Johnson, of the Boston Society of Natural History, for identifications and suggestions.

Tipulidae.—*Tanyptera* [*Xiphura*] *frontalis* O. S., *T. fumipennis* O. S., *T. topazina* O. S.

Adults of the three species were collected in flight, from May 25th until June 10th, in a swampy bottom, northern exposure, at Inglenook, Pennsylvania. Larvae of *Tanyptera* may be found in this swamp throughout the year in galleries in watersoaked or moist brashy stumps, logs, and limbs of trees on the ground.

Mycetophilidae.—*Diomomus subcaeruleus* Coq. An adult of this rare fly was captured flying at Inglenook, Pa., June 17.

Tabanidae.—*Haematopota rara* Johnson. Represented by two specimens, both collected by Prof. J. G. Sanders at Montebello, Pa., June 24, 1917, and at Hummelstown, Pa., June 10, 1920, respectively, while sweeping sedges along the edge of small streams.

Leptidae.—*Xylophagus abdominalis* Loew.

Adults were reared from larvae collected beneath the bark of dead pine, where they were observed feeding on the larvae of the beetle, *Rhagium lineatum* Oliv.

Cyrtidae.—*Oncodes dispar* Macq.

While chopping into an old decaying log in Wildwood Park, Harrisburg, Pa., August 20th, some years ago, adults of this Cyrtid were found dead, but in good condition, in the cells of a

* Publication suggested by Prof. J. G. Sanders, Director of the Pennsylvania Bureau of Plant Industry.

spider-killing wasp. The wasp apparently caught the spiders that were infested by larvae of *Oncodes*, stored them in cells with her eggs, sealed the gallery and departed. The *Oncodes* larvae consumed the spiders and possibly the wasp larvae, then transformed and were unable to get out. Remains of the spiders were present in the cells.

*Opsebius pterodontinus* O. S., Manada Gap, Dauphin Co., Pa., July 4, 1920,—a living adult found floating in a small spring at the foot of the mountain.

MYDAIDAE.—*Mydas tibialis* Wied. A single example of this species, labeled Perdix, Pa., July 19, 1914, is in the Bureau collection. It was collected by Mr. J. E. MacNeal, who presented it to the late V. A. E. Daecke.

ASILIDAE.—*Dasyllis grossa* Fabr.

An adult of this large fly was observed capturing a specimen of *Tibicen sayi* S. & G. in midair, at Montebello, Pa. The cicada was probably twenty feet from the ground when it suddenly dropped to earth with the *Dasyllis*. In this case the prey was too bulky to carry off, as is the usual practice.

*Nusa fulvicauda* Say, Hummelstown, Pa., June 1.

Larvae and pupae of this species found in the pupal cells of *Chrysobothris femorata* Oliv. in *Quercus* sp. were caged and reared.

EMPIDAE.—*Rhamphomyia* sp.

"On April 12th, 1921, I noted the mating of flies of this genus. My attention was attracted to what seemed to be small clusters of dead flies on the roots of some uprooted peach trees in Miller's orchard at Marion, Pa. Each cluster proved to be a male and female in copulation. The male hung suspended by the hind legs from a support and held the female with his middle and front legs. The female in turn held a smaller fly with her legs and appeared to be feeding upon it. In collecting three pairs of flies, I obtained three different species of flies in the grasp of the females. Two of these flies were dead and one alive."—J. R. STEAR.

PHORIDAE.—*Aphiochaeta*? sp.

Violet seeds collected for the seed herbarium by Mr. W. A. McCubbin were found to be infested by specimens of a small

maggot that had eaten out the interior of the seed. The seeds had been collected at Edenville, Pa., May 24th, and were not examined until August 28, 1922, when the damage was noticed. At this time there were a number of dead, dried larvae in the vials (probably on account of lack of moisture) and about six pupae, which were also dead. These pupae, however, were identical with the drawing and description of *Aphiochaeta rufipes* Meig., a species that was recorded as infesting onion seed,[1] by Mr. B. H. Walden in Connecticut.

It is likely that the seed became infested when on the drying trays.

SYRPHIDAE.—*Microdon craighcadi* Walton.

This beautiful little green species occurs at Rockville, Pa., July 23 to August 4th. It may easily be mistaken for a "Cuckoo wasp," *Chrysis* sp., as it has the habit of flying up and down in a nervous manner, along the trunks of dead trees (*Pinus*) like the *Chrysididae*. It seemed to be especially interested in the dead snags infested by ants and probably breeds in these stumps. It is rare and difficult to catch.

*Meropioidus villosus* Bigot. One specimen of this species captured on the mountain top at Rockville, Pa., 1200 feet elevation, March 30, on open catkin of Alder, (*Alnus* sp.)

*Volucella vesiculosa* Fabr. The larvae may be found breeding in wounds and pockets in oak trees, the adults feed on running and fermenting sap on oak trees. The records in the collection are as follows:—Charter Oak, Pa., July 11, two males, Knull. Cresco, Pa., June 10, one male, H. B. Kirk. Harrisburg, Pa., July 20, at fermenting sap, four females, H. B. Kirk; Manumuskin, N. J., June 23, male, V. A. E. Daecke; Da Costa, N. J., June 4, Daecke.

*Criorhina nigriventris* Walton.

The type of this species[2], a female, was taken in Wildwood Park, Harrisburg, Pa., March 24, resting on a tree trunk, in a swampy region, near the foot of the first mountain and no additional specimens were taken for several years. The apparent center of distribution was finally located. On the extreme top of the first mountain (Rockville, Pa.), three miles from where

[1] Rep. Conn. Agriculture Experiment Station 1909-10, 693.

[2] W. R. Walton, Ent. News, XXII, p. 318, 1911.

the type was taken, there is a rocky ridge where the boulders are piled by nature in picturesque confusion; cropping out here and there in addition to other vegetation grows a wild gooseberry, *Ribes rotundifolium?* From April 20th until May 15th, or thereabouts, the adults of *Criorhina nigriventris* are to be found, flying about in the air, resting on the boulders in the sunny spots and visiting the gooseberry blossoms, which appear to furnish their favorite food.

In company with *C. nigriventris*, which is not rare, but exceedingly wary and swift in flight, and difficult to capture, we find *Criorhina verbosa* Walk. very common, and also feeding in the gooseberry flowers.

Our captures of *C. nigriventris* are not very numerous; a visit to "Criorhina Hump," as we now call it, at the proper time each year, will furnish sport, exercise, and the possibility of a specimen or two of this interesting fly.

TACHINIDAE.—*Schizotachina vitinervis* Thomp., Hummelstown, Pa., 1922.

Reared from Yellow Pine needles infested with needle-mining Lepidopterous larvae, probably *Paralechia pinifoliella* Cham.

*Pachyophthalmus signatus* Meig., Linglestown, Pa. Reared from cocoon of *Trypoxylon albitarse* Fab.

*Euthera tentatrix* Loew, Charter Oak, June 20; Chambersburg, June; Cresco, July; Hunters Run, Pa., May 30.

DEXIIDAE.—*Eutheresia canescens* Walk. This species is a parasite of *Rhagium lineatum* Oliv. Adults were reared in June from *Rhagium* larvae, collected beneath white pine bark at Charter Oak, Pa.

SAPROMYZIDAE.—*Lonchaea polita* Say.

"Wildwood Park, Harrisburg, Pa., February 12, in swamp. Quite a number of larvae found scattered between the thin, moist, frosty, ribbon-like inner layers of bark on a dead black locust log.

"Some of the larvae, separated for observation, are quite active and are capable of climbing up the vertical side of a vial. They also 'skip' vigorously. They have a pair of small, black, curved hooks which they 'thrust from the mouth' or hook to the anal end when 'skipping.'

"The larvae went into the sand in the cages to pupate, some

at the bottom of the cage, others scattered through the sand, but all beneath the surface.

"There was a species of *Trypetid* among the flies that emerged but the majority were *Sapromyzidae*."—A. F. SATTERTHWAIT.

Harrisburg, Pa., May 14. Larvae and pupae from beneath loose bark of dead white pine stub. Adults emerged May 19. —H. B. KIRK.

ORTALIDAE.—*Pyrgota chagnoni* Johnson. One specimen collected at Wilkes-Barre, Pa., May 27.

TRYPETIDAE.—*Rhagoletis pomonella* Walsh.

"From infested apples caged near New Bloomfield, Perry County, Pennsylvania, the first fly emerged on June 27, and the first fly of the second brood emerged on August 31. The last fly of the second brood emerged on October 12. Flies were observed in the orchard from June 27 until frost."—T. L. GUYTON and J. N. KNULL.

MICROPEZIDAE.—*Tacniaptera* [*Calobata*] *antennipes* Say. Eberleys Mills, Pa.; July 11 to 14, on trees in a small, triangular bottom along the Yellow Breeches Creek.—Kirk and Champlain.

HIPPOBOSCIDAE.—*Ornithoica confluenta* (Say), Wellsboro, Pa., Nov. 21, from Barred Owl.

### Change of Address.

Mr. Hermann Hornig has removed his residence to 1233 North 44th St., Philadelphia, Pa.

### A Bird Catching a Butterfly (Lepid.: Pieridae).

On April 29, 1923, I went to Almonessen, New Jersey, to have a collecting trip for *Anthocharis* and *Thecla*.

Insects were very few: 3 *Anthocharis genutia*, 2 *Pieris rapae*, 2 *Thecla hypophleas*, 1 *Th. comyntas*, 2 *Th. damon* and a few Crane-flies. I caught 2 genutias. The third one, a female, was flying at the edge of the woods near briars. I watched for it to come into the open. Unexpectedly a bird swooped down, caught the genutia and settled on a branch overhead about 12 feet away from the place I was standing. The bird, a red eyed Vireo, shifted the genutia lengthwise in his beak and swallowed it entirely.

You may know how surprised I was, as I never in all the past years saw a bird catching a butterfly. (I saw them picking moths). I thought the bird would drop the butterfly's wings so I could examine and take them as proof, but there was nothing left.—H. HORNIG, City Entomologist, Room 758, City Hall, Philadelphia, Pa.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JULY, 1923.

### The Zoological Record.

In the NEWS for March, 1922, page 91, under the caption "Save the Zoological Record!" we reprinted from *Science* an appeal issued by Mr. W. L. Sclater, Editor of the Record, for the Zoological Society of London, urging fuller support for the *Record* from working zoologists everywhere. In our editorial for April, 1922, pages 119-120, we strongly seconded this appeal.

*Science* for May 18, 1923, page 577, reprints a letter by Mr. P. Chalmers Mitchell to the London *Times* in which the following occurs:

> May I say that the council of the Zoological Society will much regret if the *Zoological Record*, which it has supported with increasing financial difficulty for many years, has to be dropped? But the annual loss on the issues is over £1,100, and is likely to increase as the output of zoological research increases. . . . Last year the council, in its annual report and in circulars addressed to zoologists and zoological institutions throughout the world, explained the financial position, and stated that unless those to whom the *Record* was "invaluable" showed their appreciation of it by subscribing for a sufficient number of copies, the society could no longer undertake the publication. The response was unsatisfactory, and the council has accordingly taken the inevitable step of making it known that the *Record* will be discontinued unless substantial help is forthcoming. But it is so anxious to give those to whom the *Record* is necessary full opportunity of coming to its support, that it has undertaken to proceed with the compilation so that no time may be lost. . . . . Because of the drain of the *Record* on our resources we have already been compelled to suspend the publication of our "Transactions," and to postpone other scientific work of immediate interest to us; we are certainly not going to suspend the issue of our "Scientific Proceedings," which have appeared continuously since 1829, in order to carry out bibliographical work for other institutions. On the other hand, we are ready to continue the *Record*, and to regard a loss of £500 a year as part of our contribution to the common good of zoological science, if other institutions guarantee us against further loss.

We do not know to what extent entomologists have responded to the Zoological Society's appeal of 1922. In the

event that this editorial may meet the eyes of some who can help with the *Record*, but have not done so, we put the question to them: Do you realize what the discontinuance of the *Record* will mean to you? Do you realize that unless the Concilium Bibliographicum speedily brings up its bibliographical data (now back in 1917) to the present, supposing also that the *Concilium* is satisfactory to you, you will be compelled to gather your own zoological bibliography at a great expense of time and with probably much less completeness than the *Record* has afforded? Are you willing to see this deplorable state of affairs come about? If not, will you not exert yourself immediately to obtain additional subscriptions for the *Record* and forward them to the Zoological Society of London? The subscription price for the entire volume per annum is £2 10s (single volumes £3), but separate divisions of the volumes may be subscribed for, *e. g.*, the Insecta at 15 shillings, the Trilobita, Arachnida and Myriopoda, at 4 shillings for the three groups combined.

We urge this upon zoologists and entomologists even if the institutions with which they are connected are already subscribers to the *Record*. The writer is not asking others to do what he has not done himself a year ago in response to the appeal then issued, even though a large part of each volume will be of no use to him. Better still, let all institutions who can offer to guarantee to the support of the *Record* a certain annual sum, say fifty or one hundred dollars each. No great number of guarantors throughout the world would be required to cover all expenses.*

We may again voice the hope expressed in our editorial of April, 1922, that co-operation between the *Zoological Record* and the *Concilium Bibliographicum* may be arranged, but, pending that consummation, the *Record* should be kept going and, as usual, the necessity is financial support.

* Since the above was written the Council and the Library Committee of the Academy of Natural Sciences of Philadelphia have voted to offer to the Zoological Society of London a guarantee of $100. toward the expenses of the volume of the *Record* issued during the year ending July 1, 1924, and to address other institutions, urging them to take similar action.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## Correction of Several Typographical Errors (Phalaenidae = Noctuidae, Lepid).

Attention is called to a paper by Professor Grote, "Introduction to a Study of the North American Noctuidæ," published 1883, Proc. Am. Phil. Soc., XXI. Page 159 calls attention to a number of typographical errors most of which have been perpetuated to date. These names are quoted herein; each name being followed by the name of the genus now commonly employed and the Barnes and McDunnough 1917 Check List number, in order to facilitate correction. The name before the *as* is intended by Grote as the correction for the name which follows: "Phiprosopus Callitrichoides *as* Phyprosopus Callitrichoides," *Phiprosopus*, No. 3436.

"Phisia Viridisignata *as* Plusia Viridisigma," *Autographa*, No. 3234 syn.

"Perigea Sole *as* Perigea Scole," *Perigea*, No. 2322a.

"Hadena Perpensa *as* Hadena Perpenoa," *Trachea*, No. 2289.

"Oncocnemis Gracillima *as* Oncocnemis Gracillinea," *Oxycnemis*, No. 2541.

"Heliochilus Paradoxus *as* Heliocheilus Paradoxus," *Heliothis*, No. 1087.

Strangely, in these corrections there are three more typographical errors; *Phisia* for *Plusia*, *Sole* and *Scole* for *Iole* and *Icole*. The correct spelling of the name of the *Perigea* is shown on page 146 of the same paper, "Perigea Iole *m.*," and the *Perigea icole* of the lists should be amended to read *Perigea iole*.—Wm. Barnes and F. H. Benjamin, Decatur, Illinois.

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## On Megathymus stephensi Skinner (Lepid., Hesperiidae).

*Megathymus stephensi* Skinner

1905, Wright, Butt. W. Coast, p. 255, pl. XXXII, f. 483, as *neumoegeni* in err., *Megathymus*.

1912, Skinner, Ent. News, XXIII, 126, *neumoegeni* ssp., *Megathymus*.

1912, B. & McD., Contr. Nat. Hist. Lep. N. A., I, (5), 44, *neumoegeni* race, *Megathymus*.

1913, B. & McD., Contr. Nat. Hist. Lep. N. A., II. (1), 4, pl. I, f. 7, *neumoegeni* ——, *Megathymus*.

1917, Skinner, Ent. News. XXVIII, 232, an sp. dist., *Megathymus*.

1921, Lindsey, U. of Ia. Studies, IX, (4),=Hesp. Amer., p. 109, *neumoegeni* race, *Megathymus*.

Having examined the genitalia of the various species of Megathymus of the *neumoegeni* group, the authors are quite willing to agree with Dr. Skinner's latest version of the status of *stephensi*. It is apparently a distinct species; the valves of the male genitalia differing considerably in shape from other members of the *neumoegeni* group.

WM. BARNES AND F. H. BENJAMIN, Decatur, Illinois.

### External Parasites of the Prairie Mole Scalops aquaticus (Linn.) (Siphonap., Anopl.).

What appears to be a new host record was the finding of a flea, *Ctenophthalmus genalis* Baker, (fide Ferris) by the writer on moles caught in the vicinity of Ames, Iowa, during November, 1922, and April, 1923. This flea was taken on several different moles but it never occurred in large numbers. The type specimens of this parasite, which furnish the only published record of its capture, were taken in Michigan without identification of host.

A louse, *Euhaematopinus abnormis* Osborn, was also found and was very abundant. It was originally recorded from Ames, and seems to be a species that is peculiar to this particular species of mole. As a result of very heavy infestation on one side of an animal the fur was very short, giving it the effect of a rather close clipping; the fur and skin on the uninfested side of this mole were normal.—E. W. DUNNAM, Dept. Zoology and Entomology, Iowa State College, Ames, Iowa.

## Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **12**—Journal of Economic Entomology, Concord, N. H. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Re-

search, London. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **50**—Proceedings of the United States National Museum. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **52**—Zoologischer Anzeiger, Leipzig. **54**—Proceedings of the Biological Society of Washington, D. C. **57**—Biologisches Zentralblatt, Leipzig. **64**—Parasitology, London. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison-on-the-Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **76**—Nature, London. **90**—The American Naturalist, Lancaster, Pa. **91**—The Scientific Monthly, Lancaster, Pa. **94**—The American Journal of Science, New Haven, Conn. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **115**—Societas Entomologica, Stuttgart. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **125**—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien. **128**—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig. **138**—American Museum Novitates, New York. **145**—Annali del Museo Civico di Storia Naturale Giacomo Doria, Genova. **146**—"Konowia," Wien.

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# Doings of Societies.

## The American Entomological Society.

Meeting of April 26, 1923, in the hall of the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner, President, in the Chair; seven members present.

Mr. Cresson of the Property Committee reported the receipt of insects for the collection from the following: 7 Diptera from T. D. A. Cockerell; 1 Diptera, 4 Neuroptera and 2 Orthoptera from M. Hebard; 1 Orthopter from F. M. Jones; 268 insects, 210 galls (Paratypes) from A. C. Kinsey; 22 Mayflies from G. S. Dodds; 4 Cicadidae from W. T. Davis; photographs of H. Strecker and C. T. Ramsden from Henry Skinner. The following publications: Le Monde Social des Fourmis by A. Forel, 3 parts; The Structure and Life History of the Cockroach by Miall & Denny; Les Larves et Nymphes Aquatiques des Insectes d'Europe by E. Rousseau; Pterophoridae of California and Oregon by Lord Walsingham.

The President read a communication from the Council of the Academy of Natural Sciences of Philadelphia requesting the Society to appoint a committee to meet with other committees representing a number of other scientific societies to consider suitable methods for commemorating the 100th anniversary of the birth of Dr. Joseph Leidy. A motion was made and carried that the President appoint a committee of three of which he should be one for this purpose. The following were appointed: Henry Skinner, E. T. Cresson, Jr. and R. C. Williams, Jr.

Communications were read from Mr. C. M. Van Duzee and Mr. Theodore H. Frison in which they refer to types and paratypes of insects they are sending to the Society for its museum as the best repository for such material.

A motion was made and carried that a committee be appointed to make arrangements for a field day. Dr. Skinner appointed Messrs. Williams, Rehn and Cresson on this committee.

Mr. Robert J. Titherington was elected a member of the society.

Mr. Cresson exhibited several boxes of Paratypic Cynipidae (69 species, 268 insects and 210 galls) from the United States received from Mr. A. C. Kinsey.

Mr. Rehn gave an interesting account illustrated by lantern slides covering his recent trip with Mr. Hebard through the West and Southwest, showing the character of the collecting grounds, the topography and the vegetation of the districts covered.

R. C. Williams, Jr., Recording Secretary.

## Entomological Union of Stettin.

The Entomologischer Verein zu Stettin is sorely in need of funds to continue the publication of its well-known *Zeitung*. For that purpose it desires to sell single volumes or complete sets of Vols. 2-83. Those interested should address Prof. L. Krüger, Stettin, Museum, Hakenterrasse, Germany.

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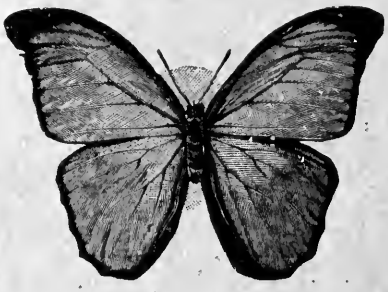

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OCTOBER, 1923

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PHILIP P. CALVERT, Ph. D., Editor.
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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV OCTOBER, 1923 No. 8

CONTENTS



## The Life-History of Pieris beckeri Edwards (Lepidoptera, Pieridae).

By KARL R. COOLIDGE, Hollywood, California.

*Pieris beckeri* is a common and widespread butterfly in the West, occurring in all the Pacific Coast states and ranging thence eastward into Nevada, Utah, Colorado and Arizona.

It is an abundant species in the desert and semi-arid regions of Southern California, also ascending the mountainous regions to a considerable elevation, but does not seem to frequent the sea-coast district to any extent. In the immediate vicinity of Los Angeles it is rare, and Mr. W. S. Wright did not report it in his list of the butterflies of San Diego County.

But in the back country, on both the Colorado and Mohave Deserts, it is a common thing. At Palm Springs, on the Colorado Desert, it seems to be practically continuously brooded and can be seen on the wing nearly every month of the year.

The past season a few fresh specimens were observed at Palm Springs in early January. The first week in March

another brood appeared and a third came into existence about the middle of April. The hot months of the desert, June, July and August, have not been studied entomologically, but as there are at least two more fall emergences it is safe to assume that there are at least seven broods in that region.

Mead, in Psyche, vol. 2, p. 183, 1878, gave a brief description of the larva and chrysalis of *beckeri*. Edwards, Butt. N. Am., vol. 2, p. 73, 1883, quotes Mead and gives figures of the mature larva and pupa, the larva as drawn and colored by Mead, while the coloration of the pupa is based on Mead's description.

Considering the wide range of the species there is no doubt an extensive assortment of food-plants, Mead stating that on the Mohave Desert larvae were found on various crucifers, but the following only are definitely known:

CAPPARIDACEAE.—*Isomeris arborea* Nutt.—Bladder Pod. A handsome but foul smelling plant common on the desert, and also frequent along the bluffs and hills near the coast.

BRASSICACEAE.—*Brassica nigra* (Linn.) Koch.—Wild mustard, an introduction from Europe. I think also that the well known loco weed, *Astragalus* spp., of the Fabaceae family, will eventually prove to be a food-plant. I have captured many females of *beckeri* about this, but as yet have no positive evidence of its use as larval food.

On June 17th, 1921, I caught 2 ♀ *beckeri* in Mint Canyon, which leads into the Mohave Desert, and brought them to Los Angeles. Both were confined with sprigs of the common wild mustard (*B. nigra*), and on the following day both began to lay freely—almost feverishly. By June 20th a total of 65 eggs had been laid, placed on the sprigs as follows:

| | |
|---|---|
| 27 on young flower buds. | 7 on stems. |
| 17 on under surface of leaves. | 4 on dried seed pods. |
| 5 on upper surface of leaves. | 5 on sides of confinement jars. |

The eggs hatched in five days, when the young larvae voraciously attacked the sprigs of mustard, eating all parts of it, but seeming to prefer the tender flower buds. The larvae were exceedingly active and nervous, eating almost incessantly, hardly appearing to pause for the periods of moulting, which were passed as follows:

Larvae hatched June 24th.
Passed first moult June 27th.
Passed second moult June 30th.
Passed third moult July 3rd.
Passed fourth moult July 6th.
Suspended July 9th.

Mead gives the duration of the pupal state as fifteen days, but my pupae began to disclose imagoes ten hours after the larval skin had been thrown off, and inside of twenty-four hours all the butterflies had emerged—a speed record as far as my experience goes.

*The Egg.*—In shape fusiform, but slightly less than twice as high as broad. The base sharply docked, .40 mm. in diameter; the greatest breadth, .50 mm., in the middle, whence the sides slope at first gently and then rapidly to the truncate summit, where the width is only .12 mm. The micropyle in a circular flat depressed field, .08 mm. in diameter. The rosette composed of a central circle, surrounded by four disconnected ovals, between and beyond which are larger roundish cells, and finally an edging of still larger transverse semi-lunar cells. Height of egg .96 mm.

Running longitudinally, a series of sharply defined but not greatly elevated straight ribs; on the sides these are .08 mm. equidistant, .018 mm. in height, and .02 mm. in thickness. Originating at the base the ribs, except in rare instances, reach the summit; occasionally one will terminate just before the apex is attained, when an oblique shoot connects it with an adjoining rib. The ribs vary in number, from thirteen to fifteen. Between the ribs a series of cross striae, straight, equidistant, about .01 mm. in thickness and .025 mm. apart, and with the longitudinal ribs forming regular quadrangular cells. Surface of egg punctulate.

Color, when first laid, a rather vivid lemon yellow, but at the end of twenty-four hours becoming more and more orange tinged. In forty-eight hours of a decided uniform orange coloration.

Of five eggs examined two had thirteen ribs, one had fourteen and two had fifteen. These eggs were laid by the same female.

*Larva, First Instar.*—Body cylindrical, largest in the middle, tapering gently and quite uniformly towards either extremity. Anal segment bluntly rounded, furnished with a few fine pointed pale hairs. Spiracles round, prominent, with a rather heavy black ringing, .015 mm. in diameter.

Head dark chestnut brown, shining, .32 mm. in width; clothed with a very few long slender sharp hairs, .22 mm. in length, and more numerous much smaller fine pale hairs, but .04 mm. in length; ocelli black; greatest height of head .26 mm.

Body furnished with four longitudinal series of broad, shining red brown mammiform elevations, each with a central high, truncate, conical

nipple, emitting hairs. These elevations slightly irregular in outline, but about .05 mm. in diameter on the average and arranged in the following series:

A laterodorsal series, placed anteriorly. A lateral series, on the thoracic segments anteriorly placed in line with the laterodorsals, but situated posteriorly on the abdominal segments. A laterostigmatal series placed anteriorly. In the above three series but one wart to a segment on either side. A substigmatal series, two to a segment; the anterior one of the normal size; the posterior one, situated a little above and slightly back of the middle, much smaller, only .02 mm. in diameter.

The hairs arising from these nipples black, very slender, slightly tapering and apically expanded into an oval club. But those of the laterodorsal row on the first thoracic segment taper gradually to a fine point, project forward slightly, and are much longer than the others, being .26 mm. in length. The other hairs are erect, .10 mm. in length, with the expanded tip .01 mm. in width.

Color of body at birth bright lemon yellow, but shortly after feeding, the ground color begins to submerge into a brownish ochre, or varying to a solid green, and minute irregular blotchings of red brown appear, these becoming more and more conspicuous as the stage proceeds. Prolegs and ventral surface bright lemon yellow; legs pale shining yellow, infuscated apically.

Length, at birth, 1.54 mm. Width at first thoracic segment .32 mm.; width at fourth abdominal segment .36 mm.; width at anal segment .28 mm.

The young caterpillar makes its egress by eating out a hole in the side, near the apex. Its first step is to turn and devour more or less of the egg shell, usually eating it down to the base, but at other times deserting it after a few nibbles.

*Second Instar.*—Head now greenish gray, shining, .54 mm. in width; armed with a number of papillae giving rise to pallid or infuscated hairs; the smaller papillae .017 mm. in diameter, with the arising hairs .06 mm. in length; the larger papillae .02 mm. in height and diameter, with the hairs .30 mm. in length; all the hairs slender and sharp. Ocelli pallid.

The series of warts now .12 mm. in diameter, on the average dark gray green, prominent. The arising hairs black, .14 mm. in length, .02 mm. in width at the tips, and ordinarily supporting a hyaline droplet.

In addition to the series of warts of the previous stage, the whole body is sprinkled with smaller warts, dark gray green, about .04 mm. in diameter on the average, which give rise to shorter tapering slightly clubbed hairs, about .10 mm. in length; these are mostly black, but along the substigmatal fold are colorless. Spiracles .02 mm. in diameter,

with a rather prominent luteous ring, and situated on a roundish gray patch, .04 mm. in diameter.

Color of body greenish yellow, of varying shades; the dorsal line clear pale lemon yellow, except when the whole body is solidly green, when the dorsal line is concolorous. Scatteringly mottled with patches of reddish brown. Ventral surface paler than above. Prolegs pallid. Legs pale gray green, with the apical portions pellucid.

Length, just after moult, 3.40 mm. Width at first thoracic segment .56 mm.; width at anal segment .40 mm.

*Third Instar.*—Head dark gray green, .90 mm. in width; the large hairs of head .52 mm. in length, black, with the tips colorless; the black tubercles giving rise to these .04 mm. in height and diameter. The shorter hairs of head mostly colorless and varying in size from .10 to .20 mm., and the black tubercles from which they arise are .02 mm. in height and diameter.

The larger series of warts now .24 mm. in diameter; the smaller warts .08 mm. in diameter. The hairs from larger warts .50 mm. in length; those from the smaller warts .16 mm. in length. The large hairs mostly black, especially in the dorsal region, but substigmatally many are colorless; for the most part the small hairs are colorless. Some still smaller dark tubercles scattered over the body, only .02 mm. in height and diameter, these giving rise to straight erect colorless hairs, .06 mm. in length, and enlarged at the tips into bulbous clubs. Spiracles .025 mm. in diameter, with a luteous ring, and as before seated on a roundish gray patch.

Color of body greenish yellow. The warts reddish brown, deep in tone, some almost purple. As before, scatteringly mottled with patches of reddish brown. Ventral surface concolorous with above. Prolegs subhyaline yellow. Legs dark brown, almost black,

Length 7.5 mm. Width at first thoracic segment .92 mm.; width at anal segment .68 mm.

*Fourth Instar.*—Head gray green, 1.46 mm. in diameter; the long sharp black hairs of head 1.10 mm. in length, arising from heavy black tubercles .16 mm. in height and .20 mm. in diameter. The shorter hairs of head vary from .14 to .35 mm. in length and are mostly white, with the basal papillae relatively smaller.

The larger warts now .34 mm. in diameter and .12 mm. in height, deep red brown, almost purple. The hairs from the larger warts .80 mm. in length, mostly black, especially in the dorsal region, with the apices colorless. The minute scattered black papillae .025 mm. in diameter, with the arising colorless clubbed hairs .10 mm. in length on the average. Spiracles suboval, .08 mm. in length, .005 mm. in width, seated on patches of deep gray green, surrounded by roundish patches of pale blue.

Color of body yellow green, of varying shades, but with the green

always predominating. Irregularly mottled as before now with patches of bright purple, especially conspicuous surrounding the larger warts. The segments divided into the usual subsections, indicated by rather faintly impressed lines, and the larger warts are arranged on these in fairly regular transverse rows. The segmental creases lined with bright orange, sometimes conspicuously so and again indicated only with a bright spot along the stigmatal line. The dorsal line of an even bright lemon yellow, more or less prominent sometimes quite obsolete. Ventral surface of a deeper green than above. Prolegs slightly paler. Legs basally clear gray green, the remaining portion brown black.

The mottlings of purple, to the naked eye, stand out prominently as purplish patches against the green ground color, and when the orange segmental linings are strongly present the larva is a handsome one.

Length 15. mm. Width at first thoracic segment 1.65 mm.; width at anal segment 1.10 mm.

*Fifth Instar.*—Head pale green, 2.32 mm. in diameter; densely studded with papillae of varying sizes, some .30 mm. in diameter and .28 mm. in height, others grading down to but .08 mm. in diameter; there are also a few scattered colorless papillae but .04 mm. in height and diameter, giving rise to hairs .34 mm. in length. The larger hairs of head 2.60 mm. in length, .04 mm. in width at base. The shorter hairs .60 mm. in length on the average. These head hairs colorless, but the larger ones are more or less blackish to one-half or two thirds their length, and all the hairs are sharp. The papillae of head black, with only now and then a colorless one, and are surrounded irregularly by blackish patches. The head sometimes with a mottling of golden yellow on the sides, generally inconspicuous and in none of the larvae developed into a definite prominent mark. Ocelli brown.

The warts, arranged transversely on the segmental subsections, vary considerably in size; the larger ones ovate and the smaller ones roundish; the largest about .50 mm. in diameter and .30 mm. in height. These warts purple-black.

The hairs from the larger warts 2. mm. in length, sharp, wavy. They are mostly white, to the naked eye appearing blue-white, but some are black or fuscous basally and to a half or slightly more of their length, this being especially so of those in the dorsal region. Some smaller papillae, brown basally, black-tipped, .04 mm. in height and diameter, giving rise to colorless hairs .50 mm. in length on the average. In addition, a host of minute pale greenish or greenish yellow papillae, from .02 to .03 mm. in height and diameter, projecting delicate colorless hairs of varying lengths, but perhaps .20 mm. in length on the average. These are particularly noticeable in the substigmatal region.

Color of body a rather vivid yellowish green, and as before, conspicuously mottled with bright purple, especially prominent dorsally. These irrorations increase in distinctness as the stage proceeds and even-

tually more or less obscure the ground coloration. Substigmatally the ground color is pale bluish-green. The dorsal line even, varying in conspicuousness and in color, from pale green to a light lemon yellow. Ventral surface pale blue green. Prolegs rather deep green. Legs pale gray green basally, tipped with reddish brown. Legs and prolegs encircled at their bases with bright golden yellow. Segmental creases broadly and conspicuously banded with bright golden yellow, growing more and more prominent as the stage proceeds. These golden bands ring the anterior portion of one of the two connecting segments, and fully cover the posterior subsections of the other adjoining segment. Spiracles oval, .20 mm. in length, .14 mm. in width, pallid, with a fine yellow brown ring.

Length, just after the moult, 21. mm. Width at first thoracic segment 2.40 mm.; width at anal segment 2.10 mm.

The mature larva is very handsome. The purplish irrorations have almost completely obscured the yellow green ground color, so that to the naked eye the larva has the appearance of being prominently and definitely banded alternately with transverse stripes of bright golden yellow and purple.

*Chrysalis.*—Head case and tongue distinctly greenish, with more or less brown intertinged. Thorax in color brownish green. Wing cases cream colored. First two abdominal segments gray white, the remaining segments green, somewhat brown-tinged, while others are tinged with bluish. Whole upper surface covered with minute shallow impressions, a narrow faint white dorsal line on the abdominal segments. Tongue surpassing the wing cases by only 1. mm. Cremaster testaceous, .80 mm. in length, .60 mm. in width, truncate, the hooklets .06 mm. in length, brown orange in color. Spiracles .36 mm. in diameter, pallid.

Length 13. mm. Breadth of thorax 4.60 mm. Breadth at third abdominal segment 5.20 mm. Height of dorsal tubercles 4.70 mm.

The pupa is of t' e usual *Pierid* type and Edwards quotes Mead in comparing it with *P. protodice*, as follows:

"Is of much the same general shape as that of *Pieris protodice* Bois., but less angulated; the front is terminated by a blunt point; the cephalic portion is rounded, with uneven surface, and with the dorsal surface of the thorax, is dark grayish brown; the ridge above the wing cases, which is quite conspicuous in *protodice*, is absent in *beckeri*."

## Funds for the Entomological Society of London.

In view of the appeal for funds made on behalf of the Entomological Society of London by Dr. L. O. Howard in the NEWS for June, 1921, page 183, it is of interest to note from the English journals of the present year that the Society received £500 toward the housing fund from the Misses Chapman on behalf of their brother, the late Dr. T. A. Chapman, and a bequest of £1000 from the late Mr Hamilton Druce, the income of which is to be devoted to the library.

## District of Columbia Diptera: Sciomyzidae.

By J. R. Malloch and W. L. McAtee, Washington, D. C.

The Sciomyzidae are flies of medium size, the wings with dark markings often developed as handsome reticulations, which frequent moist places from the smallest springy spots to the most extensive marshes. The aquatic larvae are pale, somewhat enlarged at one end, move freely on the bottom or through the water, and sometimes float upon it. The pupae are somewhat decanter-shaped, eventually float upon the surface, and then to the shore, where the adults later emerge.

Two revisions of the family (see bibliography, p. 234) have recently appeared in which keys and illustrations of the characters of these flies may be found. The present list contains about the same number of species as the New Jersey report (Johnson, C. W., Ann. Rept. New Jersey State Mus. 1909, pp. 796-797). Additional described species which apparently should be collected here are: *Melina albovaria* Coquillett, New Hampshire to North Carolina; *Melina griseseens* Meigen, Pennsylvania to Florida, and westward; and *Hoplodictya setosa* Coquillett, Masschusetts to Georgia.

The abbreviations P. I. and V. P. I. in the list mean that the species has been collected on Plummers Island, Maryland, or in the vicinity respectively. Nine species have been taken on the island and 8 others in the vicinity. The total number of species in the list is 21.

Genus **Pteromicra** Lioy.

P. APICATA Loew.—District of Columbia, July, D. W. Coquillett.

Genus **Atrichomelina** Cresson.

A. PUBERA Loew.—Chain Bridge, Virginia, Sept. 8, 1912, F. Knab and J. R. Malloch; Sept. 18, 1921, Malloch; Dead Run, Virginia, March 14, 1915, at maple sap; June 18, 1913, R. C. Shannon.

Genus **Melina** Desvoidy.

M. ANNULIPES var. SIMILIS Cresson.—District of Columbia, D. W. Coquillett.

M. NANA Fallen.—Washington, D. C., Oct. 14, 1906; Maryland near Plummers Id., Aug. 22, 1916, McAtee.

M. TENUIPES Cresson.—Cabin John, Maryland, March 25, April 11, 15, 1916, R. C. Shannon; Stubblefield Falls, Virginia, Oct. 23, 1921, Malloch.

Genus **Chaetomacera** Cresson.

C. CLARA Loew.—A fairly common species; dates of collection range from June 11 to July 25. V. P. I.

C. ELATA Fabricius.—Chain Bridge, Virginia, June 12, 1912, McAtee.

C. PLEBEIA Loew.—Chain Bridge, D. C., June 12, Geo. M. Greene; Cabin John Bridge, Maryland, June 14, 1916, R. C. Shannon; Hyattsville, Maryland, Sept. 1, 1912, F. Knab and J. R. Malloch.

C. VICINA Macquart.—Many records, the season running from May 8 to September 19.

Genus **Trypetoptera** Hendel.

T. PALLIDA Loew.—Fairly common; has been collected from May 19 to October 14. P. I.

Genus **Monochaetophora** Hendel.

M. UMBRARUM Linnaeus.—Common everywhere in marshy spots; season March 9 to October 26. P. I. A single specimen was taken on a warm winter day, Jan. 2, 1916, at Maywood, Virginia, McAtee.

Genus **Euthycera** Latreille.

E. ARCUATA Loew.—A common species; dates of collection from May 3 to Sept. 12. Variety *uniformis* Cresson has been taken several times in June. Both the species and variety, P. I.

Genus **Limnia** Desvoidy.

L. COMBINATA Loew.—Dyke, Virginia, May 28, 1915, McAtee; Rock Creek, D. C., August 3, 1913, R. C. Shannon. Variety SPARSA Loew, Chain Bridge, Virginia, September 10, 1922; Vietch, Virginia, June 9, 1912, Malloch.

L. COSTALIS Loew.—Fairly common, season May 25 to September 15. P. I.

L. LOUISIANAE var. SEPTENTRIONALIS Melander.—Washington, D. C., August 17, 1913.

L. SARATOGENSIS Fitch.—The commonest species of the family; season May 18 to October 14. P. I.

L. SHANNONI Cresson.—Plummers Id., Md., Oct. 16, 1913, Oct. 28, 1915; Bladensburg, Maryland, Oct. 2, 1917, R. C. Shannon.

Genus **Sepedon** Latreille.

S. ARMIPES Loew.—Maryland near Plummers Id., July 27, August 15, McAtee; Glen Echo, Maryland, July 23, August 6, Malloch.

S. FUSCIPENNIS Loew.—Many records, extending from July 14 to October 28. P. I.

S. PUSILLUS Loew.—Common; season runs from May 1 to October 4. V. P. I.

S. TENUICORNIS Cresson.—Numerous records from the Plummers Id. to Chain Bridge region, dates ranging from May 2 to August 22; has been taken also near Bladensburg, May 10, McAtee.

Bibliography.

Banks, N. At the Ceanothus in Virginia. Ent. News, 23, No. 3, March 1912, p. 110.

Lists *Tetanocera costalis;* see under *Limnia* of this paper.

Cresson, E. T., Jr. A revision of the nearctic Sciomyzidae (Diptera, Acalyptratae.) Trans. Am. Ent. Soc., 46, pp. 27-89, Pls. 1-3, March 31, 1920.

Records 17 species, 2 new, and 4 varieties, 1 new from our region.

Loew, H. Die nordamerikanischen arten der Gattungen Tetanocera und Sepedon. Wien. Ent. Monats., 3, No. 10, Oct. 1859, pp. 289-300.

Lists 4 species of *Tetanocera*, 2 new, and 3 of *Sepedon*, all new, from the District of Columbia.

Monographs of the Diptera of North America, Pt. 1, Smiths. Misc. Coll., April 1862, 221 pp., 2 Pls.

Lists *Tetanocera pictipes* (= *Monochaetophora umbrarum*) from Washington.

Melander, A. L. Review of the nearctic Tetanoceridae. Ann. Ent. Soc. Am. 13, No. 3, Sept. 1920, pp. 305-332, Pl. 30.

Records 13 species and 2 varieties (one of the latter new) from our region.

## Two New Species of Psephenus Hald., with a Note on Narpus angustus Casey (Coleop.).

By Frank E. Blaisdell, Sr., San Francisco, California.

In 1893, Col. Casey described two new species of *Psephenus* from California (Coleop. Not., V, Annals N. Y. Acad. Sci., VII, p. 578.) At the present time are given two additional species, also from California.

**Psephenus lanei** new species.

*Form* moderately depressed, subcuneate-oval, narrowed anteriorly.

*Color* black; antennae toward base and first three joints of the maxillary palpi slightly paler; surface luster dull, feebly shining. Pubescence moderately abundant; hairs short and silvery on the body beneath; on the upper surface, nearly erect, sparse and rather stiff, longer hairs are intermixed with abundant small, short, semi-recumbent, apically pale hairs.

*Head* transverse, eyes prominent and rounded; raised apical margin evenly arcuate from side to side between the antennae, as viewed perpendicular to the surface; front broadly and moderately concave, punctures rather closely placed, subequal in size and rather small; deflexed edge of the front narrow and moderately inflexed, labrum about three times as long as the inflexed front and emarginate at apex as in *lecontei*.

Maxillary palpi fully three-fourths as long as the antennae; second joint elongate, at least four times as long as wide at apex. Antennae rather slender, not incrassate, and extending to about the pronotal base; joints four to ten inclusive, scarcely longer than wide, third obconical and about twice as long as wide near the apex; eleventh short oval.

*Pronotum* transverse, apex arcuate and about two-thirds as wide as the base; apical angles rather broadly rounded; sides moderately convergent anteriorly, broadly but not strongly arcuate and somewhat broadly sinuate a short distance before the base, thence arcuate to the basal angles, the latter obtuse and distinct and not in the least rounded; base rather strongly lobed at middle, thence broadly and rather strongly sinuate to the angles; disk almost evenly and rather moderately convex, distinctly impressed within the angles and more narrowly along the sides, most strongly so at the basal angles; punctures larger and smaller intermixed, the larger are subgranulate, more sparsely placed and give origin to the black hairs, the smaller to the pale hairs.

*Elytra* about one-third longer than wide, slightly widest posteriorly; sides feebly converging toward base, rather straight in basal half, thence arcuate to the less broadly rounded apex, sutural angles not evident; disk rather evenly and less than moderately convex, somewhat flattened apically and subexplanate laterally, less and narrowly so toward base, punctures fine, larger and smaller intermixed, the latter most abundant.

Sixth abdominal segment deeply emarginate at middle, emargination rounded at base, edges clothed with black hairs. Tibiae and tarsi slender.

Measurements.—Length (type) 3.5 mm.; width 2 mm.

*Holotype*, male, and one *paratype*, male, in my own collection. Type locality.—Juliaetta, Idaho. Collected on July 7th, 1922, by Mr. Merton C. Lane, of Ritzville, Washington, to whom I dedicate the species.

I have before me a series of six specimens of *P. lecontei*, collected in Maryland and Pennsylvania. *Lanei* is distinct in its very long maxillary palpi and different form of the pronotum. It resembles *lecontei* in the character of the pubescence and form of the labrum. In *lanei* however, the basal angles of the pronotum are distinct and not in the least rounded, and the pronotal sides are less convergent and more arcuate; the prosternal process is less sharply carinate between the coxae. In *haldemani* the front is longitudinally divided; in *falli* the vestiture is dense and the pronotal apex truncate and the disk evenly convex; in *veluticollis* the pronotum is velvety-black in the female. The female of *lanei* is not at hand.

**Psephenus calaveras** new species

*Form* oblong-oval, about twice as long as wide, moderately depressed.

*Color* black, under surface opaque; appendages and abdominal segments more or less fuscous or testaceo-fuscous, basal margin of the elytra slightly paler. Surface somewhat shining, head and pronotum opaque and velvety black. Pubescence dual as in the other species, finer and shorter than in *lanei* or *lecontei;* longer hairs semi-recumbent, paler ones very small and inconspicuous.

*Head* transverse, eyes very prominent and rounded; frontal apex arcuate, rather feebly reflexed; front broadly impressed, punctures rather dense, small and subequal in size, a few larger ones in the supraorbital region, where the hairs are long and overhang the eyes. A few large punctures are seen on the vertex. The frontal apex is arcuate from side to side and narrowly, evenly impressed, inflexed edge very short as viewed longitudinally from the front; the labrum is about twice as wide as long, impressed in the central area and the apex emarginate. The pubescence is abundant on the labrum and apical parts of the front. Second joint of the maxillary palpi about as long as the third and fourth taken together, antennae moderately short, extending to about the middle of the pronotum; joints four to eleven inclusive subequal in relative proportions, fourth and fifth smallest, thence the joints increase very slightly and gradually in size, scarcely incrassate; third joint triangulo-obconical and slightly elongate.

*Pronotum* transverse, about one-third wider than long; apex rather moderately arcuate and about two-thirds as wide as the base; apical angles broadly rounded into the apex and sides, the latter moderately convergent anteriorly, almost straight or very feebly and broadly sinuate in middle two fourths, thence arcuately continuous with the apical angles, posteriorly more strongly rounding to the basal angles which are obtusely rounded and somewhat prominent posteriorly; base broadly and evenly lobed at middle, thence broadly, evenly and distinctly sinuate laterally to the angles; disk rather evenly and very moderately convex, quite broadly impressed laterally and slightly reflexed, impressions wider and deeper within the angles, especially at the base, punctures very minute, scarcely larger than the base of the hairs, those for the larger hairs feebly subasperate especially at the periphery; hairs notably fine.

*Elytra* about one-third longer than wide, scarcely wider posteriorly; sides subparallel and feebly arcuate, deflexed in basal half beneath and behind the humeri, evenly and rather strongly arcuate posteriorly into the more narrowly rounded apex, sutural angles absent; base of each elytron arcuate and adapted to the sinuate pronotal base; disk very moderately convex, less so and rather flattened apically, punctures abundant and small, the larger giving origin to the coarser hairs; surface finely rugulose.

Beneath very abundantly clothed with fine, short, soft hairs. Propygidial segment broadly emarginate at apex. Fifth abdominal segment as a whole broadly arcuate, but feebly sinuate in middle two fourths. Tibiae and tarsi very slender.

Measurements.—Length 4 mm.; width 2 mm.

*Holotype* a unique female, in my own collection. This was secured from beneath a rock on the edge of the Calaveras River, near Lombardi's ranch, Calaveras County, California, July 18th, 1910. During the many years that I have collected along the mountain streams in the Sierras and elsewhere, this is the only specimen that I have ever collected. They are evidently very rare.

*Calaveras* is very distinct from any described species. Up to the present time I have referred it to *veluticollis* Casey. The punctures of the pronotal disk are excessively small, the minute hairs seem to arise directly from the surface. The long hairs of the supraorbital region appear to be more marked than in *lecontei;* the labrum is impressed at middle, not so in *lanei* and *lecontei.* In *calaveras* the two basal joints of the metatarsi are subequal and together about equal to the length of the last.

In *lecontei* the labrum is short and quite equal in length to the inflexed edge of the frontal apex (male); both longer and likewise quite equal in length (female). In the latter sex the pronotal punctuation is very fine, almost as in *calaveras* (female).

The six known species may be tabulated as follows:

Impression of the head longitudinally divided; elytra pale at base. California ..... **haldemani** Horn.

Impression of the head not longitudinally divided; elytra uniform in coloration, except very narrowly on the basal margin

Sides of the pronotum strongly convergent, the apex not more than one half as wide as the base. Eastern United States ..... **lecontei** Lec.

Sides of the pronotum feebly convergent, the apex wider, two-thirds to three-fourths as wide as the base.

Pronotum velvety black.

Sides of the pronotum evenly and feebly arcuate from base to apex; Pronotal punctures rather strong and dense anteriorly, becoming finer and sparse behind. California ..... **veluticollis** Casey.

Sides of pronotum straight or feebly sinuate in middle two fourths, anteriorly arcuately continuous with the rounded apical angles; apex arcuate; labrum impressed at middle; pronotal punctures scarcely recognizable. Female. California ..... **calaveras** n. sp.

Pronotum dull and opaque, not velvety.

Sides of the pronotum broadly rounded and subparallel toward base, more convergent and nearly straight anteriorly; apex truncate; elytra with impressed lines, disk feebly elevated along the suture. Male. California ..... **fallei** Casey.

Sides of the pronotum broadly arcuate, somewhat broadly feebly sinuate at middle; apex arcuate; elytra without impressed lines, not elevated along suture. Male. Idaho ..... **lanei** n. sp.

**Narpus angustus** Casey.

Two specimens of this rare species were taken by the writer on July 23d, 1908, while collecting along the Russian River, Sonoma County, at Monte Rio. At that time the river was quite low and there were numerous side pools. One in particular was very prolific as regards the immense number of specimens that I secured from it; it was situated at the base of a clump of red alders and the many roots, both dead and living, in it formed an obstacle to its thorough exploration. The base of another and small tree, which had been felled and afterward washed out was in the bottom of the pool. It was from this that I took my two specimens of *Narpus*. There were many hundreds of specimens of *Hydroporus eximius* Mots. about the old stump; by the use of the net a large number of *Agabus lugens* Lec., *Ilybiosoma regularis* Lec. and *Helichus suturalis* Lec. were obtained. Col. Casey's specimen was found dead and mutilated. My capture is the first record of living specimens having been collected that I have any knowledge of. The species may have been taken by others but if so I have never seen any account of it.

**Flies Preying on Mosquito Larvae (Diptera: Muscidae, Culicidae)**

Having been instrumental in getting some work accomplished above Millbourne Dam on Philadelphia side, I took a picture of one of the breeding spots of *Culex pipiens* after the water had slowly receded. Half an hour afterwards flies (*Lucilia caesar*) commenced to feed on the larvae lying as thick as a pie.

But what is a spot of breeding ground about 20 feet long to an area of 4 acres? The men worked one day and are being used for other work the next day. The flies commenced laying eggs when I left the place. H. Hornig, Philadelphia, Pa.

# New and Known Species of Porphyrops from North America (Diptera, Dolichopodidae).

By M. C. Van Duzee, Buffalo, New York.

**Porphyrops slossonae** Johnson.

Psyche, Vol. xiii, p. 59, June, 1906 (*Leucostola*).

Mr. C. W. Johnson sent me a specimen labeled *Leucostola slossonæ* which proves to be a typical *Porphyrops*. It answers his description well.

This species is almost like *Porphyrops elegantula* Meig., having the same form of hypopygial appendages and antennæ; it is not quite as brightly colored, it differs in having the upper edge of fore femora black. The fore tarsi in *slossonae* are yellow with last four joints darker, but only the last joint black, the joints as 39-17-15-13-13: middle tarsi with their joints as 60-28-20-12-13; joints of hind tarsi as 47-50-32-20-14. First joint of anterior tarsi considerably enlarged below at tip. The fore femora have short, the middle ones longer, white hairs below, those on the middle pair nearly as long as the width of the femora. Middle tibiæ black on the whole of their lower surface, upper edge black on apical fourth. There is a row of six small black bristles on each side, back of the upper orbital cilia ending in the post-vertical bristle. Length 7.3 mm.

*P. elegantula* Meig., according to Dr. Becker, has the fore femora wholly yellow; hind femora and tibiae becoming blackish at tip; hind tarsi black, first joint shorter than second; first joint of fore tarsi thickened below at tip, as long as the four following joints (as long as the two following joints, Dr. Lundbeck) outer hypopygial lamellae simple, narrow, tapering, as long as the height of the hypopygium; inner appendages a little enlarged and hollowed at tip (spoon-shaped). *Elegantula* has been taken in Alaska by both Prof. Hine and Dr. Aldrich.

**Porphyrops barbipes** new species.

♂. Length 5.3 mm. Face narrow, silvery white; front green. Antennae black; third joint nearly as long as the face; arista as long as the antennæ. The long white beard abundant and reaching the upper fourth of the eye, the upper orbital cilia short, black.

Thorax green, shining, with a spot of white pollen on each side extending from the humeri to the suture and a blackish spot above the root of the wing; scutellum with four marginal bristles.

Abdomen green, apical segments almost black, spots of white pollen and long white hair on the sides. Hypopygium not very large, its outer lamellæ as long as the height of the hypopygium, curved, of equal width, not tapering, fringed with pale hairs; inner appendages not quite one-third as long as the outer, straight, blunt, divergent.

Coxæ, femora, hind tibiæ and hind tarsi black. Coxæ with long white hair, middle and hind pairs with a black thorn at tip; tips of fore and middle femora and their tibiæ yellow. Fore femora on posterior surface, middle pair below and hind ones on anterior surface with abundant, long, white hair. Fore tarsi yellow, infuscated towards their tips, first joint slightly compressed, a very little hollowed below beyond their middle and with a row of about seven blunt teeth on the middle of lower edge; joints of fore tarsi as 37-17-13-8-8. Middle tarsi black from the tip of first joint. Joints of hind tarsi as 48-37-16-15-15. Calypters and halteres yellow, the former with white cilia.

Wings very slightly tinged with brown; third and fourth veins approach each other a little but are parallel towards their tips.

♀. Two females that seem to belong with this male have the face wide, white, rounded below, its suture below the middle; third antennal joint about half as long as in the male; beard not conspicuous, except on lower part of the head; coxæ, fore and hind femora, and posterior tibiæ and their tarsi black; all trochanters, entire middle femora, and fore and middle tibiæ yellow; fore tarsi infuscated from the tip of the first joint; middle tarsi mostly blackish; wings as in the male, still more tinged with brown.

Described from one pair (male *holotype*, female *allotype*) taken at Machias, Maine, July 21 and 22; and one female found at Princeton, Maine, July 12; all were taken by C. W. Johnson and are in the collection of the Boston Society of Natural History.

**Porphyrops johnsoni** new species.

♂. Length 5-5.5 mm. Face narrow, silvery white. Front shining green. Antennæ black; third joint about as long as the height of the front; arista apical, a little longer than the antennæ. Beard long, abundant, white; upper orbital cilia black, rather short.

Thorax dark shining green; scutellum with four large marginal bristles. Abdomen green, its incisures black or bronze, hairs on its dorsum black, those on the sides and venter long and white. Hypopygium black, not very large; its outer lamellæ rather short, black, of about equal width to the tip, which is somewhat truncate; inner appendages small.

Coxæ black with long white hair, middle pair with black bristles at tip, these do not form a thorn. Femora black, fore and middle pairs with yellow tips, the former with long white hair on posterior surface; middle ones with long white hair on both anterior and posterior edges below. Hind femora with rather long, black, stiff hairs on outer surface and lower inner edge. Fore and middle tibiæ and most of their tarsi yellow. Hind tibiæ and tarsi wholly black. Joints of fore

tarsi as 37-11-9-4-10; of hind tarsi as 40-37-25-11-12. Calypters and halteres yellow, the former with white cilia.

Wings grayish; third and fourth veins bent so as to approach each other a little, but parallel towards their tips; last section of fifth vein as long as the cross-vein.

♀. A female that seems to belong with these males has the antennæ very nearly like the male's; face wide with its sides parallel, rounded below, its suture just above lower third; the white hair forming the beard, on the coxæ and on the fore and middle femora much shorter than in the male, the black hair on the hind femora also short.

Described from three males and one female. The *holotype*, a male, was taken at Lahaway, Ocean Co., New Jersey; the female (*allotype*) was taken by Nathan Banks, at Falls Church, Virginia, May 16; one of the other males was taken at Jeffrey, New Hampshire, June 18, and the other at Kingston, Rhode Island, June 17, by C. W. Johnson. Holotype and allotype in the author's collection.

**Porphyrops brevicornis** new species.

♂. Length 4 mm. Face rather wide above, narrow below, silvery white. Front green, dulled with gray pollen. Antennae black; third joint scarcely longer than wide at base, conical; arista apical, about twice as long as the antennæ. Beard sordid whitish, not very abundant for the genus; the black upper orbital cilia extend down to about upper fourth of eye height; there is only one pair of postvertical bristles.

Thorax green, dulled with brownish pollen and with a brown stripe on each side of the acrostichal bristles.

Abdomen green, with a few white hairs on the sides, that are longest on first segment. Hypopygium black; its outer lamellæ are long, narrow, brown, ribbon-like, of nearly equal width throughout, fringed with pale hairs on one side, if stretched out they would nearly reach the ventral edge of second segment; the inner appendages are a pair of straight organs, slightly widened at tip and reaching the ventral edge of fourth segment.

Coxæ and femora black, tips of the latter narrowly yellow. Fore and middle coxæ with long sordid whitish hair, middle ones without a thorn at tip. Fore femora with long delicate white hair on posterior surface, middle pair with only short hair. Tibiæ yellow, hind pair black at tip, the black shading into the yellow and reaching to or beyond the middle on posterior side. Fore and middle tarsi yellowish, darker at tip, the former just equal to their tibiæ in length, their joints as 28-13-12-9-9, first joint a little widened at tip below. Fore tibiæ

with rather long hair on lower surface. Middle tarsi with their joints as 32-23-15-10-9. Hind tarsi wholly black, their joints as 40-55-20-14-9. Calypters and halteres yellow, the former with white cilia.

Wings tinged with brown; third and fourth veins slightly arched so as to approach each other, being nearest together at tips; last section of fourth only a little arched, without a distinct bend; last section of fifth vein twice as long as the cross-vein.

♀. Face very wide, yellowish white; front nearly opaque with brown pollen. Antennæ as in the male; thorax dulled with brown pollen, the brown stripes can scarcely be traced, but the central band has less pollen. Coxæ blackish with very short pale hairs; fore femora yellowish on anterior, black on upper and posterior surfaces; middle femora wholly yellow, still the upper edge is dark; hind femora yellow with the tip black above; tibiæ yellow, hind pair with apical two-fifths black and slightly black at extreme base; tarsi colored about as in the male.

Described from two males and one female, taken by Mr. Cole at Hood River, Oregon, the males on June 2 and the female on April 21. *Types* in the author's collection.

**Porphyrops ornatus** new species.

♂. Length 5 mm. Face narrow, silvery white. Front green. Antennæ black, third joint as long as the face; arista apical, as long as third joint. Beard moderately long, white; the black orbital cilia reach down nearly to the middle of the eye, there are three postvertical bristles on each side,.

Thorax shining green with a brown stripe on each side of the acrostichal bristles; scutellum with two pairs of marginal bristles, the outer ones much smaller than the inner pair; in one male there is a pair of marginal hairs between the central bristles.

Abdomen green with bronze brown incisures and the usual white hairs on the sides. Hypopygium black with short, black, stiff hairs; its outer lamellæ long, slender, tapering, blackish with yellow base, fringed with pale hairs; inner appendages slender, curved, yellowish, reaching the ventral edge of fourth segment.

Coxæ black with white hair; middle pair with a long black thorn at tip. Fore femora black more or less yellow on anterior surface, broadly yellow at tip, their lower posterior surface with long white hair, upper posterior surface with three small black bristles near the tip. Middle femora and basal half or more of hind femora yellow, the latter with nearly the apical half black; middle and hind femora each with a few small yellow hairs below. Fore and middle tibiæ yellow, the former with a little silver pollen on posterior surface. Hind tibiæ black with basal half of upper and about basal third of lower surface yellow. Fore tarsi with the first two joints yellow, last four infuscated;

the first is much widened below at tip; second joint two-thirds as wide as long, being nearly as wide as the tip of the first; joints of fore tarsi as 33-12-11-9-6. Middle tarsi black from the tip of first joint, their joints as 48-27-17-9-9, the first joint has several longer hairs at base below. Hind tarsi wholly black, their joints as 48-40-21-18-14. Calypters and their cilia yellow; knob of halteres yellow, stem brown.

Wings slightly tinged with brown; third and fourth veins considerably bent, approaching each other and again separating just before their tips; last section of fifth vein one and one-half times as long as the cross-vein.

♀. Face wide, rounded below, its suture at its middle; antennæ small, third joint about as long as the two basal joints taken together; arista more than twice as long as the antennæ. Femora and tibiæ colored about as in the male, except that the hind tibiæ are yellow with about apical third black; femora with short hair; fore tarsi plain, blackened from the tip of the first joint. Wings about as in the male.

Described from two males and two females; the males were taken at Colden, Erie County, New York, July 9 and 23; the females at Lancaster, Erie County, New York, June 2. *Types* in the collection of the author.

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**The Nesting Habits of Odynerus pedestris Sauss, and Stenancistrocerus saecularis Sauss (Hymen.; Eumenidae).**

*Odynerus* or more correctly *Stenodynerus pedestris* was found nesting in a sumac twig. A mud plug sealed the aperture of this burrow. Upon splitting the twig it was found that this was an old gallery made by the bee, *Ceratina calcarata*, and only the top 2¾ inches was used by the present occupant. This tenant had made a mud floor at the aforementioned point and another mud wall at the top for a plug. The space of 2¾ inches contained three cells, two of which had dead larvae, and the third had an adult wasp ready to emerge; this was the condition of the nest on August 7, 1922.

I was very much surprised when Mr. S. A. Rohwer identified this wasp as *S. pedestris*, since this wasp is described in our "Wasp Studies Afield" as one that burrows in clay banks. Both specimens were resubmitted for verification, the one that recently emerged from the twig, and the specimen whose behavior was described in the aforementioned work; reexamination proves that the inhabitant of the twig is *Stenodynerus pedestris* and the name of the burrower in the clay bank should be corrected to *Stenancistrocerus saecularis* Sauss.

I regret very much that this error has crept in, and the object of this note is to correct the name of the wasp, whose behavior is described on pages 332-334 of the above book to *Stenancistrocerus saecularis* Sauss.

PHIL RAU, St. Louis, Missouri.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., OCTOBER, 1923.

### Duty on Insects Imported into the United States.

We have had inquiries in relation to the import duty on insects and have had considerable trouble and annoyance ourselves in respect to this matter. When insects are addressed to the Academy of Natural Sciences of Philadelphia, they may or may not be held for duty, probably depending on the action or opinion of the customs officer. When boxes or packages are addressed to individuals, they are usually held for duty and the consignee notified to call and pay duty. The tariff law of 1922 in respect to insects for institutions is clear enough—it reads as follows: "1663. Specimens of natural history, botany and mineralogy, when imported for scientific public collections, and not for sale" (are free of duty). Insect eggs are also free. This probably means silk-worm eggs. The duty on insects, imported by individuals, is apparently ten per centum ad valorem,* at least that is the rate charged in Philadelphia. It

* "Treasury Department.
Washington, September 15, 1923.

MR. HENRY SKINNER, President,
The American Entomological Society,
Logan Square, Philadelphia, Pa.

Sir:—

In reply to your letter of the 11th instant, requesting information as to the classification of insects imported by individuals, I have to advise you that if the insects are imported in crude condition and unmounted they would be dutiable at the rate of 10% ad valorem under paragraph 1459 of the tariff act, and if prepared in any manner or mounted at the rate of 20% ad valorem under the same paragraph.

Respectfully,

[Signed] McKENZIE MOSS,
Assistant Secretary."

Paragraph 1459 reads: "That there shall be levied, collected and paid on the importation of all raw or unmanufactured articles not enumerated or provided for, a duty of 10% ad valorem, and on all articles manufactured, in whole or in part, not specially provided for, a duty of 20% ad valorem."

would be interesting to know what is charged in other places, as in some cities they are said to come through free. Living pupae and chrysalids are liable to confiscation. Duty is charged on pins, whether for institutions or individuals, and the rate is thirty-five per centum ad valorem. We have found it impossible to get good insect pins in the United States. We would suggest that the U. S. Bureau of Entomology try to clarify these matters, as at present they are very unsatisfactory and very annoying.—HENRY SKINNER.

### Another Reference to Barbellion.

EDITOR, ENTOMOLOGICAL NEWS:

I was much gratified to see in your editorial for June a quotation from the pen of W. N. P. Barbellion, but I was disappointed that you did not call the attention of the reader to his posthumous work entitled "The Journal of a Disappointed Man." This teems with interesting remarks, entomological and otherwise, in which I am sure your readers will find much food for thought. May I quote one choice bit, entitled "The Entomological Society," on page 110?

"There were a great many Scarabees present who exhibited to one another poor little pinned insects in collecting boxes. . . . It was really a one-man show, Prof. ———, a man of very considerable scientific attainments, being present and shouting with a raucous voice in a way that must have scared some of the timid, unassuming collectors of our country's butterflies and moths. Like a great, powerful sheep-dog, he got up and barked, 'Mendelian characters,' or 'Germ plasm,' what time the obedient flock ran together and bleated a pitiful applause. I suppose, having frequently heard these and similar phrases fall from the lips of the great man at these reunions, they have come to regard them as symbols of a ritual which they think it pious to accept without any question. So every time the Professor says, 'Allemorph,' or some such phrase, they cross themselves and never venture to ask him what the hell it is all about."

PHIL RAU, St. Louis, Missouri.

### Memorials to Godman and Salvin.

The NEWS for October, 1919, page 231, noticed the initiation of a movement to place a memorial tablet to Messrs. Godman and Salvin, founders and editors of the *Biologia Centrali-Americana*, in the British Museum (Natural History) and to establish a "Godman Memorial Exploration Fund." During the past summer we have received the report of the Executive Committee in charge of the fund. According to it, subscriptions received from 84 individuals, three business firms, the British Ornithologists' Union, the Entomological, Royal Geographical, Royal Horticultural, Zoological and Royal Societies, with interest, amounted to

£1272 13s. 1d. The total cost of the tablet is £470 and, after deducting various small expenses, there remains about £788 2s. 2d. for the Exploration Fund, which, as we stated in 1919, had its beginning in a gift of £5000 from Dame Alice Godman and her daughters.

The bronze tablet was designed by Sir Thomas Brock and cast by Mr. F. Arnold Wright. Its place is to be on the right-hand side of the statue of Darwin, half way up the main staircase of the Museum, and the date of unveiling set for July 28, 1923. We have no information as to the size of the tablet, but a photographic reproduction of it shows a horizontal rectangular outline, the middle section of the upper edge arched and spanning a relief map of Central America, within a circular scroll bearing the words "Biologia Centrali Americana." Below this, to left and right, are profile portraits of Salvin and Godman respectively, facing each other, each with his initials and dates of birth and death below: O. S. 1835-1898, F. D. G. 1834-1919. Between the two portraits is the inscription: "To Commemorate the Services to Natural Science and to the Museum of Frederick Ducane Godman, D. C. L., F. R. S., and Osbert Salvin, F. R. S., this Tablet is placed here by some of their friends and admirers."

The purpose of the Godman Exploration Fund is to collect, or acquire by exploration, specimens for the Natural History Museum.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **14**—Proceedings of the Zoological Society of London. **19**—Bulletin of the Brooklyn Entomological Society.

**20**—Bulletin de la Societe Entomologique de France, Paris. **24**—Annals de la Societe Entomologique de France, Paris. **29**—Annual Report of the Entomological Society of Ontario, Toronto, Canada. **31**—Proceedings of the Acadian Entomological Society, Truro, N. S. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **39**—The Florida Entomologist, Gainesville, Florida. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **47**—Neue Beitrage zur systematischen Insektenkunde. Ed. by G. Paganetti Hummler, Voslau. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **52**—Zoologischer Anzeiger, Leipzig. **57**—Biologisches Zentralblatt, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **68**—Science, Garrison on the Hudson, N. Y. **76**—Nature, London. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **80**—Revue Suisse de Zoologie, Geneve. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **101**—Journal of the Linnean Society of London. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **107**—Rivista del Museo de la Plata, Buenos Aires. **111**—Archiv fur Naturgeschichte, Berlin. **115**—Societas Entomologica, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a M. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **138**—American Museum Novitates, New York. **147**—Archiv fur Mikroskopische Anatomie und Entwicklungsmechanik, Berlin. **148**—Revista de la R. Academia de Ciencias Exactas, Fisicas y Naturales de Madrid.

**GENERAL. Adair, E. W.**—The study of insects. (Cairo Sci. Jour., xi, 133-46.) **Bequaert, J.**—Recent publications on tropical entomology. **19**, xviii 99-163. **Caesar & Ross**—Insects of the season in Ontario. **29**, 1922, 33-39. **Calvert, P. P.**—The geographical distribution of insects and the age and area hypothesis of Dr. J. C. Willis. **90**, lvii, 218-29. **Champlain, A. B.**—Fish-killing insects. (Nature Mag., ii, 119-20.) **Costa Lima, A de**—Catalog systematico dos insectos que vivem nas plantas do Brasil e ensalo de bibliographia entomologica brasileiro. (Arch. Esc. Sup. Agr. e Med. Vet., Nichtheroy, vi, 107-205.) **Crampton, G. C.**—Preliminary note on the terminilogy applied to the parts of an insect's leg. **4**, lv, 126-32. A comparison of the terminal abdominal structures of an adult female of the primitive termite Mastotermes darwinensis with those of the roach Periplaneta americana. **19**, xviii, 85-93. **Fowler, W. W.**—Obituary notice. **8**, 1923, 150-2. **Grandi, G.**—Gli insetti dei caprifichi. (Rev. Biol., Roma, v, 69-90.) **Herter, K.**—Untersuchun-

gen ueber den temperatursinn der hausgrille (Acheta domestica) und der roten waldameise (Formica rufa). **57,** xliii, 282-85. **Howard, L. O.**—A fifty-year sketch history of medical entomology. (Smith. Inst. Rep., 1921, 565-86.) **Locket G. H.**—Tactile vision of insects and Arachnida. **76,** cxi, 848. **McAtee, W L.**—Insects, Arachnids, and Chilopods of the Pribilof islands, Alaska. (U. S. Dep. Agr., Biol. Surv., N. Am. Fauna, No. 46, 128-244.) **MacGillivray, A. D.**—The value of landmarks in insect morphology. **7,** xvi, 77-84. The subcostal vein in the wings of insects. **90,** lvii, 371-74. **Maheux, G.**—Provancher, the Canadian Linnaeus—his life and works. **29,** 1922, 28-30. **Melander, A. L.**—Collecting insects on Mount Rainier. (Smith. Inst. Rep., 1921, 415-22.) **Rabaud, E.**—La capture des insectes par les plantes. **20,** 1923, 122-4. **Riley, N. D.**—Translation of Finkler's communication on the Head-transplantation in insects. **9,** lvi, 143-44. **Ross, H.**—Pflanzengallen. (Natur, Leipzig, xiv, 273-82.) **Scheerpeltz u. Schild.**—Mikroprojektionsmethoden. **124,** iii, 65-9 (cont.) **Snyder, L. H.**—Instinct and intelligence in nature. (Nature Mag., ii, 102-4.) **Weber, H.**—Zur gliederung des insektenthorax. **52,** lvii, 97-116.

**ANATOMY, PHYSIOLOGY, ETC.** **Boring, A. M.**—The varieties of Monocephora bicincta from the point of view of a cytologist. **5,** xxx, 89-92. **Junker, H.**—Cytologische untersuchungen an den geschlectsorganen der halbzwitterigen steinfliege Perla marginata. (Arch. f. Zellforschung, xvii, 185-259.) **Metz & Ferry.**—The parallel characters "crossveinless" and "vermilion" in Drosophila willistoni. **90,** lvii, 381-4. **Schrader & Sturtevant**—A note on the theory of sex determination. **90,** lvii, 379-81. **Sturtevant & Morgan**—Reverse mutation of the bar gene correlated with crossing over. **68,** lvii, 746-47. **Tamura, O.**—Morphologische studie chromosomen und zellkerne (Arch. f. Zellforschung, xvii, 131-64.) **Ward, L.**—The genetics of curly wing in Drosophila. Another case of balanced lethal factors. (Genetics, viii, 276-300.)

**ARACHNIDA AND MYRIOPODA.** **Chamberlin, R. V.**—Results of the Bryant Walker expedition of the Univ. Mich. to Colombia, 1913, and British Guiana, 1914. **88,** No. 133. **Elton, C. S.**—The colors of water-mites. **14,** 1922, 1231-39. **de Vecchi, B.**—Le ghiandole a secrezione interna bell 'acrania. (Rev. Biol., Roma, iv, 634-61.)

**Chamberlin & Banks**—Arachnida and Chilopoda of Pribilof islands. (See McAtee under General.) **Watson, J. R.**—An addition to the Thysanoptera of Florida—XI. **39,** vi, 58.

**THE SMALLER ORDERS OF INSECTA.** **Brethes, J.**—Un Dorypteryx nouveau de Buenos-Ayres. **20,** 1923, 117-9. **Brittain, W. H.**—The morphology and synonymy of Psyllia mali. **31,** 1922,

23-51. **Brues, C. T.**—The geographical distribution of the Onychophora. **90,** lvii, 210-17. **Carpenter & Phillips.**—The Collembola of Spitsbergen and Bear Island. (Proc. R. Irish Ac., xxxvi, 6, 11-21.) **Ferris, Banks, McAtee**—Malophaga, Anoplura, Trichoptera, and Mecoptera of Pribilof islands. (See McAtee under General.) **Karny, H. H.**—A new Liothrips from Trinidad. **11,** xii, 160-1. **Kelly, R.**—Thrips; An unpopular insect, treated popularly. (Vict. Nat., Melbourne, xl, 49-57.) **Klapalek, F.**—Plecopteres nouveaux. **33,** 1923, 21-9. Collections zoologiques du Baron Ed. de Selys Longchamps., Cat. Syst. et Descr., Fasc. iv, 2, Plecopteres, Fam. Perlidae. **Kotlan, A.**—Ueber die blutaufnahme als nahrung bei den Mallophagen. **52,** lvi, 231-33. **Longinos Navas, R. P.**—Insectos sudamericanos. **148,** xix, 255-67. **Perfiljew, P.**—Ueber den mechanismus der kiemenautotomie bei den larven einiger Libellen. **147,** xcviii, 283-91. **Snyder, T. E.**—Three new termites from the Canal Zone, Panama. **10,** xxv, 126-31. **Treherne, R. C.**—Notes on Frankliniella tritici. **29,** 1922, 39-43. **Weiss & Lott**—Notes on Trichothrips ulmi in New Jersey. **19,** xviii, 94-7.

**ORTHOPTERA. Bodine, J. H.**—Hibernation in Orthoptera. **85,** xxxvii, 457-76. **Carothers, E. E.**—Notes on the taxonomy, development and life history of certain Acrididae. **2,** xlix, 7-24. **Caudell, A. N.**—Grylloblatta in California. **4,** lv, 148-50. Phorticolea boliviae, a new myrmecophilous cockroach from S. America. **5,** xxx, 28-30. **Chopard, L.**—Recherches sur la conformation et le developpement des derniers segments abdominaux chez les orthopteres (Pub. with Insecta, Rennes, 1920.) **Hebard, M.**—Orthoptera of Pribilof islands. (See McAtee under General.)

**Rehn, J. A. G.**—North American Acrididae. Paper 3. A study of the Ligurotettigi. **2,** xlix, 43-92.

**HEMIPTERA. Britton, W. E.**—The Hemiptera or sucking insects of Connecticut. (Conn. Geol. & N. H. Surv., Bull. 34, 807 pp.) **Brittain & Whitehead**—Papers on the leaf hoppers of Nova Scotia. **31,** 1922, 57-72; 128-57. **Barber, G. W.**—Notes on Sinea diadema. **5,** xxx, 74-6. A preliminary report on the Hemiptera-Heteroptera of Porto Rico collected by the Am. Mus. N. H. **138,** No. 75. **Ferris & Kelly**—Some Coccidae from about the Gulf of California. **61,** xii, 315-18. **Laing, F.**—On some Psyllidae from the new world. **11** xi, 696-705. **Leonard, L. T.**—Mealy bugs on the roots and nodules of legumes growing in the field. **68,** lvii, 671-2. **MacGillivray, A. D.**—The Maskell collection of Coccidae. **68,** lvi, 734-35. **Matheson, R.**—The wax secreting glands of Pseudococcus citri. **7,** xvi, 50-6. **Morrison, H.**—A report on a collection of Coccidae from Argentine. II. **10,** xxv, 122-26. **Obenberger, J.**—Analecta IV. **47,** ii, 113-5. **Parshley, H. M.**—Records of Nova Scotian hemiptera-heteroptera.

31, 1922, 102-8. **Speyer, E. R.**—Researches upon the larch chermes (Cnaphalodes strobilobus) and their bearing upon the evolution of the Chermesinae in general. (Phil. Trans. R. Soc. London, B, ccxii, 111-46.) **Van Duzee, E. P.**—Expedition of the Cal. Ac. Sci. to the Gulf of California in 1921. The Hemiptera. **61,** xii, 123-200.

**Drake, C. J.**—Two new species of Cantacaderia. **19,** xviii, 81-84. **Metcalf, Z. P.**—A key to the Fulgoridae of eastern North America, with descriptions of n. sps. (Jour. Elisha Mitchell Sc. Soc., xxxviii, 139-230.) **Morrison & Morrison**—The scale insects of the subfamilies Monophlebinae and Margarodinae treated by Maskell. **50,** lvii, Art. 17. **Osborn, H.**—Some confused species of Phlepsius and Eutettix. 82, xxiii, 160-2. **Patch & McAtee**—Homoptera and Heteroptera of Pribilof islands. (See McAtee under General.) **de la Torre-Bueno, J. R.**—A new North American Notonecta. **19,** xviii, 104-7.

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A notice of the foundation of the Entomological Society of Brazil was given in the NEWS for October, 1922, page 240. The Society has recently published numbers 1-3 of the first volume of its BOLETIM (Rio de Janeiro, 1922) containing articles (in Portuguese) on Brazilian Lepidoptera, Diptera and Coleoptera which have been listed under our department of Entomological Literature.

A relatively new entomological journal is the NORSK ENTOMOLOGISK TIDSSKRIFT, published (in Norwegian) by the Norse Entomological Society at Christiania. The first volume is dated 1920.

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GENERA INSECTORUM, fasc. 181. APIDAE, SUBFAM. PROSOPIDINAE, by GEOFFREY MEADE-WALDO. 45 pp., 1 col. pl., Bruxelles, 1923.

This, the first of the parts treating of the bees which has been promised since 1919, reached the writer on June 28. As a catalog of the known species it supersedes this part of the volume of Dalle Torre in 1896. The latter work listed 284 species in 6 genera, the present one has 19 genera (one of doubtful position) with 753 species. Australia has 300 of the species, including almost all of the genera excepting *Prosopis*, which appears under the generic name *Hylaeus*. *Euryglossa* has 88 species, the other genera from 1 to 17 each. The colored

plate shows representatives of 17 genera and some details of legs, mouthparts and antennae. No American species are illustrated.

A note by the editor states that since the death of Meade-Waldo the manuscript has been brought up to date by Prof. Cockerell, who has added the names of species recently described. A few notes on synonomy of American forms have been inserted by Prof. Cockerell.

Several typographical errors appear in the text. Two generic names are misspelled on the plate but corrected on the page of explanations of figures. The reference to figure 8 is omitted on page 11, and in line 7 of page 30, the use of "be" for "he is" might prove puzzling to one unfamiliar with English.

The description of habits is very brief (5 lines) and the statement that "The larvae are fed on a liquid food probably pollen regurgitated in the form of honey" would seem to imply that the bees were able to convert pollen into honey. Whether or not the bees make the cavities which they use is not stated. The nests which have been found by the writer indicate that our species use old cavities made by *Alcidamea*, *Ceratina*, *Odynerus*, etc., and he also has found them using the portion of a twig left empty by the *Alcidamea* above her cells.

One important comment is made by the author concerning the origin of the group. The short emarginate ligula has been regarded as evidence of the close affinity of these bees with the wasps. In two genera, *Meraglossa* and *Palcorhiza* the ligula of the male is acute, and in *Eupalcorhiza*, described (male only) from New Guinea by Meade-Waldo in 1914, the tongue is quite long and folded when in repose. The author suggests that perhaps the broad ligula is an adaptation associated with the habit of coating the nest with salivary secretions. Its recurrence in the *Colletinae* which have no other similarity to the *Prosopidinae* would seem additional evidence of such origin.

The treatment of the synonomy evidently is somewhat unequal. The species distribution of *Hylaeus* is as follows (Dalle Torre's numbers in the parentheses): palearctic 158 (161), nearctic 42 (12), neotropic 93 (13), ethiopian 47 (5), oriental (including Japan) 49 (11), Australian 119 (56), Hawaii 60 (12). The 42 North American species include the 20 recognized by Metz, the 11 placed by him as uncertain, 2 placed as synonyms and 2 unmentioned, also 7 since described. That the palearctic region has lost 3 species is due to the placing of many of those of Förster and others in the synonomy, but Europe still seems to have a rather generous allowance compared with North America (71 of the 158). Of Förster's species, 25 are retained, 5 of them as varieties. Of Cockerell's North American forms, 17 stand while 24 fall, but of his Australian ones, 82 stand and only 10 fall. All of the 52 described by Perkins from Hawaii are retained.

Much as one may admire the execution of such a work, the writer cannot help feeling that the plan of it is a mistake. He realized that

its circulation must be comparatively small, but was surprised when informed by the editor that only 150 copies of this part would be printed. In botany we have *Die Naturlichen Pflanzenfamilien*, a somewhat similar work except that it does not attempt to list all of the species and is not printed on such an elaborate scale. That publication covers the entire plant kingdom, was completed in 23 years (most of it in 13), and still can be obtained quite readily from dealers in second-hand books for about $100. In addition to the high cost of the GENERA INSECTORUM, and the length of time necessary to complete it, the small edition will make opportunities to secure complete sets quite rare.—O. A. STEVENS.

## OBITUARY.

WILLIAM EVANS, a fellow of the Royal Society of Edinburgh, died in that (his native) city, October 23, 1922, in his 72nd year. His interests in natural history were very wide and he contributed much to the knowledge of British insects in numerous notes and papers in the British journals, such as a series in the *Scottish Naturalist* for 1914 and 1915 dealing with insects found at the Scottish lighthouses. Mr. K. J. Morton, his fellow townsman, to whom we were indebted for a delightful evening spent in Mr. Evans' company, has written a sympathetic notice of his life (Ent. Mo. Mag., Jan., 1923).

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At the meeting of the Entomological Society of Belgium of November 4, 1922, the death of the distinguished hemipterologist, A. L. MONTANDON, at Jassy, Rumania, was announced, but no particulars are given.

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The Reverend Canon WILLIAM WEEKES FOWLER died June 3, 1923, in the vestry of his parish church, St. Peter's, Earley, Reading, England. "He had officiated at the early service" that day, but later "collapsed without warning, and life was extinct before medical aid could be summoned." He was born in January, 1849, son of the Rev. Hugh Fowler, attended Rugby, took a degree at Jesus College, Oxford, was ordained priest in 1875, and was master of Lincoln Grammer School, 1880-1900. He was appointed Canon of Welton Brinkhall in Lincoln Cathedral, in 1887. His best known works are *The*

*Coleoptera of the British Islands*, five volumes, 1887-1891, and a supplementary volume by himself and Mr. H. Donisthorpe in 1913; Rhynchota-Homoptera, parts of Vols. I and II, of the *Biologia Centrali-Americana*, 1894-1909; the general introduction to the Coleoptera and the volume on Cicindelidae and Paussidae in the *Fauna of British India* and the Languriidae in Wytsman's *Genera Insectorum*. He was President of the Entomological Society of London in 1901-02. His great activity, bodily and mental, and his readiness to assist fellow students in every possible way were outstanding features of his character. (Entom. Mo. Mag., July, 1923, Entom., July, 1923.)

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The death of M. Paul Mabille at Perreux, France, on April 6, 1923, at the age of 88 years, was announced at the meeting of the Entomological Society of France of April 11. He was president of the Society in 1890 and in 1904 and was elected an honorary member in 1901. He was both a botanist and an entomologist, his chief works on insects being those on the Lepidoptera of Corsica (1867-69), of Madagascar, of Assinie, on the genus *Eupithecia* (1880), on the Hesperidae of the world, and an essay on the fauna of the island of Oleron (1906.) (Bull. Soc. Ent. Fr., 1923, No. 7, p. 102.)

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The death of Eugene Boullet who published several works on the Hesperidae in collaboration with M. Mabille and, more recently, with M. F. LeCerf, was announced at the meeting of the same Society of February 28, 1923, but without any dates. He had formed a very important collection of Lepidoptera of the entire world which he gave to the Museum national d'Histoire Naturelle, bequeathing to the Laboratoire d'Entomologie thereof a sum sufficient to assure the maintenance of the collection.

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At the same meeting was also announced the death of Ed. Blanc, coleopterist, who made a successful entomological exploration of the Caucasus, Turkestan, parts of China and Siberia in 1890-91. (Bull. Soc. Ent. Fr., 1923, No. 4, pp. 48-49.)

# NEW ARRIVALS

From Colombia, South America:

**OVER 10,000 BUTTERFLIES, INCLUDING**

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

**1500 BUTTERFLIES AND MOTHS, INCLUDING**

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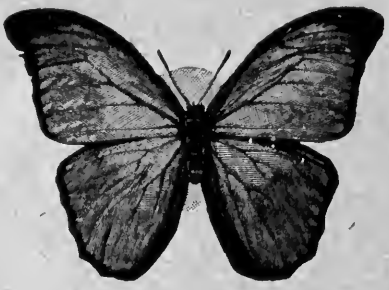
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera



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Kallima inachis
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# ENTOMOLOGICAL NEWS

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV NOVEMBER, 1923 No. 9

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## A New Species of an Achias-like Fly from Nicaragua, apparently belonging to the little-known genus Plagiocephalus (Diptera : Ortalidae).

By E. T. CRESSON, JR.

Among the material collected by Mr. Wharton Huber on the Nicaraguan Expedition of the Academy of Natural Sciences of Philadelphia, in the spring of 1922, was found a specimen of the curious pseudo-stalked-eyed flies, which upon close examination proved to be quite distinct from *Achias* and its allies. An examination of the literature relative to species of *Achias* soon established the similarity of this fly to the figure

of *Plagiocephalus lobularis*, given in Wiedemann's 1830 paper. That species was the only known *Achias*-like dipteron, excepting some species of the drosophilid genus *Zygothrica* occurring in the New World, which fact makes the finding of the present species all the more interesting. I give below a rather full description, in absent of detailed illustrations, endeavoring to include all characteristics of specific and generic importance.

**PLAGIOCEPHALUS** Wied.

1830. Wiedemann, Achias, 12. pl. ii, f. 1a-b.
1843. Macquart, Dipt. Exot., ii (3), 213.
1873. Loew, Mon. Dipt. N. A. iii, 26.
1880. Osten-Sacken, An. Mus. Civ. St. Genova, xvi, 478.
1909. Hendel, Gen. Ins., fasc. 96, 47.
1911. Hendel, Gen. Ins., fasc. 113, 52.

This genus was erected for *Achias lobularis* Wied., a well marked species described from Brazil, but which apparently has not been seen since its discovery. Consequently, and in part owing to the insufficiently characterized description, the position of the genus has been little understood. Prior to Loew's and Osten Sacken's papers above cited, the genus had been associated with *Achias*, but Hendel following their suggestions, placed it in the ortalid subfamily Richardinae.

That the present species is closely related to *lobularis* is certain, but I have doubts as to it being congeneric. The fact that it has a distinctly plumose arista (that of *lobularis* being bare) alone suggests generic distinction and, furthermore, this may be substantiated by other characteristics not mentioned in the descriptions of *lobularis*. However, in the absence of more knowledge of *lobularis*, I hesitate to erect another genus for the present species. The pedal structure and the venation of *lobularis* may offer some valid generic characteristics, but one is guided only by the general figure of that species in these respects.

That the present species is a member of the Richardinae, is evident by the following characteristics: Vibrissa absent; median part of face flattened with a distinct transverse sulcus above the projecting epistoma; sutural impressions of mesonotum oblique; two pairs of post-dorso-centrals; mesopleural bristles well de-

veloped, but there are no propleurals nor sternopleural. Auxillary vein entering costa slightly beyond branch of second and third veins, at which point the first vein is thickened and nearly contiguous with the auxillary vein; first vein short and bare; anal cell short with its cross-vein convex, without acute lower angle. Abdomen rather slender basally.

**Plagiocephalus huberi** new species

Yellow; third antennal segment above, a transverse stripe on head above from eye to eye, including frontal bristles and ocellar tubercle, a similar stripe on occiput from eye to neck, including inner and outer verticals, brown. Mesonotum dark brown to black, opaque, marked with golden pollinose design as follows: a broad median stripe extending nearly to base of scutellum, then laterally, including postalar callus, then anteriorly, emarginated at suture and including humerus. There is also a vertical golden stripe over mesopleura but not including the shining sternopleura, a spot of same color on metapleura and a stripe below halteres. Scutellum sordid, sparingly golden pollinose. Metanotum dark with median pale vertical stripe. Pleura pale with dark vertical stripe behind prostigma and another before poststigma. Halteres nearly white. Abdomen (much shrunken and deformed) is dark with first segment and a median stripe on second and third, also lateral apical angles of second, pale. Legs entirely yellow but apices of tarsi darker. Wings yellow with pale veins immaculate but faintly longitudinally infuscated in first posterior cell.

Structurally, in general habitus, similar to Wiedemann's figure, but the head more slender as in Macquart's figure. Ocelli well developed, bristles strong and parallel and situated behind line of anterior ocellus; post-verticals divergent; inner verticals situated slightly beyond line of humeri, while the outer verticals are about midway between the former and the eyes; one frontal situated slightly beyond line of inner verticals; all these bristles well developed. Lunular margin straight, distinct to eyes where it becomes carinate, and the eyes are angular at that place. Antennae close together; third segment three times as long as second, and three times as long as broad, rounded apically; arista longer than third segment, shortly but distinctly plumose to tip. Face subopaque, medianly flattened; facialia produced laterally in form of a triangle, evanescing slightly beyond line of frontal bristle; no vibrissae or setulae on face. Epistoma concave, narrow but prominent, with a distinct transverse sulcus above; clypeus narrow, short, not as broad as the oral opening. Proboscis short; palpi broadly scapulate apically.

Thorax robust, as broad as long; fore coxae not attaining base of middle ones; all bristles strong. Mesonotum yellow setulose; two post-

dorso-centrals; two post-alars; one supra-alar; one presutural; one humeral; two noto-pleurals; one meso-pleural, and some pale hairs on the posterior margin and on the golden stripe. Scutellum triangular, flattened, with two diverging apical and one lateral bristles. Legs rather robust, especially hind femora. Fore legs without dorsal bristles, but with pale hairs; middle femora with few short flexor bristles and a preapical on tibiae; hind femora thickened, with stout flexor spines and several slender extensor bristles, without preapical on tibiae. Squama-thoracalis linear; squama-alaris small with long pale cilia.

Abdomen much shrunken and impossible of critical description.

Wings 8 mm. long. Costal cell narrow; auxiliary vein entering costa at break; no costal spine; stigmal area short; first vein bare, short, ending far before line of ante-cross-vein; second vein long; second costal section about three times as long as third. Third and fourth veins bare, converging so that first posterior cell is considerably narrowed apically; ante-cross-vein perpendicular, beyond middle of discal cell; ultimate section of fourth vein three times as long as preceding section; post-cross-vein straight, perpendicular; anal cell not longer than second basal, and its cross-vein convex, rounding into sixth vein. Alula moderate. Length.—8 mm. width of head 10 mm.

*Type.*— ♂ ? Eden, Nicaragua, 14°-0′N., 84°-26′ W., May 17, 1922, (Wharton Huber, [A. N. S. P., No. 6284.]

## An Interesting New Species of the Genus Melanoplus from Central Georgia (Orthoptera, Acrididae).

By Morgan Hebard, Philadelphia, Pennsylvania.

In June of the present year, Dr. Henry Fox, for the first time, examined a small upland grove, three miles east of Macon, Georgia, and about a mile north of a spot locally known as "Cross-Keys." He there secured eight specimens of a short-winged member of the genus *Melanoplus*, which represent a previously unknown species. This insect is described below and we take great pleasure in naming it in honor of Dr. Fox, whose observations and studies in the Orthoptera show a thoroughness, accuracy and scientific concept which places them with the most important contemporary contributions.

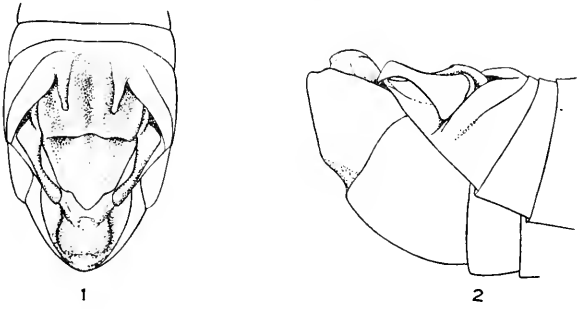
**Melanoplus foxi** new species. Text figures 1 and 2.

This insect is nearest *M. strumosus* Morse, being one of the species of the Puer Group having broadly oval tegmina, dull glaucous caudal tibiae and a truncate prosternal spine. Further agreement with *strumosus* is found in the general form, the

male cerci and subgenital plate being of the same general type, though showing striking differentiation. Superficially, the attingent tegmina give to the present insect a slightly stronger resemblance to *M. scapularis* Rehn and Hebard.

From *strumosus*, males of *foxi* are readily separated by the attigent tegmina, more slender furcula, which are separated at their bases by a considerable interval, much more elongate supra-anal plate, showing a different contour, particularly in the sharp transverse carina mesad, cerci straighter and slightly surpassing the apex of the supra-anal plate and similarly broadly truncate subgenital plate, which, however, is proportionately decidedly shorter.

*Type*: ♂ ; Macon, Georgia. June 4, 1923. (Dr. Henry Fox.) [Hebard Collection, Type No. 924.]




*Melanoplus foxi* n. sp. Dorsal (1) and lateral (2) views of apex of abdomen of male type. (Much enlarged).

Size and form closely resembling *strumosus*, very slightly less robust. Weak sulcation of vertex and frontal costa similar. Eye considerably longer than cheek, distinctly more than twice as long as infra-ocular sulcus. Pronotum with lateral carinae of disk not well defined, very feebly diverging caudad; medio-longitudinal carina percurrent, sharp and distinct; caudal margin of disk very weakly convex, however, very faintly less truncate than in *strumosus*. Tegmina abbreviate rotundate, not much longer than broad, very slightly overlapping. Extremity of abdomen moderately tumid and slightly upcurved. Furcula represented by a pair of slender, finger-like processes, parallel (or feebly diverging) and separated at their bases by a distance slightly less than the length of one of these. Supra-anal plate elongate shield-shaped, one and one-half times as long as greatest width; proximal half with a broad and decidedly concave medio-longitudinal sulcus and lateral

portions even more strongly concave, separated from distal portion by a sharp transverse carina; distal half showing concavity proximad on each side, its lateral margins weakly emarginate before the angulate apex. Cerci broad proximad but rapidly tapering, produced as a slender shaft, which is straight in lateral aspect but feebly incurved in dorsal aspect, its apical portion slightly thickened and produced to an acute point directed ventro-caudad. Subgenital plate broadly truncate-conical, longer than cercus but much shorter than supra-anal plate. Limbs as in *strumosus*.

The measurements of the type are given first. ♂. Length of body 16 and 15.8, length of pronotum 4 and 3.9, caudal width of pronotal disk 2.8 and 2.8, length of tegmen 3.6 and 3.3, width of tegmen 2.8 and 2.7, length of caudal femur 10.7 and 10.8 mm.

The most noteworthy color differences found between this insect and *strumosus* are the more reddish shade and apparently less strikingly paler face, genae and ventral portion of the pronotal lateral lobes of *foxi*. Vertex, occiput, disk of pronotum and tegmina blackish chestnut brown. A shining black, broad post-ocular bar extends from the eye to the principal sulcus of the pronotum. Eyes russet. Other portions of head, lateral lobes of pronotum and ventral portions of pleura vinaceous russet. Other portions of pleura blackish, with an oblique line of vinaceous-pink. Abdomen pecan brown, with an abruptly terminated black area on each side proximad. Ventral surface chamois. Cephalic and and median limbs vinaceous russet mottled with brown. Caudal femora mikado brown, the genicular areas and three transverse suffusions of blackish forming the usual external pattern, the ventro-external portion light pinkish cinnamon; ventral surface clear tawny, internal surface dorsad largely suffused with blackish. Caudal tibiae very dull glaucous-blue, spines black, spurs buffy with black tips.

Two paratypic males and five large immature individuals, representing both sexes, were also secured. Dr. Fox writes that "they were found in scrubby undergrowth, consisting predominantly of huckleberry, deerberry (*Polycodium sp.*), brake (*Pteridium aquilinum*) and oak sprouts (mostly *Quercus cinerea*, the upland willow oak), in an open grove of mixed longleaf pine and scrub oak. The locality is on nearly level upland, in the section known as the Sand Hills, a few miles below the 'Fall Line.' More than an hour's search was required to secure this small series. The insects appeared to be rather sluggish, leaping and then clinging to some twig or other convenient support, in much the same manner as other brachypterous forms."

## Some Peculiarities of the Dragonfly Fauna of Trinidad (Odonata).

By E. B. Williamson, Bluffton, Indiana.

Trinidad, in latitude between 10° and 11° north, with an area of about 2050 square miles, lies sixteen miles east of the northeastern extremity of Venezuela, its northern coast line on about the same parallel as that of the mainland lying west of it. To the south lies the delta of the Orinoco, whose southern affluents, together with the coastal streams of the Guianas to the southeast, rise from the highlands which are the northern watershed of the lower Amazon. The topography of Trinidad is varied, rising from sea level to a maximum at a few points of about 3000 feet. The flora is rich and generally luxuriant.

In 1912 with my father, L. A. Williamson, and Mr. B. J. Rainey, I made a small collection of dragonflies in Trinidad. This collection has not been fully worked up, but Dr. Ris has published on the Libellulines and I have recorded some of the Agrionines. These records in connection with the known distribution of dragonflies in northern Venezuela and Colombia and Central America, on the one hand, and in British Guiana and the lower Amazonian basin on the other, present some points of interest which students of other groups of the fauna of Trinidad may find significant. My first hand knowledge of the lower Amazonian dragonflies is based almost entirely on a very large and complete collection made by J. H. Williamson and J. W. Strohm, under the auspices of the University of Michigan, which collection is now being studied by J. H. Williamson and myself.

This note on the dragonflies of Trinidad is brief and general and it is not my purpose to discuss the distribution of any species in detail. So the region lying west and north of Trinidad, as mentioned in the preceding paragraph, will be referred to as *western*, while the Guianian and Amazonian regions will be referred to as *southern* when these regions are compared with Trinidad.

Dr. Ris records forty species of Libellulines from Trinidad, based on our collections. Of these one is insular, but not confined to Trinidad; twenty-six occur in both the southern and western regions; ten occur in the southern only; and three occur only in the western. Thus the predominance of the southern species, in view of the geographical position of Trinidad, is striking and rather unexpected. The three western species belong to two genera, *Dythemis* and *Macrothemis*, and are stream-frequenting species, but there are other species in Trinidad of these genera which occur in both the western and southern regions or in the southern region only.

Two genera of protoneurines with a single species of each occur in Trinidad. These two species occur only in the western region. They are stream species. None of the species of protoneurines of the southern region is known from Trinidad.

In the same way two species of *Hetaerina*, like all the species of the genus, stream dwellers, occur only in the western region, none of the numerous species of the southern region being known from Trinidad.

At a little woodland swamp near Cumuto, in Trinidad, we took three species of *Metaleptobasis*. Species of this genus frequent small woodland swamps, swampy forests, subject to seasonal inundation, and similar habitats found about sluggish, muddy, wet-weather woodland streams. They are inconspicuous insects usually resting near the ground on twigs or the upturned edges of fallen leaves or in grass or sedge clumps and sometimes rising to higher perches in bushes or low trees. Their flight is usually direct and rapid but for short distances only. The distribution of the three species found in Trinidad is exactly the opposite of what we find in the case of the stream dwelling protoneurines and Hetaerinas. For the three *Metaleptobasis* are all southern. One is known from British Guiana, another is known from far up the Madeira River, about as far south of the equator as Trinidad is north, and the third species is known also from far up the Madeira and from Manáos and Pará. The genus is known from the western region but none of the western species is known to occur in Trinidad.

Lacking a knowledge of the geology of Trinidad and such light as data on floral or other faunal groups may throw on these facts, I may yet hazard in a very diffident way a theory to account for the present dragonfly fauna. We may suppose the *Metaleptobasis* are members of a very old fauna, present when Trinidad was a part of the Guianian land mass or directly connected therewith. During the time of separation the stream faunas became extinct from some reason or, if they survived, they were later replaced by an invasion of better adapted stream species from a contiguous region of similar geographical position and similar climatic conditions, that is, from northeastern Venezuela.

[The following data bearing on the theory proposed by Mr. Williamson are added at his request. F. M. Chapman (Bull. Amer. Mus. Nat. Hist. VI, p.7, 1894) lists 194 species of land birds common to Trinidad and the continent of South America. Of these: 153 are found in both Guiana and Venezuela, 25 in Venezuela but not in Guiana, 11 in Guiana but not in Venezuela. He holds that the Trinidad avifauna "belongs in the Colombian rather than in the Amazonian subregion." He does not consider the relations of parts of Trinidad separately. R. T. Hill (Bull. Mus. Comp. Zool. XXXIV, 1899) thinks that "Trinidad, Tobago and the adjacent islands were severed from the South American coast" in late Miocene and Pliocene time (p. 214). "The continental coastal plains of South Florida, Mexico, Yucatan, Costa Rica and Trinidad were veneered during Pliocene time with a coating of oceanic debris composed of shells and calcareous muds" (p. 217). Wheeler (Amer. Mus. Novitates, No. 45, New York, Sept. 7, 1922, p. 1) says: "the ant fauna of Trinidad . . . is in great part identical with and probably quite as rich as that of the adjacent Venezuelan coast."—EDITOR.]

### Collecting in the Southwestern United States.

DEAR DR. SKINNER: I am making a belated and hurried collecting trip through the Southwest—Texas, Arizona, and California. On arriving here, was fortunate in getting the services of a U. S. Forest Ranger (on vacation) and his Ford auto. Have been into the Catalinas at various points to 6000-7000 feet; the Santa Ritas, east and west slopes; the Huachucas (Carr and Ramsey canyons); Nogales, Patagonia, and other points, I looked principally for *Psychidae*, but have a lot of other material including *Megathymus* and other interesting diurnals. Saw Biederman in Carr Canyon, and the Magny brothers, just below him. Didn't find your big *Psychid*, which has apparently disappeared from the station for it. Barnes has it, I believe, from elsewhere. I've picked up some flies for Mr. Cresson, and some dragon flies for Dr. Calvert. Shall hope to tell you about my Huachuca experiences soon after my return in late October.

Yours very truly,

FRANK M. JONES, Wilmington, Delaware.

## New Tachinidae from Texas (Diptera).

By H. J. Reinhard, Texas Experiment Station, College Station, Texas.

**PARATACTA** new genus.

Related to *Atacta* Schiner. Abdomen, thorax and head with distinct macrochaetae. Palpi well developed, proboscis slender, shorter than height of head. First vein bare, sides of face with bristly hairs on the lower half, apical cell open, ending well before wing tip. Eyes bare. Front of male greatly narrowed above, about equal to one-half the width of either eye, in female one and one-half times as wide as either eye. Ocellar bristles present, proclinate. Lowest frontal bristles about opposite the middle of second antennal joint. Antennae reaching to lower third of face, vibrissae rather weak, somewhat approximated, situated less than one-half the length of second antennal joint above oral margin. Facial ridges practically bare, only one or two bristles at the base above the vibrissae. Cheeks in the female about one-third, in the male one-fourth, as wide as eye height. Wings of normal shape, whitish hyaline, costal spine obsolete. Hind tibiae ciliate on the post-exterior edge. Type of genus, *Paratacta facialis* new species.

**Paratacta facialis** new species.

♀. Black, the first two antennal joints, palpi, scutellum and fourth abdominal segment, except at its base, yellow. Frontal bristles diverging abruptly at base of antennae, cruciate, except the vertical pair. Two pairs of orbitals, and a pair of posteriorly directed macrochaetae situated outside of the frontal rows about mid-way between the hind pair of orbitals and the anterior ocellus. Inner and outer verticals strongly developed. Antennae separated at base by a carina, third joint black, except at base, slightly shorter than second. Arista bare, thickened on basal third, the penultimate joint slightly longer than broad. Sides of face at narrowest part nearly one-third as wide as median depression, bearing several irregular rows of bristly hairs extending from the lowest frontals nearly to lower end of the eyes. Proboscis moderately long, distal segment rigid, shining black, labella fleshy, yellowish; palpi spatulate.

Thorax gray pollinose, dorsum with five black vittae. Three postsutural dorsocentral and four sternopleural macrochaetae. Scutellum gray pollinose, with three pairs of long marginal macrochaetae and a smaller discal pair, dorsum covered with sub-erect bristly hairs.

Abdomen short, broad, gray pollinose, clothed with coarse reclinate bristles, all macrochaetae marginal, large and erect. The first two segments with the usual pairs, third with a marginal row and the fourth with a submarginal row.

Legs black, knees yellowish, middle tibiae with three macrochaetae on the front side near the middle, pulvilli short.

Wings whitish hyaline, veins yellow, all except third bare, the latter with two or three bristles at the base. Hind cross vein nearly straight, nearer to bend of fourth than to small crossvein. Apical cell open, ending distinctly before wing tip. Bend of fourth vein rounded, without a stump or fold. Calypteres whitish, tinged with yellow.

Total length 7 mm.

♂. Similar to female except as noted in the generic description and as follows: Parafrontals with numerous long slender black hairs, no orbital or outer vertical bristles present, third antennal joint as long as second. Eyes larger and the facets on the upper half enlarged.

Described from one male and one female specimen, the former not perfect. Collected at Balmorhea, Texas, August 4, 1922. (C. S. Rude). *Type*, a female, deposited in the U. S. National Museum, Washington, D. C. This species differs from *Atacta* principally in having the parafacials hairy, and is generally much less robust.

**Xiphomyia texana** new species.

♀. Length 6 to 7 mm. Eyes bare. Front nearly as wide as either eye, faintly yellow pollinose, except on the outer borders, vitta broad, occupying about one-third the width of the front, opaque, brownish-black. Ocellar triangle yellow pollinose, with numerous short black hairs, and a pair of weak proclinate bristles. Two pairs of orbital bristles. Frontals in two rows, directed posteriorly and descending slightly below the base of third antennal segment. Parafacials, cheeks, and median depression cinereous. Antennae nearly as long as face, black, third joint slightly more than twice as long as second. Arista black, thickened only for a short distance beyond the base, microscopically pubescent on less than basal half, penultimate joint not longer than broad. Facial depression rather large, ridges diverging strongly downward, bearing four or five bristles above the vibrissae. The latter large and strongly cruciate, situated on level with the oral margin and lower end of the eyes. Sides of the face bare and narrow. Proboscis short, labella fleshy, yellowish; palpi brownish at base, yellow apically. Cheeks narrow, about one-fifth as wide as eye height. Posterior orbits and occiput cinereous.

Thorax black, the pollen on dorsum tinged lightly with yellow, four distinct vittae, the outer pair broad and interrupted at suture, pleurae

thinly gray pollinose. Four postsutural dorsocentral and three sternopleural macrochaetae. Scutellum black, bearing three pairs of marginal macrochaetae, the posterior pair extending almost to base of third abdominal segment, the apical pair small or obsolete.

Abdomen somewhat conical, clothed with reclinate bristly hairs, last three segments white pollinose on base, shining black apically, with both marginal and discal macrochaetae; the latter are sometimes asymmetrically placed. The piercer strongly developed, when unsheathed extends forward to second abdominal segment.

Legs black, middle tibiae with one bristle on the front side near the middle, hind tibiae sub-ciliate.

Wings whitish hyaline, costal spine inconspicuous, veins yellow. Third vein with two or three bristles near the base, all others bare. Posterior crossvein sinuous, nearer to bend of fourth than to small crossvein. Apical cell open, ending well before wing tip. Fourth vein nearly straight beyond bend, not distinctly appendiculate, but sometimes with a very short rudimentary stump at the bend. Calypteres white with a faint tawny tinge.

Described from three female specimens, collected at College Station, Texas, September, 1917, July, 1918, and October, 1921. (H. J. Reinhard). *Type*, a female, deposited in the U. S. National Museum, Washington, D. C. This species is evidently near *gladiatrix* Townsend, but differs in the color of the face, scutellum, abdomen, etc., the piercer is not as long, and discal bristles on all abdominal segments except the first.

**Metachaeta cinerosa** new species.

♂. Black, palpi, proboscis and base of third antennal segment, yellow. Front at vertex as broad as either eye, thinly gray pollinose, sub-shining, vitta opaque, brown, rather broad and extending around sides of ocellar triangle, the latter also gray pollinose and sub-shining. Ocellar bristles small, directed forward. Frontal bristles descending to tip of second antennal joint, usually two pairs of orbitals, the posterior pair sometimes very small. Cheeks, facial depression and sides of face gray pollinose. Antennae as long as face, third joint four or five times as long as second, convex on the front edge. Arista yellowish, short and thickened to the middle, densely clothed with short microscopic pubescence, the penultimate joint about as broad as long. Sides of face narrow, with a row of macrochaetae extending from the lowest frontal bristles to the lower corner of the eyes. Vibrissae large, cruciate, inserted on the oral margin, one or two bristles above each. Cheeks about one-third as wide as eye height. Proboscis short and fleshy, palpi slender, not thickened apically. Eyes apparently bare, but with a few short microscopic hairs.

Thorax thinly gray pollinose, dorsum sub-shining, with three pruinose vittae in front of the suture, the middle one extending postsuturally about half way to base of scutellum. The latter black, shining, bearing three pairs of marginal macrochaetae.

Abdomen elongate-ovate, shining black, narrow bases of second and third segments gray pollinose, all segments with marginal macrochaetae situated somewhat before the posterior border of the segments. No true discals present.

Wings hyaline, tinged with yellow at the base, costal spine strongly developed, veins yellow. The first vein bristly on basal half, third vein with bristles almost to small crossvein, all others bare. Posterior crossvein nearly straight, nearer to small crossvein than to bend of fourth, the latter without an appendage or fold. Last section of fifth vein more than one-half as long as the preceding section. Apical cell closed and long petiolate, the third vein ending near to wing tip. Calypteres white, with a tawny tinge.

Legs black, front tarsi considerably dilated, pulvilli and claws very short. Middle tibiae with a single bristle on the front side near the middle, hind tibiae not ciliate. Total length 4 mm.

Described from four male specimens collected at College Station, Texas, May, 1917, June, 1919, and March, 1921. (H. J. Reinhard). *Type*, a male, deposited in the U. S. National Museum, Washington, D. C. This species differs from *helymus* Walker, in having hyaline wings, pruinose vittae on thorax, no discal macrochaetae on abdomen, and the intermediate segments of the latter pollinose on base.

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**Hunting Rare Beetles and Bugs Above Clouds (Coleop.).**

Howard Notman, of 136 Joralemon Street, Brooklyn, New York, although now possessing one of the largest collections of preserved insects in the Western Hemisphere, still continues his quest for rarer species (July, 1923). The accompanying "snap shot" caught the entomologist examining a carabus beetle, an almost extinct species which he recently found under a rock on the top of Altyn Mountain in Glacier National Park. Mr. Notman will remain in this Rocky Mountain region the rest of the summer adding to his collection which now numbers 75,000 insects. He has been gathering this collection since boyhood. He has 5,000 varieties of beetles. Instead of having a large library room as most men of his financial circumstances do, he has built one commodious room on the top floor of his Brooklyn house which he devotes to his collection. He keeps them in a score of long show cases. HOKE SMITH, St. Paul, Minnesota.

## Two Fossil Hymenoptera from Florissant (Vespidae, Megachilidae).

By T. D. A. Cockerell, Boulder, Colorado.

The wasp and bee now described, from the Miocene shales of Florissant, Colorado, belong to the Colorado Museum of Natural History, and were kindly placed in my hands for study by Director J. D. Figgins.

**Palaeovespa relecta** new species.

Length 17.5 mm.; anterior wing 10.7 mm.; first discoidal cell slightly over 5 mm.; length of marginal cell 3 mm.; prothoracic lobes not striate; abdomen broad at base as in *Vespa*. Head and thorax black; antennae stout, ferruginous, dark at extreme base; first two segments of abdomen pallid, with small lateral dark markings; segments 3 to 5 with broad dark bands, about as broad as the intervals between them, each with a broadly rounded lobiform extension posteriorly on each side, and at posterior middle a very minute point easily overlooked; apex dark. Wings clear, suffusedly somewhat dusky along upper margin; nervures light ferruginous; marginal cell produced and narrowly pointed as usual in genus; end of first discoidal not more oblique than in *Vespula;* second recurrent nervure ending much more than half way from first recurrent to end of second submarginal cell.

The following measurements are in microns: Second submarginal cell on first discoidal, 208, on second (third of many authors) discoidal, 560, from second recurrent to end, 320; width (depth) of marginal cell, 690; second submarginal on marginal, 384; third submarginal on marginal, 720.

This is an extremely interesting species, for several reasons. Among the species of *Palaeovespa*, it falls next to *P. gillettei* Ckll., but that has the abdomen black, with narrow light sutural bands, and differs in various details. The abdominal bands of *P. relecta* are lobed posteriorly as in the living *Vespula consobrina* Sauss.; in *V. germanica* Fabr. the lobes have become elongated and basally constricted, or cephaliform; in *V. vulgaris* L. they have become spots. The posterior median point so conspicuously developed in *Vespula* is a minute dentiform process on the hind margin of the bands of *P. relecta*. The slender apex of the marginal cell, and the position of the second recurrent nervure, place *P. relecta* in *Palaeovespa*, but *Vespula* is divided into two groups according to the position of the second recurrent. In true *Vespula*, with short malar space, the second recurrent ends about midway between the first and the end of the second submarginal cell. I have examined *V. occidentalis* Cress. (San Ignacio, New Mexico, at flowers of

plum, May 4.). *V. germanica* Fabr. (The Mount, Funchal, Madeira, Dec. 28), *V. vulgaris* L. (Winfrith, Dorset, England, Oct. 11), and *V. consobrina* Sauss. (Buford, Colo.). In Rohwer's *Dolichovespula*, which may be taken as a genus, not only is the malar space long, but the second recurrent is more than twice as far from the end of the second submarginal as from the first recurrent. I have before me *D. maculata* L. (Buford, Colo.), and *D. diabolica* Sauss. (Boulder, Colo., and Las Vegas, N. M.). With these structural differences, go others in nesting habits. In respect to the position of the recurrent nervures, *Dolichovespula* stands midway between *Vespula* and *Palaeovespa*, and therefore presumably represents the latest stage of evolution.

**Heriades mersatus** new species.

Length 6 mm.; anterior wing 3.8 mm.; base to stigma 2.2 mm.; width of head 1.5 mm., of abdomen not quite 2; length of abdomen 2.7 mm. Head and thorax black; abdomen pale reddish, darkened at apex and base; legs pale ferruginous; wings clear, nervures ferruginous; antennae stout; head and thorax closely and strongly punctured, as in modern *Heriades*, the punctures of thorax about 24 microns in diameter.

The following measurements are in microns: width of flagellum, 160; width (depth) of marginal cell, 304; straight section of basal nervure not greatly shorter than the curved (lower) section, the latter 416; length of marginal cell, 976; first intercubitus to end of marginal cell, 800; greatest length (diagonal) of first submarginal cell, 704; length of second submarginal, 624; second submarginal on marginal, 272; second recurrent before end of bulging second submarginal about 50 (as in the living *H. truncorum*, but in the fossil *H. halictinus* Ckll. the nervure is at end of cell). The first recurrent nervure joins second submarginal cell at distance from its base equal to about half intercubitus, as in *H. halictinus*. The nervulus, placed typically for the genus, is a very little basad of the basal nervure, and slightly arched outward. The first discoidal cell is 944 long.

Nearest to *H. halictinus* Ckll., among the Florissant fossils, but differently colored, and with different wing measurements. The lower section of basal nervure is not greatly curved.

This makes the sixth fossil *Heriades* from Florissant, while in the modern fauna of Colorado we know only three species. In Miocene times it appears that *Heriades* was prolific in species in the Rocky Mountain country, just as it is in South Africa today. Why it has become limited to a few types in modern Colorado we cannot conjecture, unless it may be that suitable nesting places are now less frequently available.

# The Reason why Catocala Eggs are Occasionally Deposited on Plants upon which the Larva cannot Survive; and a New Variation (Lepid., Noctuidae).

By Ernst Schwarz, St. Louis, Missouri.

Twelve years ago Rowley (Entomological News, 1911, Vol. XXIII, p. 207.) collected from hickory a live egg of *Catocala ilia*. The egg hatched, the larva refused to feed on the hickory; but feasted on the burr oak. After mentioning that he had occasionally found on the shagbark hickory, dead eggs and dead larvae of what seemed to be this same species, Rowley inquires "Why are these eggs laid on a tree whose leaves the young larva cannot eat?"

For nearly eleven years the present writer has been investigating that problem. After conducting numerous experiments, all of which yielded the same results, the present writer thinks he has the solution to this problem which has long puzzled the naturalists. These experiments extended over a period of seven years; but, since the results of all experiments are similar, I shall confine my discussion to an experiment performed in 1921.

On August 16, 1921, I captured two females of *C. cara*. Each was placed in a two-pound paper bag and carried home. There each was confined in a large glass globe. In each globe I had previously placed a willow twig, a poplar twig and a hickory twig; willow is the natural food plant of this species.

The night beginning August 17th and ending August 18th both rested quietly on the willow, but no eggs were deposited. On the following night number one laid ten eggs and number two, eleven, all on the willow. The next night number one deposited twenty-one and number two, thirty eggs, all on the willow. Both seemed contented with their surroundings and continued to lay. By September 15, number one laid two eggs on the poplar; on the 16th, one on the poplar and two on the hickory. On the same night number two deposited one on the hickory. On the night of the 17th each rested on the

paper in the bottom of the cage. In the morning both were dead; but each had deposited an egg on the paper.

In previous years similar experiments were conducted with *C. ilia* Cram., a burr oak feeder; *C. titania* Dodge, a cockspur thorn (*Crataegus crus-galli* L.) feeder; and *C. palaeogama* Gn., a walnut feeder. The results were practically the same as that described above.

These experiments seem to permit of but one interpretation. As far as the catocala moths are concerned, ovipositing on other than the food plants of the larva is a function of old age. It is a sign of physical exhaustion. When the senses of sight and of smell have been so dulled by age that the moth has lost the power of discrimination then, and not until then, eggs are deposited on objects other than the food plant of the species. Fortunately for the species, this condition seldom occurs until after the bulk of the eggs have been deposited; hence it is not a handicap to the survival of the species.

### A New Variation

**Catocala hypolita,** Strk. variety **walteri,** new variety.

Ground color light bluish, speckled lightly with black atoms. All markings very contrasting, heavy black, except the subterminal line, which is white. A heavy basal dash extends across the wing, terminating at inner angle between veins 1 and 2, only interrupted by the subterminal line. In all other respects as in the type. Expands 75 mm.

Described from one male and one female collected and reared by Mr. C. Walter. Type locality, Anaheim, California. *Type*, one male in the collection of the author and one female in that of Mr. Walter.

This variant rivals *semirelicta* in beauty.

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### The Bacot Memorial Fund.

In memory of Arthur William Bacot, whose death from typhus, while investigating the transmission of the disease by lice, was reported in the NEWS for 1922, page 255, the Bacot Memorial Fund has been started in England to provide assistance to the authorities of the council schools in his home (Loughton) in furthering the study of natural history. (*Nature*, as reported in *Science*, lviii, p. 29).

# A New Species of Agrilus from Kansas (Buprestidae, Coleop.).

By A. B. Champlain and J. N. Knull, Bureau of Plant Industry, Harrisburg, Pennsylvania.

The following species of *Agrilus*, found among some material sent to the writers for identification, through Prof. J. G. Sanders, is believed to be undescribed.

We are indebted to Prof. H. C. Fall for comparing it with the type of *Agrilus townsendi* Fall, and to Mr. C. A. Frost for examination of material.

**Agrilus paramasculinus** new species.

Form and size of *A. masculinus* Horn, dull cupreo-aeneous, each elytron with an indistinct vitta. Antennae reaching to the middle of the prothorax in the male, serrate from the fourth joint, head convex, front slightly strigate, vertex punctate, clypeus extremely broadly emarginate, becoming nearly truncate. Prothorax wider than long, sides strongly arcuate, sinuate near hind angles which are strongly carinate in both sexes, disk convex with two slight median depressions, lateral oblique depressions well marked, surface transversely strigate, densely pubescent laterally. Scutellum granulate, transversely carinate. Elytra dilate behind the middle, sinuate behind the humeri, apices rounded, serrulate, surface granulate-imbricate. Body beneath more shining than above, rather markedly pubescent, prosternal lobe emarginate, pygidium punctate, not carinate, abdomen densely but lightly punctate, tarsal claws deeply cleft, the inner portion turned inward, nearly, or quite touching that of the opposite side. Length 6 mm.

♂. Pro-, meso- and metasternum densely pubescent along median line, fore and middle tibiae mucronate on inner side, hind tibiae not mucronate.

♀. Ventral surface without any marked pubescence along median line, none of the tibiae mucronate.

According to Horn's key* this species would run to *A. masculinus* Horn, but it can easily be distinguished from this species by the faint vittate elytra and the much shorter first joint of hind tarsi.

Described from a series labeled "Kan. T. B. A.," in the Purdue University collection. *Type* in the Purdue University collection. The authors are indebted to Prof. J. J. Davis for the privilege of describing the species.

*Horn, G. H.—Trans. Amer. Ent. Soc., V. 18, p. 283—1891.

## Notes on the Family Nemestrinidae (Diptera).

By FRANK M. HULL, Ohio State University, Columbus, Ohio.

The family Nemestrinidae comprises an unique group of flies rarely met with by most collectors and then only in its peculiar habitat—the dry and arid regions of the world. The North American representatives, of which there are now nine species in four genera, have been recorded from Central America, Mexico, western United States and Florida.

**Neorhynchocephalus volaticus** Williston.
Canadian Entomologist, 15, p. 71, 1883.

This species was exceedingly abundant in the vicinity of the Mississippi Agricultural and Mechanical College, during the month of July, 1922. The college is located near Starkville, Mississippi, in the north-eastern part of the state and this locality forms quite an extension of range for the species. It is a section of the state that becomes extremely dry in summer and very few flowers are then present. Pine-covered areas meet there with areas of decidous growth. There are no streams in this immediate region.

The writer found the species while collecting in tall, half-dried field grass. There was also an occasional shrubby bush and considerable half-grown goldenrod (*Solidago*). The flies were poised in the air from about a foot above the tops of the grass, to all depths within it. Apparently they were engaged in threading the mazes of the grass close to the earth. None were observed at rest upon the earth or vegetation. They flew slowly when not alarmed, at every few inches stopping to hover in the air, when they constantly emitted a very high-pitched hum or drone that is quite characteristic. The note appears to possess something of a ventriloquial effect, for the flies were not easy to discern even long after they were heard droning.

At nearly every step flies were flushed and often several might be seen at the same time. If approached too precipitously with the net they darted off very quickly, yet not so fast but that they might be followed with the eye for some sixty or seventy feet, when they apparently descended to earth again. In all, 32 males and 38 females were taken, during the period from July 21 to 29, 1922. A specimen was subsequently taken

by the writer at West Point, Mississippi (20 miles distant,) on Aug. 4, 1922, under similar conditions. Further, an examination of student collections showed three specimens collected a week to ten days before July 21, at Mississippi Agricultural and Mechanical College. In the collection of the college of the fall of 1921, were found three specimens taken in July of that year, one of them on July 7. The earliest record known from the state is of a specimen collected by Prof. R. W. Harned, July 16, 1909, at the college.

The flies were observed upon flowers in only a few instances; once on a small blue flower and twice on flowers of the *Rudbeckia* type. They were most active from two p. m. to four-thirty p. m., after which they became noticeably scarcer. No collecting was done in the forenoon. From the fact that they were quiet at noon and most active in the hottest part of the day, it is probable that they were quiet in the forenoon. They were observed on all sides of the college in situations similar to the one described. The breeding of the flies at the locality may be taken without question.

I have found the species in abundance on two other occasions. At Kingsville, Texas, June 6, 1921, nine specimens were collected from the greenish heads of a flower of the mint family. They were in a creek bed among considerable rank growth of vegetation. Hundreds of the flies were found at Raymondville, Texas, at mid-day (hottest part of the day), of June 29, 1921, over a large area of dense scrubby growth some four to five feet high and interspersed with cacti (*Opuntia*, etc.) and ebony trees in bloom. They were poising before the small greenish white flowers of white-bush (*Aloysia ligustrina* Small). About a dozen were collected.

The majority of the specimens were 10.5 to 11 mm., in length, exclusive of ovipositor (in the female). Three specimens were found to measure 12 to 13 mm., and two, only 9 mm. The ovipositor measured 2.5 mm.

The appearance of the insect is rendered characteristic by a rather thick clothing of a pale yellow, appressed pile, over the whole body, which hides the ground color, but which is generally denuded to some extent upon the abdomen. The ground color of the abdomen is shining light brown, the posterior margins of the segments usually show a

narrow black line, which, as a rule, is produced in the middle and anteriorly to form an uneven, black, median fascia on the dorsum of the abdomen. The pile of the abdomen is most adherent on the posterior margins of the segments producing a characteristic banded appearance.

**Hirmoneura bradleyi** Bequaert.

Journal New York Entomological Society, vol. 27, p. 311.

Three specimens of this species were collected by Mr. R. H. Painter, to whom the writer is indebted for the following notes. They were taken in Bee Creek Canyon, Austin, Texas, on May 19 and June 7, 1921. Bee Creek Canyon is two miles from Austin and in the dry limestone country of Edward's Plateau. Two of them, in copula, were taken at mountain cedar, *Sabina sabinoides* Small, and the third from the pink flowers of *Callicarpa americana* L. They were poising in the air and emitting the characteristic drone of the group. A fourth specimen was taken at Austin, Texas, on May 25, 1922, at mountain cedar.

*H. bradleyi* is characterized by its general dark reddish brown and smoky coloration and its longitudinally striped thorax.

## Additional Syrphidae (Diptera) from North Carolina, with Descriptions of Two Supposed New Species.

By C. S. Brimley, Division of Entomology, N. C. Dept. of Agriculture, Raleigh, North Carolina.

This list is supplementary to the one published by C. L. Metcalf, in the Elisha Mitchell Journal, Chapel Hill, N. C., December, 1916, in which he enumerates 128 species from this state, this list of fifteen more bringing the total number of Syrphidae known from the state to 143.

Pipiza festiva Meigen, Raleigh, March 21, 1921, April 7, 1923 CSB.

Pipiza nigripilosa Will., Raleigh, August 2, 1921, CSB.

Chrysogaster inflatifrons Shannon, Four males, N. C., Morrison (Shannon, Proc. Ent. Soc. Wash. XVIII, 107.)

Chilosia similis Shannon, Raleigh, September 30, October 7, 1921, CSB.

Syrphus knabi Shannon, Raleigh, March 28, 1908, August 5, 1918, late June, Black Mts., late May, 1910, F. Sherman and CSB.

Xanthogramma flavipes Loew, Raleigh, September 13, 1922, one, CSB.

Brachyopa vacua O. S., Raleigh, April 7, 1923, one on blossoms of black haw (*Viburnum prunifolium*). In this connection I may state that

I took 23 species of Syrphidae on the flowers of this shrub in four days' collecting this spring.

VOLUCELLA EVECTA Walker. Linville Falls, early June, 1920, one, FS.

ERISTALIS LATIFRONS Loew. Fayetteville, early June, 1921, one, CSB.

**Helophilus anniae** n. sp.

Face, antennae, arista, and lower part of front light yellow, the latter with yellow pile, narrower portion of front (between the eyes above) dark brown with dark pile. Thorax with two narrow submedian yellow stripes, and a somewhat broader one on each side, scutellum paler than thorax. Legs: front and middle femora dark brown for about basal two-thirds, yellow at apex, front and middle tibiae and tarsi mainly yellow, hind femora yellow on basal third, then abruptly black to apex, hind tibiae and tarsi black. Abdomen: second, third and fourth segments each with a pair of yellow spots, these wider externally and narrower internally, those of each pair widely separated, those of second and fourth segments broadly reaching the sides of those segments, those of third segment nearly or quite separated from the side of the segment by the ground color, a small yellow spot on the apex of fourth segment. Length about 11 mm.

One male taken at Raleigh, North Carolina, resting on foliage (bushes) near edge of small woodland stream, April 20, 1921 (*type*), and another male taken near the same place, May 9, 1921, both by myself. Type deposited in the United States National Museum, the paratype in the collection of the N. C. Dept. of Agric.

A female taken at Aberdeen, North Carolina, May 10, 1922, by R. W. Leiby appears to be the same species, the only differences being that it is slightly larger, the submedian stripes on the thorax are a trifle wider, there is no apical yellow spot on the fourth segment, and the pile on the front above the antennae is largely black, instead of yellow.

This species looks somewhat like a small *H. similis*, but differs from all species I know or could find descriptions of, in the following combination of characters,—wholly yellow face, antennae, and arista; three pairs of widely separated yellow spots on abdomen, and in the hind femora being yellow at base, and black in middle and apex. (Named for Mrs. C. S. (Annie) Brimley.)

TROPIDIA MAMMILLATA Loew, Raleigh, June 13, 1922, T. B. Mitchell.

**Somula marivirginiae** n. sp.

Resembles *S. decora* in general habitus, but differs in having the antennal prominence longer and more slender, in the possession of a

black facial stripe, and in the spots on the abdomen being smaller and transverse; the abdomen is not edged with yellow. Sexes practically alike in color.

Length about 16 mm. Antennal prominence slender, conical, about three times as long as its width at apex as seen from above (about twice as long, in *decora*), much less widened at base as seen from side so that the facial concavity is considerably higher up. Second antennal joint longer than in *decora*.

Coloration much as in *decora*, but differing as follows: the black on the dorsal surface of the antennal prominence is not almost or entirely surrounded by yellow at the base as in *decora*, but extends backward in undiminished width. On the underside of the prominence a narrow black stripe extends downward the whole length of the face to the oral opening; face yellow and cheeks black as in *decora*.

Arista concolorous with antennae, not much paler as in *decora*.

Thorax and scutellum about as in *decora*, with the same yellow humeri, but the patch of yellow hair on the mesopleurae is darker and less contrasting. Femora, tibiae, and metatarsi mainly yellow as in *decora*, except that the male has the middle portion of the hind femora dark brown; other portions of legs blackish or dusky.

Second, third and fourth dorsal abdominal segments each with a pair of yellow spots, these transverse and not oblique as in *decora*, somewhat smaller than in that species, all of them straight edged in front: fifth segment immaculate in both sexes. Abdomen not yellow-edged, the ground color extending to the sides. Venter blackish, the segments edged with yellow behind but not on the sides. The pile of the body about as in *decora*.

*Type*, a male collected at Raleigh, North Carolina, on blossoms of black haw, growing close to Walnut Creek, near where it enters Neuse River; *paratype*, female taken at same date and place. (Named for Mary-Virginia Dunn, my favorite niece.) Type deposited in National Museum, paratype in collection of N. C. Dept. of Agriculture.

CYN RHINA INTERSISTENS Walker, Linville Falls, early June, 1920 FS.
TEMNOSTOMA EXCENTRICUM Harris, Raleigh, May 8, 1922, CSB.
MICRODON AURULENTUS Fab., Raleigh, May 9, 1922, one, CSB.
MICRODON BOMBIFORMIS, Twnd., Raleigh, May 18, 1918, CSB.

### Prof. and Mrs. T. D. A. Cockerell Escape from the Japanese Earthquake.

It is a matter of rejoicing among entomologists to learn that Professor and Mrs. T. D. A. Cockerell escaped from the Japanese earthquake. In *The Outlook* for October 3, 1923, Professor Cockerell relates his observations of the scene in Yokohama, as witnessed from the steamship *Empress of Australia* in that harbor.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1923.

### Give!

Elsewhere in this number of the NEWS, will be found an announcement of important gifts to the Division of Insects of the United States National Museum. During the present year reference has been made in these pages to various donations to museums on the other side of the Atlantic. It is especially gratifying to be able to record an equal instance of munificence in these United States. While there are exceptions to the statement that the great endowed or state-supported museums are the best resting places for private collections, the statement is generally true and we hope that many more American entomologists will follow Dr. Aldrich's example and in their life-time place their treasures where the latter may be freely accessible to their fellow-workers.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### Two European Weevils established in North America (Coleoptera: Curculionidae).

**Notaris bimaculatus** Fabr. (wyomingensis Chittenden)

At the suggestion of Dr. Schwarz, the writer obtained a good series of the European *N. bimaculatus* for comparison with Chittenden's species. The two proved to be identical, and Dr. Chittenden who later studied the European set also pronounces his species a synonym. In addition to the type locality of *wyomingensis* (Cheyenne, Wyoming) the beetle has been found at Ft. Resolution, Mackenzie; Lone Deer, Montana; Volga, South Dakota; Spirit Lake and Lake Okoboji, Iowa; Madeline Island and Madison, Wisconsin.

The fact that nearly all the earlier records are from the west, while the later records become progressively more eastern, may indicate a west to east movement of dispersal, though nothing more than a surmise can be based on the scanty evidence now available.

**Phytonomus rumicis** Linn.

This species which is recorded as common on *Rumex and Polygonum amphibium* in Europe, was found in considerable numbers on a patch of *Polygonum* near Iowa City, Iowa, in May, 1917. Mr. F. S. Carr has also collected it at Edmonton, Alberta, (1919), and Mr. Sperry found one specimen in the stomach of an upland plover collected at Gronna, North Dakota, May 25, 1912. Dr. A Fleischer thinks it may

represent an American variety of *rumicis* on account of the somewhat brighter markings, but a separate name seems unnecessary. The better marked individuals of *rumicis* can be identified by the heavy black stripe on the elytra extending from the base backward along the suture and meeting a large transverse black spot or bar before the middle. Behind this bar the scales are whitish or at least distinctly brighter than the general surface color. The black markings are sometimes only vaguely indicated or even absent, but the patch of brighter colored scales behind the middle is present on all the specimens examined, and is apparently a distinctive feature. In the structure of the beak, antennae, and scales *rumicis* closely resembles *eximius* Lec., but the latter has the sides of the thorax more strongly arcuate and the body more convex.

Poorly marked individuals of *rumicis* might easily pass for *eximius*, and it is possible the two will be found mixed in collections.

L. L. BUCHANAN, U. S. Biological Survey, Washington, D. C.

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**The New Director of the Pennsylvania Bureau of Plant Industry.** Charles H. Hadley, recently named by Secretary of Agriculture Frank P. Willits as the new director of the Pennsylvania Bureau of Plant Industry, took immediate charge of the work of the bureau on the day of his appointment, July 23, 1923.

Director Hadley is probably most widely known to agriculturists in Pennsylvania and in other parts of the country through his endeavors during the past three years as the federal entomologist in charge of all field operations of the joint Japanese Beetle project in southeastern Pennsylvania and in New Jersey. Entering the federal service in April, 1919, as a plant quarantine inspector at the Riverton, N. J., laboratory, later put in charge of the control work with 25 to 30 men under his direction and, in October, 1920, placed in complete charge of the project, his record of achievement in entomological work has been notable.

His early education was obtained in the Manual Training High School and the Polytechnic Preparatory School in Brooklyn, N. Y. In the fall of 1908, he entered Yale University and two years later transferred to the New Hampshire College of Agriculture and Mechanic Arts, receiving the degree of bachelor of science in 1912.

While a student at the New Hampshire state college he assisted in the insectary and laboratory and also engaged in experimental work in the field. For three years after graduation he held an assistantship in entomology in the college experiment station and in 1915 he went to Cornell University to pursue a year of study in advanced entomological subjects.

He is a member of the American Association for the Advancement of Science and has been a member of the American Association of Economic Entomologists since 1912. Other affiliations include Alpha Zeta, honorary agricultural society, and Sigma Xi, honorary scientific society. Among his most recent publications are: "The Japanese Beetle" (New Jersey Station circular), and "The Clover Leaf Weevil" (Cornell

Experiment Station bulletin). Other scientific contributions include, "The Lesser Migratory Locust" (Cornell); "Potato Insects" (Pennsylvania); "Arsenical Residues" (New Hampshire); "The Rhododendron Lace Bug," "The 17-Year Locust in New York," and "The Japanese Beetle Quarantine," in various issues of the *Journal of Economic Entomology*.

It is encouraging to those interested in the successful culmination of the Jap beetle fight that an agreement has been made between the Pennsylvania and the United States governments whereby Director Hadley will continue to oversee the general operations of the co-operative project during the next few months, while also giving his attention to the new duties in Pennsylvania. Part of his time will be given to the federal work in which he has been engaged and part to the duties of the Pennsylvania directorship. In his absence on federal duty, general supervision of the State work will be vested in Deputy Director Walter A. McCubbin.

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**A Magnificent Gift to the National Museum (Diptera).**

The National Museum has recently received as a gift from Dr. J. M. Aldrich his private collection of Diptera. This collection was begun in 1890, and for 28 years received a good share of the owner's efforts; since he went to the National Museum in 1918 it has however received no additions. A recent inventory showed it to contain 44,610 pinned specimens and 4,145 species fully named; 534 of the latter were represented by type material. There are some hundreds of undescribed species; and as Dr. Aldrich collected for many years in the Pacific Coast and Rocky Mountain regions, his collection contains many named species not heretofore represented in the National collection.

Dr. Aldrich also donated to the Museum his card index of the literature of North American Diptera, begun in 1898 and now extending to about 70,000 references as nearly as can be estimated. With the exception of about 20 hours' work, this is all by the hand of the owner himself, and represents to a large extent his own conclusions from the literature rather than a mere compilation.

In a letter to his chief presenting the collection and index, Dr. Aldrich states that he was deterred from taking this action sooner because the salaries paid by the Museum are still on the scale established in 1882 (except for a temporary war bonus of $240), and he did not feel sure that he could continue permanently as one of the curators. Recently, however, under the reclassification act passed by the last Congress, the Museum staff have been assured of a new pay schedule approximating the requirements of the present time.

### A Note on the Relationships of Pyrgotidae (Diptera).

Wiedemann, when he described the genus *Pyrgota*, placed it between the genera *Tetanocera* and *Platycephala*. In Williston's Manual and Aldrich's Catalogue it is placed in the family Ortalidae, but recently Hendel, Frey, and others have elevated it to family rank, the group now containing several other genera. There is a very evident difference of opinion amongst authors as to the relationships of the group. Hendel separates it widely from Conopidae while Frey associates it more closely with that family though indicating no definite relationship with it. It is my opinion that the families Conopidae and Pyrgotidae are more closely related than is evident from a survey of existing classifications and that they ought to be more closely associated in our lists, though to what other families they are both most closely related it is difficult to decide. The families, so far as we know, are parasitic in their larval stages, Conopidae in Hymenoptera, Pyrgotidae in Coleoptera and, in addition to this affinity of habit, in both families the ocelli are frequently absent or vestigial, which is nearly unique in related forms, and the mid coxae lack the chitinized prong on their upper outer side. This last character separates the families from nearly all those in Cyclorrhapha and sets the Pyrgotidae entirely apart from Ortalidae, all of which have the process very well developed.—J. R. Malloch, U. S. Biological Survey, Washington, D. C.

## Entomological Literature

COMPILED BY E. T. CRESSON JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**2**—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of The New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic

Entomology, Concord, N. H. **20**—Bulletin de la Societe Entomolgique de France, Paris. **21**—The Entomologist's Record, London. **22**—Bulletin of Entomological Research, London. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **35**—Proceedings of the South London Entomological & Natural History Society, London. **36**—Transactions of the Entomological Society of London. **37**—Proceedings of the Hawaiian Entomological Society. **39**—The Florida Entomologist, Gainesville, Florida. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **52**—Zoologischer Anzeiger, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison on the Hudson, N. Y. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **89**—Zoologische Jahrbucher, Jena. **91**—The Scientific Monthly, Lancaster, Pa. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **103**—Biologisches Centralblatt, Leipzig. **114**—Entomologische Runschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a. M. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **149**—Deutche Entomologische Zeitschrift "Iris," Dresden.

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## SPECIAL NOTICES.

**Bulletin of the Lloyd Library,** Cincinnati, Ohio. Entomological Series. The third bulletin of this series has recently appeared, and treats of the morphology, anatomy, and embryology of Nemoura (Plecoptera). The three bulletins contain over 250 pages and many illustrations. No. 1 was on the Biology of North American caddisfly larvae; 2, treated of the biology of some of our North American species of May flies. **Manual of Entomology** by H. Maxwell Lefroy. Ed. Arnold & Co., London. 541 pp., ill., 1923. A copy of this work has just been received. A review of the same was published in the Entomologist, 1923, p. 190. **Polskie Pismo Entomologiczne.** Bulletin entomologique de la Pologne, Lwow (Lemberg). The first number of this new publication has been received, thus announcing another new European entomological society, and adding another member to the entomological bibliographical community. This number contains 24 pages, eight articles, pertaining to the palaearctic entomological fauna, mostly of Poland. **Fabre, J. H., The Life of the Scorpion.** Translated from the French series of Souvenirs Entomologiques, and completes the translation into English of this series. Published by Dodd, Mead & Co., New York, 1923, 344 pp.

The reader will find this book of exceptional interest. Fabre here tells of much that is not generally known about the life and habits of these intolerated animals in his usual entertaining manner. $2.50.

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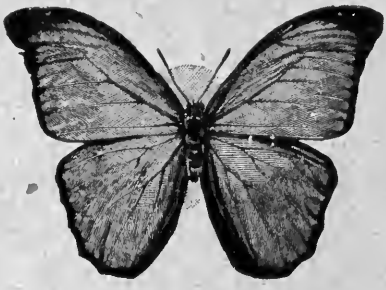

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

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## Dr. Charles Henry Turner.

(Portrait, Plate VI.)

Charles Henry Turner, Ph. D., Professor of Biology at Sumner Teachers College, Saint Louis, died at Chicago, February 14, 1923.

Dr. Turner was born at Cincinnati, Ohio, on February 3, 1867. From the University of Ohio he received the degrees of B. S. and M. S. in 1891 and 1892. The University of Chicago, in 1907, conferred upon him the degree of Doctor of Philosophy, *magna cum laude*.

While Dr. Turner left the imprint of a valuable teacher in the institutions where he held various teaching positions, the Chair of Biology, Clark University, Georgia, 1892 to 1905, Principal of High School, Cleveland, Tennessee, 1905-1906, Chair of Biology, Haynes Normal School, 1907-1908, Professor of Biology and Psychology, Sumner Teachers College, 1908

until his death, yet he is best known among scientists for his researches in the behavior and comparative psychology of invertebrates.

During his lifetime, Dr. Turner published fifty treatises on neurology, invertebrate ecology and animal behavior. In addition to these, he wrote, for a number of years reviews of the literature on comparative psychology in *The Psychological Bulletin* and in *The Journal of Animal Behavior*. His first work, on the Mushroom Bodies in the Brain of the Crayfish, was published in 1892. A few years later, jointly with Herrick, he published the 500-page treatise on the Entomostraca of Minnesota. Then, suddenly, his attention was turned from the microtome, and he produced a most interesting series of experimental investigations on the behavior of insects. His researches on the homing, on reactions to light, on death feigning, on tropisms, have cleared up some of the most perplexing problems of comparative psychology, and have thrown new light upon the subjects of the interrelations of tropisms, instincts, and what to a certain extent may be called intelligence in the insect world.

But most interesting of all was his technique of experimenting. Dr. Turner spent much thought on his method of work before he ever went into the field, and there with ingenious devices, some simple, some intricate, he solved some of the big problems of insect behavior. The following titles will convey an idea of the variety and resourcefulness of his work: "The homing of ants," "Psychological notes on the gallery-spider," "Do ants form practical judgments?", "The homing of the mud-dauber," "The homing of the burrowing bees," "The mound of *Pogonomyrmex badius* and its relation to the breeding habits of the species," "Experiments on the color vision of the honey-bee," "An experimental investigation of an apparent reversal of the responses to light of the roach," "Experiments on the pattern vision of the honey-bee," "Notes on the behavior of a parasitic bee," "An orphan colony of *Polistes pallipes*," "Reactions of the mason wasp to light," "*Sphex* overcoming obstacles," "Behavior of the common roach on an open maze," "Auditory powers of the Catocala moths,"

"An experimental study of the auditory powers of the giant silkworm moths," "Notes on the behavior of the ant-lion, with emphasis on the feeding activities and letisimulation," "The mating of *Lasius niger*," "Notes on the feeding behavior and oviposition of a captive false spider," "The locomotion of surface feeding caterpillars are not tropisms," "A week with a mining Eumenid." A complete bibliography of the fifty titles of Dr. Turner's papers is in course of publication by the Academy of Science of St. Louis.

Among Dr. Turner's notes were three completed papers of a less technical nature, which will be published by the same academy. The titles are: "The tropism theory; a protest," "The homing of Hymenoptera," and "The psychology of playing possum." A masterly work, completed during his last illness, entitled "The hydrotropism of marine invertebrates," was accepted for publication, a few days before his death, by the *Biological Bulletin*.

Dr. Turner's works have been very favorably quoted both here in America and in Europe. Dozens of quotations from his treatises are to be found in such works as Wheeler's "Ants," Washburn's "The Animal Mind," Smith's "Mind in Animals," Holmes' "Evolution of Animal Intelligence," and Bouvier's "The Psychic Life of Insects." In fact, in the behavior literature of France, they have named a certain type of orientation after the discoverer. This is best described in Bouvier's book, "The Psychic Life of Insects," translated from the French by Dr. L. O. Howard, where it is "called 'Turner's circling,' using the name of the learned American who best studied this phenomenon."

Dr. Turner's interests were not solely scientific. Often his time and strength were severely taxed by his faithful devotion to various sociological works among his people. Among his unfinished papers were found several chapters of a novel, a number of chapters of a book of nature stories for children, and the manuscript of a book of thirty-two poems. Not alone has science lost one of its most thorough students, but also the colored race has lost one of its most efficient workers for race betterment, in its various and intricate phases.

The handicaps under which Dr. Turner's work was accomplished were many, and were modestly and bravely met. Only one of these was the limitations of a small salary, out of which he was compelled to purchase his own tools and library for research, since he did not enjoy the access to laboratories and institutions where equipment is supplied.

And when at last one considers the quantity and quality of his scientific research work, accomplished under handicaps, and in addition to a full life of other activities and unusual efficiency in the classroom, one can only say—well done!

PHIL RAU.

## The Lower Permian Insects of Kansas. Preliminary Announcement.

By R. J. TILLYARD, Sc. D.
Chief of the Biological Department, Cawthron Institute.
Nelson, New Zealand.

[Studies aided by a grant from the Marsh Fund of the National Academy of Sciences.]

The Yale University Expedition to the Lower Permian insect beds in Kansas, originally suggested by me to Professor Charles Schuchert, organized by him, and carried out by Dr. Carl O. Dunbar in the summer of 1921, brought back about 2000 specimens of fossil insects, many of them in a remarkably fine state of preservation. This locality was discovered by Dr. E. H. Sellards in 1902 and his publications relating to them are given below.* The Yale Collection has recently been received by me in Nelson for description, and the preliminary study and sorting of the immense mass of material is now completed. Owing to the remarkable interest of these fine fossils, a short summary of results is here given, with Professor Schuchert's permission, in order that entomologists may have some general idea of the composition of the insect fauna of that period, and some indication of certain problems in evolu-

*E. H. Sellards, Discovery of Fossil Insects in the Permian of Kansas. Amer. Jour. Sci., vol. 16, 1903, pp. 323-324. Types of Permian Insects. Ibidem, pt. I, vol. 22, 1906, pp. 249-258; pt. II, vol. 23, 1907, pp. 345-355; pt. III, vol. 27, 1909, pp. 151-173.

tion which the new material goes a long way toward solving. The actual series of papers in which the fossils are being described will appear from time to time in the *American Journal of Science*, published at New Haven, Connecticut.

The beds are probably unique in the very large number of individuals of certain species which occur there. The 2000 odd specimens appear to represent well under 100 actual forms. By far the most abundant order in actual specimens, and probably also in species, is the Order Protorthoptera; but these are nearly all greatly reduced types, and a closer study may indicate clear lines of ordinal division amongst them. Of undoubted Protorthopterous origin are certain types which closely resemble the recent Perlaria, Embioptera, Raphidiodea and Sialoidea. There are also some very small wings which appear to have rather close affinity with the Sternorrhynchous Homoptera, and at the same time do not stand far from some of the reduced types of Protorthoptera.

Several fine impressions occur of what appeared at first sight to be undoubtedly a true Beetle, with the body, elytra and hindwings complete. A careful study of this form reveals the presence of short cerci, while the elytra have a very clear venation of Orthopteroid type. In order to elucidate the problem further, I made an enlarged drawing, and then creased it along the concave veins; the model so made shuts up like an earwig's wing, but without the transverse infolding of the apical portion. There can be little doubt, then, that this beetle-like form is really one of the ancestors of our modern Dermaptera, and requires a new Order for its reception. This Order I propose to call *Protodermaptera*.

Cockroaches are, of course, present, but not at all numerous.

The only true Holometabola, which can be recognized undoubtedly as such, are a number of very small wings, averaging 5 mm. long, belonging to the Order Mecoptera, and almost exactly similar, apart from their much smaller size, to the existing Australian Choristidae and the extinct Permochoristidae.

Of very great interest are the Palaeodictyoptera, of which one fine species is present, exceedingly closely allied to certain forms found in the Upper Carboniferous of Europe. Of one

of these a description and photographs have been prepared for insertion in Dr. Dunbar's introductory study of the fossil beds soon to appear in the *American Journal of Science*. It is one of the most perfect fossil insects ever discovered; practically the whole body is preserved, with the long cerci showing clearly their close annulation and rings of hairs; the wings spread out horizontally as in the case of a modern Anisopterous Dragonfly; the beautiful color-pattern perfect; and the macrotrichia on some of the veins quite clearly visible.

The Mayflies (Plectoptera) are abundant, and are all characterized by the presence of four almost equal wings, whose venation is almost exactly on the same plan as that of the forewing of the Order today, except that there is no definite tornus (this latter evidently developing in correlation with the reduction of the hindwing).

Of very great interest are the fine Protodonata, of which there are three very distinct species, inclusive of *Typus permianus* already discovered and described by Dr. Sellards. This genus, and an allied but larger form expanding about 15 inches, are undoubtedly true Meganeuridae; the other is a much smaller form allied to *Protagrion*. The largest specimen is almost perfect, and allows of the complete working out of the homologies of the wing-veins of this Order, which shows some close resemblances both to the Plectoptera and to recent Odonata.

Perhaps the most wonderful find of all, as regards its value in elucidating venational and phylogenetic problems, is the wing of an undoubted Zygopterous dragonfly of very remarkable structure. It is very slender, with long petiole, complete nodus and pterostigma, incomplete arculus, and with very few cross-veins placed very wide apart; *e. g.*, although the wing is very long, there are only four postnodals. This wing solves at once the whole problem of Dragonfly wing-venation, and shows what a will-of-the-wisp we have all been following over the supposed trachea Rs of Needham. The whole vein called M by all Odonatologists, inclusive of all its branches and Needham's Rs, is clearly seen to be the true radial sector, which is many-branched as in Plectoptera. The

missing vein M is present in the basilar space, but fuses with Cu half-way to arculus, and the two fused veins again part company under the open discoidal cell. This accounts for the anomaly of the supposed Cu of recent Odonata dividing into an upper *concave* (supposed) $Cu_1$ and a lower *convex* (supposed) $Cu_2$. The upper concave vein is really M, and the lower convex vein is really Cu. In the Protodonata, M remains a simple unfused vein, at any rate in the Meganeuridae. In the new Zygopteron, there is, of course, no anal vein, but the cross-vein Ac is present, placed well before the level of the first antenodal. Coupled with the evidence which I have obtained from a study of the Liassic Odonata, it is now perfectly clear that the original type of the Odonata was Zygopterous, with narrow, petiolate wings, and that the gradual broadening of the anal area led, on the one hand, to various Calopterygid types, and on the other to the Anisozygoptera, from which the true Anisoptera arose in the Jurassic. To Dr. C. H. Kennedy, of the Ohio State University, Columbus, Ohio, must be given credit of having first recognized, from his comparative studies of the penes of the males, the correct order of evolution of the various families of recent Odonata; and I wish here to express the satisfaction it gives me to be able to acknowledge the great merit of his work, and to close up, once and for all, the erroneous lines of thought which I, in company with almost every other student of Odonata, had been following for many years. In order that no avoidable delay shall take place in the publication of this most important discovery, I am arranging for the first part of my work on the Kansas fossils to include the Palaeodictyoptera, Protodonata and Odonata.

## The Life History of Phaedrotes piasus Boisd. (Lepidoptera : Lycaenidae).

By Karl R. Coolidge, Hollywood, California.

*Phaedrotes piasus* Bdv., better known in literature as *sagittigera* Felder, is a butterfly of wide range in the West, and in their recent Check List Drs. Barnes and McDunnough give it two races, formerly classed as synonyms, these being *catalina*

Reakirt and *daunia* Edw. The distinctions and limitations of these are not well known to lepidopterists of the Pacific Coast, and if some one in a postion to give them will kindly do so, I am sure such an article will be appreciated.

In Southern California occurs the race *catalina* Reakirt, subsequently called *rhea* by Boisduval, whose types came from Los Angeles. It is here a single-brooded butterfly, and no doubt this applies to the species thruout its entire range. In the immediate vicinity of Los Angeles the butterflies issue as early as the second week of March, but are not out in full force until April, the middle of April finding the brood at its height.

The butterflies are local, and are only rarely encountered at any distance from their food-plants, species of *Lupinus*. About Los Angeles I have found eggs on *L. hirsutissimus* Benth., and in Ventura County on *L. hallii* Abrams. I had supposed that Deerweed (*Hosackia glabra*) was a food plant, having on several occasions seen females fluttering about it, but larvae from *Lupinus* could not be induced to eat it.

The eggs are preferably laid on the young flower buds, but also frequently on both surfaces of the leaves, and even occasionally on the stems. Hatching, the young larvae at once bore into the flower buds, making headquarters in the stamen clusters. But after the first moult they feed outside, with their long necks entering the flower buds and eating out the contents thoroughly. Ants are constantly in attendance on the larger larvae.

As an instance of the great loss of butterfly life while in a larval stage, a check was made upon a large isolated plant of *Lupinus*.

On April 22, 1920, seventy-two eggs were noted on this plant. On May 7th the plant was carefully and thoroughly searched with the result that only six larvae were found. Very probably a spider (*Thomisus asperata*) and a little red mite (*Trombidium* sp.), both of which I found commonly on *Lupinus*, were responsible for the greater part of this destruction.

Following is the record of the larval moults:

Eggs laid April 11, 1920.
Hatched April 19.
Passed first moult April 24.
Passed second moult April 30.
Passed third moult May 6.
Passed fourth moult May 9.
Pupated May 14.

*The Egg.*—Demi-echinoid in shape, the base sharply flattened, thence swelling out roundly to the greatest diameter, from which point it rounds more quickly to the truncate summit.

Ornamented with the usual type of net-work, which divides itself into rather large mostly subquadrate cells, on the sides the smaller being about .04 mm. in their longest length, and the larger .06 mm. As the micropylar region is approached and reached the cells become smaller, but less confused than in most species. The cell walls .005 mm. in thickness, with the usual rounded protuberances at the angles, these .04 mm. in height and .02 mm. in thickness. The surface of the cells minutely punctate.

The micropyle in the center of a slope of the whole summit, in a deep, even, circular pit with abrupt walls, .06 mm. in diameter and composed of about twenty equal oval cells, .01 mm. in their longest length.

Color of egg pale green, with the raised net-work pure white. But as the embryo develops and just before the young larva hatches, the green color becomes lost, the ground color becoming a pale dirty violet but with the net-work remaining white. Height .26 mm., Diameter .58 mm. Diameter at base .40 mm.

The young larva escapes by eating out an irregular hole in the summit, about .35 mm. in diameter, and having once escaped from the egg, does not devour any more of it.

*First Instar.*—Body subcylindrical, barely tapering posteriorly, flattened beneath and less so above.

Head .12 mm. in diameter, dark brown. First thoracic segment pallid, with a number of large black papillae that project sharp colorless hairs over the head. Spiracles round, .01 mm. in diameter, with a black ring.

Two series of laterodorsal papillae, one of each to a segment, the larger .02 mm. in diameter at base, located centrally on the segments; the smaller .01 mm. in diameter, placed outside and a little back of the middle. The larger papillae emit long hairs, recurved posteriorly, .18 mm. in length; the hairs from the smaller papillae much shorter, only .04 mm. in length, and much less recurved.

Three series of substigmatal papillae, .01 mm. in height; these papillae also emit hairs, the first one .08 mm. in length; the second middle one .12 mm. in length; the posteriors but .04 mm. long. These

hairs, as well as the laterodorsals, are colorless and very minutely spiculiferous. A suprastigmatal series of small papillae, two to a segment, one placed anteriorly, the other slightly above and a little before the middle; from these come very short clavate hairs, .02 mm. in length. A laterodorsal row of naked lenticles, two to a segment on either side; the inner the smaller, .01 mm. in diameter, and the larger .016 mm.

Color of body pale olive brown, with a conspicuous hoary sheen, but as the instar develops this sheen becomes lost, and the larva alters to brownish orange. Legs fuscous. Prolegs concolorous with body. Length, just at birth, .90 mm. Width at first thoracic segment .24 mm.

*Second Instar.*—Head .24 mm. in diameter, dark chestnut brown, shining; the ocellar field white. Body now very minutely and uniformly punctulated with fine brown dots.

Color of body very pale lemon yellow, but as the stage proceeds the larva assumes a ground color of bright purple, with an indistinct white substigmatal stripe. Blotches of white on the sides represent the oblique dashes of later stages. Prolegs and ventral surface green white. Legs brown black. Length 2.20 mm. Width at first thoracic segment .54 mm.; width at anal segment .46 mm.

*Third Instar.*—Head .46 mm. in diameter, dark chestnut brown, shining.

Body densely studded with black stellate tubercles, .02 mm. in width, but varying slightly in size, and .03 mm. in height on the average; these project short, stout, minutely spiculiferous, colorless hairs, .06 mm. in height. Around first thoracic segment a fringe of colorless hairs, .28 mm. in length, extending out over the head. Along the substigmatal fold similar, erect, sharp hairs, .20 mm. in length. Mediodorsally on each segment, situated a little back of the middle, and on the whitish bands bordering the dorsal line, two high, black, stellate papillae, .04 mm. in height, from which issue erect colorless, sharp hairs, .18 mm. in length. Spiracles round, pale, .02 mm. in diameter, with a fine black ring.

Color, at beginning of instar, pale yellowish brown, but as the larva develops a dark purplish ground color is assumed, the coloration being strikingly similar to that of the young buds upon which the larva feeds. The substigmatal stripe becomes pink white, prominent, .14 mm. in width, extending the whole length of the body. A dorsal line, of a deeper tone than the ground color, and on either side of it a disconnected pink-tinged white stripe. On the sides similar colored dashes represent the usual type of oblique markings, but are here hardly more than irregular blotchings. In some of the larvae the substigmatal stripe and the lateral blotchings are entirely absent, the coloration being then almost uniformly deep

purple. Ventral surface greenish yellow; prolegs concolorous. Legs black. Abdominal slit greenish yellow.

Length, just after the moult, 4.8 mm. Width at second thoracic segment 1.36 mm.; height at second thoracic .95 mm.; width at anal segment .80 mm.

*Fourth Instar.*—Head .94 mm. in diameter, black, smooth, shining. Hairs of first thoracic segment, projecting over the head, of varying sizes, some as long as .30 mm., others but .12 mm.; these hairs sharp, colorless, spiculiferous, and having their origin in dark brown tubercles.

Body, as before, studded with stellate, piceous black tubercles, which give rise to short, stout, minutely spiculiferous hairs, .08 mm. in length on the average. Along the subventral rides a fringe of sharp, colorless, spiculiferous hairs, varying in size, some as long as .36 mm., others but .16 mm. Anal segment fringed with wavy, colorless, spiculiferous hairs, sharp, .30 mm. in length, arising from pale yellow brown tubercles .04 mm. in height. Spiracles round, pallid, .05 mm. in diameter, with a fine red brown ring. Sac and tubes present.

Color of body yellow brown. Dorsal line widest on the thoracic segments, thence narrowing posteriorly until disappearing on the last several abdominal segments. Dorsal line red brown, edged on either side with sordid yellow. The usual type of oblique dashes indicated rather feebly in sordid white stripes. A sordid white infrastigmatal stripe, fairly prominent, finely edged below with red brown. Ventral surface and prolegs blue green. Legs pale yellow brown, semi-opaque, darker at the tips.

Length 10. mm. Width at second thoracic segment 1.70 mm.; width at anal segment 1.50 mm.

*Fifth Instar.*—Head 1.1 mm. in diameter, black, smooth, shining. Hairs of first thoracic, extending out over head, .50 mm. in length, colorless, sharp, spiculiferous. Hairs fringing anal segment of varying sizes, some as long as .40 mm., others only .20 mm., all colorless, sharp, spiculiferous.

Body, as before, thickly studded with minute stellate processes, .04 mm. in diameter, the prongs sharp and widely separated. On the white backgrounds these are mostly glistening white; elsewhere mostly black, only a few red brown. The shorter spines .08 mm. in length, colorless, proceeding to a sharp point, minutely spiculiferous; the larger .40 mm. in length and .02 mm. in diameter at base, also colorless and minutely but densely spiculiferous. The sac green blue. Spiracles round oval, pale, .12 mm. in diameter, with a fine brownish ring.

Color of body yellow brown. A dorsal line, gray brown, heaviest and widest on thoracic segements, decreasing as it proceeds poste-

riorly and terminating sharply before the last two abdominal segments are reached. The usual type of oblique lateral dashes, the mediodorsal ones sordid white; the lower reddish brown. A sordid white infrastigmatal stripe, finely edged below with red brown, and the region just above it and between it and the oblique lateral dashes pale gray green. In another phase the ground color is bluish green, the dorsal stripe dark green but inconspicuous; the oblique lateral dashes only weakly indicated by grayish green, the sides with a pinkish tinge, and the infrastigmatal stripe is lacking. Ventral surface and prolegs bluish green. Legs pale yellow brown, semiopaque, darker at tips.

Length 14.5 mm. Width at first thoracic segment 4. mm.; width at anal segment 3. mm.

*The Pupa.*—Viewed dorsally, sides of thorax fairly straight to abdominal segment 2, where a sudden swelling out takes place and then rounds, at first evenly, and then on the last two abdominals swiftly, to the rounded posterior end. Anterior end truncated.

Viewed laterally, the abdomen at segment 3 is seen to be considerably higher than the thorax, rather broadly arched and falling off rapidly posteriorly. The thorax is quite well rounded also, sloping sharply from its highest point to the part where the girdle passes.

Surface of body covered with an irregular tracery of scarcely raised pale brown lines, about .02 mm. in width; between these lines the surface is minutely punctate. Spiracles elongate ovate, .10 mm. in length, with a rich brown ring. A few, short, yellowish spines, the longest .05 mm. in length, terminating in a bunch of bristles; these seem to be only on the prothorax. Elsewhere, a few scattered simple hairs, stout, clavate, sometimes slightly curving, and but .08 mm. long.

Color of wing cases varying from bright bluish green to greenish yellow, but usually with the green predominating. This bluish green also sometimes covering the thorax, but usually the thorax is pale yellowish brown. Abdomen also pale yellowish brown, reddish brown ventrally, tho sometimes more or less tinged with bluish green. A fairly prominent, yellow, fuscous, dorsal line. On either side of dorsal line on the abdomen the usual series of fuscous blotchings, more or less obscure, and not sharply defined in any of the pupae examined. In one instance these blotchings were continued on the thorax. Tegment of wing cases translucent.

Length 9.5 mm. in one example, while three others gave 9. mm. Highest point of thorax 3. mm. Highest point of abdomen, at segment 3, 4. mm. Greatest width of thorax 3. mm. Greatest width of abdomen, at segment 3, 4. mm. Width of head case 2. mm.

# A New Race of Eurema proterpia[1] (Fabricius) (Lepid.: Pieridae).

By Alex. B. Klots, New York, N. Y.

**Eurema proterpia watsonia,** new subspecies.

A very distinct race, differing from *proterpia* (Fabricius) in the following particulars.

♂.—Upperside—ground color slightly deeper orange. Outer margins of both primaries and secondaries with the smoky border darker and about double the width of *proterpia*. This is especially noticeable in the secondaries, where in *proterpia* the border is often practically missing. Veins of both wings heavily scaled with black throughout their entire length, except the veins closing the cells, and vein 5 of the primaries which is black for not quite half way to the cell from the outer margin. In *proterpia* the veins are black scaled for only about one-quarter to one-third of their distal portion. The black patch at apex of secondaries is more strongly developed, and there is also more of the dusting of black scales at the bases of both wings than in *proterpia*. Abdominal area and the area between veins 1 and 2 of the secondaries lightly dusted with black scales. In *proterpia* these areas are nearly clear of this black scaling.

Underside: primaries pale orange with a distinct yellow border along costal and outer margins which is barely indicated in *proterpia*. Secondaries yellow while in *proterpia* they are orange-yellow. There is at once noticeable a strong contrast between the colors of the primaries and secondaries. There is much less contrast in *proterpia*, some individuals, in fact, having the wings practically concolorous.

♀. of this race unknown.

Expanse of holotype—47.6 mm. (measurements taken from center of thorax to apex of each primary and results added).

Holotype male and twenty-one male paratypes, Rio Bamba, Ecuador, South America, deposited as follows: Holotype and one paratype in The American Museum of Natural History. One paratype in the collection of The Academy of Natural Sciences, Philadelphia. Nineteen paratypes in the author's collection.

I take great pleasure in naming this race for Mr. Frank E. Watson, in grateful recognition of the kind encouragement and assistance he has given me in the entomological field.

[1] *Papilio proterpia* Fabricius, 1775, Syst. Ent. p. 478, No. 152.

## Two Varieties of Eurosta solidaginis Fitch (Trypetidae, Dipt.).*

By C. Howard Curran, Ottawa, Ontario.

**Eurosta solidaginis** variety **fascipennis** new.

This variety is like the typical form but is readily distinguished by the presence of a complete, oblique, sub-apical hyaline band on the wing, a narrow, longer spot at the apex of the third longitudinal vein along the border and a smaller spot at the apex of the fourth vein.

*Holotype*—♂, Ottawa, Ont., June, 1908 (Jas. Fletcher); No. 609, in the Canadian National Collection, Ottawa.

**Eurosta solidaginis** variety **subfasciatus** new.

Intermediate between the typical and preceding forms in the presence of an interrupted, oblique fascia, as the triangle at the apex of the first vein is extended into the first posterior cell by means of a moderately large, clear oval spot. The apex of the wing is brown, with a transverse hyaline spot between the third and fourth veins and sometimes a small spot before the third vein. The outer clear spot on the hind margin also extends farther forward than in the typical form, and is usually narrower. The color of the wings is a duller brown.

*Holotype*—♂, Vernon, B. C., March 13, 1919 (E. R. Buckell); No. 610, in the Canadian National Collection, Ottawa. *Allotype*—♀, same data. *Paratypes*—3 ♂, 2 ♀, British Columbia. Reared from solidago galls.

## A Rearrangement of our North American Thyreocorinae (Hemip.).

By E. P. Van Duzee, San Francisco, California.†

Since the publication of my catalogue in 1917 two important papers treating of the Thyreocorinae have appeared. One by Dr. Horvath[1] in *Annales Musei Nationalis Hungarici,* XVII, pp. 205-273, and one by Mr. J. R. Malloch[2] in *Bulletin Illinois*

* Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agriculture, Ottawa.

† Contributions from the California Academy of Sciences, No. 220.

[1] Horvath, Dr. Geza, Analecta ad cognitionem Cydnidarum.

[2] Malloch, J. R., The Pentatomoidea of Illinois with keys to the Nearctic Genera. By Charles Arthur Hart. Edited by Mr. J. R. Malloch; the portion treating of the Thyreocorinae entirely by the editor.

*Natural History Survey*, XIII, pp. 206-216. Both appeared in 1919, but which has priority I have no means at present of knowing. However, it makes little difference which appeared first as, so far as I can discover, they do not necessarily conflict. Dr. Horvath's paper has the wider scope, covering the South American forms, but is not complete as to species and has the defect that he has misunderstood the genus *Corimelaena* White, and uses the name *Encoria* Muls. & Rey in its place, the latter, apparently being a straight synonym of *Corimelaena*. His table of genera is invaluable and enables us to place our numerous neotropical species in systematic order. Mr. Malloch's paper deals only with North American forms and covers that ground well, the only serious omissions being the genus *Euryscytus* Horvath, the type species of which (*guttiger* Stål) comes up into southern Texas, and the genus *Amyssonotum* Horvath with a similar distribution. Malloch's new genus *Cydnoides* (*ciliatus* Uhler type) is very near *Acrotmetus* Horvath, but is, perhaps, sufficiently distinct in having the elytra more strongly punctured with an incomplete venation; the marginal cilia hardly form a satisfactory generic character as they are very small in one species and are present in the type of *Acrotmetus*. Mr. Malloch's determination of *Odontoscelis pulicarius* Germar is undoubtedly correct and should be accepted as final, but unfortunately he takes no notice of the names *marginella* Dallas, *flavomarginata* Thomas and *Encoria marginipennis* Muls. & Rey, the latter of which Horvath now believes is an American form accidentally introduced into France. The former (*marginella* Dallas) is undoubtedly the same as *nanella* McAtee and *flavomarginata* apparently is another synonym.

*Corimelaena harti* Mall. I have taken at Washington, D. C., and Atlanta, Georgia; *marginella* (*nanella* McAtee) is abundant in Florida and was recorded by me as *pulicaria* in my report on Florida Hemiptera, and I have also taken it at Effingham, Kansas; *pulicaria* Germ. I have taken at Northbend, Washington, showing a distribution entirely across the northern part of the continent; *cognatus* Van D. is distributed from Jamaica to Lower California and undoubtedly occurs in California and

Arizona. In Malloch's table it runs to *extensa,* but may be distinguished by the narrower head, shorter scutellum, pale tibiae, etc. I have recently taken three males of *Cydnoides obtusa* Uhler from sand under a plant of *Euphorbia polycarpa* at Potholes, California, twelve miles north of Yuma. The two female types of this species recorded by Uhler are not now in the collection of the California Academy of Sciences; either they were not returned to the Academy as stated by Uhler or, through an oversight, they were not placed with the Academy's type collection and therefore were destroyed in the fire of 1906. However, the species is well described, very distinct and is not in doubt. The following two species should be added to our fauna:

**Cydnoides arizonensis** new species.

Larger than *ciliatus* with the broad truncate form of *renormatus;* head short, strongly sinuate either side; deep black, elytra immaculate. Length 5 mm., width 3.5 mm.

Head one-third wider than long, apex subangulate, sides deeply sinuate before the eyes; tylus well distinguished, parallel; surface flat, deeply, closely punctate, its base smooth. Pronotum large, convex, half as long as wide, but little narrowed anteriorly, sides strongly arcuate, very convex, edge marginate, humeri prominently tuberculate; surface deeply, closely punctate laterally, becoming nearly smooth on disk. Scutellum about as long as broad, regularly punctate, the punctures becoming subobsolete on basal disk. Elytra very broad, one-third as wide as long, strongly punctate, apex truncate, median field of corium punctured to its apex which becomes lost in the costal field a little before the apex; outer carina of corium complete, intermediate short. Sides of propleura deeply impressed beneath the very broadly overhanging margin. Second antennal segment scarcely longer than wide. Hind margin of basal genital plate of female rectilinear. Anterior femora with four anteroventral bristles; spines on all tibiae long and stout. Sides of body with few and very short bristles. Color deep black, polished, with a slight bluish sheen in certain lights. Antennae and rostrum fusco-testaceous, tarsi still paler.

Described from one female taken by Mr. J. R. Slevin on Mt. Lemon, Arizona, June 17, 1912, at an elevation of 9150 feet. This species approaches genus *Acrotmetus* Horv. but the elytral characters seem to place it in *Cydnoides* in spite of the short cilia. *Type,* No. 1305, female, in Museum California Academy of Sciences.

**Euryscytus diminutus** new species.

Size and form of *Cydnoides obtusa* Uhler but with a short head, the median field of corium not perceptibly narrower apically and in all respects congeneric with *Euryscytus guttiger* (Stål); deep black, polished, immaculate except for the pale antennae, rostrum and tarsi. Length 3.5 mm.; width 2.4 mm.

Head one-half broader than long, broadly rounded before, the apex subtruncate; sides arcuate, not at all sinuate, edge feebly reflexed, surface nearly vertical, flat, closely punctate, basal margin smooth, raised above the plane of the pronotum. Pronotum prominently convex, strongly punctate, but little narrowed anteriorly; sides sharply arcuate, marginate; humeri prominent, tumid. Scutellum as long as broad, uniformly but less strongly punctate, broadly rounded behind. Elytra broad, shallowly punctate; apex strongly truncate; median field of corium parallel or nearly so on apical two-thirds. Basal three segments of antennae flavo-testaceous (others wanting). Rostrum attaining apex of intermediate coxae, piceo-testaceous. Legs piceous, tarsi flavo-testaceous. Tibial spurs about as in *guttiger* Stål, less stout than in *Cydnoides*. Male genital segment deeply excavated, its apical margin feebly arcuate, scarcely elevated.

Described from one male taken by Mr. Fordyce Grinnell, Jr., at Pasadena, California, July 30, 1909. *Type* in collection of the author. An intensely black little species with quite uniform punctuation. The tumid base of the head may be the result of an accidental depression of the front of the head but that is not likely.

Below I give a re-arrangement of our species with their new generic assignments.

Genus Corimelaena White (type *lateralis* Fabr.)
- (*Eucoria* Muls. & Rey)
- *anthracina* Uhler
- *polita* Malloch
- *lateralis* (Fabr.)
- *montana* (Van Duzee)
- *pulicaria* (Germar)
- *?marginipennis* (Muls. & Rey)
- *interrupta* Malloch
- *minutissima* Malloch
- *marginella* Dallas
- *flavomarginata* (Thomas)
- *nanella* McAtee
- *harti* Malloch
- *agrella* McAtee
- *cognata* (Van Duzee)
- *extensa* Uhler

Genus Amyssonotum Horvath (type *rastrata* Stål)
- *rastrata* (Stål)

Genus Galgupha Amyot & Serville (type *atra* A. & S.)
- *atra* Amyot & Serville
- *unicolor* Palisot
- *nitiduloides* (Wolff)
- *aterrima* Malloch
- *nigra* (Dallas)
- *denudata* (Uhler)
- *coeruleseens* (Stål)
- *cyanea* (Uhler)
- *cyanconigra* (Walker)

Genus *Cydnoides* Malloch (type *ciliata* Uhl.)
- *ciliata* (Uhler)
- *renormatus* (Uhler)
- *albipennis* (Say)
- *sayi* (Van Duzee)
- *obtusus* (Uhler)
- *arizonensis* Van Duzee

Genus Euryscytus Horvath (type *guttiger* (Stål)
- *guttiger* (Stål)
- *diminutus* Van Duzee

## Two New Varieties of Ants (Hymen.: Formicidae).

By M. R. Smith, Agricultural and Mechanical College, Mississippi.

The writer has recently observed two new varieties of ants which seem worthy of description. One of these ants, *Aphaenogaster nigripes*, seems to be a very common variety in this locality as is indicated by the numerous specimens in the college collection here. Not only is this ant found in Mississippi but it also occurs in North and South Carolina. It is easily separated from the species by means of its very dark, shining legs. The body of *nigripes* is darker in color and more rough in sculpture than that of *lamellidens*.

The other new variety of ant is from Lagunitas, California. This ant is without doubt a member of the *caryae* group as is shown by its emarginate clypeus, general shape of body and color. Dr. Wheeler, who has a large collection of ants of the *caryae* group, states that this new variety, *essigi*, is more closely allied to the variety *clarithorax* than to any other ant of the group. Although *essigi* bears a striking resemblance to *clarithorax* in color, it differs from this ant in several respects; it has more flattened eyes, a more uniform glabrous or shining body appearance and it lacks the definite, elongate, piligerous foveolae on the clypeus and cheeks, which is characteristic of *clarithorax*.

**Camponotus caryae** var **essigi** var. nov.

*Worker major*: Length, 6.5-7 mm.

Head, excluding mandibles, about as broad as long, broader behind than in front, with noticeably excised posterior border and convex sides. Clypeus convex, subrectangular, apical border depressed and with a prominent notch or emargination. Frontal carinae lyrate. Eyes oblong, flattened. Antennal scapes not reaching the posterior corners of the head, slender at the base, gradually enlarging toward the tips. Thorax short, robust, with the pronotum narrower than the head; epinotum compressed laterally, the sub-equal base and the declivity forming at their juncture a slightly rounded, obtuse angle. Petiole with convex anterior and flattened posterior surface and rounded, entire border. Gaster oblong.

Head, thorax, petiole, gaster, appendages and antennae, with exception of the funiculi, smooth and shining. Mandibles shining, with scattered but distinct punctures. Head covered with distinct but scattered punctures, the punctures becoming less apparent on the posterior

corners and border of the head. Head, thorax and gaster finely shagreened, that on the gaster transverse and very fine, almost indistinct.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the thorax, coxae of the legs, the superior border of the petiole and gaster. Tips of scapes, femora and tibiae with a few, small, erect hairs. Pubescence on the head and thorax short and sparse, longer on the gaster.

Reddish brown: head and abdomen darker, the latter black with a yellowish posterior border to each segment. The mandibles, clypeus, funiculi and posterior corners of the head lighter than the rest of the head; the posterior portion of the thorax and the petiole deeply tinged with black.

*Worker minor*: Length, 4-4.5 mm.

Head narrower in front than behind, with rounded posterior border and convex sides. Clypeus trapezoidal, convex, with anterior margin slightly cut out or emarginate. Scapes reaching past posterior corners of the head, not noticeably enlarged from base to tip. Thorax similar to that of the major worker but the pronotum is almost as wide as the head.

Hairs yellowish, erect, present on the gula, mandibles, clypeus, front and vertex of the head, the dorsal surface of the epinotum, the superior border of the petiole, the gaster and coxae of the legs.

Reddish brown: Head, mesonotum, epinotum, petiole and gaster darker; the antennae, pronotum and appendages lighter.

This beautiful variety was sent to the writer for determination by Professor E. O. Essig, of the Agricultural Experiment Station of the University of California. The ants were taken at Lagunitas, California, on June 23, 1913. The variety is named in honor of Professor Essig, who has very kindly sent the writer numerous Californian ants for identification.

*Camponotus essigi* is evidently a variety of the *caryae* group as is shown by its emarginate clypeus, its general shape, size and color. Nothing is known concerning its nesting habits but the ants undoubtedly, like their nearest relatives, live in galls, in niches under the bark or in limbs of trees.

This species may be distinguished from the other forms of the *caryae* group by its very striking glabrous or shining appearance, its much flattened eyes and by the reddish brown thorax and appendages, with darker head and abdomen. It is very closely allied to the variety *clarithorax*, which it resembles very much in color.

Described from seven workers; cotypes in the collections of Dr. W. M. Wheeler and the writer.

**Aphaenogaster lamellidens** Mayr. var. **nigripes** var. nov.

*Worker*:

This variety can easily be distinguished from the species by means of its color and sculpture.

The head, thorax, petiole and postpetiole are deep reddish brown and sub-opaque, the coxae of the legs and the gaster lighter and more glabrous, while the femora and tibiae are almost a shining black. The specimens of *Aphaenogaster lamellidens* before the writer are light yellowish red, with the head, thorax, petiole and postpetiole sub-opaque, the antennae and legs darker, the gaster light yellowish and shining.

The most striking difference between the two is the color of the legs; the femora and tibiae in *nigripes* being very dark, almost black and somewhat shining, while the femora and tibiae of *lamellidens* are not noticeably dark or shining.

The sculpture of the two is noticeably different; the head, thorax, petiole and postpetiole of the variety are much coarser and more rugose reticulate than in *lamellidens*, this being particularly true of the dorsal surface of these parts.

Specimens of this ant have been collected from various towns in Mississippi but particularly from the towns of Fulton, Columbus, Aberdeen, and A. and M. College. The writer has specimens in his collection from South Carolina and Dr. W. M. Wheeler reports that he has specimens from North Carolina. Judging from the records of distribution, this ant must be a rather stable and widely distributed southern variety of *lamellidens*.

There is considerable variation in the general color of *nigripes* but the dark color of the legs is always constant and furnishes a character which easily separates this ant from the species.

Described from ten workers; cotypes in the writer's collection.

Type locality: Agricultural & Mechanical College, Mississippi.

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### Osmia cordata; A Correction (Hymen.: Megachilidae).

In the *Journal of Animal Behavior*, Vol. I, pages 374-392, 1911, Dr. C. H. Turner published a paper entitled "Notes on the Behavior of a Parasitic Bee of the Family Stelidae." Probably on account of the green color of this bee, it has been wrongly named. These insects were part of the material used by me in a work entitled "The Biology of the Mud-daubing Wasp," (Journ. Animal Behavior, Vol. 6; 27-63, 1916), and have been identified by Mr. J. C. Crawford as *Osmia cordata* Robt.; in fact, Dr. Turner in his paper acknowledges this source of his material.

It had been Dr. Turner's intention to correct this error, but his untimely death makes this duty devolve upon me.—PHIL RAU, St. Louis, Missouri.

# Undescribed Crane-Flies from Argentina (Dipt. : Tipulidae). Part VII.

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The crane-flies described at this time were collected by Dr. Charles Bruch and Señores Barreto, Durione and Weiser, and were sent to me for determination by Dr. Bruch. The types are preserved in the writer's collection.

**Geranomyia (Geranomyia) serotina** sp. n.

Rostrum elongate; antennae with the flagellar segments oval to subcylindrical; mesonotal praescutum pale fawn-brown with three gray stripes, the median one split by a capillary dark brown line; scutal lobes gray with the mesal and anterior margins dark brown; scutellum dark brown, the posterior margin broadly pale; femora uniformly brownish yellow; wings pale yellow; stigma small, pale brown; small brown spots on wing; *Sc* and *Rs* long; abdomen dark brown, the hypopygium light yellow.

♂. Length (excluding rostrum) 6 mm.; wing 8.2 mm.; rostrum 5 mm.

♀. Length (excluding rostrum) 7.5-8 mm.; wing 7.6-8 mm.; rostrum 5 mm.

Form stout. Rostrum elongate, dark brown, including the palpi. Antennae moderately elongate, dark brown, the basal half somewhat paler; flagellar segments oval to subcylindrical; verticils very short. Head dark brown, gray pruinose, paler brown on the vertex; a narrow silvery gray median line; vertex narrow.

Mesonotal praescutum pale fawn-brown with three indistinct gray stripes, the median one darker gray split by a capillary dark brown line that fades out before the suture; scutum with the median area light gray, the lobes darker gray with the mesal and anterior margins of each bordered with brown; scutellum broad, dark brown, gray pruinose, the posterior margin broadly pale; postnotum dark, gray pruinose. Pleura pale brown, gray pruinose; dorso-pleural membrane dull yellow. Halteres light yellow, the knobs brown.

Legs with coxae and trochanters yellow; femora dull yellow, passing into brownish yellow beyond the base; tibiae and tarsi dark brown.

Wings pale yellow, the costal and subcostal cells brighter; stigma small, oval pale brown; narrow brown seams at the origin of *Rs*, tip of *Sc;* on the supernumerary crossvein in cell *Sc;* along cord and outer end of cell *1st* $M_2$; veins brown. Venation: *Sc* long, $Sc_1$ extending almost to midlength of the long sector, $Sc_2$ at its tip; *Rs* very long, more than three times the basal deflection of $R_1+_5$; *r-m* relatively short or obliterated by the punctiform contact of $R_1+_5$ on $M_1+_2$; cell *1st* $M_2$ long,

approximately as long as $M_1+_2$ beyond it; basal deflection of $Cu_1$ just before the fork of $M$, longer than $Cu_2$.

Abdomen dark brown, the sternites a little paler; male hypopygium light yellow.

*Holotypes*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂ ♀.

**Geranomyia (Geranomyia) platensis** sp. n.

Rostrum short; head grayish yellow with two longitudinal dark brown lines that converge behind; mesonotal praescutum buffy with three narrow, dark brown lines; femora pale brown with a narrow, dark brown, subterminal ring preceded by a yellowish band; wings grayish subhyaline, the costal region more yellowish; a rather sparse brown pattern, including four costal areas; *Sc* ending a short distance beyond the origin of *Rs*; basal deflection of $Cu_1$ at or near the fork of *M*.

♂. Length (excluding rostrum) 5.5-5.8 mm.; wing 6.9 mm.; rostrum 1.8-2 mm.

♀. Length (excluding rostrum) 6.3 mm.; wing 7 mm.; rostrum 2 mm.

Rostrum comparatively short, dark brown. Antennae comparatively short, brown; basal flagellar segments globular, the intermediate segments short-oval, passing into oval near the tip of the organ. Head grayish yellow, the postgenae and sides of the vertex clearer gray; two conspicuous dark brown lines extend from the inner posterior angle of eyes, converging behind to the occiput.

Mesonotal praescutum light buffy with three narrow dark brown stripes that are rather approximated, the spaces slightly pruinose; median stripe not attaining suture; lateral stripes beginning at pseudosutural foveae; lateral margins of sclerite broadly dark brown; scutum with median area broadly whitish, the lobes gray, each almost encircled by a brownish black margin; scutellum and postnotum brownish testaceous. Pleura yellowish testaceous. Halteres rather short, brown, the base of the stem paler.

Legs with the coxae and trochanters obscure yellow; femora pale brown, brighter basally; a broad, dark brown, subterminal ring, preceded and followed by a yellowish ring, the apical ring very narrow and indistinct; tibiae and tarsi brown.

Wings grayish subhyaline, the costal and subcostal cells yellowish, the latter more intense; stigma brown, extended basad along $R_1$; conspicuous but relatively small brown clouds above arculus; at origin of *Rs;* at supernumerary crossvein in cell *Sc*; narrower and less distinct seams along cord and outer end of cell *1st* $M_2$; a small cloud at tip of $R_2+_3$; veins dark brown, *Sc* and *R* largely yellow. Venation: *Sc* moderately long, extending a little beyond the origin of *Rs*, $Sc_2$ at the tip of $Sc_1$; a supernumerary crossvein in cell *Sc* near midlength of cell; *Rs* long, almost straight, nearly three times the length of the basal

deflection of $R_4+_5$; *r* indistinct, about one and one-half times its length from the tip of $R_1$; cell *1st* $M_2$ pentagonal, a little widened distally; basal deflection of $Cu_1$ at or slightly before the fork of *M*; $Cu_2$ a little shorter than to about equal to the deflection of $Cu_1$.

Abdomen brown, the posterior margins of the segments darker, the basal tergite blackish; sternites pale brown.

*Holotype*: ♂, La Plata, April 1920 (Durione). *Allotopotype*: ♀. *Paratopotypes*: 2 ♀♀.

*Geranomyia platensis* belongs to the group of *G. insignis* (Loew).

**Geranomyia (Geranomyia) aequabilis** sp. n.

♂. Length (excluding rostrum) 5 mm.; wing 6.4-6.5 mm.; rostrum 3.1-3.3 mm.

♀. Length (excluding rostrum) 5.2-5.4 mm.; wing 6-6.2 mm.; rostrum 3-3.5 mm.

Closely related to *G. platensis* sp. n., from which it differs as follows: Size smaller but the rostrum very much longer. Antennae dark brown, the flagellar segments cylindrical. Mesonotum light gray, the praescutum with three, narrow, brownish black stripes, these subequal and about as wide as the interspaces; postnotum dark-colored, sparsely gray pruinose. Pleura and sternum light gray. Legs with the brown femoral band paler, narrower and more removed from the tip of the segment; yellow subterminal ring indistinct. Wings similar but the dark brown pattern much more extensive, the markings large and conspicuous; gray clouds at ends of anal veins. Venation: *Rs* slightly more arcuated at origin; veins beyond cell *1st* $M_2$ longer, $M_3$ beyond the cell being about equal to it in length; basal deflection of $Cu_1$ slightly before the fork of *M*; $Cu_2$ conspicuously longer than the basal deflection of $Cu_1$. Abdominal tergites dark brown, the sternites a little paler.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 1 ♂, 1 ♀.

**Erioptera (Mesocyphona) immaculata fuscivena** subsp. n.

♂. Length 2.8 mm.; wing 3-3.3 mm.

♀. Length 3.1-3.3 mm.; wing 3.4-3.5 mm.

Very similar to typical *immaculata* Alexander (Middle America) but with the wing-veins conspicuously bordered with fuscous; region of stigma conspicuously suffused with pale fuscous, the basal third of the wing likewise strongly tinged with this color; the nearly hyaline areas include the cells in the vicinity of the cord, the outer end of cell *1st A* and most of cells from $R_2$ to *Cu* with the exception of the seams along the veins.

*Holotype*: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype*: ♀. *Paratopotypes*: 5 ♂♂.

**Eriocera andicola** sp. n.

Antennae short; head brownish black, the conspicuously bifid vertical tubercle fiery orange; mesonotal praescutum brownish gray with three, broad, dark brown stripes; scutellum and postnotum light gray; pleura gray; wings faintly infuscated, the costal region darker brown; cell $M_1$ lacking; abdomen long, black, segments three to five more or less reddish.

♂. Length 15.5 mm.; wing 10 mm.; abdomen alone 11.7 mm.

Rostrum and palpi dark brownish black. Antennae short, black, the basal segment sparsely dusted with a grayish yellow pollen; base of first flagellar segment a little paler. Head with the vertical tubercle conspicuously fiery orange; front and occiput dark brown, the posterior part of the vertex dusted with greenish yellow; vertical tubercle very large and high, deeply bifid.

Pronotum dark-colored, dusted with light gray, the lateral angles of the scutum with a brush of hairs. Mesonotal praescutum with three, broad, brown stripes, the interspaces with a grayish yellow pollen, less distinct behind; scutum light gray medially, the lobes dark brown; scutellum and postnotum light gray. Pleura dark, heavily dusted with light gray. Halteres short, brown, the knobs dark brown.

Legs with the coxae dark, dusted with light gray; trochanters dark brown; femora dark brown, the bases obscure yellow, narrowest on the fore legs, broadest on the hind legs; tibiae obscure yellowish brown, passing into dark brown at the tips, the yellowish color brightest on the posterior tibiae; tarsi short, brownish black.

Wings rather small for the size of the body, with a faint brown tinge, cells *C* and *Sc* darker brown; stigma rather ill-defined, brown; ill-defined brown seams at origin of *Rs*, along the cord and outer end of cell *1st* $M_2$; veins dark brown. Venation: $Sc_1$ at least twice $Sc_2$; cell $M_1$ lacking; basal deflection of $Cu_1$ just beyond the fork of *M*.

Abdomen elongate. Tergites black, the bases of segments three to five obscure reddish yellow; ninth segment dark reddish brown; sternites similar but all of segments three to five and eight and nine obscure reddish.

*Holotype*: ♂, Ciudad, Jujuy, March 19, 1920 (V. Weiser).

**Tipula barretoi** sp. n.

Generally similar to *T. bruchi* but smaller; antennal flagellum uniformly brownish black; wings more uniformly brownish, the brown and subhyaline areas less contrasted; abdomen reddish, the tergites with three dark brown stripes, male hypopygium with the eighth sternite having an elongate median lobe.

♂. Length 12-13 mm.; wing 13.5-14.5 mm.

Frontal prolongation of head pale brown, with a narrow, darker brown, lateral line; palpi dark brown. Antennae with the scape and

first flagellar segment conspicuously yellow; remainder of flagellum brownish black. Head light brownish yellow adjoining the inner margins of the eyes; occiput and posterior part of vertex light gray pruinose; center of vertex largely dark brown.

Mesonotal praescutum light brownish yellow with three conspicuous, dark brown stripes; median stripe with a paler central line, most distinct anteriorly, and a capillary brownish black vitta; lateral stripes narrow, crossing the suture onto the scutal lobes; remainder of mesonotum light gray with a capillary dark brown line. Pleura light gray pruinose; dorso-pleural membrane light yellow. Halteres light brown, the knobs dark brown.

Legs long and slender, the coxae light gray, trochanters dull yellow; femora brownish yellow, the tips broadly blackened, immediately before these tips with a brighter, subterminal, yellow ring; tibiae light brown, soon passing into brownish black; tarsi brownish black.

Wings with a somewhat uniform brownish tinge, cells *C* and *Sc* more yellowish, the latter inclined to brownish yellow; cell *Sc* with a brown mark at tip; another at origin of *Rs* and a third before midlength of the cell; these marks are smaller than the yellow interspaces; stigma pale brown; whitish areas distributed as follows: An obliterative area before the cord, including the base of cell *1st* $R_1$, the end of *R*, crossing cell *1st* $M_2$ into the bases of cells $M_4$ and $Cu_1$; an obliterative area beyond the cord includes the bases of cells $R_2$, $R_3$ and $R_5$; paler marks in cells *M*, *1st A* and *2nd A*; veins dark brown. Venation: Tip of vein $R_1$ pale and without macrotrichiae, cell *2nd* $R_1$ being longer than wide; petiole of cell $M_1$ longer than *m*.

Abdominal tergites reddish with three conspicuous dark brown stripes; lateral margins of the segments narrowly grayish; sternites gray, with a broad, conspicuous, velvety-brown, median stripe. Male hypopygium with the ninth tergite yellow, large and flattened; the conspicuous lateral lobes are obliquely truncated and sparsely provided with small irregular teeth; the median area is depressed and produced caudad as a triangular, shiny, median lobe. Eighth sternite with a single, conspicuous, median lobe that is elongate-oval, pale, margined with long pale setae.

*Holotype*: ♂, Monte Veloz, Buenos Aires, March 1920 (B. Barreto). *Allotopotype*: ♀. *Paratopotypes*: 4 ♂ ♂.

*Tipula barretoi* is named in honor of the collector. The species bears a certain resemblance to *T. bruchi* Alexander (Argentina) but is readily told by the diagnostic characters listed above.

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., DECEMBER, 1923.

## AGAIN, GIVE!

The letter which the Joint Publication Committee of the Union of Biological Societies has sent out to the members of the constituent societies, proposing the publication of an abstracts journal for the biological sciences, recalls the editorial in the NEWS for July last on The Zoological Record. Thus far the responses received by the Library Committee of the Academy of Natural Sciences of Philadelphia to its appeal urging institutions interested in zoology to offer to the Zoological Society of London guarantees toward the expenses of the *Zoological Record* for the year ending July 1, 1924, have not been very encouraging. Even if the new abstracts journal becomes a reality, some time will elapse before it can begin its functions and it is indispensable that the *Record* be maintained, at least until the abstracts journal comes into being. We, therefore, renew our appeal for the support of the *Record*.

Whatever the zoological bibliography is to be—Zoological Record, Concilium Bibliographicum, a new abstracts journal or what not, a larger degree of co-operation than has existed in the past is a *sine qua non*. Institutions and individuals throughout the world must combine to furnish the necessary funds, it may be at a sacrifice. An institution must subscribe to several copies of the bibliography or the individuals working in it must each subscribe thereto. It will not do to look to any one organization now existing, not even a Carnegie corporation, to finance such a tremendous and absolutely essential task as the production of the bibliography of zoology. Again we say: Give!

### Odonata of North Carolina (Libellulidae).

On June 28, 1923, I took *Celithemis ornata* and *C. amanda*, one of each within a few yards of one another at Havelock, N. C., near Lake Ellis. On June 30, I saw an *Epicordulia* flying high overhead at Wilmington, N. C., and watched it for several minutes, but it never came within fifteen feet of the ground; on the afternoon of the same day I took a *Celithemis eponina* at Wilmington. These last two are new to the North Carolina list. C. S. BRIMLEY, Raleigh, N. C.

**Cuterebra cuniculi in the Dog (Diptera : Oestridae).***

On October 14, 1922, the Laboratory of the Pennsylvania Bureau of Animal Industry at Philadelphia received for diagnosis a fly larva taken from the skin of a dog, by Dr. J. W. Vansant, a practicing veterinarian at Fox Chase, Philadelphia. According to the history received the animal was a small male Pomeranian. It had been in Florida during the previous winter and up to April, 1922. The larva was removed from the soft skin by the sheath. There was apparently no evidence that it was doing the dog any harm. It was further stated that so far as was known, the animal had never been in contact with rabbits.

The specimen was sent to Prof. J. M. Aldrich, Associate Curator at the National Museum, and identified by him as *Cuterebra cuniculi*.

According to Dr. Albert Hassall, of the Zoological Division of the Bureau of Animal Industry, Washington, but one record of the finding of *Cuterebra* larvae in dogs has been published. This was a case reported by Cecil French, in the Journal of Comparative Medicine and Veterinary Archives, Vol. 14, 1893, p. 379. This occurred at Montreal, Canada, and the larva was stated to be that of *Cuterebra emasculator*. It was found in the scrotum and according to the author, "The dog was apparently indifferent to the fact that the parasite was slowly emasculating him."

The genus *Cuterebra* is closely related to *Hypoderma*, the bot-fly of cattle. Its natural hosts are rodents and marsupials, and it occurs only sporadically in carnivors, but there are a number of records of *Cuterebra* from cats. With regard to the mode whereby they reach their positions beneath the skin, Prof. Aldrich, in the letter which I received from him, refers to a paper published by Parker and Wells, in the Journal of Parasitology, Vol. V, 1919, p. 100. These authors introduced newly hatched *Cuterebra* larvae into the mouth of a prairie dog, and found that several days later the maggot had passed through the tissues and gained the skin, where it was producing the characteristic lump. Prof. Aldrich then adds:

"It would seem from this that the species of *Cuterebra* ordinarily obtains entrance to the host through the mouth; and from this I conclude that dogs and cats, when they have these parasites, get them from swallowing the flesh of some rodent containing an early stage of the maggot, which then proceeds to make a host of the carnivorous animal instead of the rodent."

It is known that *Cuterebra* larvae are of slow growth, requiring several months to mature. The larva in question was not far from the pupal stage, and in consequence the dog may readily have been infected while in Florida.

The specimen is preserved in the collection of the National Museum, under the designation of Accession No. 69929.—Howard Crawley.

(*Contributions from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 16.)

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of the New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **19**—Bulletin of the Brooklyn Entomological Society. **40**—Genera Insectorum, Diriges par P. Wytsman. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **68**—Science, Garrison on the Hudson, N. Y. **70**—Journal of Morphology, Philadelphia. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **114**—Entomologische Rundschau, Stuttgart. **133**—Zoologica. Scientific Contributions of the New York Zoological Society. **138**—American Museum Novitates, New York. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **150**—Jenaische Zeitschrift fur naturwissenschaft, Jena.

**GENERAL. Aurivillius, C.**—Zu Chr. Aurivillius siebzigstem geburtstage. **114**, xl, 1-2. **Hadwen, S.**—Insects affecting live stock. (Canada Dept. Agr. Bul. 20.) **Hopkins, A. D.**—A biographical sketch. **12**, xvi, 413-20. **Martini, E.**—Lehrbuch der medizinischen entomologie. Gustav Fischer, Jena, 1923, 462 pp., ill. **Muttkowski, R. A.**—Studies on the blood of insects. **19**, xviii, 127-36. **Pierce, W. D.**—The laws of nature as affecting insect abundance. (Lectures in Appl. Ent., Ser. 1, Pt. 2, No. 0, App., 33-52.) **Smith, R. H.**—Technique in studying by dissection the internal anatomy of small insects. **7**, xvi, 277-8. **Snyder et al.**—The progress of forest entomology in the United States. **12**, xvi, 413-20. **Strand, E.**—Bitte um einsendung von autobiographien. **114**, xl, 39. **de la Torre Bueno, J. R.**—On synopses and keys. **19**, xviii, 145-6. **Washburn, F. L.**—Notes on collecting insects in the Marquesas islands. **7**, xvi, 274-77. **Weiss, H. B.**—More notes on fungous insects. **4**, lv, 199-201.

**ANATOMY, PHYSIOLOGY, ETC. King, R. L.**—Heteromorphic homologous chromosomes in three species of Pseudotrimerotropis. (Ortho: Acrididae.) **70.** xxxviii, 19-64.

**ARACHNIDA AND MYRIOPODA. Garman, P.**—The occurrence of several new spider mites in Connecticut. Notes on the life history of the spruce mite. (Conn. Agr. Exp. Sta. Bul. 247, 338-42.) **Locket, G. H.**—Mating-habits of Lycosidae. **11,** xii, 493-502. **Savin, W. M.**—Friend spider. (Nature Mag., 1923, 281-88.)

**THE SMALLER ORDERS OF INSECTA. Cutright, C. R.**—Life history of Micromus posticus. **12,** xvi, 448-56. **John, O.**—On a case of probable regeneration of a leg in a thysanopteron. **11,** xii, 532-34.

**Cockerell, T. D. A.**—A new genus of mayflies from the miocene of Florissant, Colorado. **5,** xxx, 170-2.

**ORTHOPTERA. Tietz, H. M.**—The anatomy of the digestive system of the Carolina locust. **7,** xvi, 256-73. **Vignon, P.**—Que faut-il penser du mimetisme? (Rev. Scientifique, Paris, lxi, 515-20.)

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## SPECIAL NOTICES

**Diptera Danica.**—By William Lundbeck, Part VI, Pipunculidae and Phoridae. Although this work treats only of the species occurring in Denmark, it is one of those thorough treatises which should be in the hands of all students of Diptera, especially those interested in the families of which the respective parts treat. It is published in the English language. The part above mentioned contains 447 pages and many illustrations. **Genera Insectorum.**—The recent fascicles of this noted work are noted above under Hymenoptera and Lepi-

doptera, by Emery, Meade-Waldo, and Meyrick. They have the usual proportion of colored plates. **The Hemiptera or Sucking Insects of Connecticut.**—By W. E. Britton, with the collaboration of other specialists. Bulletin No. 34, State of Connecticut Geological and Natural History Survey. Hartford, 1923, 807 pp., 20 pls. This should prove a valuable addition to the library of all students of Hemiptera, especially those interested in the species of this order occurring in the eastern United States. **Macrolepidoptera of the World.**—Fauna americana. Exotica part 304 and 305 of this work have just appeared. Part 304 begins volume 7; Noctuiformes, with the family Agaristidae by M. Draudt, with two colored plates. The same author treats of the hesperidian genera Discophellus to Coccieus in part 305, with two colored plates. **Papers from the Department of Forestry Entomology.**—Tech. Bull. No. 16, N. Y. State College of Forestry at Syracuse University. This number contains papers on Hemiptera and Coleoptera by Osborn, Drake, Mundinger and Blackmen. Reference to these will be found in the above bibliography.

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Twenty-second Report of the State Entomologist of Connecticut for the year 1922, by W. E. Britton, Ph. D.—In this report just issued (October, 1923), Dr. Britton has covered the year's work in his usual interesting and thorough manner. We find articles or notes on all of the more important pests—the gipsy-moth, the brown-tail moth, Oriental peach moth, etc.—as well as accounts of new or little known pests that have appeared on the economic horizon.

Persons who are interested in entomology, but who are not familiar with the reports of the Connecticut State Entomologist, will find it well worth their while to look into these reports at their earliest opportunity.

Dr. Britton's yearly reports are very valuable reference works in our libraries on economic entomology. The material is brought together in comprehensive form, and presented in an orderly manner, with convenient and accurate indices of contents, scientific and common names and valuable statistical matter. Other admirable features of these reports are the numerous original illustrations and the many fine photographs, the separate articles by various members of the entomological staff, and the pages on miscellaneous insects.

Always careful to have identifications of questionable species verified and checked by leading specialists, Dr. Britton's references are absolutely reliable.

While the primary object of these reports is to inform the people of Connecticut concerning the work carried on by the State Entomologist, they are also very useful to every person interested in the study of insects, and could well be followed by others as a guide in the preparation of this type of publication.—A. B. Champlain, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pa.

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(* denotes *new* species, genera or varieties)

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## OBITUARY NOTICES.



## PERSONALS.

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## HEMIPTERA

## HYMENOPTERA



## LEPIDOPTERA

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# EXCHANGES

**This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.**

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

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**Will collect** in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

**I will** collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

**Correspondence** solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

**Wanted**—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

**For Exchange**—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

**Coleoptera** for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

**Endomychidae.** I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

**Buprestidae, Cleridae** and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

**Lepidoptera.** Hesperiidae (Skipper-butterflies). Will purchase, exchange or name specimens. North or South America. Pamphila comma group particularly desired. Henry Skinner and R. C. Williams, Jr., Address Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

**Lepidoptera-Noctuidae.** Will purchase or exchange moths of this family for western lepidoptera. Chas. A. Hill, P. O. Box 653, Glendale, Cal.

**Wanted**—Ants from all portions of the United States for determination or exchange. Will also exchange other insects for ants. M. R. Smith, Assistant Entomologist, State Plant Board, A. and M. College, Miss.

**Wanted** in exchange or cash 1000 Precis orithya ♂, Precis isoeratia ♂, Precis mevaria ♂. A. F. Porter, 104 W. Broadway, Decorah, Iowa.

**Cynipidae.** Galls and bred wasps wanted to determine or in exchange. Alfred C. Kinsey, Indiana University, Bloomington, Indiana.

**Wanted**—Saturnioidea and their living pupae, especially io, luna and Anisota. D. M. Bates, Agric. Exp. Sta., Gainesville, Fla.

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The American Entomological Society has placed in operation a system by which entomologists who are not situated near the larger reference libraries, or who desire to build up special entomological libraries of their own and yet do not care to subscribe to the annual volume of the Society's "Transactions," may secure copies of the papers appearing in the Society's publications promptly after their receipt from the press.

If you are interested and desire to avail yourself of this system, advise us of the order or orders in which you wish to secure publications, together with a remittance of $1.00 or more as a deposit, and all papers on such orders will be mailed to you directly on their receipt from the printer. These will be charged against your amount of deposit at 25 per cent. discount from the list or general sale price. Any balance to your credit is returnable on demand should you not care to continue the subscription.

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From Venezuela:
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From New Guinea
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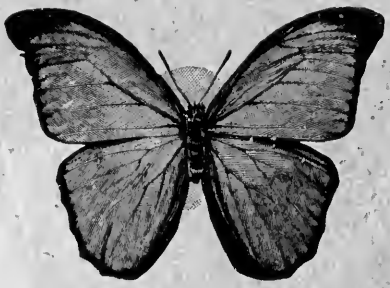

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